Aberdeenshire COUNCIL

RECEIVED
10 DEC 2012

Our ref: BB/APP/2012/2892
Your ref

Marine Scotland
Licensing Operations Team
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

Stephen Archer
Director of Infrastructure Services
Woodhill House
Westburn Road
Aberdeen AB16 5GB
Tel 01467 620981
Fax 01224 662005
www.aberdeenshire.gov.uk
stephen.archer@aberdeenshire.gov.uk
LP-3 Aberdeen 3

Please ask for Stephen Archer
Direct Dial 01224 665520
Email stephen.archer@aberdeenshire.gov.uk

5th December, 2012

Dear Sir/Madam

Proposal: **Notification under S36 Electricity Act 1989 for Applications (3) for Consent Under Section 36 of the Electricity Act 1989 for the construction of an Offshore Generating Station for the Telford, Stevenson & MacColl Offshore Windfarms (Total Capacity 1.5gW) (Total Number of Wind Turbines Not Exceeding 339 with Hub Height Range of 90-118 Metres and Total Height Range of 162-204 Metres) and a Marine Licence Under Part 4, Section 20 of the Marine (Scotland) Act 2010 & Associated Offshore Transmission Infrastructure**

Address: **Telford, Stevenson & MacColl Offshore Wind Farms The Outer Moray Firth**

I write with reference to the above notification. The application was considered by Aberdeenshire Council Infrastructure Services Committee on the 29th November 2012 following consideration by the Banff and Buchan Area Committee.

Aberdeenshire Council request that the following comments are taken into consideration in the determination of the application:

- It was queried what planning gain will be provided as a result of the development.
- Reassurance is provided from the developer that the cables would be buried beneath the sea bed to ensure that the development would not cause any safety issues for ships anchored in Fraserburgh bay.

- The development should not result in the harm or disturbance to marine species, particularly bottlenose dolphins, which is a very important species to the Moray Firth.

Aberdeenshire Council has not take a position in favour of or opposed to the development, but should the turbines be given approval the following should be considered and appropriate conditions attached:

a) Prior to the commencement of development, a programme of archaeological works in accordance with a written scheme of investigation shall be submitted to and agreed by Aberdeenshire Council. Once agreed, these works shall be carried out to the satisfaction of Aberdeenshire Council's Archaeology Service, including any recording and recovery of archaeological resources.

   Reason: To safeguard and record the archaeological potential of the onshore and offshore areas.

b) Prior to the commencement of any works on site a project specific method statement setting out how the risks of introducing marine non-native species into the site shall be avoided during the construction, operation and decommissioning phases of the project and that the measures identified in this method statement shall be employed throughout the life of this project as set out in the method statement.

   Reason: In the interests of protecting the water environment from the impacts on non native species.

c) Prior to the commencement of development, a site specific Construction Environmental Management Document (CEMD) must be submitted at least 2 months prior to commencement of any works for the written approval of the Planning Authority [in consultation with SEPA] [and other agencies such as SNH as appropriate] and all work shall be carried out in accordance with the approved CEMD.

   Reason: In the interests of pollution prevention and protection of amenity.

d) The seaward exit point of the horizontal directional drilling (HDD) will be located as far offshore as practicable towards the depth of closure; the landward exit point of the HDD will be located onshore of the high-water mark, which may move landward due to coastal retreat; and the cables will be suitably buried between the seaward exit of the HDD and the depth of closure (the depth of water beyond which annually significant wave events will cease to contribute to beach sediment supply and morphological processes).

   Reason In the interests of minimising impact on the water and natural environment.

Aberdeenshire COUNCIL

The points listed above are those agreed by the Council's Infrastructure Services Committee of 29 November 2012 and represent the list of issues which the Council consider Marine Scotland should take into account in reaching a decision.

[redacted]

Stephen Archer
Director of Infrastructure Services

Association of Salmon Fishery Boards

Response to the marine licence application for the MORL Offshore Wind Farm project November 2012

Introduction

The Association of Salmon Fishery Boards is the representative body for Scotland's 41 District Salmon Fishery Boards (DSFBs) including the River Tweed Commission (RTC), which have a statutory responsibility to protect and improve salmon and sea trout fisheries. The Association and Boards work to create the environment in which sustainable fisheries for salmon and sea trout can be enjoyed. Conservation of fish stocks, and the habitats on which they depend, is essential and many DSFB's operate riparian habitat enhancement schemes and have voluntarily adopted 'catch and release' practices, which in some cases are made mandatory by the introduction of Salmon Conservation Regulations. ASFB creates policies that seek where possible to protect wider biodiversity and our environment as well as enhancing the economic benefits for our rural economy that result from angling. An analysis completed in 2004 demonstrated that freshwater angling in Scotland results in the Scottish economy producing over £100 million worth of annual output, which supports around 2,800 jobs and generates nearly £50million in wages and self-employment into Scottish households, most of which are in rural areas.

We have significant concerns relating to the proposed development, particularly with regard to the uncertainty surrounding the potential negative effects on Atlantic salmon and sea trout and the integrity of a number of Special Areas of Conservation for Atlantic salmon.

As stated above, DSFBs have a statutory duty to protect and improve salmon and sea trout *fisheries.* All salmon fishing rights in Scotland (freshwater and marine) are private heritable titles. As the environmental effects of offshore technologies are uncertain, we would expect that developers should be required to remedy any negative consequences of such developments on the heritable assets and the value of those assets (including employment within the fishery) of all fishery proprietors. We therefore believe that, as a condition of consent (should such consent be granted), there should be a requirement for a formal mitigation agreement between the developer and relevant DSFBs.

Overarching Comments

1. Designated Species

As highlighted in the Environmental Statement a number of rivers in the area are designated as Special Areas of Conservation (SAC), part of the Natura 2000 network – a series of internationally important wildlife sites throughout the European Union. The conservation objectives for these sites are set out below[1].

> *To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and*
>
> *To ensure for the qualifying species that the following are maintained in the long term:*
>
> - *Population of the species, including range of genetic types for salmon, as a viable component of the site*
> - *Distribution of the species within site*
> - *Distribution and extent of habitats supporting the species*
> - *Structure, function and supporting processes of habitats supporting the species*
> - *No significant disturbance of the species*
> - *Distribution and viability of freshwater pearl mussel host species*

[1] http://gateway.snh.gov.uk/sitelink/index.jsp

- *Structure, function and supporting processes of habitats*

The Habitats Directive (article 6) requires that *Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive.*

It also states: *In the light of the conclusions of the [appropriate] assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public*.

If this is not the case and there are no alternative solutions, the proposal can only be allowed to proceed if there are imperative reasons of overriding public interest.

The conservation status of the Atlantic salmon qualifying interest for the various SACs (First Assessment Cycle) are set out in Table 1 below. In addition, a number of these SACs are also designated for FW pearl mussel.

SAC	Qualifying Interest	Conservation Status
River Borgie	Atlantic salmon	unfavourable recovering
River Naver	Atlantic salmon	unfavourable recovering
River Thurso	Atlantic salmon	unfavourable recovering
Berriedale & Langwell Waters	Atlantic salmon	unfavourable recovering
River Oykel	Atlantic salmon	unfavourable recovering
River Moriston	Atlantic salmon	unfavourable recovering
River Spey	Atlantic salmon	unfavourable recovering
River Dee	Atlantic salmon	favourable maintained

Table 1*: Conservation status of SACs for Atlantic salmon in the area of the development.*

In all cases, the Salmon rod catch trends in these SACs as analysed by Marine Scotland Science, show that the spring stock component is in decline. The second assessment cycle is nearing completion, and the results of this assessment must be taken into account in the licensing decision. We believe that the assessment is likely to show that the early running spring component of many of these Atlantic salmon populations continues to deteriorate.

In addition, District Salmon Fishery Boards have a statutory obligation to protect sea trout. The marine phases of both Atlantic salmon and sea trout have also been included on the draft list of Priority Marine Features drawn together by SNH - the habitats and species of *greatest conservation importance* in inshore waters.

2. Climate Change Mitigation and Adaptation

As for many other species, climate change has been identified as a threat to Atlantic salmon. The species' developmental rate is directly related to water temperature, and increasing temperature in freshwater may result in smolts developing more rapidly and entering the ocean at a suboptimal time in relation to their planktonic food sources.

In addition, as air temperatures warm, much of the snow that feeds the river systems is expected to melt earlier. This will lead to a reduction in the flow of many rivers in the spring and summer, which will increase water temperatures further and may reduce the overall optimal habitat available to the Atlantic salmon. It is also clear that survival of salmon and sea trout during their marine migration phase has fallen over the last 40 years. Some of this reduced survival can be explained by changes in sea surface temperature and subsequent contraction of feeding grounds.

The first priority in mitigating these effects is to control atmospheric concentrations of greenhouse gases and we note that the Scottish Government has committed to meeting a stated target of 50% of Scotland's electricity

demand from renewable sources by 2015. However, with further climate change inevitable in the short to medium term, attention is now focusing on the development of accommodation and adaptation strategies, through which adverse effects on species or ecosystems can be minimized. Some of the key needs with respect to developing adaptation strategies for rivers and their biodiversity were summarised by Ormerod (2009 – *Aquatic Conserv: Mar. Freshw. Ecosyst.* 19: 609–613).We would highlight the following key point in particular: *to minimize the adverse effects on river biodiversity of actions taken to mitigate climate change*.

3. Potential Negative Effects of Offshore Renewable Devices

Offshore renewable developments have the potential to directly and indirectly impact anadromous fish such as Atlantic salmon and sea trout. We would therefore expect developers to assess the potential impacts of deployed devices on such fish during the deployment, operation and decommissioning phases. Such potential impacts have been highlighted by Marine Scotland Science and could include:

- Avoidance (including exclusion from particular rivers and subsequent impacts on local populations);
- Disorientation effects that could potentially affect behaviour, susceptibility to predation or by-catch; and
- Impaired ability to locate normal feeding grounds or river of origin; and delayed migration

ASFB therefore recommend to our members that careful consideration should be given to the following activities:

i. *Subsea noise during construction*
A recent review commissioned by SNH[2] states that 'Marine renewable energy devices that require pile driving during construction appear to be the most relevant to consider, in addition to the time scale over which pile driving is carried out, for the species under investigation'.

ii. *Subsea noise during operation*

iii. *Electromagnetic fields (EMFs) arising from cabling*
The SNH-commissioned review (cited above) has shown that EMFs from subsea cables have the potential to interact with European eels and possibly salmonids if their migration or movement routes take them over the cables, particularly in shallow waters (<20m). Marine Scotland Science are currently undertaking a research programme which aims to investigate electro-magnetic force impacts on salmonids. We would hope to have some results from this work later in 2012. It is vital that all cables are appropriately shielded to ensure that EMF effects are below any threshold of effect for salmonids.

iv. *EMFs arising from operation of devices*
It is important to ensure that such effects are quantified and assessed in the Environmental Statement.

v. *Disturbance or degradation of the benthic environment (including secondary effects on prey species)*
It is important to ensure that such effects are quantified and assessed in the Environmental Statement.

vi. *Aggregation effects*
Whilst the aggregation of prey items around physical structures might be seen as a positive effect, possible negative effects might include the associated aggregation of predators.

4. General Comments on the Application

Guidance issued by Marine Scotland Science relating to information requirements on diadromous fish of freshwater fisheries interest states that an Environmental Statement should provide information on the use of the development area by such fish and that if such information was lacking then a suitable monitoring strategy should be devised. Indeed, Marine Scotland Science regard the monitoring undertaken at existing offshore developments such as Robin Rigg as being inadequate. Whilst the developers propose to develop a monitoring

[2] Literature review on the potential effects of electromagnetic fields and subsea noise from marine renewable energy developments on Atlantic salmon, sea trout and European eel. Available at: http://www.asfb.org.uk/wp-content/uploads/2011/06/SNH-EMF-Report1.pdf

strategy, no substantive details of the strategy are given and we are particularly concerned at the suggestion that 'surrogate monitoring techniques' are to be proposed, including the monitoring of sand eel populations. Whilst we believe that monitoring of sandeel populations (a key food source for wild salmonids) does have merit, we do not believe that this is a suitable alternative for monitoring population of salmon or sea trout. We believe that the lack of meaningful monitoring in the present proposal is extremely disappointing and completely inadequate. We would emphasise that any monitoring strategies must include pre-construction monitoring in order that baseline information on salmon and sea trout movement, abundance, swimming depth, feeding behaviour etc. can be collected.

As with other applications for offshore renewable energy, the Rochdale Envelope approach is set out in the application. It must be emphasised that this approach makes it extremely difficult for stakeholders to assess the potential environmental risk as there is little detailed information on: the likely size of the scheme; the type of devices to be deployed; and the degree of confidence attached to the assessment of impacts. Our comments must therefore be viewed on that basis.

Specific comments

Suspended Sediments

The effects of increased suspended sediment concentrations outlined in the ES appear to be based on a single study by Bertwell (1999) which only assesses the effects of sediment on fish in freshwater. We are unclear of the relevance of this study to the effect of sediments in the marine environment.

In the case of migratory species, assuming fish are migrating through the site, increased SSC may result in localised disturbance to migration. The ES appears to assume that delays in migration, forced movement from preferred migration pathways, disorientation, potential increases in stress etc. as a result of this localised disturbance do not influence ultimate survival and fitness rates particularly as an individual fish may experience such disturbance at several locations within the development area thus leading to cumulative effects. Such delays could, for example, make smolts more susceptible to predation. It must also be noted that salmonid smolts are physiologically stressed in adapting to the environmental challenge of movement between freshwater and seawater. Simultaneous challenge from noise, EMFs etc. during this transition will constitute a significant additional stressor. Stress leads to increased plasma levels of the stress hormone cortisol. Corticosteroids cause a range of secondary effects, including hydromineral imbalance and changes in intermediary metabolism (Wendelaar Bonga, 1997)[3]. In addition, tertiary responses extend to a reduction in the immune response and reduced capacity to tolerate subsequent or additional stressors (Wendelaar Bonga, 1997).

Given the risks associated with the increased sediment concentrations it is suggested that sensitive operations should be avoided during the annual smolt migration period. This would have the additional benefit of avoiding the migration period of returning early-running adult salmon which themselves have high economic and ecological value.

Electromagentic fields

We are aware that Marine Scotland Science are currently undertaking a research programme which aims to investigate electro-magnetic force impacts on salmonids. Until this work is completed, we are unable to assess the relative magnitude of this impact, or relate any potential EMFs arising from the proposed development to those magnetic fields likely to initiate a behavioural response in salmonids. Having for responded to a number of proposed offshore windfarms it is clear that there is not a consensus between developers as to the appropriate depth to which cables should be buried. We believe that burial depth of cables should be based on research, but in the absence of definitive data we believe that **all** cables should be buried to a **minimum** depth of 1.5m, for **all** offshore renewable developments. Where cable burial is not possible due to hard substrates etc. we believe that all cables should be shielded to an equivalent depth by placing a suitable substrate on top of the cable or by some other means.

[3] Wendelaar Bonga, S. E. (1997). The stress response in fish. *Physiol.l Rev.* 77, 591-625.

Paragraph 7.2.5.91 states that salmon and sea trout transiting the area of the wind farm will for the most part not be exposed to the strongest EMFs are they normally swim in the upper meters of the water column during migration. We also note that the SALSEA project has shown that Atlantic salmon are capable of diving to considerable depths. The ES suggests that migration and feeding are mutually exclusive activities for salmon, a suggestion that is contradicted on page 10 of the 16B Annex of the ES which states: Malcolm et al (2010) concluded based on research undertaken to date (Jakupsstovu, 1986; Holm et al, 2005; Starlaugsson, 1995) that in general terms salmon spend most of the time close to the surface although dives to greater depths of up to 280m have often been observed. Dives do not appear restricted to offshore areas, persisting late into the migration on the return to home waters. Early studies (Jakupsstovu, 1986) suggest an association between diving and feeding.

The ES does not take into account the foraging behaviour of sea trout, which we (and the developers) assume use the area in question. No information is presented as to the depths at which such fish forage. Sea trout are also more likely to be benthic feeders. Pemberton (1976) suggested a diel feeding pattern, with bottom feeding being greatest during the day and mid-water and surface feeding increasing between sunset and sunrise.

Noise

As detailed in the Environmental Statement, the assessment of noise impacts carries high uncertainty. It must be recognised that the significance of behavioural avoidance is dependent on the behaviour disrupted. For example, avoidance may be significant if it causes a migratory species to be held up or prevented from reaching areas of biological importance, e.g., spawning and feeding areas. We believe that the predicted area which salmon would avoid is significant and has the potential to at least delay smolt migration. As no information is available on smolt migration routes, we must assume that such a delay could, for example, make smolts more susceptible to predation. It must also be noted that salmonid smolts are physiologically stressed in adapting to the environmental challenge of movement between freshwater and seawater. Simultaneous challenge from noise, EMFs etc. during this transition will constitute a significant additional stressor. Stress leads to increased plasma levels of the stress hormone cortisol. Corticosteroids cause a range of secondary effects, including hydromineral imbalance and changes in intermediary metabolism (Wendelaar Bonga, 1997)[4]. In addition, tertiary responses extend to a reduction in the immune response and reduced capacity to tolerate subsequent or additional stressors (Wendelaar Bonga, 1997).

The ES operates under the assumption that Atlantic salmon and sea trout are present in the development area. However, the zones of avoidance set out do not appear to be related to the swimming speeds of fish (at different life stages), in order to assess the possibility of such fish swimming out of the zone of effect. We welcome the fact that piling operations will be intermittent. We also welcome reference to soft start piling which we believe will be necessary to ensure that Atlantic salmon and sea trout, of all life stages, can safely avoid traumatic hearing damage. However, no detail is given as to the duration of such soft start piling, and such duration must be appropriate to the swimming speeds of the species in question, to allow that species time to move out of the zone of effect. Should the development be granted consent, we believe that an appropriate duration of soft start piling, related to the swimming speed of juvenile salmon and sea trout, should be a condition of consent.

However, given the paucity of information on noise effects, we do not believe that soft piling alone is an appropriate mitigation. The ES sets out a number of options for turbine design (including gravity bases) of which the worst case scenario for noise is impact piling of pin piles. We believe that, given the sensitivity of early running returning spring salmon, and the uncertainty of effects on juvenile fish, that it is appropriate, should consent be granted for the development, that a condition of consent is that no impact pilling occurs during the period from March to June (inclusive). Such a condition is consistent with the precautionary principle and would still allow other forms of construction to continue during this period.

During pre-application discussions with the developers we have continually stressed the need for information on migratory routes and habitat usage for migratory salmonids. In the absence of such data (and the ES simply assumes that they are present), ASFB and DSFBs, in assessing the risks of the development to migratory fish, have no alternative but to assume that the entire run of each river will use the area under development. We note that

[4] Wendelaar Bonga, S. E. (1997). The stress response in fish. *Physiol.l Rev.* 77, 591-625.

Marine Scotland Science have previously commented that '*it needs to be categorically established which species are present on the site, and where, before the application is considered for consent*'.

Introduction of New Substrates
We are concerned that the potential for the structures to act as fish aggregation devices (FADs) could potentially be negative in the case of wild salmonids. However, if the structures do act as FADs we would be concerned that such areas may in fact represent new 'pinch points' for predation of migrating smolts and returning adults. This possibility does not appear to be considered in the application.

Monitoring and mitigation measures
As stated above, we are disappointed at the lack of salmonid-specific monitoring. We are keen to work with the developers and Marine Scotland to identify appropriate monitoring programmes. We would emphasise that any monitoring strategies must include pre-construction monitoring in order that baseline information on salmon and sea trout movement, abundance, swimming depth, feeding behaviour etc. can be collected.

We are very disappointed to see that no mitigation measures are proposed other than inter-array cable burial/protection, to reduce the effects associated with the construction/decommissioning and operation phase of the development. We believe that ***all*** inter-array cabling should be buried to a minimum depth of 1.5m or have a suitable shielding material placed over them. We do not believe that there should be any exceptions to this, irrespective of the technical difficulties involved. In addition, we would highlight our comments regarding mitigation with regard to impact driving during the spring. We note that reference is made to mitigation measures to minimise and mitigate noise produced during potential piling operations (such as large or small bubble curtains or sound-absorbing sleeves), but no attempt is made to quantify the effect of such mitigation measures.

Conclusion
As stated above, ASFB recognises the importance of offshore renewable energy. However, the environmental statement has failed to demonstrate that the development will not adversely affect the integrity of the SAC rivers around the Moray Firth. Where a Natura site is involved, the onus is on the developer to demonstrate no impact and in the absence of that the precautionary principle will apply. Under these circumstances, we do not consider that the proposed development is compatible with the requirements of the Habitats Directive or Scotland's Marine Nature Conservation Strategy. On that basis, we have no alternative but to formally object to the proposed development, until adequate monitoring and mitigation strategies have been put in place.

It should be emphasised that we have no wish to prevent or delay the proposed development unnecessarily and we remain keen to work constructively with the developers and Marine Scotland to identify appropriate monitoring programmes which will allow us to be able to assess the acknowledged risks of this development, and other proposed developments more appropriately. We stated in our introduction that we believe that a formal mitigation agreement should be a condition of consent. In addition, there is a clear and urgent need to fund, plan and start strategic research on the movement, abundance, swimming depth, feeding behaviour etc. of salmon and sea trout. Such research would clearly feed into the potential mitigation measures that might be deemed appropriate, and the conditions under which such mitigation should be enacted. One aspect that should be considered immediately is the installation of fish counters, particularly in SAC rivers, to allow the real time understanding of adult salmon abundance (and depending on local conditions, new technology might even allow information on smolt escapement to be collected). We believe that the installation of such counters, in close liaison with the DSFBs in question and MSS, could potentially be considered as a condition of consent, where appropriate to local conditions, should such consent ultimately be granted. Developers should be encouraged to work together to fund such strategic monitoring, including the on-going costs of operating such counters, in order to allow more certainty for all involved.

The scale of proposed offshore wind developments and other technical approaches to marine renewables development represents a step-change in the exposure of marine animals of high cultural and economic significance to attendant risks. In many cases, understanding of the risks is insufficient to support proposals for mitigation even at this late stage when substantial developments are being submitted for licensing. The cumulative impact of the MORL proposal alongside those developments already submitted or likely to follow in

the near future is potentially even greater. We would therefore recommend that an expert group is set up to rapidly consider the best way forward to plug the considerable knowledge gaps that remain. It is important that the best scientific and biological talent is made available to find practicable ways to address the unresolved issues. ASFB would be very keen to constructively engage with such a group.

For further information please contact:

Alan Wells | Policy & Planning Director
Tel: 0131 272 2797 | Email: alan@asfb.org.uk

Beatrice
Offshore Windfarm Ltd

Beatrice Offshore Windfarm Ltd
One Waterloo Street
Glasgow
G2 6AY

Mr David O'Sullivan
Marine Scotland Licensing Operations Team
Marine Scotland
Marine Laboratory
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

31st October 2012

Dear David,

Moray Offshore Renewables Limited (MORL) Application

- **Telford, Stevenson and MacColl Wind Farms Applications for Section 36 Consents and Marine Licences;**
- **Offshore Transmission Infrastructure Application for Marine Licence.**

Beatrice Offshore Windfarm Limited (BOWL) welcomes the opportunity to comment on the Moray Offshore Renewables Limited (MORL) application. BOWL is supportive of the MORL proposal, with both projects having engaged extensively with each other over the last 2-3 years.

BOWL submitted a planning application in April 2012 and is currently going through the consenting process. As was noted in MORL's response to BOWL's application we would like to highlight that there are some differences in the cumulative assessment conclusions.

At the time of BOWL's completion of the impact assessments within our Environmental Statement (ES), BOWL was working with Rochdale Envelope (RE) information supplied by MORL that has since been updated in the MORL application. MORL was therefore able to undertake cumulative assessment based on the most up to date BOWL and MORL REs, whereas BOWL was not in a position to do this.

The differences in the parameters used in the cumulative assessments along with any differences in assessment approaches may contribute to variations in assessment outputs such as likely significant effects of the projects.

BOWL and MORL will continue to work closely together and ensure appropriate collaboration as the projects progress towards achieving a planning consent. We will continue our consultation with Marine Scotland and any other relevant stakeholders as required, and trust you will take into account the rationale for discrepancies during this determination period.

Yours sincerely,

[redacted]

Colin Palmer
BOWL Project Manager

Tel: 0141 224 7103
Email: colin.palmer@sserenewables.com

Ford A (Alexander)

From: dale.aitkenhead@bt.com
Sent: 04 September 2012 08:47
To: MS Marine Licensing
Subject: Ref 011/OW/MORLE-8

Dear Sir/Madam

Your Ref 011/OW/MORLE-8

NIL Return from BT Radio Network Protection

Regards

Dale Aitkenhead
BTO Service Delivery -Operations Control TM, Radio Frequency Allocation & Network Protection
pp 4AA CTE, Newcastle Central Tel Exch (TEL-NE), Carliol Square, Newcastle upon Tyne. NE1 1BB. Tel: 0191 2696372 Fax: 0191 261 6458 e-mail: dale.aitkenhead@bt.com

Let us know how we're doing here in SD Oerations Control... Please take our 30sec Mini-Survey below

BT Internal Customers... http://formwize.intra.bt.com/run/survey3.cfm?ID=79809

External Customers…… http://formwize.intra.bt.com/run/survey3.cfm?ID=80046

Ford A (Alexander)

From: Windfarms <Windfarms@caa.co.uk>
Sent: 29 August 2012 14:08
To: MS Marine Licensing
Subject: Application for consent to construct and operate three offshore wind farms in the outer Moray Firth

Dear Sir/Madam,

Having reviewed the Environmental Statement provided, the appropriate aviation consultees (NATS/NERL, HIAL/Wick Airport, the Offshore Helicopter Operators and MOD/DIO) have been consulted. I would also like to draw your attention to the following Documents:

http://www.caa.co.uk/docs/33/CAP437RFS.pdf - Standards for Offshore Helicopter Landing Areas.

http://www.caa.co.uk/docs/33/DAP_LightingOffshoreWindTurbines.pdf - Policy Statement: The Lighting of Wind Turbine Generators in United Kingdom Territorial Waters.

http://www.caa.co.uk/docs/33/20120427PolicyStatementFailureofOffshoreAviationLighting.pdf - Policy Statement: Guidance on Actions in the Event of the Failure of Aviation Warning Lights on Offshore Wind Turbines Listed in the UK Aeronautical Information Publication.

Please be aware that the Policy Statement - The Lighting of Wind Turbine Generators in United Kingdom Territorial Waters contains some information that has been superseded by edition 7 of CAP437. The Policy Statement will be re-issued in due course to reflect this correction as well as to reflect guidance regarding the potential use of flashing red Morse Code Letter 'W' aviation warning lighting to resolve potential issues for the maritime community.

In addition to the above lighting requirements there is also a requirement, as already identified within the ES, to ensure that positions and maximum heights of wind turbines, meteorological masts and construction equipment are provided to the UK Hydrographic Office for maritime charting and subsequent forwarding to the Defence Geographic Centre for aviation charting purposes.

Should you have any further questions please feel free to contact me, details below.

Yours Faithfully

Neal Henley

N R HENLEY
Squadron Leader (RAF)

Surveillance and Spectrum Management
Directorate of Airspace Policy
Civil Aviation Authority
45-59 Kingsway London WC2B 6TE
Tel: 020 7453 6534 Fax: 020 7453 6565
windfarms@caa.co.uk

****

associated attachment(s) and inform the sender. It should not be copied, disclosed to, retained or used by, any other party.
Thank you.

Please note that all e-mail messages sent to the Civil Aviation Authority are subject to monitoring / interception for lawful business

****

********** **********

****

Cromarty Firth Port Authority

RECEIVED
04 OCT 2012

Ref: KG/em/016

2 October 2012

Mr. Alexander Ford
Marine Scotland
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

Dear Alexander

Electricity Act 1989 – Moray Offshore Renewables Limited

Thank you for including the Cromarty Firth Port Authority on the list of consultees for this application. We have no comment to make on the application as published.

Yours

Captain Ken Gray
Chief Executive/Harbour Master

Port Office, Shore Road, Invergordon, Ross-shire, IV18 0HD, Scotland
Tel: Invergordon (01349) 852308 Fax: (01349) 853181
E-mail: cfpa@cfpa.co.uk
Website: www.cfpa.co.uk

Delivering for Britain

The Chamber of Shipping
30 Park Street
London SE1 9EQ
Direct dial: +44 (0)20 7417 2888
Fax: +44 (0)20 7600 1534
Email: richard.nevinson@british-shipping.org
Internet: www.british-shipping.org

Marine Licensing Team
Marine Scotland
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

9 October 2012

Dear Sir/Madam,

RE: Moray Offshore Renewables Ltd Application Documents (011/OW/MORLE – 8)

The Chamber of Shipping welcomes the opportunity to comment on the application by Moray Offshore Renewables Ltd (MORL) to construct and operate three offshore wind farms in the outer Moray Firth. We can confirm that MORL has consulted with the Chamber throughout the pre-application stage and has generally acted on our advice.

We have no major outstanding concerns regarding the proposals, but wish to highlight the following issues for consideration during the determination of the licensing decision:

1. We request that MORL conducts post-consent consultation with navigational stakeholders, including the Maritime and Coastguard Agency (MCA), Northern Lighthouse Board (NLB) and Chamber, on final turbine layouts for each of the three sites. The three proposed layout options present varying levels of navigational risk and, while we acknowledge that final layouts cannot be determined at this stage, it will be essential to outline layouts that offer the best levels of navigational risk mitigation. Layout 1, for example, illustrated in Figure 3.2 of Appendix 5.2, may create increased navigational risk due to the undeveloped area to the east and north-east of the MacColl wind farm. This area would remain navigable but, due to its shape, could create a number of 'blind spots', thus increasing collision risk, particularly at times of reduced visibility.

   We also share concerns voiced by other stakeholders that different turbine sizes may be used in each of the three wind farm sites, reducing the possibility of achieving uniformity of spacing between turbines. This could increase risk for smaller recreational and fishing vessels that may enter the sites. MORL should work closely with Beatrice Offshore Wind Ltd (BOWL) to ensure as much uniformity of layout as possible between the Moray and Beatrice wind farms. We would prefer to see a standard 'grid' layout for

The Chamber of Shipping Limited
Registered office as above
Registered in England no. 2107383

each project, utilising as much of the site as possible, as navigational risk assessment has primarily been based on the outlined boundaries.

2. The projected deviation of the route between the Moray Firth and northern Norway/Russia (illustrated in Figure 9.2 of Appendix 5.2) may need to be reassessed given the location of the Beatrice wind farm site. Although the revised route adjustment may be minor, we feel that any projected route deviations should take the cumulative impacts of nearby developments (in this case Beatrice) into account.

3. We are satisfied that sufficient clearance between the eastern site boundaries and the main Pentland Firth route to the north-east will be achieved.

4. The decision not to develop the west of the zone alleviates the impact on shipping and navigation in the region, particularly with regard to vessels engaged in activity related to the nearby Beatrice and Jacky oil fields. This decision had significantly reduced navigational safety concerns regarding the proposed wind farms.

5. We are pleased to note that marking and lighting are to be agreed with the NLB, in line with IALA requirements. As noted above, NLB guidance on preferred turbines layouts should also be sought.

6. Removal of floating foundation options from the project envelope has alleviated the Chamber's concerns regarding the unique safety challenges presented by these technologies.

7. We require clarification regarding the likelihood of future applications for operational safety zones, including information on the proposed size of these zones. A number of options designed to reduce the negative navigational impacts of operational safety zones have recently been tabled at meetings of the Department for Transport (DfT) chaired Nautical and Offshore Renewable Energy Liaison (NOREL) group. MCA guidance should be sought on this issue.

As noted above, we have no major outstanding concerns and, therefore, have no objections to the proposals. However, we request that the above points are considered fully by MORL and Marine Scotland. Should you require clarification of any of the Chamber's comments, please do not hesitate to contact me.

Yours faithfully,

Richard Nevinson
Policy Advisor, Safety & Environment
The Chamber of Shipping

Ford A (Alexander)

From: Anne Phillips <APhillips@hial.co.uk>
Sent: 09 October 2012 13:16
To: MS Marine Licensing
Subject: Ref: 011/OW/MORLE-8 - Three consents & three marine licences to Construct & Operate three offshore wind farms etc in the Outer Moray Firth

Your Ref: 011/OW/MORLE-8
HIAL Ref: 2012/0359/INV

Dear Sir/Madam,

PROPOSAL: **Three Consents under section 36 of the Electricity Act 1989 & three marine licences under Part 4 of the Marine and Coastal Access Act 2009 to Construct & Operate three offshore wind farms etc**
LOCATION: **Outer Moray Firth**

With reference to the above, our calculations show that, at the given positions and heights, these developments would not infringe the safeguarding surfaces for **Inverness or Wick Airports.**

However, the turbines could possibly affect the performance of electronic aeronautical systems and the instrument approach procedures for these airports.
HIAL would not wish to see a degradation of any of these services, particularly the Radar installation at Inverness Airport.

It is recognised that the project has a high positive profile with the public, and within the Scottish Government, with substantial potential benefits to the economy.

HIAL are fully aware of the need to meet, and reach agreement, with the developer to gain assurance that the electronic systems and approach procedures would not be degraded.

Due to the height and positions, red aviation warning lights may be required to be fitted at the hub height of some of the turbines.

As a minimum the Civil Aviation Authority (CAA) recommend that all proposed developments over 90m in height should be notified to the CAA through:

Off Route Airspace 5
Directorate of Airspace Policy
Civil Aviation Authority
CAA House
45-59 Kingsway
London WC2B 6TE
Email marks.smailes@caa.co.uk

Provided that these conditions are met Highlands and Islands Airports Limited are unlikely to object to these developments.

Regards

Anne Phillips
Operations Manager

Highlands and Islands Airports Limited
Head Office, Inverness Airport, Inverness IV2 7JB
☏ 01667 464244 (DIRECT DIAL)
✉ safeguarding@hial.co.uk 🌎 www.hial.co.uk

The Highland Council
Comhairle na Gàidhealtachd

Alexander Ford
Marine Scotland Licensing Operations Team
Scottish Government
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

e-mail: david.mudie@highland.gov.uk
Direct dial: (01463) 702255
Our Ref: 12/03359 - 61/s36
Your Ref: 011/OW/MORLE-8
Date: 22 March 2013

Dear Andrew

ELECTRICITY ACT 1989
The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000
The Electricity Works (Applications for Consent) Regulations 1990

MARINE (SCOTLAND) ACT 2010
MARINE AND COASTAL ACCESS ACT 2009
The Marine Works (Environmental Impact Assessment) Regulations 2007

APPLICATION FOR:

- **THREE CONSENTS UNDER S36 OF THE ELECTRICITY ACT 1989 AND THREE MARINE LICENCES UNDER PART 4 OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT AND OPERATE THREE PFFSHORE WIND FARMS IN THE OUTER MORAY FIRTH, AND**
- **ONE MARINE LICENCE UNDER SECTION 20 OF THE MARINE (SCOTLAND) ACT 2010 AND UNDER SECTIONS 65 AND 66 OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT THE ASSCOICATED OFFSHORE TRANSMISSION WORKS IN THE OUTER MORAY FIRTH**

Thank you for your consultation of 28 August 2012 in respect of the above and for allowing the extension of time to respond.

At its meeting on 19 March 2013, following considerable debate on matters relating to the residual visual impact of the proposal as well as the potential economic benefits to Highland, the Council's North Planning Applications Committee decided that it wished to Raise No Objection to the proposals subject to the following:

1. No development shall commence on any Phase until the Council has been consulted, and given its considered opinion, on the design and layout options for that Phase having taken into consideration the design and layout of the neighbouring Phases and/or Beatrice wind farm.

2. No development shall commence on any Phase until the Council has been consulted, and given its considered opinion, on the lighting requirements for the chosen design and layout options for that Phase having taken into consideration the design and layout of the neighbouring Phases and/or Beatrice wind farm.

3. No development shall commence on any Phase until a TV and radio reception mitigation plan has been submitted to, and approved in writing by, the Planning Authority. The plan shall provide for a baseline TV reception survey to be carried out prior to the commencement of turbine installation, the results of which shall be submitted to the Planning Authority. Within 12 months of the Final Commissioning of the development on each Phase, any claim by any individual person regarding TV picture loss or interference at their house, business premises or other building, shall be investigated by a qualified engineer appointed by the developer and the results shall be submitted to the Planning Authority. Should any impairment to the TV signal be attributable to any development Phase, the developer shall remedy such impairment so that the standard of reception at the affected property is equivalent to the baseline TV reception.

4. The applicant shall maximise the amount of GVA in terms of employment and associated economic activities that comes to the Highlands, as a result of the construction phase of the project.

5. The applicant shall continue dialogue with the Highland's renewable energy supply chain and its ports and harbours, including Wick as a potential operation and maintenance facility.

6. The applicant shall continue to work with the relevant public and private sector bodies in the Highlands to ensure that the area achieves maximum socio-economic returns from the development.

7. The applicant shall continue to examine the potential for a turbine manufacturer to locate in the Highlands.

8. The applicant pursues opportunities for a visitor centre within Caithness and/or visitor interpretation facilities along the East Caithness/ Sutherland coastal route.

9. The applicant ensures that the liaison group to be established by way of mitigation with the fishing industry shall specifically include representatives of the Highland fishing community.

Full details of the Report to Committee can be obtained from our website at http://www.highland.gov.uk/yourcouncil/committees/npac-comms/2013-03-19-npac-ag.htm. Minutes once available can be found at http://www.highland.gov.uk/yourcouncil/committees/npac-comms/

Should you require further advice or clarification please do not hesitate to contact me.

Yours sincerely

[redacted]

David Mudie
Team Leader – Development Management
Planning and Development Service

HISTORIC SCOTLAND
ALBA AOSMHOR

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Direct Line: 0131 668 8730
Direct Fax: 0131 668 8722
Switchboard: 0131 668 8600
Robin.Campbell@scotland.gsi.gov.uk

Mr Alexander Ford
Marine Scotland
Scottish Government
Marine Laboratory
375 Victoria Road
ABERDEEN
AB11 9DB

Our ref: AMN/16/H
Our Case ID: 201203479
Your ref: 011/OW/MORLE-8

19 October 2012

Dear Mr Ford

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000
The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)
Application for consent to construct and operate three offshore wind farms in the Outer Moray Firth (Telford, Stevenson and MacColl Offshore Wind Farms) and associated Offshore Transmission Infrastructure
Environmental Statement

Thank you for your letter and the accompanying Environmental Statement (ES) requesting comments on the above. For information, this letter covers our comments on the ES for our role as consultees through the Scottish Ministers under the terms of the above Regulations. The comments in this letter relate to our statutory remit for scheduled monuments and their settings, category A listed buildings and their settings, gardens and designed landscapes appearing in the Inventory, Inventory Battlefields and designated wreck sites (Protection of Wrecks Act 1973). In this case, our advice also includes matters relating to marine archaeology out with the scope of the terrestrial planning system.

The Proposed Development
I understand the proposed development consists of three offshore wind farms and Offshore Transmission Infrastructure (OfTI) in the Outer Moray Firth. The three wind farms are to be located on the Smith Bank, approximately 22 km (12 nm) from the Caithness coastline. The OfTI will connect the three proposed wind farms to the export cable landfall point at Fraserburgh Beach.

The application consists of the following:

- Telford Offshore Wind Farm: 139 wind turbines;
- Stevenson Offshore Wind Farm: 100 wind turbines;
- MacColl Offshore Wind Farm: 100 wind turbines.

I understand the maximum turbine blade tip height would be 204m above LAT (lowest astronomical tide) and that there would be between 3 – 6 alternating current offshore substation platforms required to collect the power generated from the three wind farms. The platforms would measure 100m x 100m and approx 70m above LAT. The proposal also includes a subsea export cable to the landfall site.

I understand an application for the Onshore Transmission Infrastructure (OnTI) (connecting the three proposed wind farms from the cable landfall point at Fraserburgh Beach to the onshore substation(s) in the vicinity of Peterhead will be submitted at a later date.

Terrestrial Assets
The ES predicts the impact of the proposed wind farms on the setting of terrestrial assets to be of no significance or no effect. As such, no mitigation measures are proposed in relation to setting impacts. The impacts of the offshore substation platforms on terrestrial assets is predicted to be not significant given the height of the platforms above the sea and separation distances involved.

We have considered the potential for indirect impacts on the setting of terrestrial assets within our statutory remit. The proposed wind farms will result in a considerable concentration of wind turbines which will be visible from a large extent of coastline in the Caithness area. In particular, we have focused on coastal assets including Cairn of Get (Index no. 90048), Hill O'Many Stanes (Index no, 90162), Castle of Old Wick (Index no. 90065) and Dunbeath Castle (HB no. 7936). We have taken into account the fact that even at the closest point to the coast, the distance of the turbines is such, that they will be seen as features on the horizon, a part of the wider seascape. Having reviewed the submitted information we consider that although the proposed wind farms will not affect the understanding of the above assets, they will have a minor adverse impact on their appreciation. We consider the significance of these impacts are not of a level to warrant an objection from Historic Scotland.

We have considered the potential for cumulative impacts, when taken with other existing or reasonably foreseeable developments; in particular Beatrice Offshore Wind Farm which lies closer to the coast. We consider that due to the increased density and coverage of turbines on the horizon, the impact on the setting of the above assets shall be slightly more pronounced than with the proposed development individually. However, again, we consider the significance of these impacts are not of a level to warrant an objection from Historic Scotland.

Marine Assets
We are content that there are no designated cultural heritage assets within the Inner or Outer Study Areas.

We understand from the ES that the geophysical survey assessment identified 3 anomalies of high archaeological potential that have been positively identified as wrecks and 17 anomalies of medium potential were identified within the Inner/Outer Study Areas. The geophysical survey of the OfTI cable route identified 15 targets of high archaeological potential (positively identified as wrecks) and 42 anomalies of medium archaeological potential.

We are content with the proposed mitigation measures in relation to recorded sites and sites of medium / high archaeological potential as identified in the geophysical survey. We would recommend a condition be attached to any consent / licence issued, requiring implementation of the Protocol for Archaeological Discoveries (Offshore Renewables Projects). This should be based on good practice guidance and there is no requirement for prior agreement or approval by Historic Scotland in relation to this.

Conclusion
Overall, we are content with the principle of the development, and consider there shall be no adverse direct, indirect or cumulative impacts on terrestrial or marine assets within our statutory remit of a significance that would warrant an objection from Historic Scotland. We are content with the assessment of potential impacts on marine archaeology and with the

proposed mitigation strategy in relation to identified sites which have archaeological potential. As such, we offer no objection to the application.

Please contact me should you wish to discuss the contents of this letter.

Yours sincerely

[redacted]

Robin Campbell
Senior Heritage Management Officer (EIA)

HSE

Health and Safety Executive

Hazardous Installations Directorate

Dean Moffat

Chemical Industries Division
Belford House
59 Belford Road
Edinburgh
EH4 3UE

Tel: 0131 247 2000
Fax: 0131 247 2041
Landuseplanning.Scotland@hse.gsi.gov.uk

http://www.hse.gov.uk/

HM Principle Inspector of Health & Safety
Mrs Jo Walker

The Scottish Government
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

Date 12 October 2012

Our Ref. DM/EIA/Telford Stevenson MacColl/4.2.1.1701.

Your Ref. 011/OW/MORLE - 8

Dear Sir or Madam

ENVIRONMENTAL ASSESSMENT FOR TELORD STEVENSON AND MACCOLL WIND FARMS AND ASSOCIATED TRANSMISSION WORKS

Thank you for your letter enclosing a copy of the environmental statement for the proposed development.

Environmental Impact Assessments are concerned with projects which are likely to have significant effects on the environment. HSE's principal concerns are the health and safety of people affected by work activities. HSE has no comments on this environmental statement.

Yours faithfully

[redacted]

Dean Moffat
HID CI1B Edinburgh

ITHACA ENERGY

Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

8 Rubislaw Terrace
Aberdeen
AB10 1XE

For the attention of David O'Sullivan,
Marine Renewables Licensing Advisor
Licensing Operations Team
Marine Scotland - Marine Planning & Policy

Direct Tel +44 (0)1224 652152
Fax +44 (0)1224 635795
Email: jthomson@ithacaenergy.com

Date: 19/11/2012

Dear Sirs,

APPLICATION FOR:

- **THREE CONSENTS UNDER SECTION 36 OF THE ELECTRICITY ACT 1989, AND THREE MARINE LICENCES UNDER PART 4 OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT AND OPERATE THREE OFFSHORE WIND FARMS IN THE OUTER MORAY FIRTH,**
  and
- **ONE MARINE LICENCE UNDER SECTION 20 OF THE MARINE (SCOTLAND) ACT 2010. AND UNDER SECTIONS 65 AND 66 OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT THE ASSOCIATED OFFSHORE TRANSMISSION WORKS IN THE OUTER MORAY FIRTH.**

I refer to the above applications submitted by Moray Offshore Renewables Limited (MORL), your reference **011/OW/MORLE – 8**.

Ithaca Energy has no objection to the proposed wind farm developments, but would like to make the following general comments:

1. To ensure minimal impact on the use of helicopters for safe evacuation of offshore personnel, no turbines, offshore substation platforms or meteorological masts should be erected within 2.5km of Beatrice Alpha, Bravo, Charlie or Jacky Platforms.

2. The wind farm export cables should not be laid/positioned within 1.5km of the abovementioned offshore platforms to allow positioning of a drilling rig anchor pattern for any future drilling works in the area.

ITHACA ENERGY

I trust the above is clear. Should you require clarification of any of the above points, or any further information, please do not hesitate to contact me.

Yours sincerely,

[redacted]

Janet Thomson

HSEQ Manager

Ford A (Alexander)

From:	Karen Hall <Karen.Hall@jncc.gov.uk>
Sent:	18 December 2012 17:12
To:	Ford A (Alexander); Main RAK (Robert); Osullivan D (David) (MARLAB); May R (Roger)(MARLAB); Bennet F (Finlay)
Cc:	Victoria Appleyard; Sophy Allen; Enrique Pardo; 'Catriona Gall'; Erica Knott
Subject:	MORL Offshore Windfarm – Preliminary advice from JNCC & SNH
Attachments:	2012 12 18 - Moray Firth - Offshore Wind - application - ES - JNCC SNH memo of advice to Marine Scotland.pdf

Dear All,

Please find attached JNCC and SNH's preliminary advice on the MORL Offshore Windfarm application.

Kind Regards,

Karen

Karen Hall
Offshore Industries Advice Co-ordinator

Joint Nature Conservation Committee
Inverdee House
Baxter Street
Aberdeen
AB11 9QA
United Kingdom

Tel: +44 (0)1224 266559
Email: karen.hall@jncc.gov.uk
Website: http://www.jncc.defra.gov.uk

Number 2009/09/0052.) In case of problems, please call your organisation’s IT Helpdesk.
Communications via the GSi may be automatically logged, monitored and/or recorded for legal purposes.

********** **********

****

To	Alexander Ford (MS), Robert Main (MS), David O'Sullivan (MS).
Cc.	Roger May (MS), Finlay Bennet (MS), Victoria Appleyard (JNCC), Erica Knott (SNH).
From	Karen Hall (JNCC), Catriona Gall (SNH).
Date	18 December 2012
Subject	**MORL Offshore Windfarm – Preliminary advice from JNCC & SNH**

This memo provides JNCC and SNH advice from our review of the MORL Environmental Statement (ES). While we have some concerns about the complexity of the ES structure, we welcome the thorough approach that has been taken by the applicant, including pre-application consultation on a draft ES.

This memo provides our advice on key natural heritage interests and impacts to consider in respect of the proposed MORL windfarm development, as identified below. We do not identify any further information required from the applicant in respect of seascape, landscape and visual impact assessment (SLVIA). In respect of marine mammals, fish, benthic ecology and coastal processes, we are in current discussion with Marine Scotland regarding the consenting process, the cumulative impacts of MORL together with Beatrice, and the conditions that might be required for mitigating and / or monitoring the impacts of these proposals.

The main outstanding issue is therefore impact assessment and Habitats Regulations Appraisal for key seabird species from a number of Special Protection Areas within foraging distance. We are in current discussion with Marine Scotland and MORL over this, and with both MORL and Beatrice regarding cumulative impacts. The situation remains complicated due to each developer adopting different approaches to the impact assessment / HRA for these bird species in their submitted ES, so that providing our advice on cumulative impacts is more problematic.

1. KEY NATURAL HERITAGE INTERESTS AND IMPACTS TO CONSIDER

The following natural heritage interests and impacts (a) – (d) are those which are key for consideration of MORL by itself and together with the adjacent Beatrice windfarm proposal.

a) Qualifying Interests of Special Protection Areas (SPAs)

Habitats Regulations Appraisal (HRA) of operational windfarm impacts on key seabird species during the breeding season, as the windfarm is located within foraging range of a number of SPA breeding seabird colonies. Please see section 2 on ornithology.

b) Qualifying Interests of Special Areas of Conservation (SACs)

HRA of windfarm construction impacts on harbour seals as a qualifying interest of the Dornoch Firth & Morrich More SAC and on bottlenose dolphin as a qualifying interest of the Moray Firth SAC. Please see the further discussion under section 3 on marine mammals and our HRA advice for marine mammal interests presented in Appendix A.

HRA of windfarm construction impacts on freshwater fish and associated species – Atlantic salmon, freshwater pearl mussel and sea lamprey – which are qualifying interests of riverine SACs in the area. Please refer to our HRA advice on these species presented in Appendix B.

c) European Protected Species

Consideration of EPS licensing requirements for cetacean species. Please see the discussion under section 3 on marine mammals.

d) Marine Fish

Impacts of windfarm construction, particularly underwater noise impacts, on cod and herring. Please refer to the discussion under section 4 on fish interests.

d) Seascape, Landscape and Visual Impacts

Please see the summary of our key advice provided in section 5.

2. ORNITHOLOGY

Summary of key advice

We confirm that Appendix A (Population Viability Analysis outputs for SPA species) of Appendix 4.5 A (Ornithology) of the MORL ES addresses the key seabird species we were expecting: great black-backed gull, herring gull, kittiwake, gannet, guillemot, razorbill and puffin – as requested in our note to the Moray Firth Offshore Wind Developers' Group (MFOWDG), dated 26 August 2011. MORL are also addressing fulmar, which we consider helpful.

We provided headline points on ornithology to MORL for discussion at the meeting held on Friday 7 December 2012. At this meeting we agreed to outline the information we are expecting regarding the presentation of, and outputs from, MORL's population modelling. We further discussed these matters at a teleconference held on Friday 14 December between Marine Scotland, MORL and ourselves. Discussion over the impact assessments (including HRA) for bird species is ongoing, so we are continuing to liaise with Marine Scotland both for MORL alone, and in respect of the cumulative impacts of MORL and Beatrice together.

3. MARINE MAMMALS

Summary of key advice

As discussed at the meeting held on Thursday 6 December, JNCC and SNH are satisfied with the assessment approach undertaken by MORL: the interim Population Consequences of Disturbance (PCoD) framework outlined in Appendix 7.3B of the ES, with key areas of scientific uncertainty (and their significance) highlighted in Table 4.7 in Appendix 7.3A.

For harbour seal and bottlenose dolphin this PCoD framework allows for long-term population modelling to be undertaken. This demonstrates that while there will be short and medium-term effects on each population, the populations are sustainable over the long-term. Please see Appendix A for our advice on Habitats Regulations Appraisal (HRA) for these two species.

MORL have committed to further studies to help address the conservative assumptions used within the interim PCoD assessment framework. For example, their met mast study aims to validate noise estimates of piling activities and further define species responses to this noise (looking at harbour porpoise and harbour seal). They will also be reviewing other work (such as the Wash study of tagged harbour seals) that may help refine the assumptions and predictions made within the ES. We welcome this commitment from MORL and will continue to discuss these matters as studies progress.

As also discussed at the meeting on Thursday 6 December, MORL recognise that licensing of the project will be required to cover risk of disturbance to European Protected Species (EPS). JNCC and SNH note that all cetacean species have EPS status, so consideration needs to be given to all these species recorded within the Moray Firth, not just those listed in Appendix 7.3H. We note that further discussion is needed between Marine Scotland and ourselves with regard to an EPS licensing framework for marine developments, including renewables.

4. FISH OF CONSERVATION CONCERN

Summary of key advice on marine fish species

Underwater noise impacts during construction are the key consideration for marine fish species. Cod and herring are the key species of concern; we agree with the ES that the (pre-mitigation) underwater noise impacts of pile-driving the MORL turbine foundations are of moderate-major significance for cod and moderate for herring. We note that the piling requirements for the offshore platforms should be included alongside those for the turbines in any overall assessment of noise impacts during construction.

As we discussed at the meeting on Thursday 6 December, while MORL provide a spatial zone of impact for a 'worst case' piling scenario, this is not then discussed or explored in respect of the temporal aspects. We need a better understanding of construction programming for the 'most likely' (or realistic) development scenario that is being considered by MORL. To inform discussions over potential construction impacts, it would be helpful for the applicant to provide an analysis of available data on seasonal weather patterns and oceanographic conditions expected at the MORL windfarm site. It would then be helpful to know how the applicant is accounting for these aspects in their construction programming.

As also discussed at the meeting, we would welcome further consideration of possible mitigation options (in addition to soft-start piling) that could help reduce or manage underwater noise impacts to cod and herring in particular. We are in current discussion with Marine Scotland to agree the required conditions for consenting.

In the ES, proposed mitigation of electric magnetic fields is the burial of cables to 1m in soft sediments (comprising the majority of the cable route), and placement of 0.25m depth of rock armouring in those locations where cable burial is not possible. The ES correctly notes the considerable degree of uncertainty regarding the impacts of EMF. Nevertheless, on the basis of existing knowledge, we consider this to be sufficient mitigation for any EMF effects from the MORL proposal on marine fish. As noted above, we are in current discussion with MS to agree the required conditions for consenting.

Summary of key advice on diadromous fish species

The ES recognises the principle areas that could lead to adverse impacts on Atlantic salmon, sea trout, sea lamprey and European eel. The ES also recognises the uncertainties regarding the behaviour of these diadromous fish species in the marine environment, and their potential interaction with construction / operation / decommissioning of the proposed windfarm.

The effect of noise on Atlantic salmon and sea trout is assessed to be negative, of minor-moderate significance and probable. For sea / river lamprey the effect is estimated to be small, and for European eel, the effect is thought to be between medium and small. For these species, we consider that noise disturbance to individuals will not result in population level effects. We are in current discussion with MS to agree the required conditions for consenting.

Please see the previous section for discussion of EMF that may arise from cabling. On the basis of existing knowledge, we consider that the mitigation (cable burial / rock armouring) proposed in the ES will be sufficient to avoid any significant EMF effects on diadromous fish species. As noted above, we are in current discussion with MS to agree the required conditions for consenting.

Please see Appendix B for JNCC and SNH's advice on HRA in respect of the qualifying interests of riverine SACs.

5. SEASCAPE, LANDSCAPE & VISUAL IMPACTS

Summary of key advice for MORL

We provide the following advice on seascape, landscape and visual impacts for the proposed MORL windfarm development (the eastern development area):

- The principal change arising due to MORL will be its visibility from the Caithness coast. There will be no intrinsic character change to the Caithness landscape. MORL's distance from the shore, the activities and focus of receptors along the coast / within the coastal hinterland, and intermittent windows of visibility (needed to clearly see the development) mean that it will not dominate the Caithness coastal and landscape character.
- Sea views from the Caithness and Sutherland coasts will change from an open, 'unpopulated' sea, with incidental marine traffic. In good weather, with clear visibility, MORL (at distances of 35+km) will read as a distant, linear feature on the horizon. Overall, MORL will form a 'seascape' element associated with the distant, outer marine environment rather than inshore waters; it is not likely to be perceived as a coastal feature. Nor will it dominate the coast.
- In a core area extending from north of Wick to Dunbeath, MORL will create a prominent 'landmark' on the open sea skyline, changing sea views. Impacts on the coastal character will be moderate.
- There will be a significant change in night time character of seas and skies within the core area.
- Within this core area there will be locally major impacts on specific viewpoints, scenic panoramas and places (especially elevated clifftop castles and landmarks). These form Caithness's coastal scenic resource. There will be locally major impacts on Dunbeath Castle Historic Garden and Designed Landscape.
- There will be no impacts on nationally designated landscapes. There will be negligible impacts on Duncansby Head Special Landscape Area (SLA) and locally moderate change to Berriedale Coast section of Flow Country and Berriedale Coast SLA.
- MORL will form a significant feature on the horizon in seaward views from the A9 between Berriedale and Latheron, for 14.5km; the A99 between Latheron and Thrumster, for 20km. It will have a locally major impact on views from the A9 at the Ord of Caithness and on keyhole views from road to sea at Ousedale; as well as on travellers eastwards on the A882.
- There will be negligible impacts on the Aberdeenshire and Moray coasts as MORL lies 40+km. Visibility would be limited to periods of exceptional / excellent weather and light conditions.

Summary of key advice on cumulative SLVI of MORL and Beatrice together:

We provide the following advice on the cumulative seascape, landscape and visual impacts of MORL (the eastern development area) and Beatrice together:

- Beatrice is the windfarm proposal which significantly develops the sea skyline, and MORL only marginally increases the influence and prominence of windfarm development on the horizon.
- MORL is consistently seen behind Beatrice and the two windfarms will appear to be a single development.
- As it is further offshore, MORL is constantly more 'recessive' in the view, with its image, scale and form consistent with Beatrice standing to the 'forefront'.

Comments on the baseline assessment presented in the ES

- The coastal character assessment methodology follows relevant guidance resulting in a comprehensive, clear and well-presented description and appreciation of the baseline landscape and coastal character of the East Coast and Moray Coast study area.
- The visual baseline and assessment is also well-considered and illustrated in the ES.

6. HYDRODYNAMIC PROCESSES & COASTAL GEOMORPHOLOGY

Summary of key advice

We note the difficulty on providing advice on sediment concentration modelling and the assessment of scour effects, when the applicant retains a broad design (Rochdale) envelope. In particular the 'worst case' scenario of using all gravity bases across the windfarm is problematic, as discussed under section 7 below on benthic ecology. We recommend that the applicant further discusses this issue with Marine Scotland in the first instance.

We would welcome greater clarity on the likely distribution of sediments released as a result of scour effects, and the applicant's particle tracking modelling could be used to help inform discussion. We advise that consideration of scour effects (and any supporting modelling) is best undertaken at the point a 'most likely' development scenario can be detailed, proposing a realistic number / distribution of gravity bases and jacket structures across the windfarm site. We are in current discussion with Marine Scotland over consenting issues and how to deal with uncertainty in the impact assessment process, introduced by applicants' use of design (Rochdale) envelopes.

Table 9.2-2 in chapter 9 (Physical Environment) of ES Volume 4 (Transmission Infrastructure) indicates that the installation approach for the cable landfall has not yet been confirmed, and it may be either horizontal directional drilling (HDD) or open cut trenching. We note that the Export Cable Feasibility Study (Appendix 2.1A, ES Volume 8) provides advice that:

> Open cut trenching across these is unlikely to be technically feasible. The clear beach expanse and low height differential would be conducive to a short direct HDD (200m) breaking out onto the beach intertidal area.

As MORL refines their project proposal, JNCC and SNH seek continued consultation over the proposed location and installation approach for this cable landfall. We are in discussion with Marine Scotland to agree the required conditions for consenting.

7. BENTHIC ECOLOGY

Summary of key advice

At the meeting held on 6 December 2012, we discussed the difficulties in presenting a 'worst case scenario' using gravity bases as the proposed foundation type for all turbines. It is unclear from the ES, and from discussion with the applicant, whether this 'worst case scenario' has been, or can be, fully assessed. We recommend that the applicant further discusses this issue with Marine Scotland in the first instance – particularly with regard to anticipated dredging work and sediment discharge (with associated licensing requirements) and the decommissioning of gravity bases.

JNCC and SNH would note that the sediment concentration modelling for the 'worst case' using all gravity bases, has been done on the assumption that all dredged material would be removed from the windfarm to a licensed disposal site. On this basis, we would not be concerned that the resultant levels of sediment dispersal would have any significant effects on benthic ecology. The modelled sediment release from the windfarm is well within levels that may naturally occur (such as during storm events). We note, however, that it is not confirmed whether all dredged material can actually be removed from the site (which Marine Scotland and the applicant need to further discuss). If not, then we could be concerned about the possible levels of sediment dispersal, and require this to be modelled (i.e. using the assumption that dredged material is to be released on-site).

We welcome the sandeel survey that has been carried out by MORL following recommendations from Marine Scotland Science (MSS). This indicates low densities across the eastern development area and we are satisfied that the MORL windfarm proposal would not result in significant impacts to sandeels. MSS will be able to advise whether post-construction monitoring of sandeel could be helpful in this area.

Benthic survey work for MORL has identified Annex I habitat within the export cable route: *Sabellaria spinulosa* reef and stony and rocky reefs. As discussed at pre-application, and presented in the submitted ES, the applicant proposes micro-siting the export cable around the Sabellaria reef (which is patchily distributed) and using installation aids to prevent damage. No mitigation is currently proposed regarding the areas of stony and rocky reef, as the ES notes that impacts would be limited, compared to the wider distribution of this habitat type within the survey area.

JNCC and SNH seek further discussion over proposed micro-siting and installation methods for the export cable, as the applicant refines their project proposal. We are in current discussion with Marine Scotland to agree the required conditions for consenting.

The ES states the intention to use good practice to reduce / avoid the possibility of introducing non-native species into the Moray Firth from the range of activities associated with the proposed windfarm development. We would welcome further discussion of this aspect in order to inform our recommendations for consent conditions.

APPENDIX A

MARINE MAMMALS
JNCC & SNH ADVICE for HABITATS REGULATIONS APPRAISAL

Introduction

Habitats Regulations Appraisal is the process which applies to any plan or project with the potential to affect the qualifying interests of a Natura site. As set out in our scoping response, we advise that the marine mammal interests of the following Special Areas of Conservation (SACs) will need to be addressed under HRA for the MORL offshore windfarm proposal:

- **Dornoch Firth & Morrich More SAC** - designated for its population of harbour seals (*Phoca vitulina*) and for coastal and marine habitats including sand dune habitats, intertidal mudflats and sandflats; subtidal sandbanks and reefs.
- **Moray Firth SAC** - designated for bottlenose dolphin (*Tursiops truncatus*) and for subtidal sandbank habitat.

JNCC & SNH advice for Habitats Regulations Appraisal

We provide the following advice to Marine Scotland for informing HRA in respect of the marine mammal interests of each of these SACs:

1. Is the proposal connected with or necessary for SAC conservation management?

The proposal is not directly connected with or necessary for the conservation management of either the Dornoch Firth & Morrich More SAC or the Moray Firth SAC.

2. Is the proposal likely to have a significant effect on the qualifying interests of the SACs either alone or in combination with other plans or projects?

- **Harbour seals** of the Dornoch Firth SAC.

  The seals are not confined to this SAC itself and will range more widely within the Firth and beyond. Construction (and other) noise arising from the proposal is modelled to extend beyond the windfarm footprint and may overlap with seal use of the surrounding environment (see Technical Appendix 7.3F of the MORL ES – Noise propagation and SAFESIMM model outputs for marine mammal risk assessment). Boat movements, cable-laying and other construction activity may give rise to disturbance. There may also be impacts to the prey species of seals – either from the placement of infrastructure or due to noise.

  We therefore advise the possibility of **likely significant effect** from the MORL windfarm proposal on the harbour seals of the Dornoch Firth SAC, so impacts (including cumulative) will need to be considered in appropriate assessment (see step 3 below).

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

  The dolphins are not confined to this SAC and will range more widely within the Firth and beyond. Construction (and other) noise arising from the proposal is modelled to extend beyond the windfarm footprint and may overlap with dolphin use of the surrounding environment (see Technical Appendix 7.3F of the MORL ES – Noise propagation and SAFESIMM model outputs for marine mammal risk assessment). Boat movements, cable-laying and other construction activity may give rise to disturbance. There may also be impacts to the prey species of dolphin – either from the placement of infrastructure or due to noise.

  We therefore advise the possibility of **likely significant effect** from the MORL windfarm proposal on the bottlenose dolphins of the Moray Firth SAC, so impacts (including cumulative) will need to be considered in appropriate assessment (see step 3 below).

3. Can it be ascertained that the proposal will not adversely affect the integrity of the SAC, either alone or in combination with other plans or projects?

This step is termed **appropriate assessment**, and it is to be undertaken by Marine Scotland, based on information in the Environmental Statement (ES) submitted for MORL, with advice from ourselves. Marine Scotland are currently considering how the consenting process can take account of the design envelopes requested by windfarm applicants. So while JNCC and SNH are able to provide our overall advice on HRA, including appropriate assessment, we are still in discussion with Marine Scotland over the conditions required for consenting – to mitigate construction impacts to these marine mammal interests (see discussion below).

Appropriate assessment considers the implications of the proposed MORL windfarm for the (relevant) conservation objectives relating to the harbour seals of the Dornoch Firth SAC and the bottlenose dolphins of the Moray Firth SAC. Please refer to http://www.snh.org.uk/snhi/ for a full list of these conservation objectives as we only discuss the relevant ones below.

- **Harbour seals** of the Dornoch Firth SAC.

  The relevant conservation objective to consider is the maintenance of the harbour seal population as a viable component of the Dornoch Firth SAC. This encompasses any significant disturbance to individuals while they are outwith the SAC, such as underwater noise impacts arising from windfarm construction.

  As presented in Appendices 7.3A & B, MORL have developed an assessment framework for harbour seals which considers whether any noise (and other) impacts to individuals would result in population level effects. JNCC and SNH are satisfied with this approach as the best possible under current scientific knowledge – it sets out a process for considering the outcomes of noise disturbance and behavioural displacement as a reduction in the individual fitness of animals and then models the consequences of this for the population, using reproductive success as the key parameter that is affected. Key areas of scientific uncertainty are highlighted, including their significance to the assessment framework.

  As presented in the ES, the framework predicts that noise and other impacts from windfarm construction will reduce the breeding success of the harbour seal population for the duration of construction. While this results in population-level effects over the short and medium-term (a construction phase of up to 6 years for MORL and Beatrice together), the population is expected to recover in the long-term once windfarm construction is complete. This modelling is for a 'worst case' that considers the construction impacts of both windfarms together on harbour seals, and alongside continuing seal mortality due to licensed shooting.

  Therefore JNCC and SNH are satisfied that there will be no adverse impacts on SAC site integrity over the long-term, and that the short and medium-term effects on the harbour seal population can be reduced through construction programming at the MORL and Beatrice sites. We are in current discussion with Marine Scotland, as the competent authority, to agree the required conditions for consenting.

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

  The relevant conservation objective to consider is the maintenance of the bottlenose dolphin population as a viable component of the Moray Firth SAC. This encompasses any significant disturbance to individuals while they are outwith the SAC, such as underwater noise impacts arising from windfarm construction.

  MORL have modelled a worst case for potential noise impacts to bottlenose dolphin during construction and then modelled whether such impacts would result in any population level effects (see Technical Appendix 7.3A). As before, JNCC and SNH are satisfied with this approach as the best possible under current scientific knowledge. We are satisfied that there is expected to be no long-term effects on the bottlenose dolphin population of the Moray Firth SAC arising from the proposed MORL windfarm by itself, or from this site together with Beatrice, and as such no adverse impact to SAC site integrity over the long-term.

It is also unlikely that there will be any significant effects to the bottlenose dolphin population during construction. Although, the zones of impact from the noisiest construction activities (associated with pile-driving the turbine foundations) could slightly extend into areas used by bottlenose dolphin transiting along the coast in the Moray Firth (modelling a 'worst case' for piling at MORL and Beatrice windfarm sites together), such effects can be reduced through construction programming at each of the windfarms.

We advise that potential disturbance to bottlenose dolphin from other construction activities – and in particular the installation of export cable routes – can also be managed via construction programming for MORL and for Beatrice. We are in current discussion with Marine Scotland, as the competent authority, to agree the required conditions for consenting. These will be needed for bottlenose dolphin both as an SAC qualifying interest, and in respect of their status as a European Protected Species.

APPENDIX B

FRESHWATER FISH of CONSERVATION CONCERN
JNCC & SNH ADVICE for HABITATS REGULATIONS APPRAISAL

Introduction

Habitats Regulations Appraisal is the process which applies to any plan or project with the potential to affect the qualifying interests of a Natura site. As set out in our scoping response, we advise that the freshwater fish interests of the following Special Areas of Conservation (SACs) will need to be addressed under HRA for the MORL offshore windfarm proposal:

- **Berriedale & Langwell Waters SAC** - designated for Atlantic salmon (*Salmo salar*).
- **River Evelix SAC** - designated for freshwater pearl mussel (*Margaritifera margaritifera*).
- **River Moriston SAC** - designated for Atlantic salmon and for freshwater pearl mussel.
- **River Oykel SAC** - designated for Atlantic salmon and for freshwater pearl mussel.
- **River Spey SAC** - designated for Atlantic salmon, sea lamprey (*Petromyzon marinus*), freshwater pearl mussel and otter (*Lutra lutra*).
- **River Thurso SAC** - designated for Atlantic salmon.

We have considered other SACs and included only those that we consider relevant i.e. where there may be connectivity between the windfarm proposal and the SAC.

JNCC & SNH advice for Habitats Regulations Appraisal

We provide the following advice to Marine Scotland for informing HRA in respect of the freshwater fish interests of each of the above riverine SACs:

1. Is the proposal connected with or necessary for SAC conservation management?

The proposal is not directly connected with or necessary for the conservation management of any of the above riverine SACs.

2. Is the proposal likely to have a significant effect on the qualifying interests of the SACs either alone or in combination with other plans or projects?

- **Atlantic salmon**

We have listed a wide range of SACs due to the current uncertainty about the migratory movements of Atlantic salmon – they are recorded in the Moray Firth, but we do not know which SAC watercourses adult fish or post smolts are going to, or coming from.

We advise **likely significant effect** from the MORL windfarm proposal on Atlantic salmon due to the possibility that they could be disturbed by construction noise and / or possible effects of electro-magnetic fields (EMF) arising from installed cables. We are satisfied that operational noise would not result in likely significant effects to salmon.

Impacts (including cumulative) will therefore need to be considered in appropriate assessment (see step 3 below).

- **Freshwater Pearl Mussel**

Atlantic salmon (and other salmonids) are integral to the life cycle of freshwater pearl mussel (FWPM), therefore any impacts to Atlantic salmon that prevent them from returning to their natal rivers may have a resulting effect on FWPM populations.

We therefore advise **likely significant effect** from the MORL windfarm proposal on FWPM, so potential indirect impacts to this species will need to be considered in appropriate assessment.

- **Sea Lamprey**

  Sea lamprey is a qualifying interest of the River Spey SAC where is is virtually at the northern limit of its range in Britain. We note that there is little available information on the movements of sea lamprey in general, and within the Moray Firth in particular.

  We advise **likely significant effect** from the MORL windfarm proposal on sea lamprey due to the possibility that they could be disturbed by construction noise and / or possible effects of electro-magnetic fields (EMF) arising from installed cables. We are satisfied that operational noise would not result in likely significant effects to this species.

  Impacts (including cumulative) will therefore need to be considered in appropriate assessment.

3. Can it be ascertained that the proposal will not adversely affect the integrity of the SAC, either alone or in combination with other plans or projects?

This step is termed **appropriate assessment**, and it is to be undertaken by Marine Scotland, based on information in the ES submitted for MORL, with advice from ourselves, as presented below. It considers the implications of the proposal for the (relevant) conservation objectives relating to the SAC qualifying species of concern. Please refer to http://www.snh.org.uk/snhi/ for a full list of these conservation objectives as we only discuss the relevant ones below.

- **Atlantic salmon**

  The relevant conservation objective to consider is whether or not the proposed MORL windfarm would result in any impacts on the viability of Atlantic salmon populations supported by the SACs listed above. While there may be some level of noise disturbance to individuals during construction we confirm that this will not result in population level effects. We are satisfied that operational noise would not result in likely significant effects to salmon.

  The applicant proposes to adopt soft-start piling methods to help mitigate any noise disturbance and to bury cables to reduce EMF. We are satisfied that this mitigation will further reduce impacts to individuals, and avoid population level effects, therefore we advise that the MORL windfarm will not result in any impact to the site integrity of the SACs listed above. We are in current discussion with Marine Scotland, as the competent authority, to agree the required conditions for consenting.

  Due to uncertainty over the impact assessment and information to support HRA in the Beatrice ES, we cannot provide confirmed advice on cumulative impacts at this time.

- **Freshwater Pearl Mussel**

  As there is not impact to the viability of the Atlantic salmon populations of SACs listed above, and no significant effects on other salmonid species (such as sea trout – see our advice in section 4 of this memo) there will be no indirect effects on freshwater pearl mussel (FWPM) populations in the Rivers Evelix, Moriston, Oykel and Spey SACs. We advise that the MORL windfarm will not result in any impact to the site integrity of the SACs listed above.

- **Sea Lamprey**

  The relevant conservation objective to consider is whether or not the proposed MORL windfarm would result in any impacts on the viability of the sea lamprey population of the River Spey SAC. While there may be some level of noise disturbance to individuals during construction we confirm that this will not result in population level effects. We are satisfied that operational noise would not result in likely significant effects to sea lamprey.

  The applicant proposes to adopt soft-start piling methods to help mitigate any noise disturbance and to bury cables to reduce EMF. We are satisfied that this mitigation will further reduce impacts to individuals, and avoid population level effects, therefore we advise that the MORL windfarm will not result in any impact to the site integrity of the River Spey SAC.

  Due to uncertainty over the impact assessment and information to support HRA in the Beatrice ES, we cannot provide confirmed advice on cumulative impacts at this time.

Ford A (Alexander)

From: Erica Knott <Erica.Knott@snh.gov.uk>
Sent: 08 July 2013 21:40
To: MS Marine Licensing; Holland G (Gayle); Main RAK (Robert); McKie J (Jim) (MARLAB)
Cc: Karen.Hall@jncc.gov.uk; Catriona Gall; Susan Davies; John.Goold@jncc.gov.uk
Subject: JNCC and SNH advice on MORL and BOWL offshore wind proposals
Attachments: 2013 07 08 - Beatrice offshore windfarm proposal - SNH & JNCC response.pdf; 2013 07 07 MORL JNCC SNH Advice as sent#4.pdf

MS LOT Colleagues

Please find attached advice from JNCC and SNH on the MORL proposal and from SNH and JNCC on the Beatrice proposal.

You will note that we have identified aspects of our advice in each of the responses where further discussion with Marine Scotland,both LOT and Science, may be helpful.

Please get in touch once you have had a chance to review our advice. A meeting has already been arranged for 18th July to discuss our advice further, but in the meantime if you have any queries, please do not hesitate to contact Karen Hall - JNCC , Catriona Gall, SNH or myself.

Erica

Erica Knott
Senior Casework Manager - Offshore Renewables
Battleby
Redgorton
Perth
PH1 3EW
Direct dial:01738 458674

erica.knott@snh.gov.uk
marinerenewables@snh.gov.uk

Scottish Natural Heritage
Dualchas Nàdair na h-Alba
All of nature for all of Scotland
Nàdar air fad airson Alba air fad

Year of Natural Scotland 2013

Joint Nature Conservation Committee

Scottish Natural Heritage
Dualchas Nàdair na h-Alba
All of nature for all of Scotland
Nàdar air fad airson Alba air fad

Marine Scotland
Licensing Operations Team
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

CNS REN OSWF MORL

For the attention of: Robert Main

8 July 2013

MORAY OFFSHORE RENEWABLES LTD

TELFORD, STEVENSON and MACCOLL: OFFSHORE WINDFARM PROPOSALS

JNCC & SNH ADVICE ON APPLICATION

Background

Thank you for your consultation on the application submitted for the MORL offshore windfarm proposals, made under the Electricity Act 1989, the Marine (Scotland) Act 2010, the Marine and Coastal Access Act 2009 and supporting regulations. The proposals are located in the Round 3, Zone 1 - Eastern Development Area (EDA) in the Moray Firth about 22km from the Caithness coastline.
The site boundary is given in Figure 1.1-2 of the Environmental Statement (ES) (Volume 6a).

Within the marine environment, JNCC is the statutory nature conservation adviser for development proposals from 12 nautical miles offshore out to the edge of the continental shelf. SNH is the statutory adviser for proposals within 12 nautical miles of the coast. We have been liaising closely to provide joint advice on the MORL Round 3 zone, and the Beatrice site lying adjacent. We set out the principles of our joint working on offshore wind proposals in our memo of understanding, dated 8 February 2010.

Use of Design Envelopes

For MORL Eastern Development Area (EDA), within the identified site boundary, the applications for each of the 3 windfarms is made for a design envelope with an 'upper' and 'lower' limit of turbine number and density as follows:

- Number in site 1 – 63 to 139 turbines
- Number in site 2 – 63 to 100 turbines
- Number in site 3 – 63 – 100 turbines

The order of the site construction of the three windfarms, this will be determined post further site analysis. If the 3.6 MW turbine is selected it will only be built out in site 1. The range of turbine sizes is from 3.6MW to 8MW, with a range in blade tip height from 164m to 204m.

The final windfarm design, to be confirmed post-consent, will fall within these limits. The ancillary infrastructure for the windfarm proposal includes 1 offshore meteorological (met) masts, and up to six offshore substation platforms.

The applicant proposes that assessment for each natural heritage interest is based on the scenario (or option) that is considered a 'realistic worst case' for that interest.

HEADLINE ADVICE

i) Impacts to key SPA seabird species

Environmental Impact Assessment (EIA) and Habitats Regulations Appraisal (HRA) have shown that SPA seabird species are the key natural heritage interest which will constrain development of the MORL and Beatrice offshore windfarm proposals in combination. Impacts to birds, including collision risk and displacement, will occur over the operational lifespan of the windfarm, and not only during construction. Please see Appendix (iii) for our full advice to inform HRA, however, the headline issues are these:

- **Collision risk to great black-backed gull**

  Great black-backed gull numbers at the East Caithness Cliffs SPA have decreased from 800 pairs at citation (1996) to 175 pairs in 1999. This is a small and vulnerable population; the level of annual mortality that it can sustain is estimated to be in the order of **2 breeding adults**.

  The 'worst case' prediction of **great black-backed gull** collision mortality arising from Beatrice and MORL EDA in combination is in the order of **22.5 breeding adults**, and for each proposal individually as follows:

  - An estimate of annual collision mortality from MORL EDA in the order of **~2.5 to 7.5 breeding adults**.
  - An estimate of annual collision mortality from Beatrice 'worst case' in the order of **~15 breeding adults**.

  Such levels of collision mortality would give rise to an adverse impact on site integrity at the East Caithness Cliffs SPA in respect of great black-backed gull.

- **Impacts to herring gull – collision risk**

  While the Beatrice 'most likely' scenario and MORL EDA would not individually affect the long-term maintenance of the herring gull population at East Caithness Cliffs SPA, they could in combination. Beatrice 'worst case' affects the population both alone and in combination with MORL. The estimated levels of collision mortality could give rise to an adverse impact on site integrity at this SPA in respect of herring gull. Please see Appendix (iii) for our full advice.

- **Impacts to auk species - displacement**

  The Beatrice and MORL offshore wind proposals may also lead to the displacement of auk species, although we highlight the considerable uncertainty regarding the estimation and effect of displacement. Appendix (iii) provides our full advice in this regard, however, we highlight key impacts to **puffin, guillemot** and **razorbill** at East Caithness Cliffs SPA; and also **puffin** at North Caithness Cliffs SPAs where levels of displacement could give rise to adverse impacts on the site integrity of these SPAs.

  We therefore request a meeting with Marine Scotland to discuss these predicted impacts to key SPA seabird species, particularly the predicted mortality to great black-back gull.

ii) Construction impacts

For a number of key natural heritage interests it is the construction phase of development which gives rise to the highest levels of impact, including marine and freshwater fish interests and marine mammals. Management and mitigation of construction impacts are addressed in Appendix F which sets out JNCC and SNH's advice on the natural heritage matters to be addressed by conditions. Please also see Appendix B(iii) in this regard for advice on EPS licensing requirements for cetacean species (whales and dolphins).

SUMMARY OF KEY NATURAL HERITAGE INTERESTS AND IMPACTS TO CONSIDER

The following natural heritage interests and impacts are those which are key for consideration of the MORL proposals and together with the adjacent Beatrice Offshore Wind Limited (BOWL) windfarm proposal:

a) Qualifying Interests of Special Protection Areas (SPAs)

Habitats Regulations Appraisal (HRA) of operational windfarm impacts on key seabird species during the breeding season. Further to our interim advice (18 December 2012) we had a meeting of the Moray Firth Offshore Wind Developers' Group (MFOWDG) to discuss bird interests and cumulative impact assessment; 1 February 2013.

Please see Appendix A(i) for an outline of the process and summary of our overall advice on bird interests. Our review of the technical aspects of assessments – collision risk modelling, estimation of displacement impacts and population modelling – is provided in Appendix A(ii) and supporting spreadsheets.

Our advice on HRA for the key SPA seabird species is presented in Appendix A(iii), supported by the spreadsheet provided in Appendix (iv) which identifies the seabird species and SPAs to be addressed under HRA.

b) Qualifying Interests of Special Areas of Conservation (SACs)

HRA of windfarm construction impacts on harbour seals as a qualifying interest of the Dornoch Firth & Morrich More SAC and on bottlenose dolphin as a qualifying interest of the Moray Firth SAC.

Please see Appendix B(i) for our key comments on marine mammals from review of the MORL ES, and Appendix B(ii) for our HRA advice on SAC marine mammal species. This is largely based on the advice provided in our interim advice in December 2012.

Similarly, please see Appendix C(i) for our advice on fish interests, and Appendix C(ii) for our HRA advice on SAC freshwater interests. This advice is based on our interim advice and provides advice on HRA of windfarm construction impacts on freshwater fish and associated species – Atlantic salmon, freshwater pearl mussel and sea lamprey – which are qualifying interests of riverine SACs in the area.

c) European Protected Species

Please see Appendix B(iii) for advice on EPS licensing requirements for cetacean species (whales and dolphins).

d) Marine Fish

Please see Appendix C(i) for our key comments on marine fish.

e) Benthic Ecology & other Habitat Interests

Further to our interim advice (18 December 2012), we have had further discussion with Marine Scotland and the developer over use of gravity bases. From this, there is resolution in how to address uncertainty over the amount of dredged material, and resulting impacts, that may arise from use of this foundation option on-site. Please see Appendix D for HRA advice on SAC habitat interests.

f) Seascape, Landscape and Visual Impacts

Please see our advice on the impacts of Beatrice and MORL presented in Appendix E.

CONCLUSION

We trust this advice is of assistance in your determination of this application both individually and cumulatively with the BOWL proposal.

If Marine Scotland are minded to grant consent than both JNCC and SNH would be willing to be involved in the negotiation and agreement of conditions with Marine Scotland and developers, to ensure that these natural heritage matters are addressed in any consents and licences issued.

If you have any queries on any aspect of this advice, please do not hesitate to contact either Karen Hall – Karen.hall@jncc.gov.uk 01224 266559 or Catriona Gall – Catriona.gall@snh.gov.uk 01738 458665.

Yours faithfully

John Goold
Director of Marine Advice, JNCC

Susan Davies
Director of Policy & Advice, SNH

APPENDIX A (i)

SUMMARY of ASSESSMENT PROCESS & ADVICE for BIRD INTERESTS

Background

Pre-application dialogue on bird interests has been facilitated via the Moray Firth Offshore Wind Developer's Group (MFOWDG) comprising BOWL for Beatrice and MORL for proposed development in the Round 3 zone. The meetings have been attended by Marine Scotland; Crown Estate; the developers and their consultants; JNCC and SNH.

Towards the start of the process, JNCC and SNH provided scoping advice for each proposal (scoping response for Beatrice, 14 May 2010; scoping response for MORL, 28 October 2010). We outlined the process of Habitats Regulations Appraisal (HRA) for the range of seabird species under consideration, these being qualifying interests of Special Protection Areas – see Appendix D of each response.

Further to this, the developers (as MFOWDG) indicated how they would approach cumulative impact assessment in a discussion document, on which we provided comment, 26 May 2011. All parties (the developers, ourselves, Marine Scotland and the Crown Estate) worked from an initial 'long-list' of bird species and SPAs (submitted 11 February 2011) to scope potential impacts and work up the eventual 'short-list' of key species as discussed at the MFOWDG meeting held earlier this year (1 February 2013). This short-list is presented in Appendix A(v).

We advised that the HRA process would take precedence over EIA for the key SPA seabird species of concern, and made a request (26 August 2011) to BOWL and MORL (together as MFOWDG) for 'preliminary analysis' of the cumulative impacts that could be presented by the proposed offshore windfarms to these species, prior to the submission of any licence applications. Unfortunately it did not prove possible for the developers to co-ordinate this work together as MFOWDG, and no further meetings were held with them jointly until 1 February this year.

HRA for key SPA seabird species

Appendix A(ii) provides our review of the technical assessments submitted by BOWL and MORL for key SPA seabird interests: collision risk modelling, the estimation of displacement impacts and population modelling. We have reviewed the range of methodologies and approaches for each of these technical aspects, in order to provide our overall advice.

Our advice to inform HRA for key SPA seabird species is presented in Appendix(iii). In it, we outline the overall process of HRA, and present our advice for each decision stage. During pre-application discussion and in our response (26 May 2011) to the developers' cumulative impact discussion document, we recommended that "it would be helpful to consider the 'long-list' in respect of the seasonality of each bird interest – whether the species is present during breeding, post-breeding, passage and / or wintering periods".

This consideration of the seasonal presence of each key species in the Moray Firth informs our HRA advice, as presented in Appendix(iii). We are identifying that the reference population for HRA is the **breeding population**, against which to consider the impacts of the Beatrice and MORL windfarm proposals. The most up-to-date counts for each species are presented in Appendix A(v), although we highlight that further counts are currently underway (work commissioned by SNH, taking place this summer, 2013).

For most of the key species under consideration, the HRA assessment is focused to consideration of windfarm impacts during the breeding season, where we have identified connectivity between the individual seabirds recorded on the windfarm sites and SPA breeding colonies within foraging range. It is more difficult to assign connectivity in the non-

breeding season, when the individuals recorded at sea do not necessarily form part of the summer SPA breeding colonies in the vicinity – see further discussion in Appendix (iii).

Impacts to other seabird species

At the MFOWDG ornithology meeting held earlier this year (1 February 2013), we advised that gannet should be addressed using breeding numbers at Troup Head Site of Special Scientific Interest (SSSI) as the reference population for impact assessment. Please see Appendix (iv) for our advice in respect of gannet. We are not identifying any likely significant effect for this species as a qualifying interest of any SPAs within foraging range.

For all other seabird species originally included in the 'long-list' for assessment, such as cormorant, shag, Manx shearwater, Arctic tern, we confirm that there is no likely significant to these species as qualifying interests of any SPAs within foraging range. We have read the respective environmental statements for the Beatrice and MORL offshore wind proposals and we confirm that we are in agreement with the conclusions reached regarding these other seabird species.

Reference populations for seabirds in the non-breeding season

The UK statutory nature conservation advisers with Marine Scotland are letting a research contract to establish the scale at which non-breeding (wintering) populations of seabirds should be defined, and thus derive relevant population figures for impact assessment. .

SNH and JNCC will be able to provide an assessment of impacts to seabirds outwith the breeding season only once population estimates for seabirds in the non-breeding season have been agreed. In the meantime, for all seabird species other than great black-backed gull and herring gull (for which we direct you to our advice in Appendix (iii)) we confirm that windfarm impacts in the non-breeding season will not be significant.

Impacts on migratory wildfowl and waders

Our discussion at MFOWDG meetings concentrated on assessment of impacts to seabirds, however, we recognised that migratory wildfowl and waders would also need consideration (see our scoping advice for Beatrice, 14 May 2010 and MORL, 28 October 2010). We had only limited pre-application discussion on approaches to assessing the potential collision risk presented by the proposed windfarms to wildfowl and wader species on migration.

While MFOWDG attempted land-based and boat-based watches for migratory wildfowl and waders, we indicated concern about collating robust data on numbers of birds crossing the Firth (see our comments on first year survey reports, 26 August 2011). Under current knowledge, we do not consider it possible to apply a site-specific HRA process to migratory wildfowl and waders as we cannot identify to, or from, which particular SPA(s) any individuals may be travelling.

We therefore support the strategic assessment that Marine Scotland has commissioned in respect of these species, providing an overall estimate of collision risk that current offshore windfarm proposals in Scotland (territorial waters and Round 3) may present to migratory wildfowl and waders. Assessment will be made against the numbers of individuals of each species estimated to cross Scottish waters on migration – a 'Scottish' reference population that is relevant to the windfarms under consideration and may or may not equate to the overall UK migratory / wintering population of the species.

We consider the MS project to be sufficient to inform judgements regarding the significance of potential collision risk to migratory wildfowl and waders. We do not identify any further work for applicants to undertake in this regard in the case of BOWL and MORL.

APPENDIX A (ii)

ORNITHOLOGY
SNH & JNCC REVIEW of TECHNICAL ASSESSMENTS & MODELLING

As discussed at the MFOWDG meeting held 1 February 2013, collision risk is a concern for great black-backed gull, herring gull, kittiwake, fulmar and gannet. Displacement impacts have been assessed for guillemot, razorbill, puffin, kittiwake, fulmar and gannet. Each developer, BOWL & MORL, have undertaken their own individual technical assessments – collision risk modelling, the estimation of displacement effects and population modelling.

In this appendix, SNH & JNCC provide comments on these technical assessments, based on our review of the approaches used in each of the submitted environmental statements (ES) for these windfarm proposals in the Moray Firth. We highlight the points of similarity and points of disparity in the methodologies used by BOWL & MORL, and we provide our recommendations for the assessment of impacts.

We highlight that there are currently a number of precautionary assumptions that have had to be used in assessments, due to the lack of evidence (post-construction monitoring) regarding seabird interactions with built and operational offshore windfarms. Current recommendations will therefore have to be reviewed and updated over time as the knowledge base improves and there is greater certainty regarding the effects that offshore windfarms may have on seabirds, and on other bird interests.

COLLISION RISK MODELLING

Use of Band (2012)
Band (2012)[1] provides guidance on collision risk modelling for offshore windfarms. It includes a 'basic' model and an 'extended' version in situations where the data is adequate to support an extended analysis taking account of flight heights. The 'extended' model is particularly relevant for those species, such as seabirds, where the flight height distribution may be skewed towards low heights (see further discussion under paragraphs 61 - 75 of the guidance; Annex 3 provides the supporting mathematics of the 'basic' model and Annex 5 provides the maths for the 'extended version').

Under the 'extended' model, option 3 uses flight height distributions modelled from a generic dataset (Cook *et al.* 2012). We note some concerns over the accuracy of this generic dataset as it is solely derived from boat-based survey data and there could be associated observer error (due to the difficulty of measuring flight heights at sea, and over distance, where there are no points of reference).

The avoidance rates that are subsequently applied to the collision risk outputs from the 'extended' model have been derived from the 'basic' model, which does not account for flight height distribution in this manner. While 'avoidance' rates by name account for any avoidance action undertaken by a bird (either in close proximity or over distance, e.g. micro and macro), they also, by nature of their calculation, encompass other error and uncertainty within the modelling. Therefore we are currently investigating whether it is appropriate to apply the same avoidance rates to different models (i.e. 'basic' and 'extended') without correcting for differences in uncertainty between these models.

Due to these matters, we are mindful that in future we may suggest that a correction factor is applied to the 'extended' model. The advice we present in Appendix (iii) to inform HRA for key SPA seabird interests is based on collision risk modelling that uses the 'extended' model, option 3 at a 98% avoidance rate. However, to provide context, our supporting spreadsheets

[1] SOSS Project 02; Band, B. 2012 Using A Collision Risk Model To Assess Bird Collision Risks For Offshore Windfarms http://www.bto.org/science/wetland-and-marine/soss/projects

include the collision risk outputs from the 'basic' model, and from both models using a wider range of avoidance rates, i.e. including outputs at 95% and 99% as well as 98%.

BOWL and MORL approaches to collision risk modelling

- BOWL and MORL have based their assessment of collision on the predicted number of collisions from option 3 of Band (2012).
- BOWL have only updated collision risk for fulmar, gannet, kittiwake, great black-backed gull and herring gull within the ES addendum.
- MORL have only updated collision risk for gannet, kittiwake, great black-backed and herring gull within the ES addendum.
- BOWL and MORL have accounted for collision of immatures birds by adjusting the juvenile mortality within the population models in proportion with the numbers of immatures/adults recorded on site surveys.
- BOWL have applied a 99% avoidance rate for all species considered.
- MORL have applied species-specific avoidance rates, i.e. 99.5% for gannet, 98% for kittiwake, 98.5% for great black-backed gull and herring gull.
- Beatrice and MORL have used different input parameters for the bird species, most notably differing on nocturnal activity and flight behaviour (flapping or gliding). MORL have used the less precautionary input parameters. In our checks of the great black-backed gull and herring gull collision models we have used the parameters as set out by BOWL (see Table 1), as we consider these to be more appropriate in the light of concerns regarding these species population trends at the SPAs of concern. Although for other species we have considered the predicted number of collisions as presented in each ES addendum.
- MORL have undertaken collision risk modelling for each of the three windfarm sites (MacColl, Telford and Stevenson) for two scenarios, one at 3.6MW and the other at 5MW. They have also used different combinations of these sites.
- BOWL have included a 'most likely scenario' (MLS) and a 'worst case scenario' (WCS).
- For each windfarm scenario MORL has run the collision risk model four times to provide a weighted average based on a realistic turbine speed (rpm).
- MORL for all species, and Beatrice for great black-backed gull have both apportioned the number of collisions to estimate the number of breeding adults predicted to be impacted (i.e. removing non-breeding adult collisions from the breeding season estimates). MORL have multiplied the breeding season total by 50% whereas BOWL have suggested once collision of immatures have been removed a ratio of 65:35 is applied to the adult collisions. This has the effect of multiplying the total number of breeding season predictions by 24.4%.

  We acknowledge that there is some merit in this approach for species where adults are easily recorded and there is a good understanding and wealth of literature resources on the size of non-breeding adults associated with colonies. However, we also consider in reality that any collision impacts on immatures will have a delayed impact on recruitment into the population size, possibly affecting the population growth rate, and that similarly any non-breeding birds can act as a reservoir of potential breeders that can occupy breeding sites and territories should they come available, i.e. after wrecks.

  In our advice for great black-backed gull we have applied the approach suggested by Beatrice, however we consider this to be a minimum level of impact, and would advise that the impact may be larger than this.

Table 1 SNH & JNCC recommended input parameters for collision risk modelling

Species	Bird length	Wingspan	Flight Speed	Nocturnal Activity	Flight behaviour
Fulmar	0.475[1]	1.07[1]	13[2]	4[4]	Gliding
Gannet	0.935[1]	1.725[1]	14.9[2]	2[4]	Gliding
Kittiwake	0.39[1]	1.075[1]	13.1[3]	3[4]	Flapping
Herring gull	0.61[1]	1.44[1]	12.8[3]	3[4]	Flapping
Great black-backed gull	0.71[1]	1.575[1]	13.7[3]	3[4]	Flapping
[1] Snow and Perrins, 1998; [2] Pennycuick, 1997; [3] Alerstam *et al.,* 2007; [4] Garthe & Hüppop					

Summary of SNH and JNCC advice on collision risk

- In our advice we have used a combination of the number of collisions estimated for option 3 at a 98% avoidance rate, but with consideration of the range of collisions that has been estimated for option 1 and other avoidance rates, i.e. 95% and 99% as context for our advice.
- In our checks of the great black-backed gull and herring gull collision models we used the parameters as set out by BOWL. For other species we have considered the predicted number of collisions as presented in each ES addendum, although we acknowledge there are limitations in the comparability between developments for some species.
- For great black-backed gull we have used the approach outlined by BOWL to consider the number of collisions during the breeding season on the breeding birds only, i.e. multiplying the total number of breeding season predictions by 24.4%. This means the number we have considered is the least precautionary, and therefore we have little doubt in the magnitude of this impact.
- For herring gull we have used the approach outlined by MORL to consider the number of collisions during the breeding season on the breeding birds only, i.e. multiplying the total number of breeding season predictions by 50%. This approach is different to our approach for great black-backed gull due to the lack of survey data to establish the ratio of adults and immatures observed on the development site and is therefore more precautionary.
- We considered the number of collisions of SPA birds that may occur outwith the breeding season for herring gull and great black-backed gull as they are more sedentary than other species. To account for immigration during the wintering period we used the proportions outlined by BOWL.

DISPLACEMENT

Background

For many existing windfarms in Europe the approach used in impact assessment was to assess displacement of seabirds as an impact on adult survival as opposed to breeding productivity. This was due to the presence of predominantly non-breeding birds within the proposed development areas, i.e. impacts to birds outwith the breeding season.

For current applications in Scotland, our key concerns relate to breeding seabirds, where the birds are tied to particular colonies as 'centrally-placed foragers', attending nests to incubate and/or provision young. There is a paucity of information on the behavioural reaction and level of response that breeding seabirds may show to windfarms potentially constructed in their foraging areas. Initial monitoring of other European offshore windfarms are showing sometimes contrasting results between species and for the same species, and indicate that disturbance shown varies between and within species for responses to turbine structures (e.g. Leopold *et al.,* 2011, Canning *et al.,* 2012, Furness & Wade, 2013).

There is limited understanding of any resulting effects on the birds displaced, such as how to quantify the increased energetic demands on the adult, through additional flying around a wind farm or to alternative foraging locations, and decreased nest attendance and provisioning of

chicks during the breeding season. As such the assumptions used for assessment are currently highly precautionary: of the proportion of birds displaced from a windfarm site, it is assumed that 100% of them will fail to breed (for example, 100 birds are displaced by the windfarm so that 100 breeding units – Apparently Occupied Sites or Apparently Occupied Nests etc. – will fail). Marine Scotland Science have commissioned a research project to model the effects of displacement and we may, in the future, be able to refine these assumptions.

At the MFOWDG meeting held 1 February 2013, it was agreed that BOWL & MORL should use a similar displacement matrix to that developed by Natural England & JNCC. We amended it for Scottish waters to assess displacement in relation to breeding success (rather than mortality), for the reasons outlined above. For each site (Beatrice and MORL), we recommended using the mean peak population estimate for each species recorded on site (where displacement is the concern) and then the matrix provides a range of estimates for the numbers of birds that could fail to breed due to displacement.

BOWL approach to assessing displacement

BOWL revised their displacement assessment in line with our discussions at the MFOWDG meeting on 1 February 2013. They have summarised their approach as follows:

1. Average (across breeding seasons) peak total abundance (of flight and water) multiplied by a correction factor for turnover.
2. Taking the results from the first step above, multiplied by estimated % of the population made up of breeding individuals (obtained from pop modelling)
3. Finally, taking the result form step 2 and entering this into displacement table

All birds that were displaced were assumed to fail and assessed using population modelling.

In order to determine the proportion of the population likely to be displaced, sensitivity scores from Furness *et al.* 2013 have been converted into a percentage displaced figure (e.g. 1 = 20% and 5 = 50%). This approach is flawed as the sensitivity analysis is based on interactions between seabirds and boat disturbance. As mentioned above there is a growing body of evidence from wind farms in Europe and English waters, which suggest that some species, such as gannet, are not overly sensitive to boat disturbance, but are sensitive to the presence of wind farms.

Turnover has been taken into account by using species-specific estimates of number of foraging trips made by an individual per day and estimates of average duration of foraging trips. This is one of the first attempts at including a calculation for turnover. At this stage we do not have guidance on a specific approach; therefore given the reasoning presented behind the calculations we feel this approach is suitable and sufficiently precautionary. It would, in light of these cases, be advisable for further research into estimating turnover to be undertaken in future.

MORL approach to assessing displacement

MORL revised their displacement assessment in line with our discussions at the MFOWDG meeting on 1 February 2013. They have summarised their approach as follows:

1. Average (across breeding seasons) peak total abundance (of flight and water) was combined for the three proposed wind farm sites.
2. The site population is then apportioned to each of the SPAs for each qualifying interest.
3. This is then multiplied by the proportion of the site population assumed to be breeding (50%).
4. The proportion of birds displaced is taken from higher values for the ‘worst-case scenario’ analysis and lower values for the ‘realistic scenario’.

5. The proportion of these breeding birds that are predicted to fail in the current breeding attempt is 100% for both WCS and RS for all species, excluding fulmar and gannet. For the latter species this is taken at 50%, due to larger foraging ranges and spatial flexibility.

Key differences in the Beatrice and MORL displacement approaches

Different approaches were taken to assessing displacement between the two developments. BOWL used a percentage displaced and assumed that all birds displaced fail to breed, while MORL presented a range of displacement for the same species (see Table 2 below). Both developers used average peak estimates to derive the number of birds being displaced.

- Both developers have built precaution into their approaches to displacement, but in slightly different ways. BOWL, as mentioned above, has taken account of turnover at the development site, while MORL have summed estimates of proportions of birds from different SPAs to greater than 100% (up to 150%), where they are qualifying interests at more than one SPA.
- Both developers have included birds in flight as well as on the water.
- Both developers have used average peak rather than mean population estimates.

Table 2 Displacement ranges / percentages used in BOWL & MORL calculations

Species	% displaced – MORL	% displaced – BOWL
Fulmar	50 – 100%	20 %
Gannet	50 – 100%	60%
Kittiwake	10 – 50%	40%
Guillemot	50 – 100%	60%
Razorbill	50 – 100%	60%
Puffin	50 – 100%	40%

Summary of SNH and JNCC advice on displacement

- The use of turnover in the BOWL assessment this meant that it is difficult to directly compare the values for the two wind farms. While we were encouraged to see this being considered we did have to recalculate the BOWL displacement figures inline with the approach outlined by MORL to carry out an in combination assessment.
- For fulmar we assessed displacement at 50%, based on MORL's assessment, for all other species we assessed the level of displacement at the percentage outlined by BOWL. We do not necessarily agree with the level of displacement outlined for puffin (i.e. 40%) and would advise that they should be considered to be displaced at a similar level to other auk species. However, given that there is still uncertainty in the proportion of displaced birds that are likely to fail to breed and that our assessment found this level was sufficiently high to have a significant effect. We concluded that any further increases would only increase the magnitude of this impact and not change the conclusion for this species.
- For gannet, fulmar and kittiwake we have considered both collision and displacement as potential impacts but basing our advice on the most significant impact, collision risk. These species are all k-selected, with high adult survival rates and are therefore more severely impacted by wind farm mortality than by a decrease in productivity (Desholm, 2009 and Furness *et al.* 2013).
- For the auk species we used a combination of methods to assess the level of predicted impact in the context of the SPA populations, including the population models and PBR (outlined below). While these methods are not directly comparable, together they can provide context and an overall indication of the level of impact that may be acceptable.

POPULATION MODELLING

BOWL and MORL approaches to population modelling

Each developer has commissioned their own population models to examine the effects of displacement (reduction in productivity) and collision (increase in mortality) for the key SPA seabird species and colonies identified in Appendix (v) and discussed in Appendix (iii).

(i) Structure

- Both are stochastic, age-class structured models, based on the entire population (i.e. all age classes are included): so population impact of additional mortality to all ages is considered.
- Both model closed populations (no net immigration or emigration), and do not include density dependence.
- BOWL include both environmental and demographic stochasticity and MORL only include environmental stochasticity.
- MORL forecast to both 25 and 35 years (the period of wind farm operation, and plus 10 years respectively, while BOWL forecasts to 25 years (the period of wind farm operation).
- Demographic parameters (productivity, survival, age at first breeding and clutch size) were sourced from the published literature.

(ii) Outputs

- They model a range of increasing effects to the population from both collision (represented by additional mortality) and displacement (numbers displaced = numbers failing to breed).
- Both models present probabilistic outputs of population decline.
- The probabilities of the population dropping below a series of thresholds based on the current population size at 25 years (and at 25 year plus 10 years recovery for MORL) are presented, along with the change in probability between the no-wind farm scenario, and the range of wind-farm scenarios.
- The probabilities of the population dropping below a series of thresholds based on the forecast population size at 25 years (and at 25 year plus 10 years recovery for MORL) are also presented.
- Estimated growth rates are provided in either tabulated or graph form (MORL and BOWL respectively).

(iii) Key differences between MORL and BOWL population models

While the models are structurally similar, and examine the same species (and populations in most cases), the outputs differ, there are a number of potential reasons for this (over and above the fact that stochastic models, by definition, are not directly replicable):

- MORL does not include demographic stochasticity (this is only likely to have an effect at small population sizes).
- Demographic parameters selected differ in some instances (see table).
- Number of simulations (MORL = 1000, BOWL = 10000)
- For some species, the population scale at which modelling was conducted differs, e.g. gannet.
- Potentially there is a difference in how probability of decline is calculated. BOWL present the probability that the final population will be smaller than the current population (or median forecast one). It is unclear if MORL present the probability that the final population will be lower, or the probability that at any point during the forecast the population will be lower.

SNH & JNCC review of the suitability of the models

Parameterisation of population models is limited to the demographic data available, in most cases these data have either been collected at colonies remote from the Moray region, or at a much broader scale (e.g. national), and during earlier periods. The inputs are therefore neither spatially nor temporally specific to the colonies under consideration, and this will influence the confidence we can place in the predictive power of these models.

The outputs from population models can be useful in terms of comparing relative change (e.g. the difference in probability of a population decline under baseline (no wind farms) and impacted (presence of wind farms) between a wind farm and no-wind farm scenario, or a change in growth rates) as opposed to absolute changes (e.g. a wind farm scenario causes x level of decline). However, even relative comparisons may be influenced by the appropriateness of the model to predict changes to the population under consideration.

SNH & JNCC advice is to consider if the growth rates estimated by the model match current understanding of how the population under consideration is behaving.

In the case of the Moray region, most of the qualifying interests at the relevant SPAs have not been fully surveyed since Seabird 2000, and as such we do not have up to date population estimates, or colony specific trends. In Appendix (iii) we note the UK and Scottish trends for each species. In addition, SNH has commissioned plot counts for fulmar, kittiwake, guillemot, razorbill and puffin at East Caithness Cliffs SPA. This is work is currently being undertaken (summer 2013).

Other approaches to population modelling

As noted, there are a number of species where the presented population models may not be appropriate or sufficient to form the basis of our advice. We have therefore investigated the use of 'potential biological removal' (PBR) to aid interpretation, complementing the outputs from the BOWL and MORL models for certain species, and instead of the developers' models in those cases where we do not have confidence in the approaches used. We discuss this method under section (i) below.

We have also reviewed the population viability analysis (PVA) for gannet, commissioned by SOSS (WWT 2012). We discuss this under our advice for gannet presented in Appendix (iv). The ES assessments for BOWL and MORL make extended reference to the sandwich tern model produced for the North Norfolk Coast SPA population. There are a number of reasons why we do not think this approach is applicable to the windfarm proposals in the Moray Firth which we discuss under section (ii) below.

(i) Potential Biological Removal (PBR)

PBR is a simple form of population modelling, which was first formulated for marine mammals (Wade 1998) to estimate allowable bycatch. PBR calculates the number of additional mortalities that can be sustained annually by a population. The data requirements are reasonably simple: population size (Nmin), maximum annual recruitment (Rmax, calculated from age at first breeding and adult survival), and a recovery factor (f). Despite the limited input requirements the model allows for density dependence and stochasticity (Dillingham and Fletcher, 2008).

PBR outputs are very sensitive to f, the recovery factor, and the setting of f is a conservation management decision. Dillingham and Fletcher (2008) recommend that for threatened or endangered species, and SPA populations in decline (Dillingham, *pers comm*) an upper value of 0.1 should be used. They go on to suggest the following for IUCN classes;
f = 0.5 for 'least concern' species, f = 0.3 for 'near threatened', and f = 0.1 for all threatened species. A value of f = 1.0 may be appropriate for 'least concern' species known to be increasing or stable.

In our calculations we have determined PBRs for each species, at a range of f values. For our HRA advice in Appendix (iii) we use the outputs for the f value we consider to be appropriate

given the condition status and national trend of the qualifying interest. It should also be noted that:

- Adult survival rates used in PBRs should be estimated from survival in optimal conditions, however the PBRs presented here use the values supplied by BOWL for adult survival. Higher survival rates would result in a more precautionary output.
- Similarly, age at first breeding should ideally be a mid-point value, as opposed to the earliest breeding age, and the use of earliest breeding is less precautionary.

Nmin (the population size) should be a conservative estimate of population size, and is normally presented as a lower percentile of the estimated population to account for measurement error. In this case we have not corrected estimates for measurement error; again, this correction would lead to a more precautionary figure. The population estimates used are those agreed for each SPA, as presented in Appendix (v). However, we highlight the considerable uncertainty regarding the current population sizes at these SPA colonies.

(ii) Sandwich tern model

This model was commissioned by Centrica, to assess impacts from the Greater Wash wind farms on the North Norfolk Coast Sandwich Tern SPA. It differs from those currently under consideration for the Moray Firth for a number of reasons:

- The key input parameters were up-to-date and colony specific, with a long time series of colony-specific data on population size and productivity.
- Survival rates were calculated from all ringing data, at a UK level.
- The North Norfolk Coast Sandwich tern population was known to be relatively stable, and the population model reflected this (via incorporating a level of density dependence).

As such, JNCC had a reasonable level of confidence in the population model and due to the stable population (neither increasing nor decreasing), the use of either the starting or forecast (no wind farm) populations made no difference to the conclusions.

For the populations of seabird species at SPAs in the Moray Firth, the issue with applying this particular approach is to the poor quality of the input parameters, the fact we do not have up-to-date population counts and that there is a high level of uncertainty around the growth rates and consequently the population forecast. Therefore SNH & JNCC advise that the sandwich tern model **cannot be used to specifically inform advice on any of the species under consideration for Beatrice and MORL**.

References

Alerstam, T., Rosén, M., Bäackman, J., Ericson, P.G.P., and Hellgren, O. 2007. Flight speeds among bird species: allometric and phylogenetic effects. *PLoS Biol.* 5(8): e197.

Band, B. 2012. Using a collision risk model to assess bird collision risks for offshore windfarms. *Report to The Crown Estate, SOSS-02.*

Canning, S., Lye, G., Givens, L., Pendlebury, C. 2012. Analysis of Marine Ecology Monitoring Plan Data from the Robin Rigg Offshore Wind Farm, Scotland (Operational Year 2) Technical report, Birds. *Report: 1012206*. Natural Power Ltd.
Cook, A.S.C.P., Johnston, A., Wright, L.J., and Burton, N.H.K. 2012. A review of flight heights and avoidance rates of birds in relation to offshore wind farms. *BTO Research Report No. 618*

Desholm, M. 2009. Avian sensitivity to mortality: prioritizing migratory bird species for assessment at proposed wind farms. *Journal of Environmental Management.* 90: 2672-2679.

Dillingham, P.W., & Fletcher, D. 2008. Estimating the ability of birds to sustain additional human-caused mortalities using a simple decision rule and allometric relationships. *Biological Conservation*. 141: 1783-1792.

Furness, R.W., Wade, H.M and Masden, E.A. 2013. Assessing vulnerability of marine bird populations to offshore wind farms. *Journal of Environmental Management* 199: 56-66.

Garthe, S., and Hüppop, O. 2004. Scaling possible adverse effects of marine wind farms on seabirds: developing and applying a vulnerability index. *Journal of Applied Ecology.* 41: 724-734.

Leopold, MF, Dijkman, L. 2011. Local birds in and around the Offshore Wind Farm Egmond aan Zee (OWEZ). *Report number C187/11.*

Pennycuick, C.J. 1997. Actual and 'optimum' flight speeds: field data reassessed. *Journal of Experimental Biology.* 200: 2355-2361.

Snow, D.W., and Perrins, C.M. 1998. *The Birds of the Western Palearctic.* Concise edition. Oxford University Press.

Wade, P.R., 1998. Calculating limits to the allowable human-caused mortality of cetaceans and pinnipeds. *Marine Mammal Science*. 14: 1–37.

WWT, 2012. Gannet Population Viability Analysis: Demographic data, population model and outputs. *Report to The Crown Estate, SOSS-04.*

APPENDIX A (iii)

SPA SEABIRD SPECIES
SNH & JNCC ADVICE for HABITATS REGULATIONS APPRAISAL

Introduction

Habitats Regulations Appraisal (HRA) is the process which applies to any plan or project with the potential to affect the qualifying interests of a Natura site. In our scoping advice on Beatrice (14 May 2010), we outlined the HRA requirements (Appendix B) and discussed how this assessment process could apply to mobile seabird species where the impacts from an offshore windfarm proposal will be presented to the birds while they are away from the SPA breeding colonies, out foraging at sea (Appendix D).

We advised that the HRA process would take precedence over EIA for the key SPA seabird species of concern, and made a request (26 August 2011) to MFOWDG for 'preliminary analysis' of the cumulative impacts that could be presented by the Beatrice and MORL offshore windfarms, prior to the submission of any licence applications.

JNCC & SNH advice for Habitats Regulations Appraisal

We provide the following advice to Marine Scotland for informing HRA in respect of SPA seabird species:

1. Is the proposal connected with or necessary for SPA conservation management?

The proposal is not directly connected with or necessary for the conservation management of any of the SPAs listed in Appendix A(v).

2. Is the proposal likely to have a significant effect on the qualifying interests of the SPAs either alone or in combination with other plans or projects?

During pre-application dialogue and in our reponse (26 May 2011) to the developers' cumulative impact discussion document, we advised that a 'long-list' was drawn up to include all relevant SPA seabirds within foraging range of the windfarm sites, based on data available from the Birdlife International seabird database[2], and any other available sources such as the the Future of the Atlantic Marine Environment (FAME) project[3].

This 'long-list' informs judgements on **connectivity –** whether there could be any linkage between the proposed windfarm sites and SPAs. During the breeding season (and see further discussion below), if a species is recorded on-site in boat-based survey work, then we judge there to be connectivity between the windfarm proposal and all the SPAs for which the species is a qualifying interest, within foraging range.

The initial 'long-list' has been refined and iterated during the pre-application process: in particular it has been reviewed on the basis of the survey data collected by developers, as well as in respect to the seasonal presence of bird species. Where a species is recorded on-site and there are a number of SPAs within foraging range, **apportioning** has been carried out to determine the proportion of the birds recorded on-site from each of the SPAs.

Apportioning can help to inform judgements at this stage on **likely significant effect (LSE)**, so that any SPA to which a larger proportion of birds is assigned may be judged to experience LSE. However, SPAs to which smaller proportions of birds are assigned may in some

---

[2] Birdlife International seabird database, available at: http://seabird.wikispaces.com/

[3] For further information please see:
http://www.rspb.org.uk/ourwork/projects/details/255106-future-of-the-atlantic-marine-environment-fame-

instances still need further consideration (i.e. LSE is determined) if the SPA population is small and/or declining.

The key seabird species and SPAs where Beatrice, alone and in combination with MORL, may result in likely significant effect are presented in Appendix (v). The effects to consider for each species are listed below and require further consideration under appropriate assessment (see step 3):

- Collision risk to **great black-backed gull** of the East Caithness Cliffs SPA.
- Collision risk to **herring gull** of the East Caithness Cliffs SPA.
- Displacement to **Atlantic puffin** of the East Caithness Cliffs SPA, North Caithness Cliffs SPA & Hoy SPA.
- Displacement to **common guillemot** of the East Caithness Cliffs SPA & North Caithness Cliffs SPA.
- Displacement to **Razorbill** of the East Caithness Cliffs SPA & North Caithness Cliffs SPA.
- Collision risk and/or displacement to **black-legged kittiwake** of the East Caithness Cliffs SPA & North Caithness Cliffs SPA.
- Collision risk and/or displacement to **Northern fulmar** of the East Caithness Cliffs SPA & North Caithness Cliffs SPA.
- Collision risk to **Arctic skua** of Hoy SPA.
- Collision risk to **Great skua** of Hoy SPA.

In determining connectivity and likely significant effect, judgements also need to be informed by the seasonal presence of each species. Windfarm impacts that occur to individuals during the breeding season, can clearly be considered against the **breeding population** present at each of the SPAs under consideration above. For these SPAs, the breeding population is the reference population for HRA.

For windfarm impacts that occur outwith the breeding season, we are required to make a judgement as to whether it is possible to assign such impacts against the SPA breeding populations. For the majority of these species under consideration we are limiting the HRA to consideration of windfarm impacts during the breeding season only. This is because we cannot establish whether there is connectivity between the individuals of each species and SPAs, as designated, outwith the breeding season. During this time, individuals do not exhibit central place foraging and hence are not tied to their breeding colonies. In the non-breeding season, seabird dispersal and migration means that the individuals recorded in the Moray Firth will originate from multiple breeding colonies (both UK and abroad).

So we are not currently in a position to apply an HRA process to black-legged kittiwake, common guillemot, razorbill, Atlantic puffin, Northern fulmar, Arctic skua and great skua during the non-breeding season (see further discussion under Appendix A(i)).

However, great black-backed gull and herring gull are more sedentary and a proportion of the SPA breeding colony will remain in the Moray Firth during the non-breeding season. It is therefore possible under HRA to address impacts that may occur to these two species in the non-breeding season, and both developers have attempted do this using different approaches. We present our collision risk estimates for both the breeding and non-breeding seasons and we have based the non-breeding season estimates on the approach provided by BOWL:

- For **great black-backed gull**, BOWL estimated an overall non-breeding reference population for great black-backed gull (including gulls immigrating from Scandinavia and elsewhere) of which they considered the breeding season birds to represent 1.5% of the total.

- For **herring gull**, BOWL calculated that the wintering population was 30% larger, and estimated the breeding season population contributed 20% of the non-breeding reference population. Of this remaining number, 50% could be assigned to the breeding population of the East Caithness Cliffs SPA

3. Can it be ascertained that the proposal will not adversely affect the integrity of the SPA, either alone or in combination with other plans or projects?

This step is termed **appropriate assessment**, and it is to be undertaken by Marine Scotland, based on information submitted by developers, and with advice from ourselves. As identified, in Appendix (iv) the Beatrice and MORL offshore windfarm proposals are impacting on the same key seabird species and SPAs to which they are apportioned. Therefore our advice below, considers the implications of each proposed windfarm alone and in combination for the key SPA seabirds species, as identified.

The conservation objectives[4] to consider for each SPA are as follows:

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 bird species as a viable component of the SPA.

(iv) Distribution of the bird species within the SPA.

(v) Distribution and extent of habitats supporting the species.

(vi) Structure, function and supporting processes of habitats supporting the species.

repeat of (ii) No significant disturbance of the species.

As discussed in our scoping advice (Beatrice, 14 May 2010, and MORL 28 October 2010), the key conservation objective requiring consideration is to ensure the **long-term maintenance of the population of the bird species as a viable component of the SPA**. This is because it encompasses direct impacts to the species, such as significant disturbance to qualifying bird interests when they're outwith the SPA. It can also address indirect impacts such as the degradation or loss of supporting habitats which are outwith the SPA but which help to maintain the population of the bird species of the SPA in the long-term.

We confirm that none of the other conservation objectives require consideration at this time. Most relate to maintenance of favourable conditions at each of the SPA breeding colonies, and thus will not directly apply to individual seabirds when they are outwith the boundaries of the SPA. Some may need further consideration in the future, depending on the ports and harbours, and vessel routes, identified for windfarm construction and operation / maintenance activities.

- **Great black-backed gull** **East Caithness Cliffs SPA**

Great black-backed gull (GBBG) numbers at the East Caithness Cliffs SPA have decreased from 800 pairs at citation (1996) to 175 pairs in 1999. SNH has commissioned an up-to-date colony count, being undertaken this summer (2013), which is likely confirm a continuing decline in the great black-backed gull population at this SPA. Overall trends for the species also indicate a decline in numbers – in Scotland by 53% since 1986, and in the UK overall by 35% over the same time period.

[4] Further information on SPA conservation objectives available from: http://www.snh.org.uk/snhi/

We note that there is considerable disparity between these observed declines and the strongly positive growth rates that have been used in the BOWL and MORL population models. We do not consider that using growth rates in excess of 1.1 is biologically realistic for the population under consideration. We also note that available demographic data for GBBG is limited. An adult survival estimate is available, but there are no estimates for juvenile survival, and instead either the adult rate is used (MORL), which will be an over-estimate of survival, or a proxy species is used (BOWL).

For these key reasons, we have low confidence in the population models submitted by BOWL and MORL in support of assessments. Instead we have used 'potential biological removal' (PBR, discussed in Appendix A(ii)) to help inform our judgements on great-black backed gull. PBR calculates the number of additional mortalities that can be sustained annually by a population. The data requirements are reasonably simple: population size (Nmin), maximum annual recruitment, (Rmax, calculated from age at first breeding and adult survival) and a recovery factor (f).

For GBBG we have carried out PBR using a population size of 360 individuals with an Rmax value of 1.1086. For recovery, we recommend that an f value of 0.1 is used, due to the vulnerability of the population at East Caithness Cliffs SPA, and in light of the national trends for this species**.** Using these parameters, PBR indicates that **the population of great black back gull at East Caithness Cliffs SPA can only sustain an additional annual mortality of 2 breeding adults per year.**

As discussed at the MFOWDG ornithology meeting, held 1 February 2013, it is collision risk that is of key concern with respect to offshore wind impacts on great black-backed gull. Collision risk is a year-on-year impact that will last throughout the operational lifespan of the proposed offshore windfarms, estimated to be at least 25 years. The potential for collision mortality has been modelled by each developer as discussed in Appendix (ii).

The calculations and spreadsheets for each of BOWL and MORL have been checked by SNH and JNCC, and we have reworked the CRM to provide some consistency to the input parameters (such as nocturnal flight activity) and methods adopted (see above the discussion over modelled estimates for the breeding and non-breeding periods). Below we present our calculations of estimated collision mortality to great black-backed gull, using the extended model from Band (2012), 'option 3', and applying a 98% avoidance rate.

For the Beatrice 'worse case' scenario, we estimate that there would be ~12 collisions of breeding adults from the SPA during the breeding season and a further ~3 collisions of SPA birds during the non-breeding season. **This gives an annual estimate of collision mortality from the Beatrice windfarm proposal in the order of ~15 breeding adults per year.** For the Beatrice 'most likely' development scenario, the collision estimates are ~6.0 and ~1.4 breeding adults respectively for the breeding and non-breeding seasons.

The estimate for the MORL eastern development area (the three proposed windfarms together) is in the order of ~2 to 6 collisions of breeding adults from the SPA during the breeding season and a further ~0.5 to 1.5 collisions of SPA birds during the non-breeding season. **This gives an annual estimate of collision mortality from the MORL windfarm proposal in the order of ~2.5 to 7.5 breeding adults per year.**

Under HRA, we are required to consider these estimates alongside those for onshore wind development in Caithness. The cumulative annual collision mortality to GBBG for all relevant onshore windfarms (operational, consented, or at application) is in the order of **1 individual per year**. (This collision risk modelling for the onshore windfarms uses the 'basic' Band model, and applies an avoidance rate of 98%. We confirm that any estimate for breeding adult collisions would be less than 1.)

Conclusions

The estimated collision mortality to great black-backed gull arising from the Beatrice and MORL eastern development area (EDA) alone, and in combination, will affect the long-term maintenance of the GBBG population as a viable component of the East Caithness Cliffs SPA. **We therefore advise that each of the Beatrice and MORL (EDA) windfarm proposals alone, and in combination, would give rise to an adverse impact on site integrity at the East Caithness Cliffs SPA in respect of great black-backed gull.**

- **Herring gull** **East Caithness Cliffs SPA**

Herring gull numbers at the East Caithness Cliffs SPA have decreased from 9,400 pairs in the period 1985-88 to 3,393 pairs in 1999. SNH has commissioned an up-to-date colony count, being undertaken this summer (2013), which is likely confirm a continuing decline in the herring gull population at this SPA. Overall trends for the species also indicate a decline in numbers – in Scotland by 57% since 1986, and in the UK overall by 24% over the same time period.

We note that there is considerable disparity between these observed declines and the strongly positive growth rates that have been used in the BOWL and MORL population models. It should be noted that while both models estimate a positive growth rate they both also predict a greater than 50% likelihood that the population will be lower than it is now in 25 years time, in the absence of wind farm impacts.

For herring gull we have carried out PBR using a population size of 360 individuals with an Rmax value of 1.126. For recovery, we recommend that an f value of 0.1 is used, due to the vulnerability of the population at East Caithness Cliffs SPA, and in light of the national trends for this species**.** Using these parameters, PBR indicates that **the population of herring gull at East Caithness Cliffs SPA can only sustain an additional annual mortality of 43 breeding adults per year.**

The potential for collision mortality has been modelled by each developer as discussed in Appendix (ii). The calculations and spreadsheets for each of BOWL and MORL have been checked by SNH and JNCC, as discussed we have reworked the CRM to provide some consistency to the input parameters and methods adopted. Below, we present our calculations of estimated collision mortality to herring gull, using the extended model from Band (2012), 'option 3', and applying a 98% avoidance rate.

For the Beatrice 'worse case' scenario, we estimate that there would be ~10 collisions of breeding adults from the SPA during the breeding season. Outwith the breeding season, it is not possible to attribute impacts specifically to the SPA population, however, using the approach suggested by BOWL (see discussion under step 2 above) we estimate that there could be up to ~31.7 collisions of herring gull (from the regional breeding population) arising from the Beatrice proposal in the non-breeding season. **This gives an annual estimate of collision mortality from the Beatrice windfarm proposal in the order of ~41.7 breeding adults per year.** For the Beatrice 'most likely' development scenario, the collision estimates are ~6.4 and ~20.4 breeding adults respectively for the breeding and non-breeding seasons.

The estimate for MORL eastern development area (the three proposed windfarms together) is in the order of ~10.8 collisions of breeding adults from the SPA during the breeding season. Outwith the breeding season, it is not possible to attribute impacts specifically to the SPA population, however, using the approach suggested by BOWL (see discussion under step 2) we estimate that there could be up to ~15.8 collisions of herring gull (from the regional breeding population) arising from the MORL proposal in the non-breeding season. **This gives an annual estimate of collision mortality from the MORL windfarm proposal in the order of ~26.6 breeding adults per year.**

We acknowledge the uncertainty in deriving these estimates for herring gull, in particular, the absence of boat-based derived data on the ratio of adults to immatures and how to define the

proportion of SPA birds occurring in the non-breeding season. This uncertainty could be addressed using information on age ratios from the survey datasets and determining the proportion of collision mortality in the non-breeding season to assign specifically to the East Caithness Cliffs SPA population.

Conclusions

While Beatrice 'most likely' and MORL (EDA) individually would not affect the long-term maintenance of the herring gull population at East Caithness Cliffs, they could in combination. Beatrice 'worst case' affects the population both alone and in combination with MORL. **We therefore advise that Beatrice and MORL, in combination, could give rise to an adverse impact on site integrity at the East Caithness Cliffs SPA in respect of herring gull.**

- **Atlantic puffin** **East & North Caithness Cliffs SPAs, and Hoy SPA**

The status of puffins in the Moray region is unclear, this uncertainty is compounded by the difficulty in obtaining accurate colony counts for this species (due to its burrow nesting behaviour). BOWL and MORL both present models with positive growth rates, however, this may not be supported for East Caithness Cliffs and Hoy SPAs which both appear to be declining. The colony at East Caithness displayed a decrease from 1750 pairs in the citation year (1985-88) to 274 pairs in 1999, and the Hoy colony decreased from 3500 pairs at time of designation to 417 pairs in 2004.

We therefore use PBR to gain some understanding of the level of impact that these puffin populations could sustain. For the colonies at East Caithness Cliffs and Hoy SPAs we recommend an f value of 0.1-0.3 as being appropriate. The North Caithness SPA population may be increasing (from 1750 pairs at citation (1996) up to 7071 pairs in 1999) so we recommend an f value of 0.3-0.5. The PBR uses a population size of 514 individuals for East Caithness Cliffs SPA, 14,142 for North Caithness Cliffs SPA and 834 for Hoy SPA. The Rmax value is 1.0966.

The PBR outputs indicate that the population of puffin at East Caithness Cliffs can sustain an additional annual mortality of 2 – 7 breeding adults per year. For puffin at North Caithness Cliffs PBR indicates the population can sustain an additional annual mortality of 205 – 341 breeding adults. For puffin at Hoy, PBR indicates the population can sustain an additional annual mortality of 4 – 12 breeding adults.

We note that PBR is a method of assessing acceptable levels of additional mortality, so it is not directly comparable to the reduction in productivity that is hypothesised to result from birds being displaced. We would predict that higher numbers of pairs failing to breed would be more sustainable than adult mortality, so that the PBR outputs can be viewed as precautionary.

Conclusions

There is considerable uncertainty regarding displacement impacts (see Appendix (ii)), and in the case of puffins this is compounded by uncertainty regarding the colony population sizes. At present, our estimates are based on the assumptions that puffin will show 40% displacement from the proposed windfarm sites, leading to 100% failure in the breeding success of the birds displaced. Using our (draft) apportioning method, we consider how much of the estimated displacement should be assigned against each SPA. This indicates that ~21.4% of the impact will be to the puffin population of East Caithness Cliffs SPA, ~77.5% to the population of North Caithness Cliffs SPA and ~1.2% to the population at Hoy SPA.

For **East Caithness Cliffs SPA**, ~80 puffin are estimated to be displaced from the Beatrice windfarm and ~136 puffin from MORL (EDA), with associated breeding failure. While these figures are likely to be precautionary they indicate that there could be an effect to this SPA population when considered against the PBR (2 – 7 breeding adults). **We therefore advise that Beatrice and MORL, in combination, could give rise to an adverse impact on site integrity at the East Caithness Cliffs SPA in respect of puffin.**

For **North Caithness Cliffs SPA**, ~323 puffin are estimated to be displaced from the Beatrice windfarm and ~492 puffin from MORL (EDA), with associated breeding failure. While these figures are likely to be precautionary they indicate that there could be an effect to this SPA population when considered against the PBR (205 – 341 breeding adults). **We therefore advise that Beatrice and MORL, in combination, could give rise to an adverse impact on site integrity at the North Caithness Cliffs SPA in respect of puffin.**

For **Hoy SPA**, **~**5 puffin are estimated to be displaced from the Beatrice windfarm and ~8 puffin from MORL (EDA), with associated breeding failure. In combination, these figures are just above the PBR range of 4 – 12 breeding adults and as PBR is a precautionary method for considering the effects of displacement, we consider that the Hoy puffin population can sustain an estimated ~13 birds displaced / failing to breed. **We therefore advise that Beatrice and MORL, alone or in combination, will <u>not</u> give rise to any adverse impact on site integrity at the Hoy SPA in respect of puffin.**

- **Common guillemot East & North Caithness Cliffs SPAs**

The Scottish trend suggests a decline in numbers of common guillemot (by 24% since 1986), while for the same time period the UK numbers indicate a strong increase (by 41%). The guillemot colonies at East & North Caithness Cliffs SPAs display a strong increase from the citation counts (each based on data from 1985-88) to the Seabird 2000 counts at each SPA, undertaken in 1999. SNH has commissioned an up-to-date colony count, being undertaken this summer (2013). The plots counts conducted so far at the East Caithness Cliffs SPA suggest that guillemot numbers are down 35% since 1999, if this is indicative of the wider colony (and North Caithness Cliffs SPA) then it suggests that these guillemot populations are now displaying negative growth rates, which would be supported by the Scottish trend.

As indicated, evidence from Scottish trends and plot counts suggests that guillemot populations may now be declining in the Moray region (albeit after a period of growth), however, both BOWL and MORL predict positive growth rates in their population models. For this key reason, we are unable to place confidence in the interpretations made from these models.

Therefore we have used PBR to crudely investigate the level of displacement that each of the SPA guillemot populations could sustain. As discussed earlier, PBR is a method of assessing acceptable levels of additional mortality, so it is not directly comparable to the reduction in productivity that is hypothesised to result from birds being displaced. We would predict that higher numbers of pairs failing to breed would be sustainable than adult mortality, thus the PBR outputs we discuss can be viewed as precautionary.

The PBR uses a population size of 158,985 individuals for East Caithness Cliffs SPA and 70,154 for North Caithness Cliffs, with an Rmax value of 1.0708. As each of these SPA populations appears to be declining, we recommend using an f value of 0.1- 0.3. The PBR outputs indicate that the population of guillemot at East Caithness Cliffs SPA could sustain an additional annual mortality of 563 – 1689 breeding adults per year. For guillemots at the North Caithness Cliffs SPA, PBR indicates that the population could sustain an additional annual mortality of 248 – 745 breeding adults.

Conclusions

At present, our estimates are based on the assumptions that guillemot will show 60% displacement from the proposed windfarm sites, leading to 100% failure in the breeding success of the birds displaced. Using our (draft) apportioning method, we consider how much of the estimated displacement should be assigned against each SPA population. This indicates that ~93.2% of the impact will be to the guillemot population of East Caithness Cliffs SPA and ~5.8% on the population of North Caithness Cliffs SPA.

For **East Caithness Cliffs SPA**, 2118 guillemot are estimated to be displaced from the Beatrice windfarm and 3209 guillemot from MORL, with associated breeding failure. While these figures are likely to be precautionary they indicate that there could be an effect to this

SPA population when considered against the PBR (563 – 1689 breeding adults). **We therefore advise that Beatrice and MORL, in combination, could give rise to an adverse impact on site integrity at the East Caithness Cliffs SPA in respect of guillemot.**

For **North Caithness Cliffs SPA**, 132 guillemot are estimated to be displaced from the Beatrice windfarm and 200 guillemot displaced from MORL, with associated breeding failure. These figures are within the range of precautionary PBR outputs for this SPA population (248 – 745 breeding adults). **We therefore advise that Beatrice and MORL, alone or in combination, will <u>not</u> give rise to any adverse impact on site integrity at the North Caithness Cliffs SPA in respect of guillemot.**

- **Razorbill** **East & North Caithness Cliffs SPAs**

The UK and Scottish trends indicate an overall positive growth rate for razorbill: an increase of 37% in Scotland since 1986, and 66% for the UK over the same time period, however, they have shown an 18% decline in Scotland since 2000. The razorbill colonies at East & North Caithness Cliffs have displayed increases from the citation year (1986-88) to the Seabird 2000 count in 1999. SNH has commissioned an up-to-date colony count, being undertaken this summer (2013). The plots counts conducted so far at the East Caithness Cliffs SPA suggest that while numbers are up 62% since 1999, they have declined by 10% since 2005. If this is indicative of the wider colony (and North Caithness) this suggests razorbill populations in the region are now displaying negative growth rates, which would be supported by the emerging wider Scottish trend.

As indicated, evidence from Scottish trends and plot counts suggests that razorbill populations may now be declining in the Moray region (albeit after a period of growth), however, both BOWL and MORL predict positive growth rates in their population models. For this key reason, we are unable to place confidence in the interpretations made from these models. Therefore we have used PBR to crudely investigate the level of displacement that each of the SPA razorbill populations could sustain. As discussed earlier, PBR is a method of assessing acceptable levels of additional mortality, so it is not directly comparable to the reduction in productivity that is hypothesised to result from birds being displaced. We would predict that higher numbers of pairs failing to breed would be sustainable than adult mortality, thus the PBR outputs we discuss can be viewed as precautionary.

The PBR uses a population size of 17,830 individuals for East Caithness Cliffs SPA, 2,463 individuals for North Caithness Cliffs SPA and an Rmax value of 1.125. As each of these SPA populations appears to be declining, so we recommend an f value of 0.1- 0.3 as being appropriate. The PBR outputs indicate that the population of razorbill at East Caithness Cliffs SPA could sustain an additional annual mortality of 111 – 334 breeding adults per year. For razorbills at the North Caithness Cliffs SPA, PBR indicates that the population could sustain an additional annual mortality of 15-46 breeding adults.

Conclusions

At present, our estimates are based on the assumptions that razorbill will show 60% displacement from the proposed windfarm sites, leading to 100% failure in the breeding success of the birds displaced. Using our (draft) apportioning method, we consider how much of the estimated displacement should be assigned against each SPA. This indicates that ~98.1% of the impact will be to the razorbill population of East Caithness Cliffs SPA and ~1.9% to the population of North Caithness Cliffs SPA.

For **East Caithness Cliffs SPA**, 357 razorbill are estimated to be displaced from the Beatrice windfarm and 776 razorbill displaced from MORL, with associated breeding failure. While these figures are likely to be precautionary they indicate that there could be an effect to this SPA population when considered against the PBR (111 – 334 breeding adults). **We therefore advise that Beatrice and MORL, in combination, could give rise to an adverse impact on site integrity at the East Caithness Cliffs SPA in respect of razorbill.**

For **North Caithness Cliffs SPA**, 7 razorbill are estimated to be displaced from the Beatrice windfarm and 15 razorbill displaced from MORL, with associated breeding failure. These figures are within the range of the precautionary PBR outputs (15 – 46 breeding adults) for this SPA population. **We therefore advise that Beatrice and MORL, alone or in combination, will <u>not</u> give rise to any adverse impact on site integrity at the North Caithness Cliffs SPA in respect of razorbill.**

- **Black-legged kittiwake** **East & North Caithness Cliffs SPAs**

The Scottish and UK trends suggest declining kittiwake numbers (in Scotland by 66% since 1986, at the UK level by 55% over the same time period). At the East Caithness Cliffs SPA, however, numbers increased from 32,500 pairs in the period 1985-88 to 40,140 pairs in 1999. While North Caithness displayed a decrease in numbers from 13,100 to 10,147. Since then neither colony has been surveyed. Plots counts conducted in 2013 at East Caithness Cliffs SPA suggest that kittiwake numbers are down 24% since 2005, although this was a 17% increase on the 1999 counts. If this is indicative of the wider colony (and North Caithness Cliffs SPA) then it suggests that these populations are now displaying negative growth rates, which would be supported by the Scottish and UK trends.

There is uncertainty regarding the status of kittiwake colonies in the Moray region, so it is unclear if either the BOWL or MORL population models are appropriate. Each of the models predict different growth rates for East Caithness Cliffs; BOWL do not provide modelling for North Caithness Cliffs and MORL's modelling appears to use the wrong starting population.

We therefore use PBR to gain some understanding of the level of impact that these kittiwake populations could sustain. The PBR uses a population size of 80,820 individuals for East Caithness Cliffs SPA, 20,294 for North Caithness Cliffs and an Rmax value of 1.1155. As each of these SPA populations appears to be declining, so we recommend an f value of 0.1- 0.3 as being appropriate. PBR indicates that the population of kittiwake at East Caithness Cliffs SPA can sustain an additional annual mortality of 467 – 1400 breeding adults per year. For kittiwakes at the North Caithness Cliffs SPA, PBR indicates that the population can sustain an additional annual mortality of 117 – 352 breeding adults.

There is currently very little available information on the behavioural reaction of kittiwake to wind turbines. It is not known whether kittiwake are more likely to display collision risk or displacement effects, so in coming to a view we have considered both (see our supporting spreadsheets). For HRA, however, we base our advice on the impact that would be most significant to these kittiwake populations. This would be the risk of collisions rather than displacement because kittiwake are a *K*-selected species[5] and thus more sensitive to changes in adult survival rates (increases in mortality of adult birds) than to decreases in productivity (which could result from the displacement of breeding adults away from key foraging areas). See Desholm, 2009 and Furness *et al.* 2013 for further discussion.

We therefore make our judgements based on the assessment of collision risk to black-legged kittiwake at the East Caithness Cliffs SPA & North Caithness Cliffs SPA. For the Beatrice 'worse case' scenario, we estimate that there would be ~21 collisions of breeding adults during the breeding season and ~23 collisions during the non-breeding season. These estimates are made using the extended model from Band (2012), 'option 3', and applying a 98% avoidance rate.

The estimate for the MORL eastern development area (the three proposed windfarms together) is in the order of ~70 collisions of breeding adults during the breeding season and a further 26 collisions of SPA during the non-breeding season. As before, these estimates are made using Band (2012), 'option 3' with a 98% avoidance rate.

[5] *K*-selected species have longer life expectancy, and produce fewer offspring, which require greater parental care until maturity.

Conclusion

Using our (draft) approach to apportioning, we consider how many of the estimated collisions should be assigned against each SPA population. This indicates that ~95.1% of the impact will be on kittiwakes from the East Caithness Cliffs SPA and ~3.4% on those from the North Caithness Cliffs SPA. At these levels, it is clear that neither windfarm alone, or in combination, will affect the long-term maintenance of kittiwake as a viable component of either SPA.

We therefore advise that Beatrice and MORL, alone or in combination, will <u>not</u> give rise to any adverse impact on site integrity at either the East Caithness Cliffs SPA or the North Caithness Cliffs SPA in respect of kittiwake.

- **Northern fulmar** **East & North Caithness Cliffs SPAs**

Scottish and UK trends for Northern fulmar suggest a decline in numbers since 1986 (by 7% in Scotland, and 4% at a UK level). The populations at East & North Caithness Cliffs SPAs remained fairly stable from citation to the Seabird 2000 count in 1999. Since then neither colony has been completely surveyed. Plots counts conducted at East Caithness suggest that numbers are up 63% since 1999, so we could tentatively conclude that fulmar is increasing in the Moray Firth area (but noting the limitations around extrapolating the plot counts).

The models presented by MORL and BOWL predict growth rates in opposite directions (BOWL predicts a positive growth rate and MORL a negative one). It is uncertain which may be more appropriate. Furthermore MORL present models specific to both East and North Caithness Cliffs, while it is unclear at what population sizes the BOWL models are conducted.

We therefore use PBR to gain some understanding of the level of impact that these fulmar populations could sustain. The PBR uses a population size of 28,404 individuals for East Caithness Cliffs SPA, 27,900 individuals for North Caithness Cliffs and an Rmax value of 1.0447. We recommend an f value of 0.3- 0.5 as being appropriate, as the populations may be increasing. PBR indicates that the population of Fulmar at East Caithness Cliffs SPA can sustain an additional annual mortality of 190 – 317 breeding adults per year. For fulmars at the North Caithness Cliffs SPA, PBR indicates that the population can sustain an additional annual mortality of 187 – 312 breeding adults.

There is currently very little available information on the behavioural reaction of fulmar to wind turbines. It is not known whether fulmar are more likely to display collision risk or displacement effects, so in coming to a view we have considered both (see our supporting spreadsheets). For HRA, however, we base our advice on the impact that would be most significant to the fulmar populations East & North Caithness Cliffs SPAs. This would be the risk of collisions rather than displacement because fulmar are a *K*-selected species and thus more sensitive to changes in adult survival rates (increases in mortality of adult birds) than to decreases in productivity (which could result from the displacement of breeding adults away from key foraging areas). See Desholm, 2009 and Furness *et al.* 2013 for further discussion.

In this regard, no fulmar were observed flying at collision risk height height (20-200m) in the MORL eastern development area (refer to section 4.1.6 of technical Appendix 4.5A of the MORL ES). For the Beatrice 'worse case' scenario, we estimate there would be ~5 collisions of breeding adults during the breeding season and ~23 collisions in the non-breeding season. These estimates are made using the extended model from Band (2012), 'option 3', and applying a 98% avoidance rate.

Conclusions

We have used our (draft) apportioning method to consider how many of the estimated collisions should be assigned against each SPA population. This indicates that ~82.7% of the impact will be to the fulmar population of East Caithness Cliffs SPA and ~11.4% to the population of North Caithness Cliffs SPA. At these levels, it is clear that neither windfarm alone, or in combination, will affect the long-term maintenance of fulmar as a viable component of either SPA.

We therefore advise that Beatrice and MORL, alone or in combination, will <u>not</u> give rise to any adverse impact on site integrity at either the East Caithness Cliffs SPA or the North Caithness Cliffs SPA in respect of fulmar.

- **Arctic skua** **Hoy SPA**
  We have read the Environmental Statements for both MORL and BOWL and are in agreement with the conclusions reached with regard to Arctic skua.

- **Great skua** **Hoy SPA**
  We have read the Environmental Statements for both MORL and BOWL and are in agreement with the conclusions reached with regard to great skua.

APPENDIX A (iv)

EIA SEABIRD SPECIES
JNCC & SNH ADVICE for GANNET

The qualifying interests of Troup, Pennan and Lion's Head SPA do not include gannet and therefore gannet is not required to be assessed under HRA. However, as part of the Gamrie and Pennan Coast SSSI, the gannet colony at Troup Head are a notified feature and for this reason have been assessed further below as part of the EIA.

(i) Gannet PVA

As part of the Crown Estate offshore wind enabling actions, the Strategic Ornithological Support Services (SOSS) commissioned a stochastic, age structured population model that assessed the cumulative impact of all existing and consented offshore wind farms on UK gannet populations, and determined a threshold mortality rate that could be sustained from the cumulative effects of collisions with existing and future wind farm developments without causing population decline (WWT, 2012)[6]. We discuss this further with regard to our assessment for gannet – see ii. For general context it is worth summarising the following findings, which based on an increasing population the model predicted that:

1. Additional mortality equivalent to 1.93% of population would cause 50% of simulations to display negative growth rate.

2. Additional mortality equivalent to 0.72% of population would cause 5% of simulations to display negative growth rate.

This mortality applies to all birds within the population, not just breeding adults.

(ii) Gannet EIA Assessment – Troup Head

Gannet numbers at Troup Head have been expanding since it was established in the 1980s. Counts of the colony in 2010 estimated the population was 2787 Apparently Occupied Nests (AON) and initial surveys from 2013 indicate the population is stable (RSPB *pers comm.*). This reflects both Scottish and UK trends for this species.

The population models presented by MORL and BOWL both predict that the Gannet population will exhibit a positive growth rate (BOWL use 1.022, and MORL use 1.0116). As the colony at Troup Head has been expanding it is likely to display a more strongly positive growth rate than that of the models. We also note that a population model commissioned by SOSS is also available for gannets – this model predicts a positive growth rate.

The demographic data for both adults and juvenile gannets are good, and the growth rates are supported by wider trend information. However, the two models created by MORL and BOWL are at very different population scales. As there is a third model available - the SOSS PVA model, that has already assessed acceptable levels of mortality, we have used this for context in our assessment.

The SOSS PVA model used changes to growth rates to assess acceptable level of mortality (at both a national and SPA level) – two metrics can be derived:

1. The level of mortality that reduces the growth rate to 1 – effectively stabilising an increasing population, or to put that another way when 50% of the simulations display a negative growth rate
2. A more precautionary measure of the level of mortality that causes the lower 95% confidence interval of the growth rate to equal 1 (when 5% of the simulations display a negative growth rate.

[6] http://www.bto.org/science/wetland-and-marine/soss/projects

For Troup Head the results would be:

1. 50% chance of decline = 108
2. 5% chance of decline = 40

However, it should be noted that the population growth rate at Troup Head is likely to be much higher than the national growth rate (used in the SOSS model), and hence the values above are precautionary.

For gannet we also carried out PBR using a population size of 360 individuals with an Rmax value of 1.0989. For recovery, we recommend that an f value of 0.3- 0.5 is acceptable, as the Troup Head colony is displaying a strong increase, and is not an SPA population**.** Using these parameters, PBR indicates that **the population of gannet at Troup Head can sustain an additional annual mortality of 83-138 breeding adults per year.**

Collision Risk

Collision risk is a year-on-year impact that will last throughout the operational lifespan of the proposed offshore windfarms, estimated to be at least 25 years.

The potential for collision mortality has been modelled by each developer as discussed in Appendix (ii). The calculations and spreadsheets for each of BOWL and MORL have been reviewed by SNH and JNCC. Presented below is the summary of estimated collision mortality to gannet as shown within the ES addendums for BOWL and MORL.

For the Beatrice 'worse case' scenario, BOWL have estimated that there would be ~17 collisions of breeding adults during the breeding season, **with an annual estimate of collision mortality from the Beatrice windfarm proposal in the order of ~42 gannets per year.** These estimates are made using the extended model from Band (2012), 'option 3', and applying a 98% avoidance rate.

The estimate for the MORL eastern development area (the three proposed windfarms together) is in the order of ~29 collisions of breeding adults from the SPA during the breeding season. As before, these estimates are made using Band (2012), 'option 3' with a 98% avoidance rate. **This gives an annual estimate of collision mortality from the MORL windfarm proposal in the order of ~53 breeding adults per year.**

We acknowledge that gannets disperse away from their colonies after breeding, and agree with the description BOWL have outlined regarding non-breeding gannets passage at the wind farm site, within their ES addendum (section 7.6.5.1). Therefore we consider it is precautionary to apply the annual in-combination estimates to the Troup Head population.

As the annual estimates presented are within the upper limit of suggested mortality range for Troup Head, this would suggest that in reality collision is likely to be within an acceptable range. We are however mindful that initial evidence from offshore wind farms in Europe indicates higher levels of displacement for gannet (Canning *et al.*, 2012 and Leopold and Dijkman, 2011). We have therefore also considered the impact of displacement on gannets.

Displacement

At present, our estimates are based on the assumptions that gannet will show 60% displacement from the proposed windfarm sites, leading to 100% failure in the breeding success of the birds displaced (i.e. productivity of 0%). Based on this level of displacement 126 gannet pairs at Troup Head may fail to breed due to estimated displacement from the Beatrice and MORL windfarm proposals together. However, gannet, like fulmar, undertake few but long foraging trips and it is reasonable to consider these species have a large area of habitat available to them. In addition gannet are adapted to using efficient gliding flight, so the extra costs of additional distance from displacement are likely to be relatively small (Masden *et al*. 2010)

Conclusion

We conclude that neither collision nor displacement (as a consequence of both the proposed MORL and BOWL windfarms) are going to have a significant adverse affect on the gannet population of Troup Head SSSI. In addition, although we cannot quantify the combined impacts of some mortality through collision and some failure through displacement, it is possible that these impacts in combination may reduce the level of effect of each.

References

Canning, S., Lye, G., Givens, L., Pendlebury, C. 2012. Analysis of Marine Ecology Monitoring Plan Data from the Robin Rigg Offshore Wind Farm, Scotland (Operational Year 2) Technical report, Birds. *Report: 1012206*. Natural Power Ltd.

Leopold, MF, Dijkman, L. 2011. Local birds in and around the Offshore Wind Farm Egmond aan Zee (OWEZ). *Report number C187/11.*

Masden, E.A., Haydon, D.T., Fox, A.D., and Furness, R.W. 2010. Barriers to movement: Modelling energetic costs of avoiding marine wind farms amongst breeding seabirds. *Marine Pollution Bulletin.* 60: 1085-1091.

APPENDIX A (v)

SPA SEABIRD SPECIES
JNCC & SNH ADVICE for HABITATS REGULATIONS APPRAISAL – LIKELY SIGNIFICANT EFFECT (SHORTLIST ADVICE)

(Sent as a separate attachment)

APPENDIX B (i)

JNCC & SNH ADVICE on MARINE MAMMALS

Background

Pre-application dialogue on marine mammal species has been facilitated via the Moray Firth Offshore Wind Developer's Group (MFOWDG) comprising MORL for proposed development in the Round 3 zone and BOWL for Beatrice. The meetings have been attended by Marine Scotland; Crown Estate; the developers and their consultants; JNCC and SNH.

Towards the start of the process, JNCC and SNH provided scoping advice for each proposal (scoping response for MORL, 28 October 2010 and scoping response for Beatrice, 14 May 2010). We outlined the process of Habitats Regulations Appraisal (HRA) for the marine mammal species which are designated as a qualifying interest of Special Areas of Conservation – see Appendix D of each response.

Further to this, the developers (as MFOWDG) indicated how they would approach cumulative impact assessment in a discussion document, on which we provided comment, 26 May 2011.

We have reviewed the MORL ES and we provide our advice to Marine Scotland to inform HRA for harbour seal and bottlenose dolphin as SAC qualifying interests – given in Appendix B(ii).

We provide over-arching comments on marine mammal species below. Appendix B(iii) provides our advice on licensing requirements for cetaceans (whales and dolphins) as European Protected Species.

Discussion & assessment of impacts on marine mammals

- **Underwater noise impacts**

  Underwater noise assessment is presented throughout Chapters 7.3, 10.3, 12 and 14.2 of the original ES and various Technical Appendices.

  The zones of disturbance impact from underwater noise have been modelled for harbour seal and bottlenose dolphin, see Technical Appendices 7.3F for the maps of the model outputs. Noise from pile-driving foundations is modelled to extend beyond the windfarm footprint and result in disturbance of individuals. In this regard, the implications for European Protected Species (EPS) are discussed in Appendix B(iii).

  For the species where this noise disturbance to individuals may be such as to result in population level effects – harbour seals and bottlenose dolphin – this has been investigated through modelling. The population models for each species are presented in Chapters 7.3 (and Technical Appendix 7.3B) and we are satisfied it uses the best scientific approach, currently available – see Appendix B(ii) for further detail. The models are precautionary and predict some impact on the populations during construction, but no long-term effect.

  It may be possible to further reduce disturbance impacts through consideration of construction programming at each site, and adoption of mitigation. Please see the discussion below on mitigation and monitoring and in Appendix F on natural heritage matters to be addressed by conditions.

  Potential auditory injury spatial footprints for the majority of species considered appear to fall within the mitigation zone advised in the JNCC guidance and can be mitigated for within proposed plan(s) for Beatrice and MORL (see below).

- **Corkscrew injury**

  Collision risk is considered, in light of ship strikes and corkscrew injuries, with the uncertainty around cause and effect for corkscrew injuries highlighted through the ES and as such this potential impact pathway is not considered further. We advise that, depending on the information available at the time, both in terms of the types of vessels to be deployed and best available scientific evidence on the issue, this potential impact should be considered for each proposal (MORL & Beatrice) by an independent expert panel as recommended in Appendix F and, if required addressed via a vessel management plan, construction method statement and / or in mitigation proposals (discussed below and in Appendix F).

- **Grid connection: export cable**

  MORL have not considered the potential impacts from installation of the export cable, particularly as it comes to shore crossing coastal waters to the south side of the Moray Firth, established as an area of higher dolphin use. As discussed in Appendix B(ii), we advise that this matter can be addressed by construction programming for cable installation and/or in a construction method statement – see our recommendations in Appendix F.

- **Mitigation**

  Mitigation measures for construction impacts are noted in the ES, including the commitment to follow JNCC piling guidelines, including use of MMOs, a 500m mitigation zone, soft start, and PAM monitoring. We note that potential use of acoustic deterrent devices (ADDs) is currently under discussion via the ORJIP (Offshore Renewables Joint Industries Programmes) working group.

  We recommend that a strategic overview is taken of mitigation measures for MORL and Beatrice together in order to minimise cumulative impacts during construction (including with regard to SAC qualifying interests, as discussed in Appendix B(ii)). Please see Appendix F for our recommended conditions: we advise that mitigation and monitoring is considered by an independent expert panel as discussed below and in Appendix F.

  We advise that Marine Scotland, as the regulator and licensing authority, should take the strategic overview of licensed development activity occurring in the Moray Firth. While MORL and BOWL can advise on their construction programmes and piling plans (possibly via the Expert Panel, as discussed), Marine Scotland will need to consider the timing and duration of this windfarm construction alongside other proposed development activity (that may potentially come on-stream over the same time period) including oil & gas; ports & harbours (development proposed in the National Renewables Infrastructure Plan); SHETL and other cable proposals. We would be happy to provide further advice on these aspects as more information becomes available.

- **Monitoring**

  We welcome the impact monitoring work suggested by the windfarm developers in the *Scoping document for the BOWL & MORL Marine Mammal Monitoring Programme* (March 2013). We recommend that monitoring proposals are taken forward for discussion and agreement via an independent expert panel, facilitated by Marine Scotland, and comprising representatives from each of MORL and BOWL, alongside ourselves (SNH & JNCC) and independent experts / academia – as advised in Appendix F.

  As well as facilitating co-ordination of monitoring across the MORL and Beatrice windfarms, the expert panel could act as an appropriate mechanism to align developers' site (impact) monitoring with any wider / strategic research that is commissioned, for example, the MS project for acoustic monitoring down the east coast of Scotland, and potentially any agreed workstreams resulting from the Offshore Renewables Joint Industries Programmes (ORJIP).

  For marine mammals, we recommend that site (impact) monitoring focuses on appropriately designed surveys to determine species responses to piling noise in particular and any other construction impacts, including dose–response relationships and the temporal span of impacts.

However, the expert panel should discuss and agree a monitoring plan that across all phases of development (pre, during and post construction) in order to validate ES impact assessment predictions (and increase the evidence base on such issues).

APPENDIX B (ii)

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

Introduction

Habitats Regulations Appraisal is the process which applies to any plan or project with the potential to affect the qualifying interests of a Natura site. As set out in our scoping response, we advise that the marine mammal interests of the following Special Areas of Conservation (SACs) will need to be addressed under HRA for the MORL offshore windfarm proposals:

- **Dornoch Firth & Morrich More SAC** - designated for its population of harbour seals (*Phoca vitulina*) and for coastal and marine habitats including sand dune habitats, intertidal mudflats and sandflats; subtidal sandbanks and reefs.
- **Moray Firth SAC** - designated for bottlenose dolphin (*Tursiops truncatus*) and for subtidal sandbank habitat.

JNCC & SNH advice for Habitats Regulations Appraisal

We provide the following advice to Marine Scotland for informing HRA in respect of the marine mammal interests of each of these SACs:

1. **Is the proposal connected with or necessary for SAC conservation management?**

   The proposal is not directly connected with or necessary for the conservation management of either the Dornoch Firth & Morrich More SAC or the Moray Firth SAC.

2. **Is the proposal likely to have a significant effect on the qualifying interests of the SACs either alone or in combination with other plans or projects?**

- **Harbour seals** of the Dornoch Firth SAC.

  The seals are not confined to this SAC itself and will range more widely within the Firth and beyond. Construction (and other) noise arising from the proposal is modelled to extend beyond the windfarm footprint and may overlap with seal use of the surrounding environment (see Technical Appendix 7.3F for noise propagation and SAFESIMM model outputs for marine mammal risk assessment). Boat movements, cable-laying and other construction activity may also give rise to disturbance, although likely to a lesser degree than piling. There may also be impacts to the prey species of seals – either from the placement of infrastructure or due to noise.

  We therefore advise **likely significant effect** from the MORL windfarm proposal on the harbour seals of the Dornoch Firth SAC, so impacts (including cumulative) will need to be considered in appropriate assessment (see step 3 below).

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

  The dolphins are not confined to this SAC and will range more widely within the Firth and beyond. Construction (and other) noise arising from the proposal is modelled to extend beyond the windfarm footprint and may overlap with dolphin use of the surrounding environment (see Technical Appendix 7.3F for noise propagation and SAFESIMM model outputs for marine mammal risk assessment). Boat movements, cable-laying and other construction activity may give rise to disturbance. There may also be impacts to the prey species of dolphin – either from the placement of infrastructure or due to noise.

  We therefore advise **likely significant effect** from the MORL windfarm proposals on the bottlenose dolphins of the Moray Firth SAC, so impacts (including cumulative) will need to be considered in appropriate assessment (see step 3 below).

3. **Can it be ascertained that the proposal will not adversely affect the integrity of the SAC, either alone or in combination with other plans or projects?**

This step is termed **appropriate assessment**, and it is to be undertaken by Marine Scotland, based on information supplied by developers, with advice from ourselves. It considers the implications of the proposed MORL windfarms for conservation objectives identified to maintain site integrity relating to the harbour seals of the Dornoch Firth SAC and the bottlenose dolphins of the Moray Firth SAC.

Please refer to http://www.snh.org.uk/snhi/ for a full list of these conservation objectives as we only discuss the relevant ones below.

- **Harbour seals** of the Dornoch Firth SAC.

The relevant conservation objective to consider is the maintenance of the harbour seal population as a viable component of the Dornoch Firth SAC. This encompasses any significant disturbance to individuals while they are outwith the SAC, such as underwater noise impacts arising from windfarm construction.

A harbour seal impact assessment framework has been developed initially for the MFOWDG windfarms and is now in press for wider use[7]. This framework considers whether any noise (and other) impacts to individuals would result in population level effects, please see Technical Appendix 7.3B

JNCC and SNH are satisfied that this framework constitutes the best possible approach to impact assessment for harbour seals under current scientific knowledge. It sets out a process for considering the outcomes of noise disturbance and behavioural displacement as a reduction in the individual fitness of animals and then models the consequences of this for the population, using reproductive success as the key parameter that is affected. Key areas of scientific uncertainty are highlighted, including their significance to the assessment framework.

As presented in the ES, the framework makes a base assumption that noise and other impacts from windfarm construction will reduce the breeding success of the harbour seal population to zero for the duration of construction. While this results in population-level effects during windfarm construction (a construction phase of up to 6 years for Beatrice and MORL together), the population is predicted to recover in the long-term once this construction is complete. The modelling is for a 'worst case' that considers the construction impacts of both windfarms together on harbour seals, and alongside continuing seal mortality due to licensed shooting.

Therefore SNH and JNCC are satisfied with the conclusions in the ES - that disturbance from underwater noise will not result in any long-term effects on the harbour seal population of the Dornoch Firth SAC and thus **there will be no adverse impacts on SAC site integrity.**

It has not been established whether there is any link between the use of vessels with ducted propellers and the fatal injuries (corkscrew lacerations) that have been recorded to seal species over the last couple of years[8]. Marine Scotland and SNH have commissioned research in this regard, currently being undertaken by SMRU. We will continue discussion with Marine Scotland to agree any mitigation, monitoring and conditions required in this regard.

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

The relevant conservation objective to consider for maintaining site integrity is the maintenance of the bottlenose dolphin population as a viable component of the Moray Firth

---

[7] 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 (2013) 73–85.

[8] 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.

SAC. This encompasses any significant disturbance to individuals while they are outwith the SAC, such as underwater noise impacts arising from windfarm construction.

MORL have modelled potential underwater noise impacts to bottlenose dolphins during construction (see Technical Appendix 7.3F Predicted zones of impact from the noisiest construction activities (associated with pile-driving the turbine foundations) could slightly extend into areas used by bottlenose dolphin transiting along the coast in the Moray Firth: this is for a 'worst case' of piling activity at MORL and Beatrice windfarm sites together.

MORL have then modelled whether any resulting disturbance to individuals could result in population level effects (see Chapter 7 & Technical Appendix 7.3B). We are satisfied with the method adopted and the conclusion reached in the ES - that there are no long-term effects from underwater noise disturbance on the bottlenose dolphin population of the Moray Firth SAC. As such there is **no adverse impact to SAC site integrity**.

We also agree with the conclusion in the ES that potential disturbance to bottlenose dolphin from other construction activities will not result in population level effects. The potential for disturbance from, for example, the installation of export cable routes, may if necessary be managed through construction programming for MORL and Beatrice. We provide our advice on the natural heritage matters to be addressed by conditions in Appendix F.

APPENDIX B (iii)

MORL OFFSHORE WINDFARM PROPOSAL
JNCC and SNH ADVICE on EUROPEAN PROTECTED SPECIES

Background

The legislative framework for European Protected Species (EPS) is outlined in our scoping advice (see Appendix C of our response, 28th October 2010). In this regard, we consider Technical Appendix 7.3 H of the MORL ES to summarise the requirements for EPS licensing and the information that will be required for EPS licensing for bottlenose dolphin, harbour porpoise and minke whale.

EPS licensing guidance is currently under development for the marine environment both in Scottish and UK offshore waters. JNCC is the statutory nature conservation body who provides advice on EPS in respect of the Habitats Regulations for UK waters, outside of 12nm (territorial waters). A summary of the licence application tests[9] for EPS in offshore waters is as follows:

Any licence application (under regulation 53(1) of the HR and 49(6) of the 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 Guidance[10] sets out the three tests that must be satisfied before the licensing authority can issue an EPS licence 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).

---

9 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

10 SG Interim EPS Guidance available from: http://www.scotland.gov.uk/library3/environment/epsg.pdf

JNCC and SNH advice on impacts on EPS Favourable Conservation Status

Under the above regulations it is the responsibility of the statutory nature conservation advisers to provide advice with regard the 'third test' in each set of regulations – that the proposal will not be detrimental to maintenance of the population of the species concerned at a favourable conservation status in their natural range. For those EPS recorded more frequently in the Firth – harbour porpoise, bottlenose dolphin and minke whale – our judgements are informed by the JNCC species reports in preparation[5], alongside the risk assessments provided by each of the windfarm developers (MORL and BOWL).

For all EPS that may potentially be recorded in the Moray Firth, JNCC & SNH agree with the conclusion of the ES that disturbance arising to these species from the MORL windfarm proposals, alone or in combination with development in the Beatrice application, **will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status of these species in their natural range.** This is due to the scale of the impacts identified for these species within the impact assessments, the very conservative, worst case scenarios used in the impact assessments and the intermittent nature of the piling noise itself as described in the impact assessment, alongside the current favourable conservation status of all three species within UK waters[11] (draft Habitats Directive Article 17 species reports in preparation)).

An EPS licence (or licences) will be required for the MORL proposals, however, due to the potential for disturbance of individuals of each species. As outlined in their ES – technical Appendix 7.3H, MORL intend to apply for an EPS licence closer to the commencement of construction, once final windfarm layout, design and foundation options have been confirmed and submitted to Marine Scotland. Any licence applications, mitigation plans and construction methods statement etc must be provided to both JNCC and SNH in sufficient time for consultation on the proposals in order to ensure time for effective consultation.

Both JNCC and SNH note MORL's commitment to implementing the JNCC piling guidelines as mitigation and will review the development of an effective marine mammal mitigation plan as the developers plans are further refined closer to the point of construction. This includes effective monitoring for the full area over which auditory injury (i.e. PTS) could occur for species, as well as any further developments in relation to potential mitigation options (e.g. development of ORJIP project 4 and the use of ADDs etc).

The planned offshore renewable windfarm developments in UK waters could involve multiple piling events occurring concurrently, across a species range, over several years. This has the potential to have a detrimental impact on the FCS of populations of marine mammal species occurring in UK waters. Therefore, continued strategic discussion is needed between UK Regulators (including Marine Scotland) and statutory nature conservation advisers (including JNCC & SNH) to consider the wider issue of an EPS licensing framework across UK waters as a whole.

[11] DRAFT 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*) and Species: S2618, Minke whale (*Balaenoptera acutorostrata*).

APPENDIX C (i)

SNH & JNCC ADVICE on FISH INTERESTS

Summary of key advice on diadromous fish species

- **Underwater noise impacts**
  The ES recognises the principle areas that could lead to adverse impacts on Atlantic salmon, sea trout, sea lamprey and European eel. The ES also recognises the uncertainties regarding the behaviour of these diadromous[12] fish species in the marine environment, and their potential interaction with construction / operation / decommissioning of the proposed windfarm.

  The effect of noise on Atlantic salmon and sea trout is assessed to be negative, of minor-moderate significance and probable. For sea / river lamprey the effect is estimated to be small, and for European eel, the effect is thought to be between medium and small. For these species, we consider that noise disturbance to individuals will not result in population level effects.

  While MORL has spatially modelled the impacts, they have not explored or discussed the temporal aspects in any detail. We advise on the need for further discussion of construction programming and possible mitigation measures if / when windfarm proposals are consented – please see the discussion under HRA in Appendix C(ii).
  We recommend that mitigation options could be considered by the independent expert panel as discussed in Appendix F.

- **Grid connection: export cable**
  We highlight that MORL has not provided a thorough assessment of the impacts arising from installation of the export cable on diadromous fish, particularly where it draws close to shore. While the noise arising from cable installation may be considered less than that from pile-driving foundations, the noise will be emitted closer distance to shore and potential migration routes.

  We recommend that these matters are considered via construction programming for cable installation and/or in a construction method statement – please see the discussion under HRA in Appendix C(ii) as well as Appendix F.

- **Electro-magnetic fields (EMF)**
  The ES notes the considerable degree of uncertainty regarding the impacts of electromagnetic fields (EMF) on diadromous fish. Nevertheless, on the basis of existing knowledge, we consider that the mitigation (cable burial / rock armouring) proposed in the ES will be sufficient to avoid any significant EMF effects on diadromous fish.

Summary of key advice on marine fish species

- **Underwater noise impacts**
  Our key concern in respect of marine fish relates to underwater noise impacts from the pile-driving of turbine foundations during construction: cod and herring being the key species of concern in this regard.

  For **herring**, recent evidence from the ICES working group indicates an improved status of the relevant stock. While this leads us to conclude that impacts from each proposal (Beatrice, MORL) are minor, their cumulative impacts remain moderate.

  For **cod**, the MORL (and BOWL) ES has identified a major-moderate impact, with which we have agreed (see our interim advice, dated 18th December 2012). We do, however, continue to refer to Marine Scotland Science (MSS) for advice on the status of the stock, any updated

[12] Diadromous - fish migrating between fresh and salt waters

information on spawning grounds and for expert opinion on the significance of the impact upon wider North Sea stocks.

While a spatial zone of impact for the 'worst case' piling scenario is presented, neither MORL or BOWL have explored the temporal aspects. We advise that there should be discussion of construction programming and other potential mitigation measures to reduce or manage underwater noise impacts if / when proposals are consented – please see our recommendations in Appendix F.

It has been raised for consideration whether the use of reduced blow-forces for pile-driving could mitigate noise impacts during peak spawning periods of cod and / or herring. The value and / or viability of such a mitigation proposal could be considered further by the independent expert panel, as discussed in Appendix F.

- **Electro-magnetic fields (EMF)**
  The ES notes the considerable degree of uncertainty regarding the impacts of electromagnetic fields (EMF) on fish and shellfish. Nevertheless, on the basis of existing knowledge, we consider that the mitigation (cable burial / rock armouring) proposed in the ES will be sufficient to avoid any significant EMF effects on marine fish.

- **Impacts to sandeels**
  Although the scale of impact upon sandeel populations is not likely to be large in the context of the Moray Firth or wider region, sandeels were present in the development site during the MORL surveys. Greater densities however, were surveyed by MORL in their western development area. We refer to MSS for knowledge or predictions of local sandeel stocks. The potential for pre- and post-construction monitoring of sandeels, in conjunction with other monitoring, could present a valuable learning opportunity. We recommend that such a proposal could be considered by the independent expert panel, as discussed in Appendix F.

APPENDIX C (ii)

FRESHWATER FISH of CONSERVATION CONCERN
SNH & JNCC ADVICE for HABITATS REGULATIONS APPRAISAL

Introduction

Habitats Regulations Appraisal is the process which applies to any plan or project with the potential to affect the qualifying interests of a Natura site. As set out in our scoping response, we advise that the freshwater fish interests of the following Special Areas of Conservation (SACs) will need to be addressed under HRA for the MORL offshore windfarm proposals:

- **Berriedale & Langwell Waters SAC** - designated for Atlantic salmon (*Salmo salar*).
- **River Evelix SAC** - designated for freshwater pearl mussel (*Margaritifera margaritifera*).
- **River Moriston SAC** - designated for Atlantic salmon and for freshwater pearl mussel.
- **River Oykel SAC** - designated for Atlantic salmon and for freshwater pearl mussel.
- **River Spey SAC** - designated for Atlantic salmon, sea lamprey (*Petromyzon marinus*) and freshwater pearl mussel.
- **River Thurso SAC** - designated for Atlantic salmon.

We have considered other SACs and included only those that we consider relevant i.e. where there may be connectivity between the windfarm proposal and the SAC.

JNCC & SNH advice for Habitats Regulations Appraisal

We provide the following advice to Marine Scotland for informing HRA in respect of the freshwater fish interests of each of the above riverine SACs:

1. Is the proposal connected with or necessary for SAC conservation management?

The proposal is not directly connected with or necessary for the conservation management of any of the above riverine SACs.

2. Is the proposal likely to have a significant effect on the qualifying interests of the SACs either alone or in combination with other plans or projects?

- **Atlantic salmon**

We have listed a wide range of SACs due to the current uncertainty about the migratory movements of Atlantic salmon – they are recorded in the Moray Firth, but we do not know which SAC watercourses adult fish or post smolts are going to, or coming from.

We advise **likely significant effect** from the MORL windfarm proposals on Atlantic salmon due to the possibility that they could be disturbed by construction noise and / or possible effects of electro-magnetic fields (EMF) arising from installed cables. We are satisfied that operational noise would not result in likely significant effects to salmon.

Impacts will therefore need to be considered in appropriate assessment (see step 3 below).

- **Freshwater Pearl Mussel**

Atlantic salmon (and other salmonids) are integral to the life cycle of freshwater pearl mussel (FWPM), therefore any impacts to Atlantic salmon that prevent them from returning to their natal rivers may have a resulting effect on FWPM populations.

We therefore advise **likely significant effect** from the MORL windfarm proposal on FWPM, potential indirect impacts to this species will need to be considered in appropriate assessment.

- **Sea Lamprey**

  Sea lamprey is a qualifying interest of the River Spey SAC where it is virtually at the northern limit of its range in Britain. We note that there is little available information on the movements of sea lamprey in general, and within the Moray Firth in particular.

  We advise **likely significant effect** from the MORL windfarm proposals on sea lamprey due to the possibility that they could be disturbed by construction noise and / or possible effects of electro-magnetic fields (EMF) arising from installed cables. We are satisfied that operational noise would not result in likely significant effects to this species.

  Impacts (including cumulative) will therefore need to be considered in appropriate assessment (see step 3 below).

3. **Can it be ascertained that the proposal will not adversely affect the integrity of the SAC, either alone or in combination with other plans or projects?**

   This step is termed **appropriate assessment**, and it is to be undertaken by Marine Scotland, based on information supplied by developers, with advice from ourselves, as presented below. It considers the implications of the proposal for the (relevant) conservation objectives relating to the SAC qualifying species of concern to maintain site integrity. Please refer to http://www.snh.org.uk/snhi/ for a full list of these conservation objectives as we only discuss the relevant ones below.

- **Atlantic salmon**

  The relevant conservation objective to consider is whether or not the proposed MORL windfarms would result in any impacts on the viability of Atlantic salmon populations supported by the SACs listed above. While there may be some level of noise disturbance to individuals during construction we confirm that this will not result in population level effects. We are satisfied that operational noise would not result in likely significant effects to salmon.

  The applicant proposes to adopt soft-start piling methods to help mitigate any noise disturbance and to bury cables to reduce EMF. We are satisfied that this mitigation will further reduce impacts to individuals, and avoid population level effects, therefore we advise that the MORL windfarm will not result in any impact to the site integrity of the SACs listed above.

  The proposed Beatrice windfarm is the proposal of concern in this regard, rather than MORL, as it lies closer to this coastline.

  We recommend that monitoring proposals in respect of cumulative impacts are considered by the independent expert panel, as discussed in Appendix F.

  The applicant proposes to bury cables to reduce EMF and we are satisfied that this will be sufficient to avoid any significant EMF effects on diadromous fish. However, potential impacts arising from installation of the export cable have not been thoroughly evaluated, particularly where it draws close to shore along the Aberdeenshire coast. The ES indicates that installation of this section of the cable could just take a matter of days, so that mitigation, or avoidance, of impacts could be possible by timing the work to avoid peak smolt runs (if the timing of these can be established). We recommend that this matter is considered by the independent expert panel, as discussed in Appendix F.

  With the mitigation discussed above, we are satisfied potential impacts from cable installation can be reduced or avoided and that while there may be some noise disturbance to individual salmon, there will not be population level effects. Thus we advise **that the MORL windfarm proposals will not result in any adverse impacts on site integrity of any of the freshwater SACs listed above.**

- **Freshwater Pearl Mussel**

  As there will not be population level effects to Atlantic salmon, nor significant effects to other salmonid species, we advise that there will be no indirect effects on freshwater pearl mussel

(FWPM) in the Rivers Evelix, Moriston, Oykel and Spey SACs. Thus we advise that **the MORL windfarm proposals will not result in any adverse impacts on site integrity of any of the freshwater SACs listed above.**

- **Sea Lamprey**

  The relevant conservation objective to consider is whether or not the proposed MORL windfarm would result in any impacts on the viability of the sea lamprey population of the River Spey SAC. While there may be some level of noise disturbance to individuals during construction we confirm that this will not result in population level effects. We are satisfied that operational noise would not result in likely significant effects to sea lamprey.

  The applicant proposes to adopt soft-start piling methods to help mitigate any noise disturbance and to bury cables to reduce EMF. We are satisfied that this mitigation will further reduce impacts to individuals, and avoid population level effects, therefore we advise that the MORL windfarm will not result in any impact to the site integrity of the River Spey SAC.

APPENDIX D

BENTHIC ECOLOGY & OTHER HABITAT INTERESTS

BENTHIC ECOLOGY

Summary of key advice

- **Gravity bases**

Since the provision of our advice in December 2012 to MORL, further consideration has taken place regarding the deployment of gravity bases as a proposed foundation type for all turbines. It has now been confirmed by Marine Scotland that the use of gravity bases across all turbine locations would be the subject of a further marine licence - to consider the required dredging and disposal of sediment. We welcome and support this approach.

We advise that we can **confirm no adverse effect on site integrity on the Moray Firth SAC habitat interests.** This may require further consideration if a Marine Licence is submitted for the deployment of gravity bases.

- **Annex 1 habitats**

Benthic survey work for MORL has identified Annex I habitat within the export cable route: *Sabellaria spinulosa* reef and stony and rocky reefs. As discussed at pre-application, and presented in the submitted ES, the applicant proposes micro-siting the export cable around the Sabellaria reef (which is patchily distributed) and using installation aids to prevent damage.

JNCC and SNH seek further discussion over proposed micro-siting and installation methods for the export cable as part of a construction method statement for the expert cable – See Appendix F.

- **Non native species**

We would welcome further discussion of this aspect in order to inform good practice to reduce / avoid the possibility of introducing non-native species into the Moray Firth from the range of activities associated with the proposed windfarm developments.

APPENDIX E

MORL & BEATRICE OFFSHORE WINDFARM PROPOSALS
SNH ADVICE ON COASTAL LANDSCAPE, SEASCAPE AND VISUAL IMPACTS

Background

SNH's *Landscape Policy Framework* (Policy Statement 05/01) outlines our overall landscape remit within the context set by Government policy. For our advice on impact assessment, we follow the *Guidelines for Landscape and Visual Impact Assessment* (GLVIA)[13] and we have prepared guidance on applying this method to the assessment of marine renewables development[14]. Our guidance on seascape, landscape and visual impact assessment (SLVIA) takes into account the need to consider the key qualities and issues specific to the marine and coastal environment: for example, the conjunction of land, intertidal areas, and open seas; the shape, scale and experience of the coastline; views from the coast and from the sea. These are the key issues supplementary to those considered in an LVIA.

We have also recently updated our guidance on *Siting and Designing Windfarms in the Landscape*[15]. Although this guidance aims to inform onshore development, some aspects are relevant to consider in respect of offshore proposals.

Structure of our Advice on the Moray Firth windfarms

We provide our advice on Beatrice and MORL together, as follows:

- Summary of key impacts on coastal landscape, seascape and visual receptors.
- Core area – Noss Head (Wick) to Dunbeath.
- North area – Duncansby Head to Noss Head (Wick).
- South area – Dunbeath to Helmsdale.
- Moray and Aberdeenshire coastline.
- Key transport routes.
- Effects of lighting.
- Cumulative impacts of offshore & onshore windfarms.

The **coastal character areas (CCAs)** that we refer to in our advice are named and illustrated in Figure 8.1 of the Beatrice ES addendum (Volume 3) and Figure 5.4-4 of the MORL ES (with the numbering taken from the latter). Viewpoint mapping is given on Figure 5.4-7 of the MORL ES and Figure 14.8 of the Beatrice ES. Key viewpoints have been agreed between the developers, in consultation with Marine Scotland, Highland Council and ourselves. So the naming and numbering of viewpoints is largely consistent between each ES, in the few instances where there are differences we provide both ES references below.

Windfarm Design Envelopes

---

[13] *Guidelines for Landscape and Visual Impact Assessment* (LI-IEMA, 2002). Recently updated (2013), the release post-dates the submission of the Beatrice and MORL Environmental Statements.

[14] *Offshore Renewables – guidance on assessing the impact on coastal landscape and seascape* (SNH, March 2012). Available from:
http://www.snh.gov.uk/docs/A702206.pdf

[15] SNH guidance on *Siting and Designing Windfarms in the Landscape* is available from:
http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/landscape-impacts-guidance/

The **Beatrice** offshore wind proposal (131.5km^2) is located in Scottish territorial waters east of Caithness, at a distance of some 13.5km from Sarclet, at its closest point. The ES considers two scenarios to cover the range of potential turbine sizes, the final selection falling within:

- the maximum number and smallest-size turbine - 277 turbines @ 132m to blade tip; spaced at a minimum of 642m from each other; and
- the minimum number and largest-size turbine - 142 turbines @ 198m to blade tip; spaced at a minimum of 990m from each other.

The ES demonstrate that landscape and visual impacts do not significantly differ between these scenarios. The ancillary infrastructure for the windfarm proposal includes 1-3 offshore meteorological (met) masts, and up to three offshore substation platforms.

The SLVIA for **MORL** addresses the Eastern Development Area (EDA) of the Round 3 windfarm zone in the Moray Firth. The EDA lies offshore beyond the 12 nautical mile (STW) limit – its inshore boundary aligned with the offshore boundary of Beatrice. There are three proposed windfarms in the EDA: Telford (93km^2), Stevenson (77 km^2) and MacColl (125 km^2).

Indicative layouts are considered (presented in ES Figure 8.4-1), turbines being arranged on a grid, or 'diamond' (offset grid) pattern (see Section 2.2.6.13). A number of design scenarios are presented: Scenario 4c being nominated as the 'worst case' for SLVIA comprising the largest turbine size (204m to blade tip) and densest layout.

The ancillary infrastructure for MORL includes up to two offshore meteorological (met) masts, and up to six offshore substation platforms.

Finalising Windfarm Layout and Design

If consent is granted for either or both of these proposals, we recommend that landscape consultants continue to be employed post-consent to work with the project and engineering teams to iterate and finalise the windfarm design (see Appendix F).

This will ensure cohesiveness in the design of Beatrice and MORL (Stevenson, Telford and MacColl projects) as these proposals will be seen together as one single large windfarm development. There should be consideration of layout and design across the proposals so that a positive visual image is achieved in views from key / sensitive locations in the core area (such as areas of significant settlement or 'gateway' views on the main transport corridors).

Summary of Key Impacts

The Caithness coast varies in character and is experienced differently according to elevation – whether at sea level or on the elevated coastal edge. When at the coast, attention lies seaward and there are few views inland. The sea views are open, with limited development – the two Beatrice demonstrator turbines and five offshore platforms – and incidental marine traffic. Most settlement is situated along the coast, and mostly along the major routes – the A9, A99 and the minor roads leading off them. There is a strong maritime influence on the settlement in this area and many houses are oriented so as to take advantage of the sea views.

The key landscape, seascape and visual impacts of the Beatrice and MORL (EDA) windfarms will occur along a 39km stretch of the Caithness coast from Noss Head (lying north of Wick) to Dunbeath. Here BOWL, at its closest, is around 13km from shore, and MORL (EDA) is around 22km. The impacts of each windfarm individually and together are discussed in more detail below under the section: **Core area – Noss Head (Wick) to Dunbeath.**

In summary, there will be a major change to Caithness' coastal character and scenery in this core area impacted by the windfarms. Beatrice and MORL are likely to be perceived as one single windfarm lying offshore, parallel to the coast. They will form a prominent new feature (some 19km in length) on the skyline of the open sea and views to the windfarms from the Caithness coast will be widespread.

Where a viewpoint / location has a panoramic and expansive context, the offshore development may well appear 'incidental' on the horizon. However, landscape and visual effects will be adverse at specific viewpoints and locations, especially elevated clifftops and landmarks. This will be the case at key viewpoints such as Wick (the main centre of population), Sarclet, Whaligoe Steps, Lybster Harbour, Dunbeath Castle and from stretches of the A9. Due to lighting requirements, the windfarms will change the night-time character of seas and skies in this area, where there is currently limited light pollution.

These landscape and visual impacts are primarily caused by Beatrice, rather than MORL, due to its closer proximity to shore. Cumulative assessment demonstrates that MORL will only marginally increase these impacts as it lies further offshore, behind Beatrice, and is constantly more 'recessive' in views from Caithness.

Coastal Landscape, Seascape and Visual Impacts of the Moray Firth Windfarm Proposals

<u>Core area</u> – Noss Head (Wick) to Dunbeath

- **Noss Head CCA** (CCA 10), situated just north of Wick, demarcates the northern limit to the core area of impact. This promontory, oriented to the north and east, is made up of rugged, inaccessible coastal cliffs topped by a gently sloping farmed 'plateau'. Wick Airport and Noss Head Lighthouse are prominent features, strongly associated with Wick. There is a feeling of being 'on the edge' of the coast, but also the edge of Wick.

  The windfarms will form a new, major skyline feature in sea views out from the majority of the plateau and its coast, from Noss Head to Sealby Head; the coast of Staxigoe and Papigoe, leading into Wick itself. Due to the extent of human activity and character of the promontory, the extensive outer seascape can be considered a suitable background for offshore wind, thus impacts will be **moderate**.

- The town of **Wick** (pop. 7,300) clusters directly around Wick Bay and harbour, where shipping, harbour traffic and characteristic sea views, all give Wick a strong maritime character. Views of the windfarms will largely be restricted from within the town, and the main views will be from the harbour and the hill slopes to the north and south of the town. Seen from Wick Bay (VP 4), the windfarms will extend from behind Oldwick headland, across the open sea-horizon. The nature of the town and its maritime activities can be considered a suitable background for offshore wind, impacts here will be **moderate to minor**.

  Beatrice primarily contributes to these visual impacts seen from Wick, with turbines extending from beyond South Head across the open horizon of Wick Bay (at ~18km). The MacColl and Stevenson proposals lie at more than 35km from Wick, and at such distance they are unlikely to be picked up behind the Beatrice turbines. The Telford project (MORL Round 3 zone) will laterally extend the amount of development seen along the horizon, but is located ~25-36km.

  In the south of **Wick Bay CCA** (CCA 11) from Oldwick, we consider that the windfarms will have **moderate or major impacts**. This reflects the higher elevation of the coast, its orientation and the siting of 'The Old Man of Wick', a notable landmark and well-visited viewpoint. The castle sits on a narrow promontory '*dramatically jutting out into the sea with steep cliffs and deep geos on either side*', its topographical and defensive relationship lies clearly with the sea, thus the setting is of high sensitivity to offshore wind development.

- The **Sarclet-Lybster coast** (Sarclet Head CCA and Lybster CCA) is experienced differently according to elevation – whether at sea level or on the high coast. Settlement in this area – Whiterow, Hempriggs, Sarclet, Thrumster, Ulbster and the Clyths – is relatively dispersed along the elevated coastline, and contrasts with the less-settled, expansive, interior moorland. Historic landmarks are concentrated on the coastal edge including traditional fishing harbours at The Haven, Sarclet and the spectacular Whaligoe. The coast is irregular and rocky, with innumerable geos, stacks and caves. These are not easily accessible, but can be appreciated from high-level views, with waymarked viewpoints. Access to the shoreline is limited along this coast, found only at the compact fishing villages and harbours nestling at cliff-foot.

The effects of the offshore windfarms will be **major** on this coastline, particularly in views from cultural sites and visitor attractions such as Sarclet (VP5), Whaligoe Steps (VP10, Beatrice; VP15, MORL), Lybster (VP7) and Hill o' Many Stanes (VP6). These major visual effects are primarily due to Beatrice, rather than MORL, due to its closer proximity to shore.

From much of the coastal hinterland, views offshore to the windfarms will be limited by the presence of forestry on a number of seaward facing slopes. Elsewhere, the sweeping moorland of Moss of Whilks and Oliclate (~6km inland) has views to the sea which will change to a moderate extent due to the presence of these proposed windfarms in the Moray Firth.

Arguably, this complex coastline may best be appreciated from the sea, and a number of boat tours head out from Wick. From the sea, the coast feels remote, with a 'wild' untamed nature: cliffs rising 30m in height, featuring natural rock arches, caves, sea stacks, gloups and geos. During a boat tour, people's attention is likely to be focussed on the coast rather than directed to the open sea where the windfarms would be located. We therefore consider it unlikely that Beatrice or MORL will significantly affect people's experience or appreciation of this dramatic coastline while on a boat tour.

- **Dunbeath CCA** (CCA 14) is the southern limit to the core area of impact. Here, the coast is a broad, indented sweep, oriented south-east. Small pocket bays punctuate some of the coast with harbours set at Latheronwheel and Dunbeath (VP9), where the Burn of Latheronwheel and the Dunbeath Water break out through steep valleys to the sea. These points form relatively intensive clusters of human activity compared to inland Caithness, and are linked by the A9 close set to the coast. There are wide, expansive sea panoramas from the upland coastal edge, with housing largely oriented seawards. The older settlements sit downslope, sheltered, enclosed and associated with the junction of the inland straths and sea.

  We consider the impacts of the proposed offshore windfarms as **moderate to minor** along this coastline. However, **major impacts** will be encountered at locations where the Moray Firth forms a panoramic backdrop, particularly to historic and cultural features, such as at Latheron (VP8, Latheron Church and the Clan Gunn Heritage centre), Dunbeath (including Dunbeath Castle Garden and Designed Landscape, GDL), and Laidhay. These impacts are primarily attributable to Beatrice, lying to the fore-front, with MORL recessive in the views.

  Dunbeath Castle is perched on a high promontory jutting out into the sea. The Castle and its marine backdrop are a major axis of the landscape design, as designated. There will be impacts on this designation - Dunbeath Castle Garden and Designed Landscape. Historic Scotland are the key advisers in respect of impacts on GDLs.

<u>North area</u> – Duncansby Head to Noss Head

- **Duncansby Head** (VP1) is the most north-easterly point on mainland Britain. It is notable for its spectacular scenery – the wild seascapes and jagged Duncansby Stacks. The coast here is rugged, dynamic, with an overall feeling of remoteness: the views to sea are impressive, including those out to Orkney. Highland Council, in order to recognise this scenic and amenity value, have designated this coast as a Special Landscape Area (SLA) – a landscape of regional importance. This designation informs the Local Development Plan, alongside the Highland Coastal Classification which notes the 'isolated' character of this coast[16]. The offshore windfarms will create a new visual focus across a significant proportion of the horizon, vying with the Stacks of Duncansby, currently the key focal point of this coast. Impacts here will be **major**.

- At **Freswick Bay** and **Nybster** (CCA 8) the coast is largely low and rocky, set with small farms and crofts along the A99, and on the minor road to Skirza, north of Freswick Bay. In the townships of Auckengill and Nybster the crofts are set out on a grid pattern perpendicular to the coast. The associated hinterland is sweeping moorland, where wide open views are interrupted by crofts and some forestry blocks. Views from these areas lie out to sea, where turbines will be

[16] For information on the Highland Council Special Landscape Areas and coastal classification see: http://www.highland.gov.uk/yourenvironment/planning/coastalplanning/classificationofthehighlandcoast/

seen on the horizon, however, effects will be only **minor** due to distance, settlement context and the intermittency of views.

- **Sinclair's Bay** (CCA 9) is a large, deeply indented, sweeping bay. It is backed by the A99, which is set on a ridge and gives extensive panoramas north to Duncansby Head and South Ronaldsay, and south to Noss Head. Keiss (VP 2) on the north edge of the bay is a small, picturesque fishing port tucked into the foot of the elevated coast – it has seen little change and retains a traditional character. Cultural attractions close-by – Keiss Castle, Keiss broch and the Whitegait broch – are all located on the elevated coast with spectacular eastward sea views. A focal point in these views is Noss Head lighthouse on Noss Head; the windfarms will appear beyond and flanked by Noss Head. Overall, the windfarms will give rise to **moderate** impacts on Keiss, and the coast in this area, primarily attributable to Beatrice.

  Inland from Sortat (VP3) and Catchory (VP13), the windfarms will be seen at a greater distance, further away on the sea-horizon. Impacts on these inland areas will be **minor.**

South area – Dunbeath to Helmsdale

- There is one Special Landscape Area (SLA) in this south area – The Flow Country and Berriedale Coast. Views of Beatrice and MORL from the south-east / eastwards facing-slopes and high hilltops of Scaraben (VP11), Morven and Maiden Pap will not fundamentally alter the relationship and character of the hills to flows so the **Flow Country peatlands** will be largely unaffected. Impacts here will be **minor**.

- While the major focus of the SLA is The Flow Country, the citation notes its contrast with the **Berriedale Coast** – specifying the Berriedale Cliffs, Badbea village, and Berriedale Castle. There will be views to Beatrice and MORL from all these points, as well as from the high hills and walks above Berriedale at Inver Hill and Cnoc na Croiche. This will alter the current sense of remoteness to be found along the Berriedale Coast, resulting in **major to moderate** impacts on landscape character and visual amenity.

- Further south towards Helmsdale the impacts will lessen towards **moderate** then **minor**, as the windfarms become further away and will only be seen under clear weather conditions (VP12 Navidale).

Key transport routes

Three major routes traverse the area: the A9 (Brora to Thurso), the A99 (Latheron to Wick) and the A882 (south of Thurso to Wick). The impacts of the offshore windfarms are as follows:

- ***A9***
  The A9 follows the coast from south of Brora to Latheron, a length of some 30-50km. The sections of the route where offshore windfarms (primarily Beatrice) will be visible are:

  Helmsdale to Berriedale: travelling northwards there will be limited effects of the A9 between Berriedale and Ousedale. However, south of Ousedale there will be a **locally major** effect on views from the Ord of Caithness, the gateway into Caithness; and the filling-in of 'keyhole' views to the sea at Ousedale.

  Berriedale to Latheron: the offshore windfarms will be almost continuously visible for 14.5km, travelling north or south, appearing on the sea-horizon, parallel to the A9. Impacts here are **moderate**.

- ***A99***
  Between Latheron and Thrumster, the A99 largely follows the coast for some 20km. Beatrice and MORL will form a prominent feature on the sea horizon, changing seaward views (VP6, VP 15). These impacts are **major to moderate**.

- ***A882***
  This road is oriented at right angles to the coast. Blade tips may be visible when travelling eastwards towards Wick, but at a distance of >30km – therefore impacts will be **negligible**.

Effects of lighting

There is limited light pollution in Caithness with lighting from residential properties and street lights concentrated at the main settlements of Wick (VP9, Beatrice ES Figure 14.27) and Helmsdale, with smaller clusters at Lybster, Latheronwheel and Dunbeath.[17]

The offshore windfarms will require a variety of lighting and marking, although the turbine marking (painted yellow RAL 1004) will not be visible from land. Impacts may arise from the following:

a) Red CAA lighting on the nacelles of turbines situated on the periphery.

b) Red perimeter lighting on buoys or beacons to mark groups of structures or routes through the windfarms.

c) Yellow lights on 'significant peripheral structures' and 'intermediate structures' on corners, significant points and the periphery - these will flash every 5 secs. with a range of 5 nm.

The lighting impacts of Beatrice and MORL are likely to be most significant on the unlit areas found within the core area, including Dunbeath (VP9, Beatrice ES Figure 14.28), Sarclet (VP5), Whaligoe and Ulbster (VP10), Lybster and Latheronwheel – all low density settled areas on the elevated coast. The offshore windfarms, particularly Beatrice, will change the night-time character of the Caithness coastline with the introduction of lighting in landscapes and seascapes that currently experience little or limited lighting.

Moray and Aberdeenshire coastline

MORL, lying south of Beatrice, is closer to Moray and Aberdeenshire, but still lies over 41km from this coastline. It will only be seen in periods of exceptional / excellent weather and light conditions. Even when visible, the wind turbines will only be seen along 10-20^{o} of the horizon, and are incidental upon its vast expanse. Impacts will be **negligible**.

Cumulative Impacts of Offshore & Onshore Windfarms

In the core area of impact, the main cumulative effect of Beatrice and MORL in combination with onshore schemes is to introduce windfarm development eastwards into a new part of the view, and a new context – the open sea.

In a limited number of locations, onshore and offshore development may combine to diminish the prominence of coastal landmarks or other notable features. From Keiss (VP2), for example, the offshore windfarms will diminish Noss Head as a dominant focal point in the view. From this same viewpoint, a cluster of operational windfarms (Achairn, Wathegar, Flex Hill) and Camster (constructed / near operation) are seen inland, and vie with the distinctive and prominent peaks of Morven and Scaraben.

There is limited cumulative impact of onshore and offshore windfarm development on settlement in the core area. From **Wick** it is unlikely that the offshore windfarms will be seen in the same views as onshore development. Views to onshore windfarms are limited: there will only be occasional views to Achairn, Wathegar and Flex Hill (all operational) on the skyline, and both Camster (constructed / near operation) and Burn of Whilk (consented) are likely to be screened by buildings in most views. Cumulative effects will arise at **Sarclet** and **Lybster** from Burn of Whilk (consented) together with the offshore proposals. At **Dunbeath**, the Buolfruich windfarm (operational) is prominent in the landscape, which will give rise to cumulative effects in combination with the offshore proposals.

[17] British Astronomical Association – http://www.britastro.org/dark-skies/maps.html?7O

From **key transport routes** there will be some sequential impacts of onshore and offshore windfarms. It is primarily the **A99** where such effects will be experienced with views to onshore windfarms along a 3km stretch of road between Lybster and Thrumster, and successive views to the offshore proposals as described earlier.

APPENDIX F

NATURAL HERITAGE MATTERS TO BE ADDRESSED BY CONDITIONS

Our recommendations below should inform consideration of conditions for the MORL windfarm proposals, if consented. We consider that, as part of any S36 consent, an appendix is attached to the decision letter with a description of the proposal including all aspects that are consented. This will be particularly important for proposals submitted and assessed on the basis of a design envelope, such as is the case for MORL.

We also request that all environmental survey and monitoring information is made publicly available. As stated in our covering letter and throughout all the relevant appendices, we would welcome the opportunity to advise further on the detail of conditions to address the following:

Confirmed Layout

Confirmed turbine locations, map and co-ordinates of the final turbine layout and location of other infrastructure – offshore substation platforms, met masts and cabling (inter array and offshore transmission works) shall be submitted to Marine Scotland prior to commencement of works, within a timeframe to be agreed.

Visualisations for Final Windfarm Layout & Design

Visualisations, to an agreed standard and format, from a list of agreed viewpoints, will be provided for the final layout and design of the development. These are for statutory consultee and public information. They will be submitted to Marine Scotland prior to commencement of works, within a timeframe to be agreed.

Expert Panel

Within a timeframe to be agreed, Marine Scotland will establish an inter-disciplinary expert panel to provide advice and agree on monitoring requirements (including any adaptive management requirements) for pre-construction, construction and operational periods of this development. Marine Scotland will decide its constituent membership and terms of reference, in agreement with relevant consultees. Key aspects for consideration by an Expert Panel include, but are not limited to:

i. Underwater noise impact monitoring for key receptors: marine mammals, marine fish, diadromous fish and marine fish to take account of response, temporal span of response etc. (Appendix Bi).

ii. Monitoring of benthic impacts to include consideration of damage, recovery, colonisation and management for the prevention of marine invasive non natives.

iii. Consideration of evaluation of bird impacts from collision and displacement to take account of evaluating collision and/or avoidance behaviours of key species such as great black backed gull, herring gull and for displacement consideration of methods to calculate displacement and to measure impacts to key species such as auk species (guillemot, razorbill and puffin).

iv. Consideration of monitoring of sandeel populations pre, during and post construction

v. Provision of advice on the relevant temporal and spatial scale of monitoring to take account of individual and cumulative impact predictions within and beyond the Moray Firth and to take account of other marine renewable projects in Scottish waters.

vi. Export cable route monitoring requirements to consider damage and recovery to Annex 1 habitats, disturbance to marine mammals and fish interests.

vii. Consultation and sign off on the Environmental Monitoring Programme and any associated documentation such as construction method statements, vessel management plans, O& M programme etc.

Environmental Monitoring Programme

The expert panel shall oversee and direct a monitoring programme to investigate the environmental impacts of this, and any other relevant, development. The expert panel will agree the environmental interests to be monitored and appropriate monitoring methodologies. The monitoring programme will cover pre-construction – including the geo technical survey results, construction and operational periods of development. The programme of monitoring works will be signed off by the expert panel, subject to input from relevant consultees, and it will be regularly reviewed – the review cycle to be decided by Marine Scotland in consultation with the panel and relevant consultees.

The agreed monitoring will be implemented and the data collected will be reported on and made publicly available. Consideration should also be given to the storage of data, analysis and reporting as well as the review and application of knowledge gained to future development proposals.

Construction: Environmental Manager

Within a timeframe agreed with Marine Scotland, the developer shall employ an Environmental Manager for the development . The role, responsibilities and work programme shall be submitted to Marine Scotland and relevant consultees for approval. The Environmental Manager responsibility on-site for ensuring implementation of the Construction: Environmental Management Plan; Construction: Method Statements; Construction: Vessel Management Plan; Construction: Export Cables: including any required mitigation measures or monitoring and compliance with all consent / licence conditions. The Environmental Manager role should also be employed in sufficient time to have regard to any requirements for pre –construction monitoring.

Construction: Environmental Management Plan

Within a timeframe agreed with Marine Scotland, the developer shall draft and submit a plan for environmental management during construction. The final draft of the plan will be signed off by the Environmental Manager prior to submission. The plan shall be submitted to Marine Scotland for approval in consultation with relevant consultees. The approved plan will be implemented.

The plan will detail mitigation measures to prevent adverse impacts to species and habitats during construction, including management measures to prevent the introduction of invasive non native marine species. It shall cross-reference any relevant monitoring requirements during construction, taken from the Environmental Monitoring Programme. It will provide the overall framework in which the construction method statements (or equivalent) and vessel management plan will sit.

The Environmental Management Plan will also set out the role, responsibilities and work programme of the Environmental Manager. It will detail how each and all contractors and sub contractors will be made aware of environmental sensitivities, what requirements they are expected to adhere to and how chains of command will work.

It will also confirm the reporting mechanisms that will be used to provide Marine Scotland and relevant consultees with regular updates on construction activity, including any environmental issues that have been encountered and how these have been addressed.

Construction: Method Statements

Construction method statements (or equivalent) shall be submitted prior to the commencement of work and within a timescale to be agreed with Marine Scotland. The final draft of each statement will be signed off by the Environmental Manager prior to submission. The statements shall be submitted to Marine Scotland for approval in consultation with relevant consultees. The statements will include details of commencement dates, duration and phasing for key elements of construction.

Construction: Vessel Management Plan

Within a timeframe agreed with Marine Scotland, the developer shall draft and submit a plan for vessel management during construction. It shall present details on the type and overall number of vessels required during construction, including a specification for each individual vessel to be deployed. It shall set out how vessel management will be co-ordinated, specifying the location of working port(s), the routes of passage and how often vessels will be required to passage between port(s) and site.

If helicopters are required during construction, then an equivalent plan for their use is needed.

Arrangements for Environmental Inspection

When requested, the developer must provide access (and, if necessary, appropriate transportation) to the offshore windfarm site and associated infrastructure for inspection by Marine Scotland personnel, or their appointees. This right of access will apply during pre-construction and construction, and for the operational lifespan of the windfarm.

Construction: Offshore transmission Works (Export Cable(s))

Within a timeframe agreed with Marine Scotland, the developer shall draft and submit a construction method statement with the locations and method of installation of the grid export cable(s) and landfall. The export cables are to be buried to a minimum depth to be agreed with Marine Scotland and relevant consultees.

Operations & Maintenance (O&M): Programme

Within a timeframe agreed with Marine Scotland, the developer shall draft and submit their programme for operations & maintenance (O&M). The programme will be approved by Marine Scotland in consultation with the Expert Panel and relevant consultees. It will take account of environmental sensitivities which may influence the timing of O&M activities. It will set out O&M vessel requirements and vessel management.

The approved O&M programme will be implemented, and it will be reviewed regularly – the reporting cycle will be agreed by Marine Scotland in consultation with relevant consultees. It will cross-reference to the Environmental Monitoring Programme and O&M Environmental Management Plan where relevant.

O&M: Environmental Management Plan

Within a timeframe agreed with Marine Scotland, the developer shall draft and submit a plan for environmental management over the operational lifespan of windfarm development. It will be approved by Marine Scotland in consultation with relevant consultees and will detail measures to prevent adverse impacts to species and habitats during operation.

The O&M Environmental Management Plan will detail how each and all contractors and sub contractors will be made aware of environmental sensitivities, what requirements they are expected to adhere to and how chains of command will work during O&M activity.

The approved plan will be implemented, and it will be reviewed regularly – the reporting cycle will be agreed by Marine Scotland in consultation with relevant consultees.

O&M: Offshore transmission Works (Export Cable(s))

A monitoring and maintenance programme for the grid export cable(s) and landfall site shall be agreed with Marine Scotland. It will include the agreed actions to be taken in the event of erosion / re-exposure of cables.

Decommissioning

A decommissioning plan will be required for the entire scheme. As part of any consent, the Regulator shall consider and recommend a timeframe for the production, consultation and implementation of a decommissioning plan. We recommend that this is an iterative process and that an initial decommissioning strategy is produced by the developer.

Ford A (Alexander)

From: Windfarms Team <windfarms@jrc.co.uk>
Sent: 28 August 2012 11:52
To: MS Marine Licensing
Cc: Ruaridh.maclean@scottish-southern.co.uk
Subject: Telford, Stevenson & MacColl Offshore Wind Developments

Dear Sir/Madam,

Ref: 011/OW/MORLE-8

Name/Location: Telford, Stevenson & MacColl Offshore Wind Developments

Approximate Boundary Points (UTM 30n) :

Point 01 at : 505117 6436035
Point 02 at : 515331 6464698
Point 03 at : 524869 6443604
Point 04 at : 523034 6440559

Hub Height: 118m Rotor Radius: 86m

Cleared with respect to radio link infrastructure operated by:-

Scottish Hydro (Scottish & Southern Energy) and Scotia Gas Networks

JRC analyses proposals for wind farms on behalf of the UK Fuel & Power Industry and the Water Industry in north-west England. This is to assess their potential to interfere with radio systems operated by utility companies in support of their regulatory operational requirements.

In the case of this proposed wind energy development, JRC does not foresee any potential problems based on known interference scenarios and the data you have provided. However, if any details of the wind farm change, particularly the disposition or scale of any turbine(s), it will be necessary to re-evaluate the proposal.

In making this judgement, JRC has used its best endeavours with the available data, although we recognise that there may be effects which are as yet unknown or inadequately predicted.JRC cannot therefore be held liable if subsequently problems arise that we have not predicted.

It should be noted that this clearance pertains only to the date of its

issue. As the use of the spectrum is dynamic, the use of the band is changing on an ongoing basis and consequently, developers are advised to seek re-coordination prior to considering any design changes.

Regards

Keith Brogden

Wind Farm Team

The Joint Radio Company Limited
Dean Bradley House,
52 Horseferry Road,
LONDON SW1P 2AF
United Kingdom

DDI: +44 20 7706 5197
TEL: +44 20 7706 5199
Skype: keithb_jrc

<keith.brogden@jrc.co.uk>

Ford A (Alexander)

From: Graeme Proctor <Graeme.Proctor@mcga.gov.uk>
Sent: 09 October 2012 14:45
To: MS Marine Licensing
Cc: Nicholas Salter
Subject: Moray Firth ES - Telford, Stevenson, McColl Consent
Attachments: MORL ES Response.pdf

For Attention Alex Ford

Alex

Please find attached the MCA response for the Moray Firth Offshore Renewables consent application.

The letter provides agreement in principal, consent conditions will be subject to final project plans once submitted.

Regards

Graeme

Graeme Proctor
Offshore Renewables Lead
MCA Navigation Safety
Bay 2/04 Spring Place
105 Commercial Road
Southampton
SO15 1EG

T 02380 329191

Maritime and Coastguard Agency

Graeme Proctor
Navigation Safety
Spring Place
105 Commercial Road
Southampton
SO15 1EG

Mr Alexander Ford
Marine Scotland
Marine Laboratory PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

Tel: **+44 (0)23 8032 9191**

E-mail: **Graeme.proctor@mcga.gov.uk**

Your ref: **011/OW/MORLE-8**
Our ref:

9th October 2012

Dear Alexander

APPLICATION FOR CONSENTS UNDER SECTION 36 OF THE ELECTRICITY ACT 1998 AND A MARINE LICENCES UNDER PART 4, SECTION 20 OF THE MARINE (SCOTLAND) ACT 2010 TO CONSTRUCT AND OPERATE 3 OFFSHORE WINDFARMS, IN THE OUTER MORAY FIRTH.

Many thanks for your letter of 28th August inviting comment on the Environmental Statement (ES) for the proposed Moray Offshore Renewables consent application to construct and operate three wind farms in the Outer Moray Firth, within The Crown Estates Moray Firth Round 3, Zone 1 area.

The MCAs remit for offshore renewable energy development is to ensure that safety of navigation is preserved, as progress is made towards government targets for renewable energy. The full ES is a necessarily large and wide ranging series of documents, this response is focused on the shipping and navigation elements of the ES, primarily the Navigation Risk Assessment (NRA).

The MGN 371 checklist contained at Volume 11, appendix 5.2C, is noted as the developer's confirmation of compliance with the requirements of MGN 371 in completing the NRA.

Development Area
It is noted that the three wind farms applications, Telford, Stephenson and McColl fall with what the developers calls the Eastern Development Area of the zone, It is understood that the remaining areas yet to be developed will be subject of a separate ES. Future development will therefore be considered independently at the time of submission, taking account of any changes in traffic trends and cumulative impacts that may be affected by the EDA consent.

The development of the 3 wind farms independently raises significant concerns over the ability to effectively mark and light. The Rochdale envelope approach is noted however, final layout will be subject to consent and approval from the navigation safety perspective.

Survey Data
MGN 371 Annex 2 Paragraph 6 iii requires that hydrographic surveys should fulfil the requirements of the International Hydrographic Organisation (IHO) Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager. This information is yet to be submitted, Failure to report the survey or conduct it to Order 1a might invalidate the Navigational Risk Assessment if it was deemed not fit for purpose.

Cumulative Impacts
The cumulative impact assessment provides a comprehensive overview. Traffic in the area although not heavy, will have some displacement by the development; the effects therefore need to be carefully monitored, in particular as the individual EDA projects and adjacent Beatrice developments progress.

Safety Zones
The requirements and provisos identified for Safety Zones are correct, however it should be noted that a detailed justification would be required for a 50m operational safety zone, with significant evidence from the construction phase in addition to the baseline NRA required supporting the case. The current statements make assumptions that 50m operational safety zones will be granted, this should not be assumed as the default position.

Cable Routes
Export cable routes, cable burial protection index and cable protections are issues that are yet to be fully developed. However due cognisance needs to address cable burial and protection, particularly close to shore where impacts on navigable water depth may become significant. In particular it is noted that the current route runs through a charted recommended anchorage. The proposal as presented will require reviewing/mitigating prior to finalising.

Emergency Response & Co-operation Plans
An Emergency Response & Cooperation Plan will be provided by the developer to meet the requirements of annex 4 of MGN 371. No authorised development seaward of MHWS shall commence until Marine Scotland, in consultation with the MCA, has given written approval for an Emergency Response and Co-operation Plan (ERCoP) which includes full details of the Emergency Co-operation Plans for the construction, operation and decommissioning phases of the authorised development in accordance with the MCA recommendations contained within MGN371 "Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response Issues".

Conclusion
No authorised development seaward of MHWS shall commence until Marine Scotland, in consultation with the MCA, has confirmed in writing that the developer has taken into account and adequately addressed all MCA recommendations as appropriate to the authorised development contained within MGN371 "Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response Issues" and its annexes. This confirmation will be

embedded within a detailed letter of consent provided against formal project development plans as they are submitted.

The comments above are not considered to be blocks to development, but provided to highlight areas where further information will be required in supporting the final consenting process. Subject to the developer meeting requirements addressed, this letter provides outline acceptance in principal of the licence and consent application.

Graeme Proctor
MCA Navigation Safety

Ford A (Alexander)

From: mfp <info@morayfirth-partnership.org>
Sent: 05 October 2012 12:57
To: MS Marine Licensing
Subject: Nil Return Response from Moray Firth Partnership
Attachments: Nil Response from MFP.pdf

Dear Mr Ford,

Please find attached a letter confirming our nil return response to the proposed Telford, Stevenson and MacColl Offshore Windfarm by Moray Offshore Renewables Limited in the Outer Moray Firth.

Kind reards,

Kathryn Logan
Manager
Moray Firth Partnership
Great Glen House
Leachkin Road
INVERNESS IV3 8NW

Tel: 01463 225530
Website www.morayfirth-partnership.org
Company(Limited by Guarantee) No. 196042
Registered Charity No. SC028964

****

Alexander Ford
Renewables Licensing Operations Team
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

3 October 2012
Your Ref: 011/OW/MORLE-8

Dear Mr Ford,

NIL RETURN RESPONSE

Thank you for the notification about the application by Moray Offshore Renewables Limited on 2 August 2012 to the Scottish Ministers under Section 36 of the Electricity Act 1989, Section 20 of the Marine (Scotland) Act 2010 and Part 4 (Sections 65 and 66) of the Marine and Costal Access Act 2009 to construct and operate the Telford, Stevenson and MacColl Offshore Windfarms and associated Transmission in the Outer Moray Firth.

The Moray Firth Partnership does not propose to submit a formal response to this application.

Yours sincerely,

Kathryn Logan
Moray Firth Partnership Manager

The Moray Firth Partnership
Reg'd Office: Great Glen House, Leachkin Road, INVERNESS, Scotland. IV3 8NW
Tel: +44 (0) 1463 225530 Fax: +44 (0) 1463 725067 e-mail: info@morayfirth-partnership.org
Website: www.morayfirth-partnership.org Company No.: 196042 (limited by guarantee)
The Moray Firth Partnership is a charity registered in Scotland, No: SC 028964

Moray Firth Sea Trout Project's Response to the marine licence application for the Moray Offshore Renewables Ltd (MORL) three wind farms in the Moray Firth

October 2012

The Moray Firth Sea Trout Project

The Moray Firth Sea Trout Project (MFSTP) is a collaborative project formed by all six Fisheries Trust surrounding the Moray Firth to conserve and protect local sea trout populations. The project partners have worked together to protect habitat through restoration and policy work, conserve stocks through catch and release policies and has ongoing research to improve our understanding and management. Sea trout angling is particularly important to local community Angling Associations that often rely on sea and brown trout angling to attract their membership and visiting anglers. Trout angling brings in vital revenue through visiting anglers and associated tourism. It is difficult to put a value on trout angling alone but in the Kyle of Sutherland District salmon and sea trout angling is estimated to bring in nearly £4 million annually and support nearly 150 jobs (Radford et al 2007). While on the Spey salmon and sea trout angling is estimated to generate £10.8 million in the local economy and support 420 full time equivalent jobs (Butler et al. 2009). However, there are worrying signs of decline in Moray Firth populations where there has been a 42% decline in the average sea trout rod and line catch over the last 10 years.

In light of these worrying signs that Moray Firth sea trout populations are already under pressure the project partners have significant concerns about the proposed development. Despite acknowledging that sea trout are likely to use the development site and advocating a conservative and precautionary approach the ES offers minimal mitigation or firm commitment to further monitoring or research.

Sea Trout Conservation Status

The trout (*Salmo trutta)* is an important part of Scotland's natural heritage and as such is a priority species on the UK's Biodiversity Action Plan List and Scottish Natural Heritage have recently included sea trout on their Priority Marine Features list. Trout (Salmo trutta) are generally characterised as either; brown trout which reside in freshwater, or anadramous sea trout which migrate to sea to feed; both are the same species and readily interbreed as important components of a healthy functioning trout population, hence the need to conserve both brown and sea trout life forms.

Climate Change

Climate change is potential threat to trout populations both in freshwater systems and in the marine environment. The MFTSP acknowledges the need to limit greenhouse gas emissions and supports the Scottish Governments target to meet 50% of Scotland's electricity demand from renewable sources by 2020. However, the MFSTP feels very strongly that this target should not be met at the expensive of long term damage to local ecosystems and species.

Potential Negative Effects of offshore wind and MORL

The large scale of the offshore wind developments that are planned for around our coastline amount to a significant cumulative impact on our marine environment and as such require the highest possible environmental standards. Furthermore the relative juvenility of the industry and the unknown impact of these large scale developments in certain environments require that the precautionary approach is adopted at all levels. Our specific concern with the MORL development is the potential for direct and indirect effects on Moray Firth sea trout populations. The Moray Firth is very important common resource for the sea trout from all the rivers that surround it. Sea trout migrate to sea primarily to feed and take advantage of the productive marine environment and we are very conscious of ensuring that they are not directly threatened nor the resources they rely on disrupted. The MORL development is situated on the Smith Bank which the ES has confirmed as important habitat for three species of sea trout prey; sandeel, herring and sprat. Consequently the Smith Bank is likely a very important feeding area for Moray Firth sea trout populations and we welcome the assumption in the ES that sea trout do migrate through and feed in the development area. The potential cumulative impact on sea trout is significantly greater than other migratory species as they will spend longer foraging within the development area rather than migrating through. The impact assessment should take into account that a barrier to migration is not the only significant effect and that any dispersal or avoidance from the site could greatly limit feeding potential and have population level effects. Subsea noise and EMF could result in disorientated behaviour and potentially increased susceptibility to predation, reduced feeding ability and changes in migration timing and route. Furthermore the development may disturb sea trout prey species and habitat resulting in a diminished prey resource. It is essential that these potential effects are considered not only individually but also cumulatively.

The activities of most concern are outlined below:

- **Subsea noise during construction**
  As outlined in the SNH commissioned report (Gill & Bartlett 2010) the most likely impacts is from structures installation requiring pile driving and that duration and timing are likely very important. As highlighted by Gill, Bartlett and Thomsen (2012) there is a currently lack of knowledge of how salmonids us the environment and react to underwater noise to determine a biological effect.
- **Subsea noise during operation**
  The same SNH report concluded there was insufficient information about subsea noise during operation to make an assessment of impact but there could be long term ecological impacts. Gill, Bartlett & Thomsen (2012) also stress the need to asses the changes in behaviour over the lifetime of the project and the importance in filling in these data gaps.
- **Electromagnetic Fields (EMFs) associated with cabling or transmission works.**
  The SNH report also outlined that Salmonids are very sensitive to EMFs and indeed may be impacted by them although the likely effect or response could not be determined on current knowledge. Until further research by Marine Scotland Science is concluded it is vital all cables are appropriately shielded.
- **Disturbance of benthic environment and loss of habitat**
  Both Gravity Based Structures and Jacket structures both have significant potential impacts on the benthic environment that is crucial habitat for sea trout prey including sandeels, herring and sprat.
- **Aggregation of prey around subsea structures**

Although often highlighted as a potential positive effect the potential aggregation effects of the subsea structures may also serve as aggregating devices for predators and have a negative effect on sea trout.

General comments on the MORL application

Marine Scotland Science (MSS) have outlined that when inadequate information exists on the use of the development area by anadramous fish then a suitable monitoring strategy should be deployed (Table 1.3-7, ES Chapter 1). The ES concludes that in the absence of detailed information on salmonid migratory routes it is assumed that Salmonids do use the development area. However, although the ES acknowledges each of the separate negative effects no consideration is give to the cumulative effects of sediment, noise, EMF, habitat loss and increased predation on sea trout and their prey. There seems a significant risk that the cumulative effect of these apparently minor individual impacts could have significant population level effects. Although the ES does recognise the potential effect of construction noise as being of moderate significance and suggest that further surveying and monitoring will be conducted there is no clarification of what or when this work will take place. We would welcome a commitment to track Moray Firth trout populations to identify how they use the development area and determine potential areas of overlap. This will enable informed assessment of potential negative effects and ensure appropriate mitigation of this locally threatened species throughout the construction, operation and decommissioning phases.

Specific Comments on the MORL ES:

Sea trout prey

As highlighted in the ES important sea trout prey species sandeel and herring are both found on the Smith Bank. They both rely on specific sediment composition for part of their life cycle and are vulnerable to disruption from changes in sediment settlement and dispersion, noise and loss of habitat. Table 4.1 (Appendix 4.3 A) highlights the development area as a nursery and spawning area for herring and sandeel.

Herring - The sediment re-deposition impacts on herring eggs are dismissed as of "Minor Significance" based on the assumption that the development area does not overlap with the spawning areas described by the maps in Technical Appendix 4.3 A. The development area is between the two herring population spawning grounds which although drawn with clear delineation are likely far more variable according to environmental conditions and may well over lap with the development area. Furthermore the development area is an important nursery ground for herring Figure 4.3 (Technical Appendix 4.3-A) and as such will be seasonally important for herring larvae which have been highlighted as sensitive to increased suspended sediment in 7.2.5.16 (ES Vol 3) but this effect has also been dismissed as of "Minor Significance". Furthermore Herring are one of the most sensitive species to noise during the development phase and this effect has been assessed as a negative effect of moderate significance but no mitigation has been specifically suggested beyond soft start piling which would not be effective for the relatively immobile and vulnerable juvenile stages and the dispersion of older life stages could lead to displacement and reduced overall capacity in the Moray Firth Nursery area. Considering each of these factors in isolation does not take into account the cumulative impact of all the negative effects together. The cumulative impact of habitat loss (5.99 km2 disturbed during construction and 3.76km2 lost during operation), sediment deposition on eggs, increased suspended sediment on larvae and construction noise appears capable of causing significant negative impact to herring in the Moray Firth and consequently the depletion of key sea trout prey.

Sandeels spend most of their life buried in the sediment only leaving to spawn in the winter and feed in the spring. They rely on specific sediment composition and as result are very vulnerable to changes in the benthic environment. Figure 4.1 (Appendix 4.3A) shows that according to the literature the development area is a high intensity spawning ground and low intensity nursery ground. However based on results of the Sandeel Survey the impact of sediment re-deposition on eggs, noise and habitat loss have been dismissed as of minimum significance due to the conclusion that there are not extensive areas supporting sandeels in the MORL zone. Although the sandeel survey is very much welcomed the ES seems to rather prematurely conclude the area is not important for sandeels when the historical literature clearly considers it an important nursery and spawning area. Furthermore the report its self states that there is extensive sediment in the area that is suitable for sandeels.

Considering the historical evidence from the literature and the suitability of the habitat we conclude that one survey is not an adequate measure of the true long term sandeel productivity in the MORL Zone. Sandeels are notoriously hard to sample and show significant seasonal and annual variations and a longer term sampling strategy is required before this area can be dismissed of minimum values to sandeels. The input of MSS into survey design is very appropriate but as discussed by Greenstreet et al. (2010) sampling and measuring the absolute abundance of sandeels is very difficult. Bearing in mind the patchy distribution of sandeels and the relatively small area sampled by grabs compared to the whole development area this one survey cannot be relied upon in isolation to rule out the value of the development area to sandeels.

Impact of increased Suspended Sediment Concentrations on sea trout
The negative impact of suspended sediment on adult juvenile fish has been assessed as of minor significance based on a paper by Birtwell (1999). This single study only considered the effects of sediment in freshwater and is inappropriate for this environment.

Impact of Noise on sea trout
The impact of subsea noise on sea trout is poorly understood as outlined in the SNH report (Gill & Bartlett 2010) which also highlights the significant potential impact of subsea piling. The assumption that sea trout use the development area is welcomed and the acknowledgment of the potential negative effect of construction noise being classified as minor-moderate significance. However the assessment does not seem to acknowledge that sea trout will likely be feeding in this area and not just migrating. As result the noise is not just a potential barrier but may displace sea trout from important feeding grounds for prolonged periods of time. Although the ES suggests that further survey work and monitoring will be conducted to measure this potential effect no detail is given of what this work will entail or when it will take place. More detail is required on this before the ES can be approved. It should be noted also that soft start piling cannot be considered adequate mitigation as this will merely enable sea trout to leave the danger zone but will still result in displacement from import feeding zones.

Introduction of new Habitat
As described the construction of subsea structures and associated armouring will likely result in long term changes in overall diversity and productivity of the benthic environment within the development area. More specifically the subsea structures are likely to act as fish aggregation devices (FADs) but little consideration has been given to the fact that FADs will in turn attract predators and potentially increase predation risk to sea trout while on their feeding grounds.

Electromagnetic Fields
As summarised in the SNH Report (Gill Bartlett 2010) sea trout are potentially sensitive to EMF but the level of impact is poorly understood. Until further MSS research is completed into the sensitivity of salmon and sea trout the precautionary approach should be adopted. We welcome the commitment to mitigate against the negative effect of EMF by burying the cable to a depth of 1m and where this not possible the use of cable protection or shielding. However, should the MSS research suggest a potential negative effect after burial or shielding then further mitigation or burial should be adopted. We do not agree with the statement in paragraph 7.2.5.91 (ES Vol. 3) that "sea trout will be mainly swimming in the upper meters of the water column" as the development area is likely a feeding ground and not just a migratory pathway. As result sea trout will likely be pursuing prey throughout the water column and even within the lower 5m. Furthermore the fact that the development site is not particularly close to any river mouths does not immediately limit the effect on sea trout which likely rely on the area as a feeding zone and any widespread avoidance could have significant impacts on local sea trout populations.

ES Volume 4 - Transmission Works
EMF - As with the main development site we welcome the burial to 1m of all transmission cables and where this is not possible the shielding of cables to limit potential effects of EMF. However, this mitigation should be informed by the results of the MSS research and should they identify residual potential effects even with burial or shielding then further mitigation should be pursued.

Increased Suspended Sediment Concentrations (SSC) – In paragraph 10.2.6.15-16 the ES outlines the potential negative impact of increased SSC on migrating salmonids including sea trout. However, the ES does not specifically acknowledge the proximity of the Water of Philorth to the cable landing point in Fraserburgh Bay. Although a small waterway the Water of Philorth does have a population of sea trout and salmon (personal communication with Deveron Bogie and Isla Rivers Trust) which are fished for by the Fraserburgh Angling Club (www.fraserburgh-angling-club.org). Due to the close vicinity of this small river to the cable route it seems appropriate that trenching works in Fraserburgh Bay should not take place when sea trout smolts will be leaving the river (March- May) or when adults are returning August- October.

Summary
Although the Moray Firth Sea Trout Project welcomes the assumption that sea trout do use the development area we do however think that the cumulative impact of the various potential negative effects has been underestimated. There still appears to be a significant risk that the development will displace feeding sea trout during the construction phase and that the impact of construction and operation of the site could negatively effect sea trout prey species. We do acknowledge that there is some doubt regarding how and when sea trout use the area and therefore seek further survey work and monitoring, as required by MSS, to determine how sea trout do use this area, potential areas of conflict and required mitigation. Likewise further monitoring is required to determine the potential impact on prey species, in particular the impacts on sandeel and herring which have been dismissed as minor on limited data.

In light of the above the MFSTP is formally objecting to the proposals until there is commitment to a specific surveys and monitoring to determine potential negative effects on sea trout and their prey and consequently for adequate mitigation to be deployed.

Marcus Walters
MFSTP Project Manager
Mob: 07500602216
Walters.mfstp@googlemail.com

References

Birtwell, I.K., (1999) The Effects of Sediments on Fish and their Habitat. Fisheries and Oceans Canada. Science Branch. Marine Environment and Habitat Sciences Division. Freshwater Environment and Habitat Sciences Section.

Butler, J, Radford, A Riddington G, Laughton B. (2009) Evaluating an ecosystem service provided by Atlantic salmon, sea trout and other fish species in the River Spey, Scotland: The economic impact of recreational rod fisheries. Fisheries Research 96 259–266

Gill, A.B. & Bartlett, M. (2010) Literature review on the potential effects of electromagnetic fields and subsea noise from marine renewable energy developments on Atlantic salmon, sea trout and European eel. Scottish Natural Heritage Commissioned Report No.401

Greenstreet, S. P. R., Holland, J. H., Guirey, E. J., Armstrong, E., Fraser H. M. and Gibb, I. M. (2010) Combining hydroacoustic seabed survey and grab sampling techniques to assess "local" sandeel population abundance. ICES Journal of Marine Science 67 (5):971-984.

A. B. Gill, M. Bartlett and F. Thomsen. (2012) Potential interactions between diadromous fishes of U.K.conservation importance and the electromagnetic fields and subsea noise from marine renewable energy developments. Journal of Fish Biology 81, 664–695

Holland G, Greenstreet S Gibb I, Fraser H, Robertson M. (2005) Identifying sandeel *Ammodytes marinus* sediment habitat preferences in the marine environment. Marine Ecology Progress Series 303:269-282

Radford A, Riddington G, Gibson H. (2007). An Economic Survey of Angling in the Kyle of Sutherland Region. http://www.kylefisheries.org/uploads/Economic%20Survey.pdf

Ford A (Alexander)

From: [redacted]

Sent: 01 November 2012 16:10
To: MS Marine Licensing
Subject: Moray Offshore Section 36 Applications, McColl, Telford and Stevenson
Attachments: 20121101 - OBJ to Scottish Govt.pdf; 20121101 - OBJ to Scottish Govt.pdf; 20121101 - OBJ to Scottish Govt.pdf

FAO Alexander Ford.

Please find attached the MOD responses to the above applications.

Kind regards

Claire Duddy| Assistant Safeguarding Officer, DIO Safeguarding
| Defence Infrastructure Organisation |
Building 49 | Kingston Road | Sutton Coldfield B75 7RL
Civ: 0121 311 3781 | Mil: 94421 3714|
Fax: 0121 311 2218

Email: [redacted]
Website: www.mod.uk/dio/

MOD Safeguarding
http://www.mod.uk/DefenceInternet/MicroSite/DIO/WhatWeDo/Operations/ModSafeguarding.htm

Defence Infrastructure Organisation

MINISTRY OF DEFENCE

Defence Infrastructure Organisation

Claire Duddy
Assistant Safeguarding Officer
Safeguarding - Wind Energy
Defence Infrastructure Organisation
Kingston Road
Sutton Coldfield
West Midlands
B75 7RL

Telephone: 0121 311 3714
Facsimile:
E-mail: [redacted]

Alexander Ford
Marine Scotland Licensing Operations Team
Marine Scotland
Marine Laboratory
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

Your Reference: 011/OW/MORLE – 8
Our Reference: DIO/SUT/43/10/1/17473

01 November 2012

Dear Mr Ford

DIO Reference Number: 17473

Site Name: Moray Offshore - Telford

Thank you for consulting the Ministry of Defence (MOD) about the above application dated 01 October 2012.

I am writing to inform you that the MOD objects to the proposal. Our assessment has been carried out on the basis that there will be up to 139 turbines, a maximum of 204 metres in height to blade tip and located within the boundary indicated by the grid references below, as stated in the planning application or provided by the developer:

Turbine	100km Square letter	Easting	Northing
1	ND	66549	25737
2	ND	60673	21521
3	ND	53484	30197
4	ND	53561	30305
5	ND	53781	30626
6	ND	53995	30948
7	ND	54203	31276
8	ND	54405	31608
9	ND	54601	31941
10	ND	54792	32279
11	ND	54977	32620
12	ND	55155	32965
13	ND	55257	33167
14	ND	55349	33356
15	ND	55517	33705
16	ND	55677	34059
17	ND	55830	34414
18	ND	55979	34772
19	ND	56121	35135

20	ND	56256	35497
21	ND	56385	35863
22	ND	56507	36231
23	ND	56625	36601
24	ND	56734	36973
25	ND	56810	37289
26	ND	56822	37289
27	ND	56838	37346
28	ND	56839	37352
29	ND	56854	37394
30	ND	57609	36486
31	ND	57692	36387

Air Traffic Control (ATC) Radar

The turbines will be between 65.4km and 76.8km from, will be detectable by, and will cause unacceptable interference to the ATC radar at RAF Lossiemouth.

Wind turbines have been shown to have detrimental effects on the performance of MOD ATC and Range Control radars. These effects include the desensitisation of radar in the vicinity of the turbines, and the creation of "false" aircraft returns which air traffic controllers must treat as real. The desensitisation of radar could result in aircraft not being detected by the radar and therefore not presented to air traffic controllers. Controllers use the radar to separate and sequence both military and civilian aircraft, and in busy uncontrolled airspace radar is the only sure way to do this safely. Maintaining situational awareness of all aircraft movements within the airspace is crucial to achieving a safe and efficient air traffic service, and the integrity of radar data is central to this process. The creation of "false" aircraft displayed on the radar leads to increased workload for both controllers and aircrews, and may have a significant operational impact. Furthermore, real aircraft returns can be obscured by the turbine's radar returns, making the tracking of conflicting unknown aircraft (the controllers' own traffic) much more difficult.

Air Defence (AD) radar

The turbines will be approximately 95.9km from, be detectable by, and will cause unacceptable interference to the AD radar at RAF Buchan. Trials carried out in 2005 concluded that wind turbines can have detrimental effects on the operation of radar which include the desensitisation of radar in the vicinity of the turbines, and the creation of "false" aircraft returns. The probability of the radar detecting aircraft flying over or in the vicinity of the turbines would be reduced, and the RAF would be unable to provide a full air surveillance service in the area of the proposed wind farm.

If the developer is able to overcome the issues stated above, the MOD will request that the turbines be fitted with 2000 candela omni-directional red lighting or 200cd and 600mw/str IR lighting at the highest practicable point.

MOD Safeguarding wishes to be consulted and notified about the progress of planning applications and submissions relating to this proposal to verify that it will not adversely affect defence interests.

I hope this adequately explains our position on the matter. Further information about the effects of wind turbines on MOD interests can be obtained from the following website:

***MOD*:** http://www.mod.uk/DefenceInternet/MicroSite/DIO/WhatWeDo/Operations/ModSafeguarding.htm

Yours sincerely

Assistant Safeguarding Officer – Wind Energy
Defence Infrastructure Organisation

SAFEGUARDING SOLUTIONS TO DEFENCE NEEDS

MINISTRY OF DEFENCE

Defence Infrastructure Organisation

Claire Duddy
Assistant Safeguarding Officer
Safeguarding - Wind Energy
Defence Infrastructure Organisation
Kingston Road
Sutton Coldfield
West Midlands
B75 7RL

Telephone: 0121 311 3714
Facsimile:
E-mail: [redacted]

Alexander Ford
Marine Scotland Licensing Operations Team
Marine Scotland
Marine Laboratory
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

Your Reference: 011/OW/MORLE – 8
Our Reference: DIO/SUT/43/10/1/17474

01 November 2012

Dear Mr Ford

DIO Reference Number: 17474

Site Name: Moray Offshore - Stevenson

Thank you for consulting the Ministry of Defence (MOD) about the above application dated 01 October 2012.

I am writing to inform you that the MOD objects to the proposal. Our assessment has been carried out on the basis that there will be up to 139 turbines, a maximum of 204 metres in height to blade tip and located within the boundary indicated by the grid references below, as stated in the planning application or provided by the developer:

Turbine	100km Square letter	Easting	Northing
1	ND	58032	19625
2	ND	51054	18065
3	ND	51056	18100
4	ND	50986	19307
5	ND	50828	20170
6	ND	50649	21017
7	ND	50488	21516
8	ND	50363	21904
9	ND	49953	22874
10	ND	49405	23892
11	ND	48729	24859
12	ND	48800	24921
13	ND	49090	25177
14	ND	49376	25441
15	ND	49656	25708
16	ND	49934	25979
17	ND	50205	26256
18	ND	50472	26536

19	ND	50534	26604
20	ND	50752	26843
21	ND	51009	27133
22	ND	51260	27429
23	ND	51506	27728
24	ND	51747	28031
25	ND	51793	28090
26	ND	51875	28180
27	ND	52131	28742
28	ND	52382	28766
29	ND	52504	28913
30	ND	52630	29066
31	ND	52871	29369
32	ND	53107	29678
33	ND	53337	29991
34	ND	53484	30197
35	ND	60673	21521

Air Traffic Control (ATC) Radar

The turbines will be approximately 62km from, will be detectable by, and will cause unacceptable interference to the ATC radar at RAF Lossiemouth.

Wind turbines have been shown to have detrimental effects on the performance of MOD ATC and Range Control radars. These effects include the desensitisation of radar in the vicinity of the turbines, and the creation of "false" aircraft returns which air traffic controllers must treat as real. The desensitisation of radar could result in aircraft not being detected by the radar and therefore not presented to air traffic controllers. Controllers use the radar to separate and sequence both military and civilian aircraft, and in busy uncontrolled airspace radar is the only sure way to do this safely. Maintaining situational awareness of all aircraft movements within the airspace is crucial to achieving a safe and efficient air traffic service, and the integrity of radar data is central to this process. The creation of "false" aircraft displayed on the radar leads to increased workload for both controllers and aircrews, and may have a significant operational impact. Furthermore, real aircraft returns can be obscured by the turbine's radar returns, making the tracking of conflicting unknown aircraft (the controllers' own traffic) much more difficult.

If the developer is able to overcome the issues stated above, the MOD will request that the turbines be fitted with 2000 candela omni-directional red lighting or 200cd and 600mw/str IR lighting at the highest practicable point.

MOD Safeguarding wishes to be consulted and notified about the progress of planning applications and submissions relating to this proposal to verify that it will not adversely affect defence interests.

I hope this adequately explains our position on the matter. Further information about the effects of wind turbines on MOD interests can be obtained from the following website:

***MOD*:** http://www.mod.uk/DefenceInternet/MicroSite/DIO/WhatWeDo/Operations/ModSafeguarding.htm

Yours sincerely

Claire Duddy
Assistant Safeguarding Officer – Wind Energy
Defence Infrastructure Organisation

SAFEGUARDING SOLUTIONS TO DEFENCE NEEDS

MINISTRY OF DEFENCE

Defence Infrastructure Organisation

Claire Duddy
Assistant Safeguarding Officer
Safeguarding - Wind Energy
Defence Infrastructure Organisation
Kingston Road
Sutton Coldfield
West Midlands
B75 7RL

Telephone: 0121 311 3714
Facsimile: 01
E-mail: [redacted]

Alexander Ford
Marine Scotland Licensing Operations Team
Marine Scotland
Marine Laboratory
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

Your Reference: 011/OW/MORLE – 8
Our Reference: DIO/SUT/43/10/1/17475

01 November 2012

Dear Mr Ford

DIO Reference Number: 17475

Site Name: Moray Offshore - McColl

Thank you for consulting the Ministry of Defence (MOD) about the above application dated 01 October 2012.

I am writing to inform you that the MOD objects to the proposal. Our assessment has been carried out on the basis that there will be up to 139 turbines, a maximum of 204 metres in height to blade tip and located within the boundary indicated by the grid references below, as stated in the planning application or provided by the developer:

Turbine	100km Square letter	Easting	Northing
1	ND	58958	13553
2	ND	46215	08885
3	ND	47429	09847
4	ND	48163	10589
5	ND	48932	11516
6	ND	49595	12547
7	ND	50165	13728
8	ND	50533	14673
9	ND	50757	15544
10	ND	50879	16157
11	ND	51006	16957
12	ND	51054	18065
13	ND	58032	19625
14	ND	60673	21521
15	ND	66549	25737
16	ND	66549	25725
17	ND	66549	16334
18	ND	62156	14723

19	ND	61496	14486
20	ND	59194	13639
21	ND	59191	13637
22	ND	58962	13554
23	ND	58962	13554

Air Traffic Control (ATC) Radar

The turbines will be between 46.9km and 72.4km from, will be detectable by, and will cause unacceptable interference to the ATC radar at RAF Lossiemouth.

Wind turbines have been shown to have detrimental effects on the performance of MOD ATC and Range Control radars. These effects include the desensitisation of radar in the vicinity of the turbines, and the creation of "false" aircraft returns which air traffic controllers must treat as real. The desensitisation of radar could result in aircraft not being detected by the radar and therefore not presented to air traffic controllers. Controllers use the radar to separate and sequence both military and civilian aircraft, and in busy uncontrolled airspace radar is the only sure way to do this safely. Maintaining situational awareness of all aircraft movements within the airspace is crucial to achieving a safe and efficient air traffic service, and the integrity of radar data is central to this process. The creation of "false" aircraft displayed on the radar leads to increased workload for both controllers and aircrews, and may have a significant operational impact. Furthermore, real aircraft returns can be obscured by the turbine's radar returns, making the tracking of conflicting unknown aircraft (the controllers' own traffic) much more difficult.

Air Defence (AD) radar

The turbines will be between 88.9km and 97.9km from, be detectable by, and will cause unacceptable interference to the AD radar at RAF Buchan. Trials carried out in 2005 concluded that wind turbines can have detrimental effects on the operation of radar which include the desensitisation of radar in the vicinity of the turbines, and the creation of "false" aircraft returns. The probability of the radar detecting aircraft flying over or in the vicinity of the turbines would be reduced, and the RAF would be unable to provide a full air surveillance service in the area of the proposed wind farm.

If the developer is able to overcome the issues stated above, the MOD will request that the turbines be fitted with 2000 candela omni-directional red lighting or 200cd and 600mw/str IR lighting at the highest practicable point.

MOD Safeguarding wishes to be consulted and notified about the progress of planning applications and submissions relating to this proposal to verify that it will not adversely affect defence interests.

I hope this adequately explains our position on the matter. Further information about the effects of wind turbines on MOD interests can be obtained from the following website:

***MOD*:** http://www.mod.uk/DefenceInternet/MicroSite/DIO/WhatWeDo/Operations/ModSafeguarding.htm

Yours sincerely

Claire Duddy
Assistant Safeguarding Officer – Wind Energy
Defence Infrastructure Organisation

SAFEGUARDING SOLUTIONS TO DEFENCE NEEDS

DEVELOPMENT MANAGEMENT
Neal MacPherson
Planning Officer
The Moray Council
High Street, Elgin, Moray IV30 1BX
Telephone: 01343 563266 Fax: 01343 563263

E-mail: neal.macpherson@moray.gov.uk
Website: www.moray.gov.uk

Marine Scotland Licensing Operations Team
Marine Scotland
Marine Laboratory
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

Your Reference:
Our reference: *12/01531/S36 12/001532/S36 12/01533/S36 NM/JM*

24th December 2012

Dear Sir(s)/Madam

12/01531/S36, 12/01532/S36, 12/01533/S36
Construction and operation of an offshore generating station of up to 139 wind turbine generators Telford Offshore Windfarms, MacColl Offshore Windfarm and Stevenson Offshore Windfarm

I refer to the above three Section 36 applications submitted by Moray Offshore Renewables Limited.

The Planning and Regulatory Services Committee of Moray Council sat on the 4th December and considered the consultation on the three proposed development area, names Telford, MacColl and Stevenson. The Council has agreed to respond to the consultation from Marine Scotland raising no objection to the proposals.

Members did however ask for information purposes only that the Moray Council be informed/provided with the specific aviation and nautical lighting scheme approved by Marine Scotland. It was noted from submissions that this would be finalised once a specific layout of turbines was known and following consultation as part of the Section 36 determination process.

I trust this letter is sufficient, but should you require any further confirmation, please do not hesitate to contact the author of this letter at the above address.

Please note that information associated with the application will be published on the Council's website at http://public.moray.gov.uk/eplanning.

If you have included an email address in your letter, the Council would prefer to forward any further communications about the proposal using that address, unless you indicate otherwise.

Yours faithfully

Neal MacPherson
Planning Officer

Ford A (Alexander)

From: Barclay MJ (Michael)
Sent: 03 October 2012 14:50
To: MS Marine Licensing
Subject: Your Ref: 011/OW/MORLE - 8

Good afternoon

In response to your letter of 28th August 2012 to in regards to applications under the Electricity Act 1989, Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009 I am submitting a 'nil return'

Regards

Michael Barclay
Marine Scotland - Compliance

Scottish Government, Fishery Office, Suites 3-5, Douglas Centre, March Road, Buckie, AB56 4BT

Tel: +44 (0) 300 244 9262
Fax: +44 (0) 300 244 9265
e: Michael.Barclay@scotland.gsi.gov.uk
w: http://www.scotland.gov.uk/marinescotland

marinescotland
science

T: +44 (0)1224 876544 «Ext» F: +44 (0)1224 295511 «Fax»
enquiries@marlab.ac.uk

The Scottish Government

Mr Robert Main
Marine Scotland
Licensing Operations Team
375 Victoria Road
Torry
Aberdeen
AB11 9DB

26 November 2012

Our Ref: 011/OW/MORLE – 8

Dear Mr Main

MORAY OFFSHORE RENEWABLES LIMITED: MORL OFFSHORE WIND FARM – MSS COMMENTS ON THE APPLICATION FOR

THREE CONSENTS UNDER SECTION 36 OF THE ELECTRICITY ACT 1989, AND THREE MARINE LICENCES UNDER PART 4 OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT AND OPERATE THREE OFFSHORE WIND FARMS IN THE OUTER MORAY FIRTH

ONE MARINE LICENCE UNDER SECTION 20 OF THE MARINE (SCOTLAND) ACT 2010, AND UNDER SECTIONS 65 AND 66 OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT THE ASSOCIATED OFFSHORE TRANSMISSION WORKS IN THE OUTER MORAY FIRTH

MSS Advice

Marine Scotland has reviewed the submitted Environmental Statement for the above application and has provided comments on Physical Environment, Benthic Ecology, Fish & Shellfish Ecology and Commercial Fisheries.

Under Fish & Shellfish Ecology and Commercial Fisheries MSS has only provided comments on Marine Fish Species, we are currently awaiting final comments from the Freshwater Fisheries Laboratory therefore until these are received, this is an interim response to allow MORL to progress their application.

Our advice is as follows.

It is of our opinion that the developer has not provided sufficient information in several areas of the ES to allow sufficient assessment of the potential impacts that may arise from this development. As a result we would look for these issues to be addressed before we could give MS LOT our final views on this project.

Comments in relation to Project Description

The foundation designs considered include a gravity based system and a steel jacket system. Each will require different site preparation and installation methodologies. This will require different vessels to complete each of the stages. One of the primary concerns for assessing the potential impacts on the environment associated with these activities will depend on the timing, duration and frequency of the proposed works. Consequently understanding the weather window for the safe operation of the project vessels is essential for planning how the development will proceed and the time required to complete the project. This information appears to be omitted from the ES.

The weather window will dictate when certain works will be undertaken. The weather window may be further reduced resulting from mitigation to avoid sensitive times of the year for a particular receptor. In doing so this has the potential to reduce the project work for each year, extending the net time required to complete the project. Consequently, in order to assess the potential impacts of the development, the duration and frequency of the proposed works needs to be known. Some receptors may be more susceptible to impact from recurring exposure to an activity for short periods of time over a number of years, while other receptors will be more susceptible to prolonged exposure to an activity for longer periods of time over a shorter number of years.

To define the weather window for the proposed development we would suggest contact is made with a number of vessel suppliers for confirmation of the safe working weather thresholds for the vessels being considered for each of the foundation/installation options. We phoned Boskalis Westminster Dredging Ltd and they were very accommodating providing information and advice about their vessels and how to maximise the time available. We also contacted the Met Office who confirmed that they offered a bespoke service to companies wanting to estimate the weather window for marine operations in UK waters. This includes wave height, direction, period and similar parameters for wind and currents. This information is routinely used by the offshore oil and gas industry for exploration and production operations. The combination of the vessel threshold limits and the estimated weather conditions below the threshold limits would provide the basis for project managing the proposed development. This would provide clarity on the sequence of activities to be undertaken during the installation of the devices. The ES indicates that a sequential series of activities will be completed during the deployment of the foundations for each device. In the case of gravity based systems several vessels will be involved, consequently the process will be limited by the vessel with the most restrictive weather window. With the information provided by vessel suppliers and the Met Office, a realistic Gantt chart or charts can then be produced to demonstrate the “worst-case” scenarios for those receptors that are susceptible to different activity exposures. This will ensure that in subsequent phases of the engineering design process, the development will be within the scope of the assessed effects and in keeping with the Rochdale Envelope approach. This in turn will provide advisers with a better context for assessing the potential impacts that may arise from the proposed development. Also our understanding of the potential for in combination impacts that may arise from concurrent projects is significantly restricted without knowing the realistic timing of the different stages for the development.

Given the potential scale of the associated works with the gravity based system and their integral nature to the main infrastructure for the proposed development, why have they not been incorporated into the environmental statement? Point 4 of Annex IV of the EIA Directive specifies that the information to be supplied by the developer includes “a description of the likely significant effects of the proposed project on the environment resulting from the use of natural resources”. In such cases the European Commission suggests where the associated works are deemed to be an integral part of the main project the associated works should only be approved following the EIA process for the project as a whole. The whole project cumulative impacts assessment does not take into consideration the associated works involved in this development. Information pertinent to the use of natural resources is missing from the ES with respect to the source of the ballast material, site preparation gravel, scour protection and the disposal of dredged sediment.

Attached in Annexe 1 is a list of specific comments to help give direction to the developer as to where additional information would be required.

Comments in relation to Physical Processes

The Environmental Statement (ES), with regards to physical and coastal processes, is extremely comprehensive considering a large number of possible receptors and a comprehensive selection of physical processes affecting these receptors. The ES was, however, somewhat structurally complex and hard to follow. It is understood why the ES was split into sections on transmission infrastructure, offshore generating station etc., cumulative assessment, but there did seem to be a lot of repetition.

The technical appendices were detailed, rigours, and the methodologies adopted are sensible. It appeared that advice given during previous stages of the consultation process was taken onboard.

The scouring around the base of the foundations is considered likely to be one of the major impacts of the wind farm.

The ES presents the results from a plume dispersal simulation (particle tracking model) as evidence in support for the installation activities having an effect of minor significance on the suspended sediment concentrations. This approach is considered to be valid and proportionate with respect to the installation activities. No consideration was given, however, to the fate of suspended sediment resulting from the scour around the turbine foundations during operation.

The potential levels of scour are well assessed in the ES, but the results presented are in terms of the eventual scour pit dimensions and the impact this has on Smith Bank. There is no apparent consideration of the eventual fate of scoured material which would most likely be redistributed over the site itself. Whilst this is not considered to be a highly significant issue, it would be advisable to request some information regarding the volume and grain size(s) of sediment resuspended as a result of the scour, and the time scales associated with this. These could then be compared to the levels of suspended sediment predicted to occur during installation.

Another possible level of assessment could be to apply a similar plume dispersal methodology, as used to model the suspended sediments resulting from installation. These are not anticipated to be major pieces of work, but the results would certainly help clarify things and make it somewhat easier to make an assessment. Finally, it is recognised that the scour pretention measures being suggested will reduce the potential for scour, and resuspension of sediment, and also potentially make an assessment of sediment resuspension hard (due to uncertainty in the scour protection measures being used).

It is recommended that a short assessment of the levels of suspend sediment resulting from scour be done. This does not represent a strong or fundamental objection, but such clarifications would clear things up. The assessments recommended above are not necessarily the only ones that could be done so some freedom should be given to the developer in how they go about this assessment. For example, the developer may be able to provide sufficient conceptually evidence. In response to issue

The ES examines the frequency of sediment mobility on the Smith Bank receptor (Technical Appendix 3.4 C, Section 4.3.2) and concludes that there is no change in the form or function of the receptor, and therefore that the impact is of negligible significance. The ES goes on to argue that because the main change in currents and waves are on smith bank, there is no need for further examination of sediment mobility at the coastal receptors such as designated coastal habitats. It is not necessarily as clear cut as this. For example the coastal receptors have different grain sizes to those found on Smith Bank, and they are therefore potentially more susceptible to changes in the wave and tidal regime than Smith Bank. Having highlighted this as an area of uncertainty, the work done within the ES is considered to be appropriate and proportional for this development.

Comments in relation to Benthic Ecology

Volume 1: Non-Tech Summary

Benthic Ecology (page 39) – Marine Scotland Science (MSS) still do not agree that the effects of construction on the benthos can be considered minor, especially if gravity bases are going to be used. Seabed preparation will be a major event in our opinion. This whole section on benthic ecology appears to underplay potential benthic effects.

Volume 3: 7.1

7.1.3.1. Its not clear in the scientific literature whether benthic invertebrates are "generally insensitive" to EMF and heat effects. Not much work has been done on these topics so we cannot support the authors claim that there will be no significant effects from EMF and heat. Also, if gravity bases are to be used, how much seabed preparation is be carried out? Any dredging for instance would have permanent and major impacts on the seabed and its ecology. We would recommend that the developer provides evidence to support the claim that benthic invertebrates are generally insensitive to EMF and heat effects.

In ES Volume 1 Non-Tech Summary, in Table 7.1-2 and chapters 7.1.6.2, 7.1.6.7 (in ES Volume 3, Chapter 7) and Chapter 10.1.5.12 in ES Volume Chapter 10, the impact of seabed preparation for the sitting of gravity based turbines is discussed and rated as to how severe the changes will be on seabed ecology. As we stated we believe that the developer is understating the potential effects of the dredging/preparation operations - these are major, permanent impacts and should therefore be rated as such. The area of seabed affected is huge, in the region of 6,600m^2 per turbine with up to 339 turbines. Deposition of suspended sediments from these operations is also extremely large even if they are localised - up to 5.1m above normal seabed on some positions. There is no mention of how their dredging work will be carried out, how they plan to transport dredged material and what plans they have for disposing of this material. Given all this, our opinion is that the developer has not adequately assessed these impacts and my recommendation is that more information is required for all these processes to clarify their impact assessments. Until more information is forthcoming we cannot fully consider the effects on seabed ecology or suggest any mitigation measures.

Trenching operations are also rated as being low impact procedures. Again we disagree. This will be a major event impacting benthic ecology. The developers do not consider the disruption of chemical processes in the sediments affected. Again, more information is required and we suggest that some time is spent considering sedimentary processes and benthic recoloniosation in general.

7.1.6.4. Rapid infilling of jetted or ploughed trenches doesn't mean that these trenches will be rapidly re-colonised. These areas will take time to repopulate. Backfilling will disrupt the sediment/substrate structure causing mixing of layers. Aerobic/anaerobic interface and chemical processes will be disrupted although we would expect these structures and processes to re-establish over time (possibly years?). This is not a low magnitude impact.

7.1.6.5. Re-colonisation by import of larvae will occur but only when larvae are available in the water column.

As above, our opinion again is that the developer needs to provide more information on benthic larval settlement and on species mobility into abiotic sediments for example. Until more information is forthcoming we cannot fully consider the effects on seabed ecology or suggest any mitigation measures.

Attached in Annex 2 is a list of specific comments to help give direction to the developer as to where additional information would be required

Comments in relation to Fish and Shellfish Ecology

In general the developer has provided a robust assessment of the key impacts associated with these receptors (marine fish, shellfish and commercial fisheries). However there are a few issues which have not been addressed and these should be amended. Along with these are instances where the developer may just need to provide additional data to clarify an assessment. Additionally we have provided suggestions for possible mitigation options which could be brought forward post consent to help alleviate some of the impacts presented.

Volume 3: 7.2: 7.2.6

Noise and cod (post consent survey)
Due to the assessment that noise poses a moderate – major negative impact to cod we would recommend that the developer carry out survey work to gather further baseline information with regards to locations of spawning within the vicinity of the wind farm. This wouldn't need to be carried out pre-consent but we would look for this work to be carried out pre construction so that it may be possible to carry out post construction/post 1-2 year operation surveys for comparison to test the impact assessments made in the ES.

Noise and herring (mitigation option)
The Orkney/Shetland stock has not recovered like the other North Sea herring stocks, as a result any potential impact on this stock is of concern. The noise contours from the northerly piling sites do penetrate into the perceived spawning areas for the Orkney/Shetland herring stock. It may be possible that noise mitigation for other species (marine mammals) would provide adequate protection to herring spawning as well. This could take the form of noise dampening, seasonal closure or carrying out activities in the southern end of the sites during peak spawning.

Volume 5: Table 12.1-8 (additional data or amendment to ES)
From what has been presented in the mitigation and monitoring sections of chapters 7.2 and 10.2 it is unclear how soft start piling alone could minimize the impact to cod and herring to minor. It has not been indicated what 'other measures' may be proposed so it is difficult to agree with the statements made in this table. Either the developer should provide the additional data to support the statements made or this statement should be amended within the ES.

Volume 5: Section 6: CIA – Fish and Shellfish Ecology

14.2 (mitigation option) – The developer should seek to work with the BOWL project to try and ensure piling/noisy activities in the most northerly locations are kept to as short a period as possible, where possible they should try and avoid carrying out piling/noisy activities in these most northerly areas during key spawning periods (August – September) for herring.

Comments in relation to Commercial Fisheries

Volume 3: 8.1

8.1.4.3 (Amendment of ES) – The developer has contradicted its self with the comments made in 8.1.2.2 when describing the exclusions that would be expected during construction. This should be clarified. Will fishing be restricted by the cable laying during construction?
8.1.5.17 (provision of additional data) – We would seek that the developer provide additional data which would support the assessment that the Moray Firth is of low importance on the national scale. We find this conclusion conflicts with our understanding of the area and with the data presented in figure 6.3 of technical appendix 5.1. Indicating that ICES rectangle 45E7 has on average the 3rd most valuable landings within the national study area presented.

Volume 4: 11.1
Developer has adequately assessed the key impacts.

Volume 5: 12.1 Scour (missing information to make assessment –amend ES)
There appears to be an omission of information regarding scour protection solutions for the portions of cables that will be in areas susceptible to scour. We are of the opinion that this would need to be described before an adequate assessment of the risk to fishing vessels can be fully described. Other than burial to 1m, what measures does the developer intend to use in these areas?

(Mitigation for poor assessment of CIA due to lack of available information)
Additionally to the comments provided above on commercial fisheries, we would recommend the developer consider the application of a fisheries working group. This would include both fishing associations and local fisheries that utilise the area and provide a forum for discussions of potential conflicts, issues and mitigation etc. It would also be useful if the other developments that are planned for the Moray Firth were involved, and in turn, a line of communication be kept open for the development group in the Firth of Forth to help with cumulative issues on the wider east coast. This is particularly relevant as the cumulative impacts have been weakly assessed in section 15.1. These groups would provide the conduit for information from these other developments to be assessed more accurately and to help alleviate concerns from the industry.

Annex 1.

In relation to the gravity base system (GBS) being considered for the installation of the turbines, the following questions and comments are areas that the developer has not provided sufficient information.

Why has spacing in table 2.2-1 been left empty?

What is the proposed ballast for the GBS?

What is the worst case volume of ballast required for GBS?

Please confirm how the foundation designs are influenced by the turbine size.

How has the extraction of gravel infill for each turbine been factored into the decision making process in the ES?

How has the movement of vessels associated with the GBS option been factored into the decision making process in the ES?

How has the disposal of the dredge material from the preparation of the GBS been factored into the decision making process in the ES?

How do the carbon emissions and energy expenditure for the installation of the GBS compare with the installation of jacket structures?

Please provide additional information about the upper threshold weather limit for the proposed dredging operations/transportation in readiness for the installation of each GBS.

How do the weather threshold limits compare with predicted/ historical Met Office data for the proposed development areas?

How much weather downtime has been factored into the gant chart (plate 2.2-3)?

How was the estimate of 35,000m^3 of dredging for GBS preparation derived?

Does 35,000m^3 represent a worst case volume? What would be the consequences of an increase volume of dredge material from each site? How would this then impact on the gant chart shown in plate 2.2-3?

How will the efficiency of suction hopper dredging vary for the different sediment types likely to be encountered?

Please confirm what the developer will do if the side cast sediment is partially or completely lost during a tidal cycle. Where will the sediment come from in order to bury the cable? Has licensing (and necessary analysis) been considered for the extraction/deposition of marine sediment for this job?

Annex 2.

Volume 2: 4.2
4.2.2 Consultation
Table 4.2-1 (Page 4-12). Marine Scotland, point 6 - they have not answered the question "what is meant by epibenthic community assessment"
Page 4-13. Does the section headed "Marine Scotland (MS)" really mean Marine Scotland Science?
Marine Scotland (MS) Point 2. They miss the point in their reply here. These communities do not exist in the development area at present. Any change in the benthic community is therefore local. The MS comment attempts to illustrate that significant changes will occur; these changes are not introductions of unexpected species.
Marine Scotland (MS) Point 4 - how do they propose to handle this major impact?
Marine Scotland (MS) Point 7 - not addressed

Page 4-15
4.2.4.3. Paragraph 1Lumbineris gracilis? Give full name here. Also, Hyas coarctatus is not a member of the "sessile epibenthic community"
4.2.5.1. Was approval on methodology given by Marine Scotland, MSS or MS-LOT?
4.2.5.10. What statistical analysis was carried out? Give details here.
4.2.5.16. Was the assessment and liaison with MS, MSS or MS-LOT?
4.2.5.22. Again, who do they mean by Marine Scotland?

7.1.6.8. Sediments in dredger hopper - where are they proposing to dispose of these sediments? Onshore or offshore? Water borne SSC's are a temporary impact but once deposited they have a more long term effect.

7.1.6.12. The SS.SCS.CCS biotope will be affected by dredging operations.

7.1.6.16. The possible impact of the drill cuttings cannot be regarded as temporary as they will remain on the seabed unless removed. The magnitude of this effect should be increased. Is there any information on what the cuttings comprise?

7.1.6.18. See 7.1.6.16 above.

7.1.6.22. How can seabed preparation operations be reversed?

7.1.6.28. No mention of the possible build-up of dead shells at the bases of the turbine columns over time. These deposits will have an effect on local sediments and biota.

Volume 4: 10.1
See all comments above on perceived construction impacts.
10.1.2.3. "General insensitivity of invertebrates" Little data on these effects exist at present so this statement cannot be supported. (See OSPAR papers for example).
10.1.5.12. Trenching/ /dragging <u>will</u> damage and remove the feature, not "may" damage.
10.1.5.13. Damage to the SpnMeg biotopes should be raised from minor as this is a significant impact.
10.1.5.16. The deposited sands and gravels will not be the same as the ambient as all or most of the fines associated with these substrates will be lost.
10.1.5.19. The epifauna attached to vertical or sloping rock will be impacted by coating effects of settling suspended solids. This is probably a minor impact however.
10.1.5.20. How long will burial last? Once deposited they would assume that the sediments would remain in place for longer than 32 days. This is possibly an effect greater than "minor"
10.1.5.46. Given the lack of data available on these effects, the assessment cannot be rated as "not significant" Minor at least?
10.1.61. "In collaboration with the nature conservation agencies <u>and</u> MSS" Include MSS?
10.1.62. Are there any estimates or data on the damage possibly caused to the reef habitats by laying and removing the installation aids?

marinescotland
science

T: +44 (0)1224 876544 «Ext» F: +44 (0)1224 295511 «Fax»
enquiries@marlab.ac.uk

The Scottish Government

Mr Robert Main
Marine Scotland
Licensing Operations Team
375 Victoria Road
Torry
Aberdeen
AB11 9DB

14 December 2012

Our Ref: 011/OW/MORLE – 8

Dear Mr Main

MORAY OFFSHORE RENEWABLES LIMITED: MORL OFFSHORE WIND FARM – MSS COMMENTS ON THE APPLICATION FOR

THREE CONSENTS UNDER SECTION 36 OF THE ELECTRICITY ACT 1989, AND THREE MARINE LICENCES UNDER PART 4 OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT AND OPERATE THREE OFFSHORE WIND FARMS IN THE OUTER MORAY FIRTH

ONE MARINE LICENCE UNDER SECTION 20 OF THE MARINE (SCOTLAND) ACT 2010, AND UNDER SECTIONS 65 AND 66 OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT THE ASSOCIATED OFFSHORE TRANSMISSION WORKS IN THE OUTER MORAY FIRTH

MSS Advice

Marine Scotland Science has reviewed the submitted Environmental Statement for the above application and have provided comments with relation to Diadromous fish and associated commercial fisheries. Our comments are as follows

Diadromous Fish

Likelihood that diadromous fish will be in or close to the proposed development area

MSS are satisfied that the statement adequately covers what information is available as the main diadromous species which will potentially be present are salmon, sea trout and eels. The information provided is sufficiently detailed and fit for purpose, although there are minor errors. Some of these are listed below in Annex 1.

The statement correctly notes that there is a great deal of uncertainty about the detailed migration routes (and in the case of sea trout the sea feeding areas) of salmon, sea trout and eels. This uncertainty is dealt with by assuming that all adult salmon and sea trout, both adult and smolt, connected with Moray Firth Rivers, will enter the development area. This will overstate the situation with regard to fish connected with Moray Firth Rivers. However, it would also seem likely that some

fish from rivers out with the Moray Firth area will also enter the development area and these are not allowed for.

Potential impacts of the preparation and construction work, and operation, on diadromous fish

MSS are content that the statement adequately covers the details of the preparation and construction work, and operations which are relevant to diadromous fish

The statement also reviews and addresses the potential impacts. These are correctly identified – sediment and noise during construction, EMF during operation – and generally sufficiently well reviewed.

The likely effects of the construction phase on diadromous fish have been assessed to be of minor significance. An exception to this is construction noise, which is identified as having potential to result in significant effects (above minor) on salmon and sea trout. The statement correctly notes that any eel larvae will have limited ability to move out of areas with high levels of noise.

The statement did not identify any significant effects (above minor) on diadromous fish for the operational phase.

Cable burial would be used to reduce exposure of fish to EMF. Where burial is not feasible, cable protection would be used. The immediate landfall of the cable connection is remote from major salmon and sea trout Rivers which is good. However it is noted that it is generally close to shore that cables will be laid on the sea bed with some graded rock placement. Fish may therefore be subjected to stronger fields in these areas; shallow water will also reduce the opportunities for diadromous fish to avoid the fields, and diadromous fish including sea trout and returning adult salmon which may migrate along the coast are likely to be using these areas at least at times. The Water of Philorth which also enters Fraserburgh Bay close to the land fall does have sea trout and some salmon.

MSS have noted that the statement does not emphasise the uncertainties in the impact assessment sufficiently. The statement notes the ongoing MS EMF work, although the release date they give of 2012 is premature.

However MSS previously noted that given the substantial uncertainty associated with potential impacts on fish migration and consequences for individual rivers, that the developer / MS LOT, may wish to consider the need to monitor fish movement through the area and / or the health of salmon populations. Nothing has happened in respect of this although the developer notes that it is committed, in consultation with Marine Scotland and the relevant fisheries stakeholders, to undertake additional survey work and monitoring with the objective of increasing the confidence in this impact assessment and identifying whether mitigation is required and, if so, to define feasible measures in order to reduce the significance of the likely effects. This needs to be progressed.

Commercial fisheries

Occurrence of diadromous fish fisheries in or close to the development area

MSS are satisfied that the Environmental Statement adequately covers what information is available as there are no diadromous fish fisheries in the development area. There are river rod and line and coastal net fisheries associated with many of the rivers which drain into the Moray Firth. The information provided is again sufficiently detailed and fit for purpose, although there are minor errors, some of which are listed below in Annex 1. There are no eel fisheries in or close to the development area.

Mitigation measures and monitoring proposals

Soft start piling will be used with the aim that mobile species are not exposed to the highest noise levels during construction. The need for monitoring / survey work to increase assessment confidence and / or mitigation measures where required is noted in the statement.

Consideration should also be given as to whether it will be possible to provide additional cable protection in shallow water in the future, should any local fish monitoring or improved information on the effects of EMF on fish behaviour indicate the need for this. Monitoring of actual as opposed to modelled underwater sound levels during construction would be useful to allow consideration of modification of construction arrangements. Although sea trout and returning adult salmon could be in the vicinity of the operations at any time of year, this is not the case with salmon smolts departing from the rivers, and if there is any flexibility in the construction programme, consideration could be given by LOT to reducing pile driving during peak smolt migration times.

MSS are happy that the preparation and construction work, mitigation measures and monitoring proposals comply with any guidance, standards or legislation laid down to protect diadromous fish

Operational Noise

MSS notes the developer has not considered operational noise in the context of behavioural response from salmonids specifically with reference to breaking waves on turbine structures and mechanical noise from the rotation of the turbine. MSS is aware that there is considerable uncertainty about both the movements of diadromous fish in the development area and any possible behavioural responses of diadromous fish to operational noise. Because of the lack of available information, MSS is not looking for the developer to attach additional information but wishes MS-LOT and the developer to note the possibility of operational noise affecting the behaviour of diadromous fish.

Potential impacts of the preparation and construction work, and operation, on diadromous fish fisheries, other than through impacts on population levels

MSS are satisfied that the statement adequately reviews the potential impacts as the statement notes that changes to the behaviour of the species in the offshore marine environment arising from the construction / decommissioning and operation of the three proposed wind farm sites could affect coastal and in-river salmon and sea trout fisheries.

Designated Sites

MSS have noted that the statement suggests that the project by itself would not warrant an Appropriate Assessment, but together with other projects and activities it might with respect to disturbance to migrating salmon by underwater piling noise having the potential to affect salmon SACs

Possibility of cumulative impacts

MSS previously noted that given the substantial uncertainty associated with potential impacts on fish migration and consequences for individual rivers, which the developer / MS LOT, may wish to consider the need to monitor fish movement through the area and / or the health of salmon populations. Nothing has happened in respect of this other than to note the comments. Such monitoring activities could be in collaboration with other developers / other parties and I am aware that some consideration is currently being given to this. I would also note that there should be consideration of possible cumulative impacts with developments such as the proposed BOWL development and developments within known salmon migratory routes, including for example those in the Pentland Firth.

Summary of main recommendations.
MSS recommends that the main priorities at this stage regarding diadromous fish and diadromous fish fisheries are to develop plans for monitoring diadromous fish in the vicinity of the development and to ensure that suitable mitigation measures can be applied proportionate to any impacts detected during monitoring. There will be a need to keep this under review as development progresses.

Hopefully these comments are helpful to you. If you wish to discuss any matters further contact the MSS Renewables in-box MS_Renewables@scotland.gsi.gov.uk.

Yours sincerely

Paul Stainer
Marine Scotland Science

Annex 1

Technical Appendix 4.3B
2.2.1. “Rod and Line” and “Catch and Release” should be something like “Rod and Line (retained)” and “Rod and Line (released)”. Also same error in Fig 5.1-17 and 5.1-19

The text implies that there is some distinction between SAC Rivers depending on whether salmon or other species interest is a primary or secondary reason for selection. This is not really relevant as both situations are treated identically.

There are some errors in the sections on fisheries administration and regulations.
Some of the legislation mentioned in the text no longer exists as it has been incorporated into the 2003 Consolidation Act.

Ford A (Alexander)

From: ALLEN, Sarah J <Sarah.ALLEN@nats.co.uk> on behalf of NATS Safeguarding <NATSSafeguarding@nats.co.uk>
Sent: 28 August 2012 12:59
To: MS Marine Licensing
Subject: Your Ref: 011/OW/MORLE-8 - Proposed Offshore Windfarms (x3) - Outer Moray Firth (Our Ref: W(F)9265)

We refer to the application above. The proposed development has been examined by our technical safeguarding teams and conflicts with our safeguarding criteria.

Accordingly, NATS (En Route) plc objects to the proposal.

We would like to take this opportunity to draw your attention to the legal obligation of local authorities to consult NATS before granting planning permission for a wind farm. The obligation to consult arises in respect of certain applications that would affect a technical site operated by or on behalf of NATS (such sites being identified by safeguarding plans that are issued to local planning authorities).

In the event that any recommendations made by NATS are not accepted, local authorities are obliged to follow the relevant directions within Planning Circular 2 2003 - Scottish Planning Series: Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) (Scotland) Direction 2003 or Annex 1 - The Town And Country Planning (Safeguarded Aerodromes, Technical Sites And Military Explosives Storage Areas) Direction 2002.

These directions require that the planning authority notify both NATS and the Civil Aviation Authority ("CAA") of their intention. As this further notification is intended to allow the CAA to consider whether further scrutiny is required, the notification should be provided prior to any granting of permission.

It should also be noted that the failure to consult NATS, or to take into account NATS's comments when determining a planning application, could cause serious safety risks for air traffic.

Should you have any queries, please contact us using the details below.

Yours faithfully

Sarah Allen
NATS Safeguarding
natssafeguarding@nats.co.uk

Holdings Ltd (company number 4138218). All companies are registered in England and their registered office is at 4000 Parkway, Whiteley, Fareham, Hampshire, PO15 7FL.

Technical and Operational Assessment (TOPA)

For Outer Moray Firth Offshore

Windfarm Development

Issue 1

NATS reference: W(F)09265

Publication history

Issue	Month/Year	Changes in this issue
Issue 1	September 2012	

Contents

1. Background

1.1 En-route Consultation

NATS is responsible for the safe and expeditious movement in the en-route phase of flight for aircraft operating in controlled airspace in the UK. To undertake this responsibility it has a comprehensive infrastructure of radars, communication systems and navigational aids throughout the UK, all of which could be compromised by the establishment of a wind farm.

In this respect NATS is responsible for safeguarding this infrastructure to ensure its integrity to provide the required services to Air Traffic Control (ATC).

In order to discharge this responsibility NATS is a statutory consultee for all wind farm applications, and assesses the potential impact of every proposed development in the UK.

Section 3 of this document defines the assessments carried out against the development proposed in section 2, with the result detailed in section 4.1.

2. Application details

The Scottish Government submitted a request for a NATS technical and operational assessment (TOPA) for three developments in the Outer Moray Firth Offshore zone. Exact details are yet to be determined however up to 139 turbines each up to 204m in height are proposed within each of the three zones which are bounded by the following points.

Table 1 – turbine coordinates and height

Boundary	Easting	Northing	Boundary	Easting	Northing
Telford					
Telford_01	366549	925737	Telford_17	355830	934414
Telford_02	360673	921521	Telford_18	355979	934772
Telford_03	353484	930197	Telford_19	356121	935135
Telford_04	353561	930305	Telford_20	356256	935497
Telford_05	353781	930626	Telford_21	356385	935863
Telford_06	535995	930948	Telford_22	356507	936231
Telford_07	354203	931276	Telford_23	356625	936601
Telford_08	354405	931608	Telford_24	356734	936973
Telford_09	354601	931941	Telford_25	356810	937246
Telford_10	354792	932279	Telford_26	356822	937289
Telford_11	354976	932620	Telford_27	356838	937346
Telford_12	355155	932965	Telford_28	356839	937352
Telford_13	355257	933168	Telford_29	356854	937394
Telford_14	355349	933356	Telford_30	357609	936486
Telford_15	355517	933705	Telford_31	357692	936387
Telford_16	355677	934059	Telford_32	366549	925737
Stevenson					
Stevenson_01	358032	919625	Stevenson_19	350534	926604
Stevenson_02	351054	918065	Stevenson_20	350752	926843
Stevenson_03	351056	918100	Stevenson_21	351009	927133
Stevenson_04	350986	919307	Stevenson_22	351260	927429
Stevenson_05	350828	920170	Stevenson_23	351506	927728
Stevenson_06	350649	921017	Stevenson_24	351747	928031

Stevenson_07	350488	921516	Stevenson_25	351793	928090
Stevenson_08	350363	921904	Stevenson_26	351875	928180
Stevenson_09	349953	922874	Stevenson_27	352131	928472
Stevenson_10	349405	923892	Stevenson_28	352382	928766
Stevenson_11	348729	924859	Stevenson_29	352504	928913
Stevenson_12	348800	924921	Stevenson_30	352630	929066
Stevenson_13	349090	925177	Stevenson_31	352871	929369
Stevenson_14	349376	925441	Stevenson_32	353107	929678
Stevenson_15	349656	925708	Stevenson_33	353337	929991
Stevenson_16	349934	925979	Stevenson_34	353484	930197
Stevenson_17	350205	926256	Stevenson_35	360673	921521
Stevenson_18	350472	926537	Stevenson_36	358032	919625
MacColl					
MacColl_01	358958	913553	MacColl_13	358032	919625
MacColl_02	346215	908885	MacColl_14	360673	921521
MacColl_03	347429	909847	MacColl_15	366549	925737
MacColl_04	348163	910589	MacColl_16	366549	925725
MacColl_05	348932	911516	MacColl_17	366549	916333
MacColl_06	349595	912547	MacColl_18	362156	914723
MacColl_07	350165	913728	MacColl_19	361496	914483
MacColl_08	350533	914673	MacColl_20	359194	913639
MacColl_09	350757	915544	MacColl_21	359191	913637
MacColl_10	350879	916157	MacColl_22	358962	913554
MacColl_11	351006	916957	MacColl_23	358962	913554
MacColl_12	351054	918065	MacColl_24	358958	913553

3. Assessments Required

The proposed development falls within the assessment area of the following systems:

NERL Radar Sites	**Easting**	**Northing**	**Range (km)**	**Range (nm)**	**Bearing (True)**	**Type**
Alanshill Radar	390220	861480	72.35	39.07	332.02	CMB
Perwinnes Radar	392190	813510	117.52	63.46	342.18	CMB
NERL Nav Aid Sites	**Easting**	**Northing**	**Range (km)**	**Range (nm)**	**Bearing (True)**	**Type**
None						
NERL AGA Comms Sites	**Easting**	**Northing**	**Range (km)**	**Range (nm)**	**Bearing (True)**	**Type**
None						
NSL Sites	**Easting**	**Northing**	**Range (km)**	**Range (nm)**	**Bearing (True)**	**Type**
None						

Table 2 – Impacted Infrastructure

3.1 En-route radar technical assessment

3.1.1 Predicted impact on Allanshill Radar

Using the theory as described in Appendix A and development specific propagation profile it has been determined that the terrain screening available will not adequately attenuate the signal, and therefore this development is likely to cause false primary plots to be generated.

A reduction in the radar's probability of detection, for real aircraft, is also anticipated.

3.1.2 En-route operational assessment of radar impact

Where an assessment reveals a technical impact on a specific NATS radar, the users of that radar are consulted to ascertain whether the anticipated impact is acceptable to their operations or not.

Unit or role	Comment
Aberdeen En Route ATC	Unacceptable
Prestwick Centre ATC	Unacceptable

Note: The technical impact, as detailed above, has also been passed to non-NATS users of the affected radar, this may have included other planning consultees such as the MOD or other airports. Should these users consider the impact to be unacceptable it is expected that they will contact the planning authority directly to raise their concerns.

3.2 En-route navigational aid assessment

3.2.1 Predicted impact on navigation aids.

No impact is anticipated on NATS's navigation aids.

3.3 En-route radio communication assessment

3.3.1 Predicted impact on the radio communications infrastructure.

No impact is anticipated on NATS's radio communications infrastructure.

4. Conclusions

4.1 En-route consultation

The proposed development has been examined by technical and operational safeguarding teams. A technical impact is anticipated, this has been deemed to be **unacceptable**.

Appendix A – background radar theory

Primary Radar False Plots

When radar transmits a pulse of energy with a power of $\mathbf{P_t}$ the power density, **P**, at a range of **r** is given by the equation:

$$P = \frac{G_t P_t}{4\pi r^2}$$

Where $\boldsymbol{G_t}$ is the gain of the radar's antenna in the direction in question.

If an object at this point in space has a radar cross section of **σ**, this can be treated as if the object re-radiates the pulse with a gain of **σ** and therefore the power density of the reflected signal at the radar is given by the equation:

$$P_a = \frac{\sigma P}{4\pi r^2} = \frac{\sigma G_t P_t}{(4\pi)^2 r^4}$$

The radar's ability to collect this power and feed it to its receiver is a function of its antenna's effective area, $\mathbf{A_e}$, and is given by the equation:

$$P_r = P_a A_e = \frac{P_a G_r \lambda^2}{4\pi} = \frac{\sigma G_t G_r \lambda^2 P_t}{(4\pi)^3 r^4}$$

Where $\boldsymbol{G_t}$ is the Radar antenna's receive gain in the direction of the object and $\boldsymbol{\lambda}$ is the radar's wavelength.

In a real world environment this equation must be augmented to include losses due to a variety of factors both internal to the radar system as well as external losses due to terrain and atmospheric absorption.

*For simplicity these losses are generally combined in a single variable **L**.*

$$P_r = \frac{\sigma G_t G_r \lambda^2 P_t}{(4\pi)^3 r^4 L}$$

Secondary Radar Reflections

When modelling the impact on SSR the probability that an indirect signal reflected from a wind turbine has the signal strength to be confused for a real interrogation or reply can determined from a similar equation:

$$P_r = \frac{\sigma G_t G_r \lambda^2 P_t}{(4\pi)^3 r_t^2 r_r^2 L}$$

Where $\mathbf{r_t}$ and $\mathbf{r_r}$ are the range from radar-to-turbine and turbine-to-aircraft respectively. This equation can be rearranged to give the radius from the turbine within which an aircraft must be for reflections to become a problem.

$$r_r = \sqrt{\frac{\lambda^2}{(4\pi)^3}} \sqrt{\frac{\sigma G_t G_r P_t}{r_t^2 P_r L}}$$

Shadowing

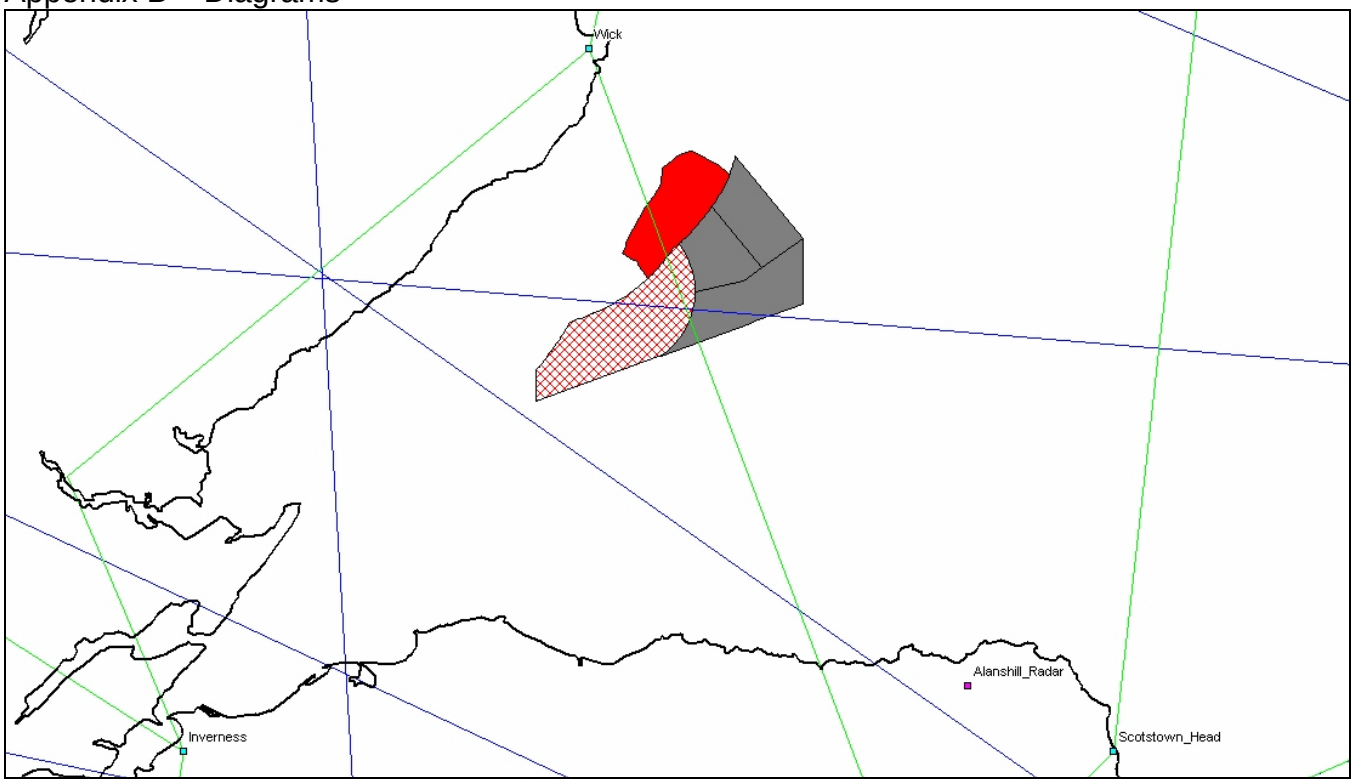
When turbines lie directly between a radar and an aircraft not only do they have the potential to absorb or deflect, enough power such that the signal is of insufficient level to be detected on arrival.

It is also possible that azimuth determination, whether this done via sliding window or monopulse, can be distorted giving rise to inaccurate position reporting.

Terrain and Propagation Modelling

All terrain and propagation modelling is carried out by a software tool called ICS Telecom (version 6.99). All calculations of propagation losses are carried out with ICS Telecom configured to use the ITU-R 526 propagation model.

Appendix B – Diagrams



Key
Red Solid - Beartrice Exclusivity Zone
Red Hatched - Moray Firth Round 3 Zone
Grey - Proposed Zones

Northern Lighthouse Board

84 George Street
Edinburgh EH2 3DA
Switchboard: 0131 473 3100
Fax: 0131 220 2093
Website: www.nlb.org.uk
Email: enquiries@nlb.org.uk

CAPTAIN PHILLIP DAY
DIRECTOR OF MARINE OPERATIONS

Your Ref: 011/OW/MORLE - 8
Our Ref: AJ/OPS/CPA/O6_01_148

Mr Alexander Ford
Marine Scotland – Licensing Operations Team
Marine Laboratory
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

12 September 2012

Dear Alexander,

THREE CONSENTS UNDER SECTION 36 of the ELECTRICITY ACT 1989 AND THREE MARINE LICENCES UNDER PART 4, SECTION 20 of the MARINE (SCOTLAND) ACT 2010 TO CONSTRUCT AND OPERATE THREE OFFSHORE WINDFARMS, and ONE MARINE LICENCE UNDER SECTION 20 of the MARINE (SCOTLAND) ACT 2010, and SECTIONS 65 and 66 of the MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT THE ASSOCIATED TRANSMISSION WORKS IN THE OUTER MORAY FIRTH.

Thank you for your correspondence dated 28 August 2012 regarding the application by **Moray Offshore Renewables Limited (MORL)** to install and operate wind turbines, offshore sub-stations and the associated electrical interconnecting and export cables at three wind farm sites, namely Telford, Stevenson and MacColl in the outer Moray Firth.

With regard to the consultation and the scope of the assessment, we would only comment on any part relating to Shipping and Navigational Safety contained within the supporting documentation. We would require that Notice(s) to Mariners, Radio Navigation Warning and publication in appropriate bulletins be issued stating the nature and timescale of any works carried out in the marine environment relating to this project.

Marking and lighting of each site will be required for each of the three phases of wind farm life, namely the construction, operational and de-commissioning phases, to give the best possible indication to the mariner of the nature of the works being carried out. We note that it is the intention of the developer to commence operations at the Eastern Development Area and migrate towards the Western Development area. This will require, when necessary, the alteration and repositioning of the Navigational Marking and Lighting schemes, possibly with the integration of both the fixed Aids to Navigation (mounted on the support jackets) and floating Aids to Navigation (boundary buoyage) to ensure the mariner has the most effective indication of the construction site during the installation progress.

We are unable to specify final marking and lighting requirements at this time as the number and layout of turbines, the number and location of offshore sub-stations and meteorological masts, and cumulative impacts with regard to the Beatrice Offshore Wind Farm are unspecified in this application. We can however give an indicative proposal of what may be required.

Construction Phase

To ensure that the mariners are adequately warned of the construction site, its progress and growth; during the construction phase we require that the site boundary by Cardinal Mark buoys (number to be determined when final layout is known). The Cardinal Buoys shall be a minimum of 3 metres in diameter at the waterline, have a focal plane of at least 3 metres above the waterline and be of suitable construction for the sea conditions commonly experienced in the Outer Moray Firth. The light range on these buoys shall be 5 Nautical Miles.

All required buoyage shall remain in place until completion of this phase.

During this construction phase, any vessel engaged in these works shall be marked in accordance with the International Rules for the Prevention of Collisions at Sea whilst under way, and in accordance with the Standard Marking Schedule for Offshore structures if secured to the seabed.

Operational Phase

We are unable to specify any final marking and lighting requirements owing to the lack of clarity in the licence application with regard to the number and layout of turbines, the number and location of offshore sub-stations and, the cumulative impacts with regard to the Beatrice Offshore Wind Farm. Final requirements will be specified once these are confirmed.

In general terms, during the Operational Phase the windfarm site shall be marked and lit as per IALA Recommendation O-139 as follows:

- The tower of every wind generator should be painted yellow all round from the level of Highest Astronomical Tide (HAT) to 15 metres or the height of the Aid to Navigation, if fitted, whichever is greater.
- The structures designated as Significant Peripheral Structures (SPS) shall have lights visible from all directions in the horizontal plane. These lights should be synchronised to display a character of one yellow flash every 5 seconds, with a range of not less than 5 nautical miles.
- Selected Intermediate Structures (IS) on the periphery of the wind farm should be marked with lights visible from all directions in the horizontal plane. These lights should be synchronised to display a character of one yellow flash every 2.5 seconds, with a range of not less than 2 nautical miles.
- All lights shall be placed not less than 6 metres and not more than 30 metres above Mean High Water Springs (MHWS).
- A sound signal shall be attached to each SPS and IS as to be audible upon approaching the wind farm from any direction. The sound signal should be placed not less than 6 metres and not more than 30 metres above MHWS and should have a range of at least 2 nautical miles. The character shall be rhythmic blasts corresponding to Morse letter ‘U’ every 30 seconds. The

minimum duration of the short blast shall be 0.75 seconds. The sound signal shall be operated when the meteorological visibility is two nautical miles or less. All sound signals should be synchronised.

- Each tower shall display identification panels with black letters or numbers one metre high on a yellow background visible in all directions. These panels shall be easily visible in daylight as well as at night, by the use of illumination or retro-reflecting material.
- All navigation lights should have an availability of not less than 99.8% (IALA Category 1) over a rolling three year period. Sound signals should have an availability of not less than 97% (IALA Category 3) over a rolling three year period.
- Offshore sub-stations and meteorological masts shall also be marked.

Appropriate means of ensuring the required IALA Availability target for Category 1 AtoN is achieved through redundancy, monitoring and repair must be in place, and arrangements made to warn the mariner promptly of any AtoN fault and its subsequent return to fully operational service.

Any existing Meteorological Masts within the site area will have marking and lighting amended to suit the final layout of the wind farm.

The marking and lighting of the wind farm may require to be altered or amended to reflect the development of the adjacent Beatrice site in order to form a continuation of a suitable marking of the area occupied by turbines and sub-stations. The licence holder will be expected co-operate fully in this matter.

We also require that once agreed, the final number, layout and positions of each of the wind turbine generators, along with that of any sub-sea infrastructure is communicated to the United Kingdom Hydrographic Office in order that all relevant nautical charts are correctly updated.

It may also be necessary to mark the landfall site of the export cable routes depending on the location chosen after the OFTO process has been completed. We would then require that Lit Cable Marker Boards should be positioned as near as possible to the shoreline so as to mark the points at which the cable comes ashore. The Cable Marker Boards shall be diamond shaped, with dimensions 2.5 metres long and 1.5 metres wide, background painted yellow with the inscription ‘Cables’ painted horizontally in black. The structures shall be mounted at least 4 metres above ground level, with a navigation light flashing yellow once every five seconds (Fl Y 5s) mounted on the upward apex of the board. The nominal range of these lights should be 3 nautical miles, and they should have an availability of not less than 97% (IALA Category 3) over a rolling three year period.

<u>Decommissioning Phase</u>

When the site eventually reaches the end of its designed life, we would require that the Northern Lighthouse Board is consulted on the requirement for marking and lighting during this phase.

12 September 2012

Alexander Ford

General

All navigational marking and lighting of the site or its associated marine infrastructure will require the Statutory Sanction of the Northern Lighthouse Board prior to deployment.

These recommendations are based on the application documents and previously supplied documentation. We have considered the information contained within the documentation and have detailed all of the above requirements on the interpretation that the development will commence in the Eastern Development Area (EDA) with further considerations still to be met by the developers before construction phase work will commence in the Western Development Area (WDA).

Please advise if we can be of any further assistance, or require clarification any of the above.

Ford A (Alexander)

From: Ferguson V (Val)
Sent: 27 August 2012 15:17
To: MS Marine Licensing
Subject: ref 011/OW/MORLE - 8

Dear Alexander,

Thank you for sight of the various applications for the three offshore wind farms and associated transmission works. I have no comments to make on these applications.

Could I request that future applications/letters are send to me electronically (to save paper)

Thanks

Val Ferguson

Ports and Harbours Branch

Area 2G North

Victoria Quay

Edinburgh

EH6 6QQ

0131 244 7878

val.ferguson@transportscotland.gsi.gov.uk

nature's voice

RSPB SCOTLAND

David O'Sullivan
Marine Scotland – Renewables Licensing Operations Team
375 Victoria Road
Aberdeen
AB11 9DB

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
Karen Hall – Joint Nature Conservation Committee
Catriona Gall – Scottish Natural Heritage

SCOTLAND Headquarters
2 Lochside View
Edinburgh Park
Edinburgh
EH12 9DH

Tel 0131 317 4100
Fax 01767 685008
Email planning.scotland@rspb.org.uk
www.rspb.org/scotland

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.

RYA SCOTLAND

Royal Yachting Association Scotland

RYA Scotland

Caledonia House
1 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

Tel: +44 (0)131 317 7388
Fax: +44 (0)844 556 9549
Email: admin@ryascotland.org.uk
Web: www.ryascotland.org.uk

9 October 2012

Alexander Ford,
Renewables Licensing Operations Team
Marine Scotland
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

Dear Mr Ford

On behalf of the RYA and RYA Scotland I have read the relevant parts of the Environmental Statement and associated documentation relating to the Moray Offshore Renewables application. I have also re-read my comments on the draft ES. In general I agree with the parts relating to shipping and navigation. However, there are some parts that, while not affecting the outcome, ought to be corrected.

In section 11.2.6.20 and in the Navigational Risk Assessment in Appendix 2D only a small number of vessels were recorded on AIS or radar. As I mentioned in my response to the draft ES, rather fewer than 10% of recreational craft transmit an AIS signal. Moreover, recreational craft can be difficult to spot on radar even when a radar reflector is mounted. The AIS and radar tracks (Fig. 10.3) should give a good indication of typical tracks. However, without an intensive campaign of visual observations by day and by night, the figures must be an underestimate. There is an assumption in the work that recreational craft generally travel during daylight hours but this is not necessarily the case, particularly where a tidal gate, such as the Pentland Firth is involved. The number of recreational vessels passing through these waters is generally low in winter but not zero. Moreover the number passing through in summer will vary from year to year and from month to month. The records held by Wick marina, which were analysed as part of the Pentland Firth and Orkney Waters Strategic Area shipping study, are informative.

it is indeed true as stated in section 11.2.6.21 that no problems are expected in good conditions. This is consistent with the experience of RYA members passing through wind farms. The real problems are when a vessel is passing through this area in adverse conditions, particularly when the weather unexpectedly deteriorates when it is committed to its course.

In section 11.2.6.31 it seems extremely unlikely that a recreational vessel would attempt to anchor in the vicinity of the wind farm due to the length of chain that would be required in the depth of water.

In 11.2.7.3 promulgation should also be through the relevant pilot books and sailing directions (for the farm itself) and by notices to relevant marinas from Kirkwall to Peterhead in the case of operations.

Section 11.6.6.36 considers that the socio-economic impact of the development on recreational craft is adequately considered in section 11.2. However, that section only relates to navigation and safety. Although the RYA prioritises its responses on navigation and safety, anything that reduces the likelihood of vessels going to Wick, Stromness or Kirkwall, or elsewhere, would be likely to have an adverse affect on the local economy and consequently on the facilities there.

It is unclear what the in-combination effects of the various east coast wind farms is likely to be. The effect of Beatrice is not likely to be great provided the layout of turbines is consistent with those in Stevenson and Telford. However, a vessel passing up the east coast from Blyth in Northumbria heading for Orkney will have to pass through or alongside several windfarms and it is unclear whether this will act as a discouragement. If weather conditions are poor, vessels may be inhibited from taking a direct route thus lengthening passage times. Note that it is not necessarily the actual risk that is important - the perceived risk, which may be influenced by letters in the yachting press, may be more important.

The Navigation Risk Assessment (Appendix 5.2D) is broadly correct but needs some minor changes of emphasis to reflect realities. The lines in Fig. 10.3 are consistent with our data but, as mentioned above, probably significantly under-record the vessels passing. The issue of radar interference is important, particular in adverse conditions within the development but probably of more importance is a radar operator forgetting to readjust the set's gain after altering it to reduce clutter on the screen. This can render small craft effectively invisible and is likely to be most of a problem when small craft are passing on the outside of the scheme and coming close to the waypointed routes adopted by commercial vessels. The risk of mast collisions (13.3.4) is low but the calculation ought to recognise the importance of wave height on clearance and that some vessels such as sail training craft can have masts that are rather taller than 22 m. Also in this section, but in relation to vessel/structure collision, the point about the availability of weather forecasts might be relevant for vessels from Wick. However, many passing through this area may have come from much further away and the weather may start to deteriorate after the point of no return.

While weather forecasting for sea areas is much improved, important small-scale feature can be missed such as when there is a zone of unexpectedly high wind speeds in the region between a stationary anticyclone and a frontal system. Moreover, it is not just wind speed that is important but also wave length and height and visibility with the former being influenced by factors such as tidal direction, and swell generated many hundreds of miles away. Alerting Aberdeen VTS or the Coastguard would be via VHF. Use of a mobile phone will depend on reception and flares are only of use when there is someone to see them. The use of GPS is growing together with the use of chartplotters. However, as the General Lighthouse

Authorities have noted, there is a risk of loss of signal for a variety of reasons, aerials can be lost due to wave action and electronic charts for recreational vessels are not always up to date. While a steel or wooden boat could escape with minor damage from a low speed impact, the same is not true of the majority of recreational craft which are constructed of GRP. In 13.5.3 future levels of activity will probably largely depend on developments in Orkney where further investment is being considered. The proposed 10% increase in the actual current movements (rather than the numbers estimated from radar and AIS) would be a safe prediction. There is likely to be an increased risk of collision between a recreational and commercial craft (13.5.4) when the recreational craft passes outside the farm and is squeezed by a commercial vessel minimising its passage time by using a waypoint close to the edge of the development.

Yours sincerely

[redacted]

Dr G. Russell FRMetS MIEEM
Planning and Environment Officer RYA Scotland.

Ford A (Alexander)

From: Campaign Intern <pow@sas.org.uk>
Sent: 19 December 2012 14:16
To: MS Marine Licensing; Osullivan D (David) (MARLAB)
Cc: andy@sas.org.uk
Subject: SAS Response to the MORL Offshore Wind Farms Telford, Stevenson and MacColl
Attachments: SAS Response to Environmental Statement for MORL.doc

Dear Sir/Madam,

Re: MORL Offshore Wind Farms; Telford, Stevenson and MacColl; in The Outer Moray Firth

I apologise that SAS was not able to respond within the given deadline, this aside I have attached the comments made by SAS on the above project. I trust these comments will be accepted and considered in the licensing process, despite our very late submission, as discussed earlier on the telephone.

Many thanks.

Yours sincerely,

Sophie Stevens
Campaign Intern

Surfers Against Sewage
Direct Line : 01872 555 945

SURFERS AGAINST SEWAGE
www.sas.org.uk

Protecting surfers, waveriders, waves and beaches
Wheal Kitty Workshops, St Agnes, Cornwall TR5 0RD

SURFERS AGAINST SEWAGE

Surfers Against Sewage
Unit 2, Wheal Kitty Workshops
St Agnes, Cornwall, TR5 0RD

T: 01872 553 001 F: 01872 552 615
E: info@sas.org.uk W: www.sas.org.uk

Surfers Against Sewage comments on the Environmental Statement for the Telford, Stevenson and MacColl Offshore Wind Farms

Surfers Against Sewage (SAS) would like to comment on the Environmental Statement (ES) for the Telford, Stevenson and MacColl. Overall SAS is pleased to see MORL has followed the guidance notes provided by SAS.

Surfers Against Sewage are pleased to see (in the 'Environmental Effects' section of the report) that the likely significant effects on recreational surfing venues from the subsea components of the construction, operation and decommissioning phases of the proposals have been assessed. It is even more pleasing to see that the developments are predicted to have no measurable effect on wave period and wave direction. Nonetheless it is disconcerting that wave height appears to be omitted from this section suggesting that the effect on wave height has not been considered. Surfers Against Sewage requests modelling to determine the potential effect on the wave height specifically at the surfing venues, listed in Table 6.1-1, where the waves are a valuable asset to the surfing community. SAS would like the opportunity to review the modelling results and add constructive feedback if necessary.

Another concern regards the route and the method of deployment of the subsea cable as it enters the shore. Will the cable impinge on any nearby surfing areas, specifically at Fraserburgh? The Environmental statement mentions that any effect (of the transmission infrastructure) on tourism or recreation would come 'from the closure or diversion of access to tourism assets during construction', any restriction to surfing areas is obviously undesirable and SAS requests that we are consulted if the installation of the cable is likely to have an effect on recreational water use.

Surfers Against Sewage advises that Moray Offshore Renewables, if not already done so, makes contact with local clubs such as Broch Surf Club (based in Fraserburgh), as well as the Scottish Surfing Federation, to discuss details such as commonly used access routes as well as a time period for construction.

VAT registration no: 557 675 885
Registered in England and Wales no: 2920815
Printed on 100% post consumer waste recycled paper using vegetable based inks.

Ford A (Alexander)

From: Eddie Palmer <eddiepalmer@classmail.co.uk>
Sent: 03 October 2012 15:39
To: MS Marine Licensing
Subject: re. Offshore Wind Farms - Moray Firth

Dear Sirs

From our point of view, considering sea kayaking, our concerns would be the normal ones;

1) Exclusion zones, either in construction or operation, which could preclude navigating from the north to the south side of the Moray Firth, even though this construction is well out from the shore.
2) Adequate navigation marks to warn kayakers of any obstruction, permanent or temporary
3) Any on-shore works which might preclude landing, or forcing a more seaward passage than is sensible.

regards

Eddie Palmer
Scottish Canoe Association
Director (Access and Environment)

Our ref: PCS/122096
Your ref: 011/OW/MORLE-8

Alexander Ford
Marine Scotland
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

If telephoning ask for:
Nicola Abrams

8 October 2012

By email only to: MS.MarineLicensing@scotland.gsi.gov.uk

Dear Alexander

ELECTRICITY ACT 1989;
MARINE SCOTLAND ACT 2010 and
MARINE AND COASTAL ACCESS ACT 2009
APPLICATION FOR MORAY OFFSHORE RENEWABLES LTD, TO OPERATE OFFSHORE GENERATING STATIONS FOR TELFORD, STEVENSON AND MACCOLL OFFSHORE WINDFARMS AND CONSTRUCT ASSOCIATED TRANSMISSION WORKS, MORAY FIRTH

Thank you for your consultation letter of 28 August 2012 which SEPA received on 29 August 2012.

We are generally supportive of renewable energy projects, provided they can be achieved with acceptable environmental impact. In this case, insofar as interests within our remit are concerned, we are satisfied with the proposals provided conditions to protect the environment are attached to any permission. We therefore ask that the **conditions in Sections 1 and 2** be attached to the consent. Please also note the advice provided below.

Advice for the determining authority

1. Water Framework Directive

1.1 The Environmental Statement (ES) states that the proposals (both windfarms and transmission infrastructure) will generally have minor effects on the marine environment. Overall, we are satisfied that the proposed development will not compromise the objectives of the Water Framework Directive. However the ES does not appear to refer specifically to coastal waterbodies located in the vicinity of the project. Under the Water Environment and Water Services (Scotland) Act 2003, SEPA is responsible for producing and implementing River Basin Management Plans for the Scotland and the Solway Tweed River Basin Districts. River basins comprise all surface waters (including transitional (estuaries) and coastal waters) extending to 3 nautical miles seaward from the Scottish territorial baseline. Although the turbines themselves will be located way beyond this limit, the nearshore and

onshore elements will fall within the Scotland River Basin District, and this aspect should be considered within the assessment.

1.2 As the accidental introduction of marine non-native species is a risk for water body degradation, we recommend that controls should be included in the project relating to marine non-native species in line with Water Framework and Marine Strategy Framework Directive objectives. We request that this matter be addressed by a **condition** attached to any grant of consent. To assist, the following wording is suggested:

"Prior to the commencement of any works on site a project specific method statement setting out how the risks of introducing marine non-native species into the site shall be avoided during the construction, operation and decommissioning phases of the project and that the measures identified in this method statement shall be employed throughout the life of this project as set out in the method statement.

Reason: In the interests of protecting the water environment from the impacts on non native species."

2. Environmental Management and Pollution Prevention

2.1 We request that the following **condition** is attached to any grant of consent:

"prior to the commencement of development, a site specific Construction Environmental Management Document (CEMD) must be submitted for the written approval of the planning authority [in consultation with SEPA] [and other agencies such as SNH as appropriate] and all work shall be carried out in accordance with the approved CEMD.

Reason: In the interests of pollution prevention and protection of amenity."

Note: We suggest that the CEMD is submitted at least 2 months prior to commencement of any works on site to allow the necessary reviews to be undertaken and to ensure no impact on project timescales.

Detailed advice for the applicant

3. Water Framework Directive

3.1 The ES does not appear to explicitly recognise coastal waterbodies which are located in the vicinity of this project. It should be recognised that the overall classification of ecological status under the Water Framework Directive is made up of several different tiers of classification and includes the consideration of chemical, biological and hydromorphological parameters, and not just water quality. The structure and condition of the intertidal zone is a quality element under the Water Framework Directive.

3.2 Information on the current status of the Rosehearty to Cairnbulg Point (WB ID 200500) and Cairnbulg Point to the Ugie Estuary (WB ID 200142) water bodies can be found on the SEPA website (http://www.sepa.org.uk/water/river_basin_planning.aspx), and can form part of the baseline assessment in the ES.

4. Marine Non Native Species

4.1 To assist with the preparation of the method statement further information can be gained from:-

- Scottish Government Code of Practice on non-natives (www.scotland.gov.uk/Topics/Environment/Wildlife-Habitats/InvasiveSpecies/legislation/CodeofPracticeonNonNativeSpecies)

- Marine Non-Native Species guidance produced by the Oil & Gas Industries can be found here: (http://www.ogp.org.uk/pubs/436.pdf);
  4.1

- Marine Non-Native Species guidance from The Green Blue (recreation advice): http://www.thegreenblue.org.uk/clubs_and_training_centres/antifoul_and_invasive_species/best_practice_invasive_species.aspx;
  4.2

- SNH advice: http://www.snh.gov.uk/land-and-sea/managing-coasts-and-sea/marine-nonnatives/

5. Environmental management and Pollution Prevention

5.1 A draft Schedule of Mitigation should be produced as part of this process. This should cover all the mitigation measures identified to avoid or minimise environmental effects. Details of the specific issues that we expect to be addressed are available on the Pollution Prevention and Environmental Management section of our website.

5.2 A key issue for us is the timing of works. Therefore, the Schedule of Mitigation should include a timetable of works that takes into account all environmental sensitivities.

5.3 The CEMD should form the basis of more detailed site specific Construction Environmental Management Plans (CEMPs) which along with detailed method statements may be required by condition or, in certain cases, through environmental regulation. This approach provides a useful link between the principles of development which need to be outlined at the early stages of the project and the method statements which are usually produced following award of contract (just before development commences).

5.4 We recommend that the detailed CEMD is submitted for approval to the determining authority at least two months prior to the proposed commencement (or relevant phase) of development to order to provide consultees with sufficient time to assess the information. This document should incorporate detailed pollution prevention and mitigation measures for all construction elements potentially capable of giving rise to pollution during all phases of construction, reinstatement after construction and final site decommissioning, as applicable. This document should also include any site specific CEMPs and Construction Method Statements provided by the contractor as required by the determining authority and statutory consultees. The CEMD and CEMP do not negate the need for various licences and consents if required. The requirements from the obtained licences and consents should be included within the final CEMPs.

5.5 Useful guidance can be found in CIRIA C584 entitled “Coastal and marine environmental site guide”. Reference can be made to the appropriate checklists and good practice advice generally in this document.

5.6 The CEMP should also give consideration to how all waste streams from the project will be minimised, recycled, reused and disposed of using the principles of the waste hierarchy.

5.7 The CEMP should give specific consideration to the two EC Designated Bathing Waters at Fraserburgh, Fraserburgh Tigerhill and Fraserburgh Philorth with regard to minimising water quality and amenity impacts during construction.

6. Cable Installation

6.1 We note the applicant has indicated that HDD will be the preferred method of cable installation beneath the dunes, we welcome this as preferable over trenching through the dunes which has the potential to lead to localised erosion of the dunes.

Regulatory advice for the applicant

7. Regulatory requirements

7.1 Details of regulatory requirements and good practice advice for the applicant can be found on our website at www.sepa.org.uk/planning.aspx. If you are unable to find the advice you need for a specific regulatory matter, please contact a member of the operations team in your local SEPA office at:

28 Perimeter Road, Pinefield, ELGIN, IV30 6AF, Tel: 01343 547663, Fax: 01343 540884

If you have any queries relating to this letter, please contact me by telephone on 01224 266698 or e-mail at planning.aberdeen@sepa.org.uk

Yours Sincerely

Nicola Abrams
Senior Planning Officer
Planning Service

Copy to: Dan.Finch@edpr.com

SCOTTISH FISHERMEN'S FEDERATION

Our Ref: MM/fl/CR12-119

Your Ref: 011/OW/MORLE-8

10th October 2012

Scottish Fishermen's Federation
24 Rubislaw Terrace
Aberdeen, AB10 1XE
Scotland UK

T: +44 (0) 1224 646944
F: +44 (0) 1224 647058
E: sff@sff.co.uk

www.sff.co.uk

Marine Scotland Licencing Operations Team
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

Dear Sirs,

Applications for Consents and Licences for 3 Windfarms and Associated Transmission Works in the Outer Moray Firth

The Scottish Fishermen's Federation (SFF) represents the interests of the membership of the Anglo Scottish Fishermen's Association, the Clyde Fishermen's Association, The Fishsalesmen's Association (Scotland) Ltd, the Mallaig and North-West Fishermen's Association, the Orkney Fishermen's Association, The Scallop Association, The Scottish Pelagic Fishermen's Association, The Scottish White Fish Producers Association Ltd and the Shetland Fishermen's Association. The SFF clearly understands the importance of engagement in the consultation process surrounding the development of offshore renewables as these developments may have a disproportionate effect on our members, so the opportunity to comment on this application is most welcome.

As befits an important piece of work this application has a huge amount of information, and therein lies the problem for consultees; the physical manifestation of this information required two men to carry it into our office. The CD version has the same information and thus lent itself better to an overview of the application, which nevertheless took many hours to complete, prior to an in-depth study of the sections with particular relevance to the fishing industry.

With the recent news that the Scottish Government has set aside a large sum of money to provide the capacity for local authorities to cope with the onslaught of the applications for onshore farms, it is surely time to consider providing such assistance to marine environment stakeholders.

This could only serve to help the process, as, described above the resources that must go into preparing our response are significant, and on top of already busy workloads are to say the least onerous. Since there is a perception that developers have a staff dedicated to this process it is seen as an unfair imposition on another industry which has little resource available to cope with extra demands.

It remains a source of concern to many of our members to read Environmental Impact Assessments that describe the impact of a development on their legitimate fishing activity as minor. This particular application goes some way to addressing the different sectors of the fleet and the variations in how they can cope with displacement, but it would be both fruitful and conciliatory to ensure that stakeholders when reading these statements had an understanding that the phrases being used are dictated by legislation and not a denigration of their professional activity.

Whilst the Federation welcomes the introductory statement of the project director, and can see throughout the application that his staff have been listening to stakeholders views and addressing them where they are applicable, the SFF on behalf of its members must take the position that we remain opposed to this development until such time as it can be proved that its effects will not be totally detrimental to the fishing industry.

Leading on from that position, the SFF are understanding of the political and societal desire to develop renewable energy, and when our primary role of protecting and preserving the livelihoods of our members has been satisfied we see the need to lead the process towards ensuring co-existence in the marine environment of both fishing and renewables.

From the SFF perspective, it is obvious that the Scallop fleet is hugely important in terms of this actual wind farm site. This not to say that any less attention should be given to the impacts on any other fishery, for example, the squid fishery in the vicinity, the smaller class of Nephrops trawlers who operate on the inshore grounds or indeed the static gear vessels inshore, who will also be affected by the cable export route.

The biggest single concern of the SFF is that the development could lead to either restricted access or total loss of traditional fishing grounds. The application states that only 1% of the development area will be covered by safety zones, but as there are few examples to compare this with, it may be disingenuous to say that individual skippers may consider it unsafe to operate within the windfarm. It remains to be seen how skippers, particularly of mobile gear vessels, will react to the concept of operating in this new environment.

The SFF would hope that construction of the windfarm would be cognisant of the fishing industry's need to make a living from the actual Windfarm area, but also have serious concerns about the prospect of the exclusion zone for the export cable, especially given that it will be 105 km long and closed for 200 days. The expectation of the SFF based on previous experience is that 1m is the minimum depth of trenching sought for the cable.

Further to both the above points, it will be incumbent on the developer to understand the possible displacement of some fishing vessels, due to the nature and extent of the exclusions and the vessels ability to move to other fisheries prosecuting the species they are concerned with. These displacements may be of a significant negative effect on some vessels.

A final point that needs to be considered are the consequences of the seabed activity involved in the development, from anchors and jack up vessels to cable trenches, all of which are likely to either introduce new and extra sediment to the area or cause mounds of different strata to appear on the seabed. These could form another danger to vessels, particularly those engaged in towing gear.

As described in the application, the proposal to form a Working Group to instigate a management plan in conjunction with the fishing industry will be an important part of the work for agreeing measures including mitigation which will lead to a possible co-existence of fishing and renewables. It would seem sensible to form one group for the entire Moray Firth including all prospective developments and industry representatives

The SFF would consider it essential as a condition of consent that this working group would fulfil the objectives set out in eg: 11.1.65.3 of the current application, which would include:-

A protocol for engagement onshore and interaction at sea. To the SFF this would include inclusion of fishers in the design phase to attempt to ensure the optimum layout for both turbines and interarray cabling to allow some fishing activity to continue in the site during the operational phase.

Following fishing industry agreement on the design. There would need to be discussion and agreement reached on a construction programme. Again the aim is to minimise the disruption caused to the fishing fleet bearing in mind the logistics of construction, but being aware of the physical problems that the process throws up and the need for exclusion zones.

Upon final completion of the development, there must be an agreement for the procedures required to ensure that the seabed is overtrawled to check for debris and sediment in order for fishing to resume. On this note SFF would expect an agreed policy of compensation, both for moving for construction and loss of gear due to problems arising from seabed debris.

The SFF would also consider it essential that prior to consent and construction there would be an agreement in place for the decommissioning phase of the development.

As part of the mitigation process the SFF would expect the developers to sign up to ongoing scientific assessment of the fish population. There may be a baseline understanding but this now needs to go forward, preferably with work designed by an authoritative body such as Marine Scotland Science, so that the data gathered is capable of being used fully and properly for the benefit of the fishing industry. This data would need to cover all the normal biological data that is required, but also an assessment of the impacts of the development has on the fish population in terms of noise, Electro Magnetic fields, sediment shifts and the introduction of major physical constructs into the environment.

Further to the obvious benefit of the collection of scientific data, this information may later be helpful in determining the true socio-economic impact of the development in the traditional users of the windfarm site, thus informing any assessment of the losses suffered by fishers in the process of development.

The SFF would expect consent for the construction to be conditional upon the developer developing ways to ensure mitigating measures are directed at the industry which is potentially going to be the worst affected. By this we mean that we expect the developers to ensure that employment opportunities and training are directed at fishermen who might lose out because of the development. This can take many forms, from employing men as Fishing Industry Reps through to training for any specific requirements for operation of the windfarm, and should be informed by the Best Practice Guidelines for Fishery Liaison published by the Crown Estate.

As the importance of this consultation process is clear to us, the SFF remain open to dialogue and look forward to a successful cooperation with this development. It is our hope that this dialogue will occur in a timescale and manner that would lead us to revisit our opposition to the development and become supportive of the licence application.

Yours faithfully,

[redacted]

Bertie Armstrong
Chief Executive
Scottish Fishermen's Federation

Our Ref SCT6591B

12 September 2012

JMP Consultants Limited
Mercantile Chambers
53 Bothwell Street
Glasgow
G2 6TS

T 0141 221 4030
F 0800 066 4367
E glasgow@jmp.co.uk

www.jmp.co.uk

Alexander Ford
Renewables Licensing Operations Team
Marine Scotland
Marine Laboratory
375 Victoria Road
ABERDEEN
AB11 9DB

Dear Alexander

ELECTRICITY ACT 1989
THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2000
SECTION 36 APPLICATION FOR PROPOSED WIND FARMS - MORAY FIRTH (TELFORD, STEVENSON AND MACCOLL) AND ASSOCIATED OFFSHORE TRANSMISSION WORKS

As Term Consultants to Transport Scotland – Trunk Road and Bus Operations (TS-TRBO), we have been passed a copy of the Environmental Statement produced in support of the Applications for Section 36 Consent for three Wind Farms located on the Smith Bank on the Outer Moray Firth. We have reviewed the Environmental Statement (ES) in relation to issues affecting the trunk road network, and provide comment as follows on behalf of Transport Scotland.

We understand that the proposed offshore Wind Farms are located within a Zone approximately 22km from the Caithness coastline. The Zone has been split into two – a Western Development Area and an Eastern Development Area. The ES relates to three proposed Wind Farms within the Eastern Development Area (EDA) and we note that the WDA will be the subject of future development.

We also understand that the development site lies in the outer Moray Firth and covers an area of 520 km^2. Each Wind Farm will comprise up to 139 turbines, with a maximum number of turbines across the three sites stated as 339. The maximum capacity for the overall Zone is 1,500 MW (1.5 GW). Consent is being sought to construct a maximum total capacity of 1,500 MW across the EDA.

We note that there will be up to eight offshore substation platforms, with transmission infrastructure connecting the three wind farms to the National Grid via an onshore connection from Fraserburgh Beach to the Peterhead Power Station. This will result in an onshore cable route of approximately 30 km. We further note that an application for the onshore transmission infrastructure will be submitted at a later date but as details of the transmission infrastructure are covered by the ES, we have provided comments on this aspect as well.

It is noted that the traffic and transportation associated with the construction of the offshore wind farms and offshore Transmission Infrastructure (OfTI) has **not** been considered within this assessment due to the uncertainty of which port will be utilised during construction and the method of transportation for the offshore elements. The ES states that it is likely that this will be assessed once a port(s) is selected.

Transport Scotland would seek to be consulted on the impact of these elements on the Trunk Road network at the appropriate time.

Traffic and Transport Associated with the OnTI

Despite it being the subject of a later planning application, the impact of the traffic associated with the onshore transmission infrastructure has been assessed within the ES. It is noted that the construction phase of the OnTI is assumed to take 6 months to complete and would comprise of vehicles associated with the movement and installation of onshore export cables, associated plant and materials for both cables and the substations, directional drilling rigs for the cables and abnormal load deliveries associated with the substation construction.

Consideration has been given to the proposed access routes to the OnTI and the changes to trunk and local / minor road traffic patterns as a result of the additional development traffic. The proposed route for abnormal load transportation will be subject to a full assessment, however, it is understood that the junction of the A892/ A90(T) will be affected. Transport Scotland would seek to be consulted upon during this stage, to ensure the impact of any abnormal loads on the Trunk Road network is mitigated, and to ensure the safety of the trunk road traffic.

Site Access

It is noted that transportation to and from the onshore export cable installation site would be via the A90 trunk and local road networks. We also note that construction traffic will access the development at several points along the onshore export cable route. This is due to the length of the routes and that they will cross public highways at several locations.

The access point to the substations will be either from the A90 or C roads near to the existing Scottish and Southern Energy substation at Boddam, south of Peterhead. It is noted that details of any new connection to the trunk road should be provided to Transport Scotland for review.

Vehicle Trip Generation

The effect on daily traffic flows on the A90(T) due to the trips generated during the construction phase is estimated to be a maximum total increase of 2.7% and an increase in HGVs of 12.5%. This is estimated to occur around the Cruden Bay area (south of Peterhead).

Due to the limited number of residential dwellings close to the A90(T), the impact of construction traffic is considered to be minor within the ES, with the exception of the sections through Crimond and St Fergus. These villages are considered to have a moderate sensitivity to significant change. Transport Scotland accepts this view.

Mitigation

The ES indicates that the increase in traffic associated with construction traffic will be mitigated by the following measures:

- All construction and operational vehicles will be required to only use the approved access route to site;
- The Contractor will be required to prepare a Traffic Management Plan;
- A condition survey to be carried out in conjunction with the local council before and after construction;
- Make provisions for alerting road users of construction activities and delivery routes through signage;
- Provide suitable diversions around works where necessary; and
- Timing of works to avoid peak traffic periods.

It is noted that the above mitigation is to be made for the unclassified roads, with effects on the trunk road (including the sensitive sites of Crimond and St Fergus) being deemed negligible. Transport Scotland would seek that the Traffic Management Plan be extended to include the trunk road network as well.

Summary

In summary, Transport Scotland have no objection to the proposed Offshore Windfarm development but would ask that the following Condition be applied to any Consent granted:

1. No part of the development shall commence until the impact of road-based traffic and transportation associated with the construction of the offshore wind farms and offshore Transmission Infrastructure (OfTI) has been considered to the satisfaction of the Local Roads Authority in consultation with Transport Scotland.

Reasons for the above Conditions:

1 To maintain the free flow and safety of the Trunk Road network.

I trust that the above is satisfactory, however, please do not hesitate to contact me at our Glasgow Office if you have any queries.

Yours faithfully

[redacted]

Alan DeVenny
Associate Director

Tel 0141 226 6923
Email alan.devenny@jmp.co.uk

cc Mr Malcolm Forsyth, Transport Scotland Network Management

Ford A (Alexander)

From: Thompson, Professor Paul M. <lighthouse@abdn.ac.uk>
Sent: 17 October 2012 09:34
To: MS Marine Licensing
Subject: FAO David O'Sullivan re. MORL ES

David,

Just to let you know that I won't be submitting comments on the MORL application given my involvement in the preparation of the ES.

Best wishes,

Paul

Professor Paul Thompson,
Lighthouse Field Station,
Institute of Biological & Environmental Sciences,
University of Aberdeen,
Cromarty IV11 8YJ.
Tel: 01381600548 Fax: 01381600841
email: lighthouse@abdn.ac.uk
http://www.abdn.ac.uk/lighthouse

WDCS Scottish Dolphin Centre
Spey Bay, Moray
Scotland
Phone 44 (0) 131 661 7722
[redacted]
sarah.dolman@wdcs.org
www.wdcs.org

ms.marinelicensing@scotland.gsi.gov.uk

3rd October 2012

Alexander Ford
Marine Renewable Licensing Advisor
Marine Scotland – Marine Planning & Policy Division
Scottish Government
Marine Laboratory
PO Box 101
375 Victoria Road
Aberdeen AB11 9DB

Dear Alexander

WDCS comments on MORL Environmental Statement

WDCS understands that this application covers Telford, Stevenson and MacColl wind farms and the associated transmission infrastructure in the outer Moray Firth.

WDCS are endeavouring to assist with the environmentally sustainable development of marine renewable energy in Scotland. Whilst welcoming the Scottish Governments' commitment to renewable energy generation, particularly noting the potential consequences of climate change for cetaceans, we have serious concerns about current levels of uncertainty and the possible negative impacts these developments, both individually and cumulatively, may have on cetaceans (whales, dolphins and porpoises) in Scottish waters.

We recognise the timeframes within which the industry is required to build in order to meet targets is tight and we also recognise the existing technological limitations in using alternative sources to pile driving as well as the lack of established mitigation measures, however, the requirement to

understand and mitigate impacts to ensure strict protection of European Protected Species (EPS), including all cetacean species, remains.

The Moray Firth is in a unique situation in that it is the most comprehensively studied region for cetaceans in Scottish waters, particularly the inner waters. We note that there has been some recent effort to further assess the offshore area, which may have been initiated due to seismic surveys associated with the oil and gas industry, and that the data available start to provide a solid baseline to inform decision making for all marine users, including MORL. We are also aware of, and welcome, the fact that the wind developers have worked closely with cetacean scientists in continuing and developing a suitable monitoring plan to understand the distribution of cetaceans and other species in the region.

However, the existing and significant uncertainties that remain include:

- Cetacean population trends and movements generally;
- Welfare implications of developments (especially pile driving);
- Acoustic and behavioural impacts; and,
- The lack of understanding of long-term population impacts for any cetacean species.

Previous comments on MORL development

In previous comments, our concerns included: noise generated by pin piles; consideration of minke whales and harbour porpoises in cumulative assessment beyond MF; and the general confusion documented between mitigation and management measures. We note that none of these issues have been dealt with substantially.

General comments on MORL ES

It has not been possible for WDCS to read and review all of the literature. Our attention is focused on those areas directly relating to marine mammals.

WDCS acknowledge the amount of work undertaken to determine baselines and understand theoretical impacts, particularly the technical appendices in Volume 10.

Overall, whilst considerable theoretical and field work has been undertaken, given the existing levels of uncertainty, we do not agree that MORL can be confident that the development will have no significant impacts on harbour seals and European Protected Species (EPS). Evidence for this includes the following.

- MORL have underestimated the value of the so called ‘corridor’ between the inner Moray Firth and the Firth of Tay for bottlenose dolphins (section 7.2.7.14). This coastline is not merely a ‘corridor’ but provides important feeding habitat (e.g. Culloch and Robinson, 2008; Embling, Walters and Dolman, in preparation). In a spirit of full disclosure, we note that the WDCS Dolphin Centre is located in Spey Bay and is an important tourist attraction in the area. We anticipate that our centre may be adversely impacted. WDCS has been conducting land-based hourly watches (in appropriate sea states) for more than seven years. We regularly observe the dolphins feeding in the mouth of the Spey. We do not know if such displacement will be temporary or permanent. This disturbance will also be occurring in the

centre of the range of this small population with unknown potential consequences for the animals and the integrity of their social groups.

- Moray Firth harbour seal population has already declined by 40% since the mid-1990s (or over the long term based on the time periods used in this ES). Piling impacts of displacement and injury need to be seen in this context, given the existing long-term decline;
- Predicted harbour seal habitat preference is greatest within the development and surrounding area (Fig. 4.4-2);
- WDCS find Table 7.3-9 very troubling, and do not agree with the significance determined based on potential levels of risk associated with applying the criteria laid out in Table 7.3-6 to this population of harbour seals or the other marine mammal populations;
- The ES calculates that harbour porpoise densities within the site are higher than within the surrounding Moray Firth and proportion of detection positive days were almost entirely 100% in the development area (Fig. 4.4-8).

Should the long term impacts be underestimated using this theoretical approach, then it would be too late to reverse this trend (see, for example, Taylor et al., 2007). Taylor *et al*. (2007) assessed scientists' ability to detect declines of marine mammal stocks based on recent levels of survey effort, when the actual decline is precipitous. They defined a precipitous decline as a 50% decrease in abundance in 15 year, at which point a stock could be legally classified as "depleted" under the U.S. Marine Mammal Protection Act. They assessed stocks for three categories of cetaceans: large whales (*n* = 23, most of which are listed as endangered), beaked whales (*n* = 11, potentially vulnerable to anthropogenic noise), and small whales/dolphins/porpoises (*n* = 69, bycatch in fisheries and important abundant predators), for two categories of pinnipeds with substantially different survey precision: counted on land (*n* = 13) and surveyed on ice (*n* = 5), and for a category containing polar bear and sea otter stocks (*n* = 6). The percentage of precipitous declines that would *not* be detected as declines was 72% for large whales, 90% for beaked whales, and 78% for dolphins/porpoises, 5% for pinnipeds on land, 100% for pinnipeds on ice, and 55% for polar bears/sea otters (based on a one-tailed *t*-test, _ = 0.05), given the frequency and precision of recent monitoring effort in US waters. Thus, a good management decision rule should not require large numbers of precise estimates in order to trigger warranted management actions (Taylor *et al.,* 2007).

In addition to concerns about impacts on the animals themselves, as a result of this displacement, marine wildlife watching boat operators in this area whose business relies on the presence of the animals, are likely to be adversely affected. Given the considerable uncertainties that remain if developments are allowed to proceed, it is important that at the very least a well-considered robust research monitoring strategy is in place to understand and recognise potential individual and population level impacts on both nationally and internationally important species.

Scottish MPA Project and minke whales

Minke whales are an important migratory species that reside in the Moray Firth during the summer months to forage. Whilst there has been some research in other parts of Europe on the impacts of pile driving on harbour porpoises, none exists for minke whales. The Moray Firth is a primary feeding area for minke whales and the impacts on them are not known. In order to meet the requirements of the EU Habitats Directive, minke whales should remain a focus of attention.

We note that Chapter 4 does not mention the Scottish marine protected areas project and that the southern Moray Firth is a Search Area that includes minke whales.

We reiterate that whilst the Moray Firth has the best baseline data for bottlenose dolphins and harbour porpoises than elsewhere in Scotland, the industry does not yet appear to be taking concerns about minke whales impacts, both individually and cumulatively, seriously enough. Minke whales are very vulnerable to the impacts of intense noise pollution. A northern minke whale was found in the 2000 Bahamas military sonar mass stranding (Balcomb and Claridge, 2001). Thirty-four short-finned pilot whales (*Globicephala macrorhynchus*), one minke whale and two pygmy sperm whales (*Kogia breviceps*) stranded in the Outer Banks, North Carolina in January 2005 (Kaufman, 2005). Coincident with the stranding, one US Navy vessel was known to have used sonar about 90 nautical miles southeast of the stranding area (Kaufman, 2005). In one particularly noteworthy case in May 2003, researchers noted abnormal behaviour in killer whales (*Orcinus orca*), harbour porpoises and a minke whale in Haro Strait, in Washington State (Vancouver Aquarium Marine Science Centre, 2003). Simultaneously, the researchers heard an extremely loud screeching sound while recording whale calls, which was later revealed to come from the mid-frequency SQS-53C sonar on a US Navy destroyer transiting the area.

Closer to home, there was a significant decrease in northern minke whale sightings rates in western Scotland during periods of naval exercises (Parsons et al., 2000) and a minke whale was seen to be seemingly fleeing military sonar off the west coast of Scotland during Exercise Joint Warrior (HWDT, personal observation).

More generally, Gedamke *et al.* (2011) suggest a reasonable likelihood that baleen whales at a kilometre or more from seismic surveys could potentially be susceptible to TTS. They demonstrate the large impact that uncertainty and variability can have on risk assessment. In a review of impacts of UK seismic surveys, Stone and Tasker (2006) reported all mysticetes combined remained significantly further from the source during periods of shooting on surveys with large volume airgun arrays. Although effects of active airguns on the physiology of the mysticetes around the UK are largely unknown, shorter blow intervals indicated an increase in the respiration rate of fin whales within 1km of the airguns during periods of shooting (Stone, 1998).

In addition to the boat-based and acoustic studies that occurred in recent years in the outer Moray Firth, long-term studies have been conducted on the minke whales occurring along the outer southern Moray Firth coastline since 2000 by the Banff based research group the Cetacean Rescue & Research Unit (CRRU). The organisation has published five peer-reviewed scientific publications, one Bachelors, three Masters and a PhD thesis from ongoing studies on the species. The CRRU studies have focused on the distribution, occurrence, site fidelity, feeding behaviour and diving ecology of minke whales in a 1,280km^2 area of the outer firth between Lossiemouth and Fraserburgh. Moreover, ongoing fine-scale monitoring studies by the CRRU are likely to provide details of changes in behaviour due to activities associated with the wind farm development and can thus provide valuable insights into the level of impact to individuals that would not be possible on a wider scale. Consideration of changes in the foraging behaviour of minke whales is a vital issue to consider, particularly with regards to cumulative effects as development will be occurring at a number of key

foraging habitats throughout Scottish waters. In this respect, WDCS advocates the consideration of appropriate support for this work being carried out by the CRRU.

Met mast research

It's unclear how the research surrounding the installation of the met mast will inform the development in an adaptive approach.

Mitigation

The proposed mitigation for marine mammals is inadequate. Operating soft start at the beginning of operations is a management decision, it is not mitigating impacts, as there is mixed evidence about animals moving away from the source once soft start commences. Mitigation would entail shutting down the source (pile driving activities) once a marine mammal approaches within a predetermined radius of the activity and/or a range of other measures such as noise reduction techniques. No noise reduction methods are currently being proposed. Mitigation must include noise reduction methods – either alternatives to pile driving or the use of bubbles, jackets or curtains to reduce sound levels. This was advocated by JNCC and SNH in their consultation response in October 2010 (section 2.11).

Summary

Overall, whilst considerable theoretical and field work has been undertaken, given the existing levels of uncertainty, we do not agree that MORL can be confident that the development will have no significant impacts on harbour seals and EPS.

We would be happy to meet with you to discuss these comments further.

Yours sincerely

Sarah Dolman
WDCS Head of Policy for Scotland

References

Balcomb, K.C. and Claridge, D.E., 2001. A mass stranding of cetaceans caused by naval sonar in the Bahamas. *Bahamas Journal of Science* 8, 1–12.

Culloch, R. M. and Robinson, K. P. 2008. Bottlenose dolphins using coastal regions adjacent to a Special Area of Conservation in north-east Scotland. Journal of the Marine Biological Association of the United Kingdom, 2008, 88(6), 1237–1243.

Embling, C.B., Walters, A.E.M. and Dolman, S.J. In preparation. Detecting temporal trends in bottlenose dolphin occurrence from community-collected land-based observation data in the Moray Firth, NE Scotland.

Gedamke, J., Gales, N. and Frydman, S. 2011. Assessing risk of baleen whale hearing loss from seismic surveys: The effect of uncertainty and individual variation. J. Acoust. Soc. Am. 129.

Kastak, D., Mulsow, J., Ghoul, A., Reichmuth, C. 2008. Noise-induced permanent threshold shift in a harbor seal. Abstract of presentation. J. Acoust. Soc. Am., Vol. 123, No. 5, Pt. 2.

Parsons, E.C.M., Birks, I., Evans, P.G.H., Gordon, J.G., Shrimpton, J.H., Pooley, S., 2000. The possible impacts of military activity on cetaceans in West Scotland. *European Research on Cetaceans* 14, 185–190.

Stone, C.J. and Tasker, M.L. 2006. The effects of seismic airguns on cetaceans in UK waters. *J. Cetacean Res. Manage.* 8, 3, 255–263.

Stone, C.J. 1998. Cetacean and seabird observations in Tranche 52 and Quad 214 during 1998. Unpublished report to Conoco (UK) Limited. 73pp.

Taylor, B. L., M. Martinez, T. Gerrodette, J. Barlow, and Y. N. Hrovat. 2007. Lessons from monitoring trends in abundance of marine mammals. *Marine Mammal Science* 23, 157-175.

ANNEX
CONSENT CONDITIONS

To ensure that impacts of the development are in line with predictions made in the application, and given this is based on theoretical work and so considerable uncertainty that remains, the Consent Holder should ensure:

- An agreed programme of marine mammal monitoring pre- and post- construction to assess population impacts for the range of species that can reasonably be impacted for the long term i.e. for up to 25 years, or the life of the wind farm, whichever is greater should there be any uncertainty about accuracy of impact predictions.
- The Marine Mammal Mitigation Protocol (MMMP) of the Environmental Management Plan (EMP) should cover post-construction monitoring as well as pre-construction and construction monitoring.
- The MMMP should include EPS species as well as those protected by Natura 2000 sites.
- Survey methods must be statistically robust to detect change and any monitoring must feed back into site management to trigger adaptive management.
- The monitoring strategy should be appropriate to consider cumulative impacts including, but not limited to, the Beatrice development.
- Survey results must be made available in a reasonable time frame to enable independent scrutiny.
- Collected data should be made available to government, and all stakeholders, and an adaptive approach is applied where development is halted should significant impacts be observed.
- This monitoring should include funding for minke whale research in the Moray Firth to investigate changes in dive profile and displacement due to noise generated during construction and operation.
- We note the MacColl site appears to contain the highest densities of seals and porpoises. We therefore request that development begins elsewhere until potential impacts can be monitored and determined to be fit for purpose using an adaptive approach if required.
- Noise modelled generated for this application should be ground-truthed during construction and operation.
- JNCC Guidance alone is not adequate to mitigate potential impacts. Noise levels should be reduced using alternative techniques or quietening mitigation measures. If neither of these options is pursued then, should animals approach the activities whilst pile driving is on-going, activities must be shut down until animals move away.
- An EPS Licence, with appropriate conditions, should be required.
- Quarterly monitoring of business impacts (for example, local marine wildlife watching boat operators, cetacean researchers (Cetacean Rescue and Research Unit (CRRU)) and visitor centres such as the WDCS Dolphin Centre) should be required.

WDCS recommendations for Scottish Government

We note that JNCC state in their comments on the draft ES (Chapter 1, page 1-114) that:

"For species which are part of wide ranging larger populations (harbour porpoise, minke whale, white beaked dolphins), although we acknowledge the usefulness of such approach we advise that

the assessment of potential population level effects needs to be carried out at the strategic level by the regulator taking into account several developments within the large ranges of the populations *and not by individual developers as given the number and scale of developments this would not be feasible. However, in the final ES we would expect to see an estimation of what potential contribution will the MORL development do the overall potential impact (i.e. how many days/area affected by piling and how many individuals could be affected and in what way) as presented in the draft ES. This should be then put in the context of population estimates and Favourable Conservation Status assessments (from 2007)."*

We look forward to understanding what efforts the Scottish Government plans to make to take this key strategic cumulative work forward in the immediate future.

In addition, in order to ensure strict protection of cetaceans and other European Protected Species (EPS), it is essential that the Scottish Government commits to:

- Prioritising the development of alternatives to pile driving; and until such technology is available:
- Prioritising effective mitigation measures that do not introduce more noise pollution into the marine environment;
- Alternative and mitigation technologies that develop in the timeframe before construction of Beatrice commences would need to be implemented; and,
- Providing strong guidance to assist developers in meeting their environmental responsibilities, including through appropriately managing disturbance.