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Marine Licensing Team,
Marine and Fisheries Division,
Department of Agriculture, Environment and Rural Affairs,
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6th February 2020

Dear Sir/Madam,

RE: ISLANDMAGEE GAS STORAGE PROJECT CONSULTATION

Ulster Wildlife is Northern Ireland's largest local nature conservation charity with over 14,000 members. Our vision is for a healthy, well-cared for natural environment which contributes to enjoyment, quality of life, prosperity, health and well-being. On Islandmagee, we manage the Isle of Muck nature reserve which is the third largest cliff-nesting seabird colony in Northern Ireland, supporting thousands of nesting seabirds including fulmar, shag, razorbill, guillemot, black guillemot and kittiwake.

We welcome the opportunity to respond to the Islandmagee Gas Storage Project consultation but have serious concerns regarding the proposed activities. The project will require the creation of gas caverns within the Permian salt beds beneath Larne Lough, involving construction and operational activities to disperse hypersaline seawater off the eastern side of Islandmagee. These activities would occur directly within two Marine Protected Areas (the North Channel Special Area of Conservation and the proposed East Coast Special Protection Area) and within close proximity of a further five protected sites (within 2km), including the Portmuck ASSI, the Maidens SAC, Larne Lough Ramsar site, Larne Lough SPA and Larne Lough ASSI.

We believe the project activities have the potential for significant detrimental effects on the designated features of these protected areas. In particular, we are seriously concerned about the potential for temporary and permanent hearing loss to harbour porpoise and grey seals (designated features of the North Channel SAC and Maidens SAC, respectively). Also, the potential for disturbance and loss of feeding opportunities for marine mammals and seabirds within important foraging grounds.

Decisions regarding marine license applications within NI inshore waters should be directed by devolved policy and legislation. Currently, the consultation processes for the NI Marine Plan, NI Energy Strategy and Environment Strategy for NI are all underway with no completed policy in place to direct decision making. Furthermore, management plans for the two protected areas within which the brine dispersal would directly occur are in the early stage of development and have not been released. We feel strongly that it is not appropriate for any decision on this project to be made without this policy and management framework in place.

For these reasons, we object to the granting of a marine license for the Islandmagee Gas Storage Project. We support the responses of the Northern Ireland Marine Task Force, RSPB NI and the National Trust, who are united in objecting to the proposals.

Furthermore, we believe the consultation documents are of a poor standard and fail to adequately and clearly describe the proposed project. The NI Guidance on Marine Licensing (DAERA, 2016) states that the marine license consultation documents (i.e. the Environmental Impact Assessment process) should: 'Provide sufficient details to allow readers to make an independent decision on the impacts associated with the proposed development'.

However, the Islandmagee Gas Storage Project consultation uses documents from a previous application in 2010 with amendments apparently inserted in a random and disorganised manner. Most notably, the Environmental Statement Non-Technical Summary is entirely unchanged. It omits the North Channel SAC and proposed East Coast SPA designations and includes inaccurate figures on NI's current energy use. For example, by stating that NI produces and consumes only 7% of its electricity from renewable sources when current evidence shows that this has significantly increased to 44.9% of NI energy coming from renewables (DfE, 2019).

Given that the full consultation documents amount to over 1900 pages, the non-technical summary is likely to be the main resource used by many stakeholders, such as local residents, councillors and political advisors. However, the summary provided is 10 years out

of date, misrepresents the implications of the proposed project and therefore fails to facilitate informed stakeholder engagement in the consultation process.

Further details on the reasons for our objection are provided below, relating to: (1) Protected Areas and Species of Conservation Importance; (2) Potentially Damaging Project Activities; and, (3) Consequences for Climate Action.

1. Protected Areas and Species of Conservation Importance

The recent IPBES Global Assessment Report on Biodiversity (IPBES, 2019) found that ‘nature is declining globally at rates unprecedented in human history – and the rate of species extinction is accelerating, with grave impacts on people around the world now likely.’ The State of Nature 2016 report showed that the UK is one of the most nature-depleted countries in the world and Northern Ireland is the most nature-depleted part of the UK. The 2019 Report shows no let-up in loss of wildlife: ‘Of 2,450 species in Northern Ireland that have been assessed using IUCN Regional Red List criteria, 11% have been classified as threatened with extinction from Ireland as a whole’. Last year, Defra’s UK Marine Strategy Assessment Part One concluded that we are failing to meet 11 out of 15 indicators for healthy seas.

We are facing a biodiversity crisis. The purpose of protected areas is to provide sanctuaries for our most threatened, fragile and functionally important plants and animals, allowing them to recover and improve the health of our wider marine environment.

The area around Islandmagee is known for its outstanding biodiversity and, as such, has been designated as a wildlife sanctuary for many of our most threatened species and habitats (Table 1). This area supports many unique and rare marine assemblages within the UK. For example, the Maidens SAC site selection assessment states that the ‘hydrographic conditions present round the Maidens and the proximity of deep water to the plateau result in conditions not found in many other UK areas and consequently these habitats are extremely rare’. The diversity of fragile sponge species and the presence of rare species make the sponge communities found within the Maidens SAC ‘some of the most important in the British Isles’. The official information sheet for the North Channel SAC describes the site as ‘one of the best areas in the United Kingdom’ for harbour porpoise (JNCC, 2019).

Table 1. Summary of the protected sites and designated marine species within the project area.

Site name	Designated Marine Features
Larne Lough Ramsar site	The site regularly supports internationally important numbers of light-bellied Brent geese in winter. It also supports an important assemblage of vulnerable and endangered Irish Red Data Book bird species. The site regularly supports nationally important numbers of breeding populations of the Annex 1 species: roseate and common tern.
Larne Lough SPA	The principal interests are the breeding colonies of Roseate, Sandwich and Common Tern and the wintering population of Light-bellied Brent Goose. These are deemed to be 'internationally important populations'.
Larne Lough ASSI	Invertebrate assemblage, Common Tern, Goldeneye, Great Crested Grebe, Light-bellied Brent Goose, Red-breasted Merganser, Redshank, Roseate Tern, Sandwich Tern, Shelduck, Breeding bird assemblage. Saline lagoons, Coastal saltmarsh
Portmuck ASSI	Breeding seabird populations including Razorbill, Guillemot, Puffin, Kittiwake, Fulmar, and Black guillemot
North Channel SAC	Harbour porpoise
Maidens SAC	Reefs (including fragile hydroid forests and sponges), sandbanks and grey seal
East Coast proposed SPA	The site qualifies by supporting internationally important populations of: Great Crested Grebe, Red-throated Diver, Sandwich Tern, Common Tern, Arctic Tern, Manx Shearwater, Eider Duck.

Marine Protected Areas are designated with the purpose of providing long-term conservation of nature. If well-managed, a completed network of protected sites will provide various additional benefits ('ecosystem services') and improve the overall health of our local seas. Considering the reported declines in biodiversity summarized above, we need Marine Protected Areas more than ever if we are to halt biodiversity loss and aid much-needed ecosystem recovery.

A well-managed MPA network is a key tool to achieve Good Environmental Status (GES) in the marine environment (as required by the UK Marine Strategy Regulations 2010). GES has not been met for seabirds with a declining trend reported. The extent to which GES has been achieved for cetaceans remains uncertain; for harbor porpoise, there is insufficient

data to determine population size and the overall species status in the NE Atlantic is classed as unknown.

To achieve Good Environmental Status of our seas, the conservation of these species must be at the heart of decision-making. We are seriously concerned about the need to advocate for this within areas designated for the protection of these species, especially given the recent poor assessments for harbour porpoise and seabirds in UK waters.

We are particularly concerned about the close proximity of the project to the Ulster Wildlife Isle of Muck nature reserve and the Portmuck ASSI. The nature reserve supports the third largest colony of cliff-nesting seabirds in Northern Ireland including fulmar, shag, razorbill, guillemot, black guillemot, and kittiwake. A large variety of other birds pass through, feeding on the productive waters around the island, including gannet, storm petrel, Manx shearwater, terns, divers and passage migrants such as skuas.

Ulster Wildlife has dedicated a considerable amount of conservation effort into the Isle of Muck nature reserve to further enhance the area as a refuge for seabirds, including habitat management works and the reintroduction of grazing to reduce dense grassland vegetation. In 2017, we launched the Isle of Muck Seabird Recovery Project with funding from Biffa Award to conduct predator eradication of brown rats and improve the habitat for breeding seabirds. The project successes were highlighted in the BTO Northern Ireland Seabird Report 2018 (Booth Jones & Wolsey, 2019). This work is also intended to increase the prospects for species such as Manx Shearwater and Puffin to establish on the island. Ulster Wildlife has an ongoing programme of seabird monitoring at the Isle of Muck, providing training to volunteers and trainees and working to ensure the next generation of seabird surveyors. Our successes to date and the ongoing conservation work at the Isle of Muck is reliant on the availability of suitable foraging opportunities and seabird habitat within the Marine Protected Areas surrounding this site.

The NI Marine Protected Area network has not been completed (JNCC, 2018). Species and habitats of conservation importance remain as gaps in the current network and data gathering activities are underway within the NI inshore region.

The inshore area from Islandmagee northwards to Red Bay is an Area of Search (AoS) for a Marine Conservation Zone to protect the critically endangered Common Skate. Ulster Wildlife's Sea Deep project has been working with licensed sea anglers in this region to tag and collect data on the species. Our data (and that held by CEDaR from other sources) provides strong evidence for the year-round presence of Common Skate in the region. From 2018 alone, our Sea Deep project has tagged 23 Common Skate within the project area (around Larne Lough, Islandmagee and the Maidens), including three recaptures which may

indicate residency. (Please note – due to the confidential nature of angler tag records, we have not provided exact locations in this response. The coordinates of Common Skate records obtained by the Sea Deep project are shared with CEDaR and restricted to 10km for public access. Exact coordinates are made available to DAERA for management purposes.)

Common Skate is the largest skate species in the world, reaching a total length of up to 3 metres. Their body size and flattened shape constrain movement, resulting in low levels of activity and long periods spent resting on the seabed (Wearmouth & Sims, 2009). The species frequently exhibits site fidelity and, as such, have been identified as able to benefit from site-based MPA protection. However, the mobility of the species and evidence of both resident and transitory individuals, makes connectivity between protected sites a key consideration for their protection.

The Loch Sunart to Sound of Jura MPA on the west coast of Scotland was designated in 2014 to protect Common Skate. The records along the NI coast and west coast of Ireland indicate the potential for the Antrim Coast to function either as an area for resident skate or as an important ground for transient skate from nearby areas. Once designated, the MCZ for Common Skate within NI inshore waters will therefore provide connectivity to the nearby Scottish MPA with wider benefits for the conservation of this critically endangered species.

We are working in partnership with Queen's University Belfast to inform the placing of acoustic arrays which will provide a greater understanding of the movement of Common Skate within this area. We strongly believe that the ongoing work to designate a Marine Conservation Zone for this species should be a key consideration in the decision-making process for this project. A precautionary approach must be applied until we have adequate data on the movement of skate within this area.

The MPA network is a key tool to protect and restore our marine environment. However, additional mechanisms are in place outside of designated sites for the conservation of local biodiversity. The Wildlife and Natural Environment Act (Northern Ireland) 2011 places a duty to conserve biodiversity on the Department. The Northern Ireland Priority Species (NIPS) list sets out the species and habitats which are of principal importance for the purpose of conserving biodiversity. The area that will be impacted by hypersaline brine discharge supports many Northern Ireland Priority Species, as evidenced by the CEDaR data submitted with the consultation documents, including Ocean Quahog, circular crab, and rare and fragile cnidaria and echinoderm species.

The previous NI Biodiversity Strategy to 2020, Valuing Nature, aimed to halt biodiversity loss, stating that 'We are entrusted with protecting [our natural heritage] and handing it on safely to future generations'. A public call for evidence to inform the development of a new

Environment Strategy for NI has recently closed with a formal public consultation still to take place. Guidance on the protection of our local biodiversity must be in place to inform the decision-making process, especially given the many potentially damaging activities related to the project.

2. Potentially Damaging Project Activities

The proposed project will involve various activities throughout the construction and operational phases with various potentially damaging effects on wildlife. We have concentrated our response on noise from drilling activities and hypersaline brine dispersal.

Noise from Drilling Activities

The project will involve the construction of sub-surface seawater and brine pipelines and a brine outfall diffuser located 450m offshore. The construction of the seawater intake and brine outfall pipes will require Horizontal Directional Drilling (HDD) over an estimated 6-month period.

The Shadow Habitat Regulations Assessment (SHRA) acknowledges that the noise levels anticipated to occur from the project activities have been derived from 'limited data' (SHRA, p.29). The Marine Environmental Conditions Update (MECU) further states that the data used to estimate drilling noise has come from HDD drilling below the seabed in schist, a medium/hard rock. The report states that the bedrock in the project area is basalt, a hard rock, however concludes that this will only affect the speed of the drilling activity and will not 'significantly' affect the noise levels. We are not satisfied with this assumption and stress that a precautionary approach must be applied to the use of these figures and the conclusions drawn from them. Furthermore, the EIS states that 'Explosives may be required to excavate the drilling pit / sump into the rock' (EIS, p. 4-44), yet the potential impact of explosive use has not been assessed. It is not acceptable to allude to the potential use of explosives without assessing any impacts that may be detrimental to wildlife.

The SHRA assesses the potential for temporary and permanent hearing loss (defined as Temporary Threshold Shift (TTS) and Permanent Threshold Shift (PTS) values) to harbour porpoise and grey seals by the drilling activities. The SHRA states that 'the construction related underwater noise does have the potential to exceed the harbour porpoise TTS threshold limit and slightly exceed the PTS threshold limit' (SHRA, p.30). The SHRA recognizes the behavioural impacts of noise on marine mammals, including longer intervals between surfacing, cessation of vocalization, increased swimming speeds, avoidance, increased group cohesion and more dramatic escape responses. It further describes how

dependent marine mammals are on their auditory senses for basic life functions such as feeding, predator avoidance, communication and navigation:

Harbour porpoise are small cetaceans which makes them vulnerable to heat loss and requires them to maintain a relatively high metabolic rate. This makes them potentially vulnerable to disturbance if they are unable to obtain sufficient levels of prey intake. (SHRA, p.31)

The SHRA states that the worst-case underwater noise emissions are expected to occur over a short period of time (approx. 18 days), therefore any disturbance is likely to be a temporary, recoverable impact. We stress that the potential for permanent hearing loss in harbour porpoise is not a recoverable impact and is an unacceptable scenario for the feature species of the protected site.

Additionally, the SHRA defends the expected project noise levels, stating that they are within those already occurring in the area due to ferry traffic. Yet no assessment is made of the cumulative noise level and potential impact on marine mammal hearing. Based on the worst case levels of noise, and the potential cumulative effects of noise in the area, we consider that the risk of permanent injury and displacement of harbour porpoise is not in support of the conservation objectives for the site.

For seals, the SHRA states that they are accustomed to periods of fasting (during natural annual cycles of breeding and moulting), therefore are 'unlikely to be particularly sensitive' to any additional (unexpected) displacement from foraging grounds during periods of noise activity. Yet the report also states that this is not the case for juvenile seals which may be more sensitive to displacement due to smaller body size and higher energetic needs. The time of year when noise activities will take place is not clear from the consultation documents. The SHRA must take into account the impacts of disturbance on fasting seals and juveniles.

The SHRA does not assess the potential effects of noise on grey seals, stating that there will be no likely significant effects as the modelled noise levels are below the TTS and PTS values for this species. First, this does not address the issues of displacement due to noise and sub-lethal energetic impacts, particularly on fasting adults and juveniles. Secondly, the grey seal TTS threshold is 181 dB re 1 $\mu\text{Pa}^2\text{s}$ and the worst case noise levels are only marginally lower at 179.4 dB re 1 $\mu\text{Pa}^2\text{s}$. We again stress that the modelled noise levels are based on 'limited data' and as the noise is expected to reach only 1.6 dB re 1 $\mu\text{Pa}^2\text{s}$ below the grey seal TTS value it is not appropriate to conclude that there will be no significant effect. The potential for temporary hearing loss and displacement on grey seals must be assessed.

The effects of noise on bird populations has not been included, despite the fact that fish – their prey – have been assessed. For ‘Group 3’ fish species, whereby hearing involves a swim bladder or other gas volumes, it is stated that they may experience TTS and behavioural effects at individual or population levels. Such effects, especially at population levels would have a consequential effect on foraging opportunities for birds and marine mammals in the area. The link between vital ecosystem components has been omitted.

We draw attention to the Conservation Objectives for the North Channel SAC which state that: ‘The supporting habitats and processes relevant to harbour porpoises and their prey are maintained’. We request clarification from the Department regarding the conservation advice and guidance documents that will be used in relation to assessing disturbance impact on the harbour porpoise SAC.

Hypersaline Brine Dispersal and Habitat Loss

Hypersaline brine will be produced as a by-product of the leaching process involved in cavern creation. The construction footprint of the seawater intake and brine outfall will result in the permanent loss of 126 m² of benthic habitat within the inshore foraging grounds of two Marine Protected Areas. The brine is expected to have a salinity level of ~260 psu which is over seven times greater than the natural salinity levels for the project area (30.5 to 34.8 psu). This baseline salinity data was obtained from AFBI and NIEA at the initial project development stage. However, the background salinity of the study area was taken as 34.2 psu for the purposes of the brine dispersion modelling. The reason why this higher figure was used is not clear and we are concerned that this may underestimate the potential effect of the brine dispersal. Furthermore, we are concerned that the greater density of hypersaline brine has not been considered in the brine dispersion modelling.

The cavern construction process and dispersal of hypersaline brine is estimated to require at least four years to complete. In addition, maintenance of the caverns will result in continued dispersal of hypersaline brine throughout the operational period of the project, up to 30 years. No detail is provided on the expected frequency of further leaching activities despite the significant consequences this could have for the recovery of the site. Clear information on the expected frequency, duration and rate of brine dispersal from ongoing maintenance activities must be assessed.

The brine modelling document states that the temperature of the hypersaline brine will be ~2°C higher than ambient. The potential impacts of seawater temperature increase have not been assessed despite the known effects on marine species, for example invertebrate and fish larval development.

Due to the extreme salinity levels and temperature increase, the area surrounding the brine dispersal site will be severely damaged, resulting in the loss of marine life, particularly benthic species, within the foraging grounds of harbour porpoise, grey seals and seabirds – the feature species of the surrounding protected areas.

We draw attention to the following text from the Shadow Habitat Regulations Assessment (SHRA, p.25):

Inshore waters may be important as nursery habitats during summer months. Harbour porpoise need to feed frequently in order to maintain their body temperature and other energy needs. For this reason, porpoise may be highly susceptible to changes in the abundance of prey species or disturbance from foraging areas.

The conservation objectives of the North Channel SAC state that the supporting habitats and processes relevant to harbour porpoises and their prey are to be maintained (JNCC & DAERA, 2019).

The SHRA states that permanent habitat loss will occur in 0.0079% of the total SAC area, concluding that this is not significant as harbour porpoise are highly mobile with a wide foraging area. However, it also states that ‘harbour porpoise are known to forage off Islandmagee’, that ‘the majority of sightings occurred within 4km of the shore, or around the Maidens rocks area’ and that ‘high concentrations of sightings also occurred around Islandmagee, Ballystrudder and Whitehead’.

The northern extension of the North Channel SAC was proposed as it is an area of persistently high harbour porpoise density. Survey data (submitted during the North Channel SAC consultation) from the Irish Whale & Dolphin Group (IWDG) provides evidence that the inshore waters around Islandmagee are an important foraging site. Harbour porpoise have metabolic rates 2-3 times higher than similar-sized terrestrial mammals and must forage almost continually day and night to meet their metabolic demands. Therefore, even a moderate level of disturbance in inshore waters may have ‘rapid and severe’ fitness consequences at individual and population levels (Wisniewska et al., 2016).

Therefore it is inappropriate to use 0.0079% as justification for concluding that the expected habitat loss will have no significant effect on populations. Harbour porpoise have a preference for inshore waters and the area of loss is therefore of greater importance. Furthermore, it is not sufficient to state that the ability of a species to travel to and forage in other locations mitigates the loss of habitat. The displacement of harbour porpoise from this area is likely to have an energetic and stress effect that may lead to condition loss and subsequent negative impacts on reproductive ability.

Throughout the consultation documents, the assessment of in-combination effects is lacking with little to no use of quantitative data. The likely significant effects of the additive impacts of the project activities must be fully assessed.

Finally, we feel that many of the proposed mitigation measures are either inadequate or wholly inappropriate. Although the SHRA recognises the potential for significant detrimental effects from noise on harbour porpoise (requiring a Stage 2 assessment), the only mitigation measure provided is the deployment of Marine Mammal Observers. We stress that the use of MMOs to detect animals is a monitoring measure, not a mitigation measure.

We draw attention to the following text from the of the European Commission Article 6 Habitats Directive Guidance from 21st November 2018 which establishes the obligation to monitor the effectiveness of mitigation measures:

For the competent authority to be able to decide if the mitigation measures are sufficient to remove any potential adverse effects of the plan or project on the site (and do not inadvertently cause other adverse effects on the species and habitat types in question), each mitigation measure must be described in detail, with an explanation based on scientific evidence of how it will eliminate or reduce the adverse impacts which have been identified. Information should also be provided of how, when and by whom they will be implemented, and what arrangements will be put in place to monitor their effectiveness and take corrective measures if necessary.
(European Commission, 2018)

Furthermore, the EIS mitigation measure for 'Impacts on commercial fish for crustaceans and shellfish through damage to stocks either by mortality or evacuation of the area' states that:

The use of sentinel organisms within the mixing zone and at control sites may be effective in monitoring the impact of the brine discharge on commercially important species. Lobster, crab and scallops could be held in pots or alternative devices to monitor mortality rates at various distances from the outfall in comparison to control sites; trigger levels may be based on baseline mortality rates established at the control sites. These experiments may also facilitate a more detailed assessment of organism health in the area surrounding the discharge.

This measure is archaic and raises serious ethical concerns regarding animal welfare. Furthermore, the information obtained would only provide a crude estimate of mortality and no consideration has been given to the monitoring of non-lethal effects which may result in condition loss with consequences potentially at the population level.

3. Consequences for Climate Action

We are now in a climate and environment emergency with the UN's Intergovernmental Panel on Climate Change warning last year that, "...humankind has less than 12 years to avoid potentially irreversible climate disruption." The UK Government declared a climate emergency in May 2019, followed by over 270 local UK councils including Belfast City, Derry and Strabane, and Ards and North Down. In February 2020, the Northern Ireland Assembly declared a climate emergency, with MLAs supporting immediate action to cut carbon emissions.

There has been a significant shift in public awareness and support for climate action, most notably within younger generations as demonstrated through the School Strike 4 Climate movement. In September last year, over 7000 people of all ages marched through Belfast to demonstrate against the lack of progress.

We must implement the commitments agreed in the New Decade, New Approach agreement, including a review of the Executive's strategies to reduce carbon emissions in respect of the Paris Agreement and to set ambitious targets and actions to achieve a zero carbon society. Reducing greenhouse gas emissions will require a transition away from fossil fuels.

In addition to the biodiversity impacts outlined above, the Islandmagee Gas Storage Project is in direct conflict with the measures required to achieve our climate targets. We are also concerned about the statement made within the EIS that the proposed project facility will be 'one of the biggest power consumers in Northern Ireland when running at peak operations'. We stress that tackling the nature and climate emergencies must be a key priority for the Department.

Summary

In summary, we object to the marine license application due to the potential detrimental effects on wildlife, particularly of the designated feature species of the local marine protected areas. The original marine license application was submitted 10 years ago when the North Coast SAC and proposed East Coast SPA designations were not in place. The (outdated) EIS states that the project location was chosen partly because the intake and dispersal pipes did not fall within a protected site. This is no longer the case and the conservation of these areas must be prioritised.

The UK Marine Policy Statement (UK MPS) states that: 'As a general principle, development should aim to avoid harm to marine ecology, biodiversity and geological conservation interests (including geological and morphological features), including through location,

mitigation and consideration of reasonable alternatives'. It further states that the use of 'existing storage features and infrastructure is likely to result in negligible additional impacts although the production of salt caverns may result in significant local impacts and interference with other users of the area'. However, the consideration of reasonable alternative sites and/or methods of brine disposal contained in the EIS are significantly outdated.

Please contact the Ulster Wildlife Living Seas Manager for any further information required in relation to this response.

Yours sincerely,

Rebecca Hunter
Living Seas Manager

References

Booth Jones, K.A. & Wolsey, S. (2019) The Northern Ireland Seabird Report 2018. British Trust for Ornithology, Thetford.

<https://www.bto.org/sites/default/files/ni-seabird-report-2018.pdf>

European Commission (2018) Commission notice: Managing Natura 2000 sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC

http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/Provisions_Art6_nov_2018_endocx.pdf

DAERA (2018) Marine Conservation Zones in the Northern Ireland Inshore Region – Justification Report for Selection of Proposed Marine Conservation Features

<https://www.daera-ni.gov.uk/sites/default/files/publications/dae/marine-report-mcz-justification-report-for-selection-of-pmczs-features-2014.PDF>

DAERA (2018) Report on the Creation of a Network of Conservation Sites in the Northern Ireland Inshore Region

<https://www.daera-ni.gov.uk/sites/default/files/publications/daera/MPA%20Assembly%20report%20-%202018%20compressed.pdf>

DAERA (2015) Valuing Nature: A Biodiversity Strategy for Northern Ireland to 2020
<https://www.daera-ni.gov.uk/sites/default/files/publications/dae/natural-policy-biodiversity-strategy-to-2020-2015.pdf>

DAERA (2016) Northern Ireland Guidance on Marine Licensing – Environmental Impact Assessment, under Part 4 of the Marine and Coastal Access Act 2009
<https://www.daera-ni.gov.uk/sites/default/files/publications/dae/marine-licensing-guidance-environmental-impact-assessment-under-part-4-marine-and-coastal-access-act-2009-may-2016.pdf>

DfE (2019) Electricity Consumption and Renewable Generation in Northern Ireland October 2018 to September 2019
<https://www.economy-ni.gov.uk/sites/default/files/publications/economy/Issue-13-Electricity-Consumption-and-Renewable-Generation-in-Northern-Ireland-October-2018-to-September-2019.pdf>

IPBES (2019): Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S. Díaz, J. Settele, E. S. Brondízio E.S., H. T. Ngo, M. Guèze, J. et al. (eds.). IPBES secretariat, Bonn, Germany. 56 pages
https://ipbes.net/sites/default/files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf

JNCC (2019) Natura 2000 - Standard Data Form. Site: UK0030399, North Channel
<https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030399.pdf>

JNCC (2018) Assessing progress towards an ecologically coherent network of Marine Protected Areas in the Northern Ireland inshore region
<https://www.daera-ni.gov.uk/sites/default/files/publications/dae/JNCC%20DAERA%20NIMPA%20Network%20Progress%20v6.0.pdf>

JNCC & DAERA (2019) Harbour Porpoise (*Phocoena phocoena*) Special Area of Conservation: North Channel. Conservation Objectives and Advice on Operations
http://archive.jncc.gov.uk/pdf/NorthChannel_ConsAdvice.pdf

State of Nature (2019)
<https://nbn.org.uk/wp-content/uploads/2019/09/State-of-Nature-2019-UK-summary.pdf>

State of Nature (2016)

<https://www.wildlifetrusts.org/sites/default/files/2019-03/2016%20state-of-nature-uk-report-2016.pdf>

Wearmouth, V.J, & Sims, D.W. (2009) Movement and behaviour patterns of the critically endangered common skate *Dipturus batis* revealed by electronic tagging. *Journal of Experimental Marine Biology and Ecology* 380: 77-87

Wisniewska, D.M, Johnson, M., Teilmann, J., et al. (2016) Ultra-High Foraging Rates of Harbor Porpoises Make Them Vulnerable to Anthropogenic Disturbance. *Current Biology* 26: 1441-1446