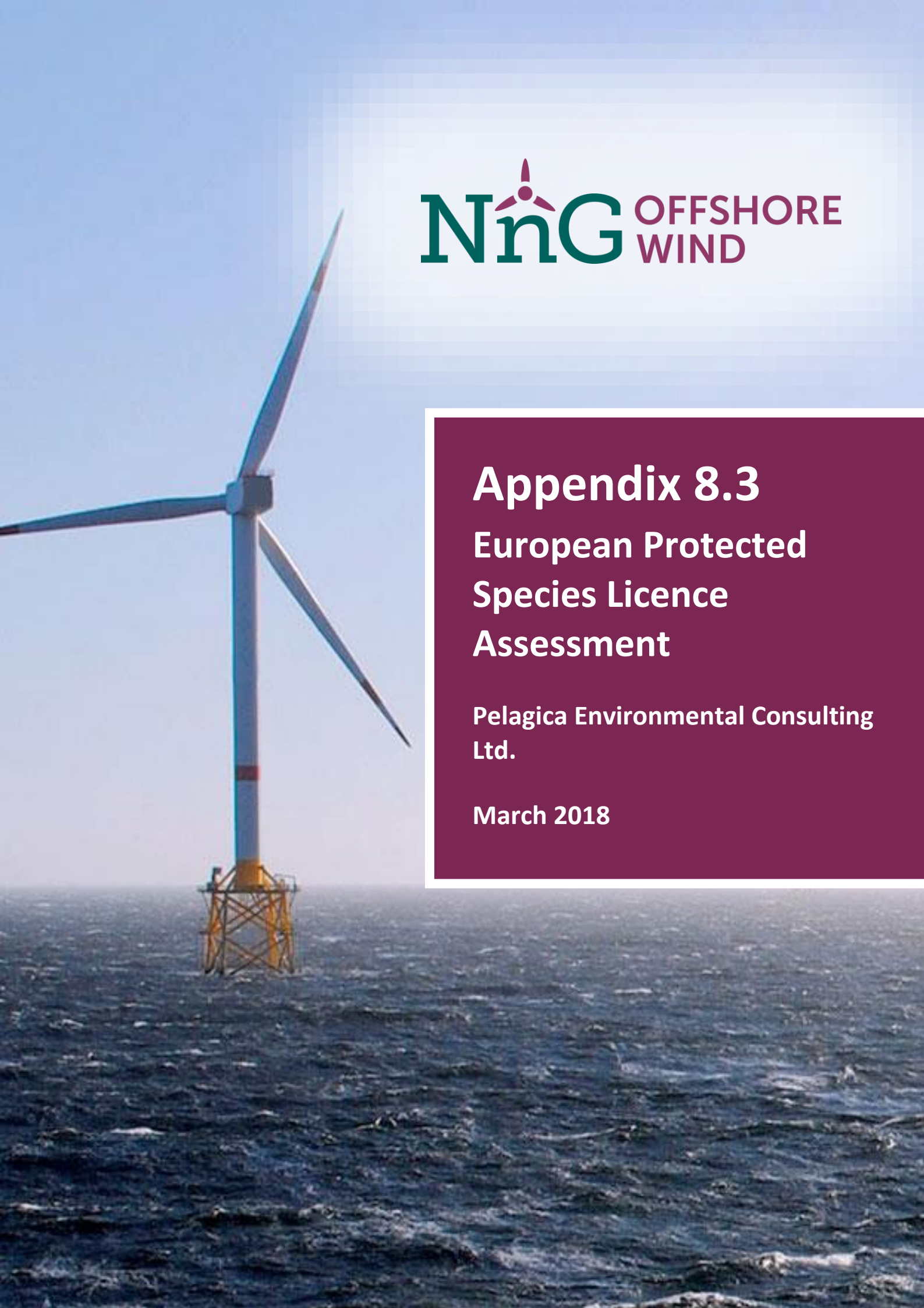

Appendix 8.3

European Protected Species Licence Assessment

Pelagica Environmental Consulting Ltd.

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1 European Protected Species

1.1 Information Relating to European Protected Species Licence

1. The Scoping Opinion advised that the information requirements for a European Protected Species (EPS) Licence should be given consideration and that information should be presented in a form that means it can be used for the EPS process (Marine Scotland 2017). This Appendix provides the information that may be required in support of an EPS licence application should one be required in order to undertake certain works relating to the Project. It is recognised that in the event an EPS licence application requires to be made in the future, additional information may require to be submitted at the time.
2. An EPS Licence will be required prior to the commencement of any activities that could cause impacts on European Protected Species. These are species listed in Annex IV of the Habitats Directive which are species of European Community interest in need of strict protection.
3. The EIA has identified the European Protected Species that could be impacted by the proposed Project. These are: Harbour porpoise, bottlenose dolphin, white-beaked dolphin, orca and minke whale. Seals are not listed under Annex IV of the Habitats Directive and are therefore not subject to EPS requirements.
4. An EPS licence assessment comprises three tests to ascertain:
    - That the activity is for one of the purposes specified in the Regulations;
    - That there are no satisfactory alternatives to the activity proposed (that would not incur the risk of an offence); and
    - That the licensing of the activity will not be detrimental to the maintenance of the populations of the species concerned at a Favourable Conservation Status (FCS) in their natural range.
5. An application for an EPS licence will fail unless all three tests are satisfied.
6. This assessment follows published guidance by Marine Scotland on the *Application for a licence for European protected species* (Marine Scotland 2012a) and *The protection of Marine European Protected Species from injury and disturbance. Guidance for Scottish Inshore Waters* (Marine Scotland 2014) that provide guidance for a licence application under Regulation 44 of the Habitats Regulations.

1.1.1 European Protected Species Legislation

7. The following summarises the relevant legislation relating to European Protected Species.
8. All species of cetacean are listed on Annex IV of the Habitats Directive (92/43/EEC). Article 12 of the Habitats Directive requires that such species are offered strict protection prohibiting all forms of deliberate capture and killing; deliberate disturbance, particularly during the period of breeding, rearing, hibernation and migration; and deterioration and destruction of breeding sites or resting places. There is also an obligation to establish a system to monitor incidental capture and killing of such species.
9. In Scotland, the provisions of the Habitats Directive relating to EPS have been transposed into domestic law by the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) in relation to the terrestrial environment and in territorial waters out to 12 nautical miles (nm).

10. Under Regulation 39(1) of the Habitats Regulations (as amended) for activities within Scottish inshore waters (12 nm) (Marine Scotland, 2014), it is an offence:

(a) deliberately or recklessly to capture, injure, or kill a wild animal of a European protected species;
(b) deliberately or recklessly:
i. to harass a wild animal or group of wild animals of a European protected species;
ii. to disturb such an animal while it is occupying a structure or place which it uses for shelter or protection;
iii. to disturb such an animal while it is rearing or otherwise caring for its young;
iv. to obstruct access to a breeding site or resting place of such an animal, or otherwise to deny the animal use of the breeding site or resting place;
v. to disturb such an animal in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species to which it belongs;
vi. to disturb such an animal in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; or
vii. to disturb such an animal while it is migrating or hibernating.
(d) to damage or destroy a breeding site or resting place of such an animal

11. Regulation 39(2) provides that it is an offence to 'deliberately or recklessly disturb any dolphin, porpoise or whale (cetacean)'.

12. The above offences apply to all stages of the life of the animal to which they apply (SNH, 2014a).

Deliberate Injury Offence

13. The term 'deliberate' has been interpreted as an intentional act undertaken knowing that it will or may have particular consequences. The term 'reckless' arises if it is known, or reasonably foreseeable, that an action undertaken is likely to cause injury or disturbance. The deliberate injury offence has been interpreted as occurring if a cetacean receives a sound exposure level, which may cause permanent threshold shift in hearing (Marine Scotland, 2014; JNCC, 2010).

Disturbance Offence

14. A disturbance offence may occur if the level of disturbance is likely to:

- Impair the ability to survive, to breed or reproduce, or to rear or nurture their young, or migrate;
- Affect significantly the local distribution or abundance of the species.

15. The consideration of what constitutes disturbance should be undertaken on a species by species approach that takes into account the intensity, duration and frequency of repetition of disturbances and the specific characteristics of the species concerned and the situation. Consideration should be given to the rarity and favourable conservation status of the species in question and the impact of the disturbance on the local population of a species (Marine Scotland, 2014).

16. In JNCC guidance (JNCC, 2010) a disturbance offence is more likely to occur when there is a risk of:

- Animals incurring sustained or chronic disruption of behaviour scoring 5 or more in the Southall *et al*. (2007) 'behavioural response severity scale'; or
- Animals being displaced from the area, with redistribution significantly different from natural variation.

17. The risk of a disturbance offence will exist if there is sustained noise in an area and/or chronic noise exposure, as a result of an activity (JNCC, 2010).

18. In order to commit an offence under regulation 39, the impact on the species must be certain or real. The activity concerned must have a "negative or adverse" impact on the conservation status of the species (Marine Scotland, 2014).

1.1.2 European Protected Species Licence

19. Under Regulation 44 of the Habitats Regulations certain activities that might be considered to cause an offence may be carried out under licence if it can be demonstrated that by doing so the licensing authority remains fully compliant with the requirements of the Habitats Regulations.

20. In order to achieve this, it must be demonstrated that:

- The activity is one of the licensable purposes listed in regulation 44;
- There is no satisfactory alternative; and
- That the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range (Marine Scotland, 2012a; SNH 2014b).

21. European Protected Species licensing in Scottish waters of commercial activities such as seismic surveying or testing, or installing renewable energy devices in inshore waters which might affect cetaceans is the responsibility Marine Scotland (SNH, 2014a). Marine Scotland may seek advice from SNH and/or JNCC.

22. Licences can only be issued for specific purposes (SNH, 2014b). Under Regulation 44(2) these are as follows:

- Science, research or education,
- Ringing, marking or examining rings or marks on wild animals,
- Conserving wild birds, wild animals or wild plants or introducing them to particular areas,
- Conserving natural habitats,
- Protecting zoological or botanical collections,
- 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,
- Preventing the spread of disease,
- Preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber, or any other form of property or to fisheries.

1.1.3 Licensing process

23. Marine Scotland have issued guidance on the EPS licensing process for areas both within and outwith 12 nm (Figure 1-1) (Marine Scotland, 2012b; Marine Scotland, 2014).

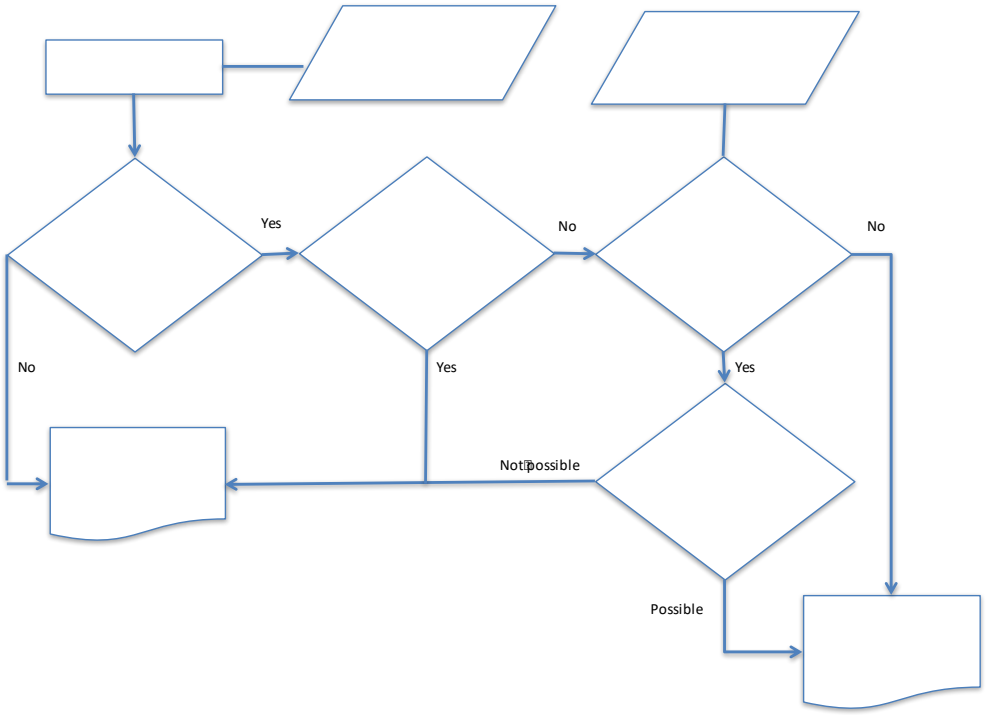

Figure 1-1: EPS Licensing Process (Marine Scotland, 2012b)

24. Information required to support any possible future EPS applications is presented in detail within the EIA in Chapter 4: Project description and Chapter 8: Marine Mammals.

25. Possible Project related activities that have the potential to cause a level of disturbance which may require an EPS licence have been identified as:

- Pile-driving;
- Geophysical surveys.

26. Other activities associated with the proposed Project that produce sound, e.g. vessels and drilling are not predicted to cause noise at the levels of disturbance which would require an EPS licence application.

1.1.4 Estimated Potential Impacts

1.1.1.1 Pile-driving

27. Pile-driving will be required for the installation of turbines, offshore substations and the meteorological 'met' mast during the construction phase. It will take place either as a single operation in the 'Pile Driving' scenario during which pile-driving will last for approximately 21 hrs for up to six piles, or in two stages in the 'Pile Drilling' scenario during which activities including pile driving will last approximately 62 hrs and 180 hrs. The duration of the pile-driving may vary depending on the duration of any ramp-up and the energy force used. The seabed conditions may also either lengthen or shorten the duration of any pile-driving activity. Further details on the construction activities can be found in Chapter 4: Project Description in the EIA. Pile driving may be undertaken using a single vessel at one location or concurrently at either the same location or at different locations within the Wind Farm Area.

28. The potential disturbance impacts arising from pile-driving are assessed in Chapter 8: Marine Mammals and Appendix 8:1 Noise modelling. Table 1:1 presents a summary of the number of

individual EPS predicted to be at risk of the onset of PTS or be disturbed from the pile-driving from the proposed Project.

Table 1:1: Estimated number of individuals predicted to be affected by pile-driving.

Species	Single pile driving		Concurrent pile driving	
	PTS	Disturbed	PTS	Disturbed
Harbour porpoise	77	1,177	144	1,880
Bottlenose dolphin	0	2	0	2
white-beaked dolphin	<1	30	<1	50
Minke whale	14	77	23	123

Densities from which the estimated number of individuals predicted to be **affected have been** obtained from the SCANS III Block R. However, for **white-beaked dolphin a regional specific density** has been used **as this is considered to be** a **more appropriate** density **than** those predicted by SCANS III **(Hammond *et al*. 2017; King and Sparling, 2012).**

29. In order to determine the potential population level effects from noise on marine mammals, population modelling has been undertaken using the interim Population Consequences of Disturbance (iPCoD) model (See EIA Appendix 8.2: iPCoD population modelling).

30. The model allows the population consequences of disturbance to be predicted for three European Protected Species: Harbour porpoise, bottlenose dolphin and minke whale. It is not possible to undertake population modelling for white-beaked dolphin using iPCoD.

31. Based on the results from the population modelling the median ratios of impacted and unimpacted growth rates and population sizes following 15 months of single pile driving or nine months of concurrent pile driving are presented in Table 1:2. The estimated Management Unit population sizes of EPS following pile driving after 24 years are presented in Table 1:3.

Table 1:2: Estimated median ratios of impacted and unimpacted growth rate and population size after 24 years following 15 months of single pile driving or nine months of concurrent pile driving

Year	Harbour porpoise		Bottlenose dolphin		Minke whale	
	Single Pile driving	Concurrent pile driving	Single Pile driving	Concurrent pile driving	Single Pile driving	Concurrent pile driving
Median of the ratio of impacted to unimpacted annual growth rate	0.998	0.998	1.003	1.002	0.993	0.993
Median of the ratio of impacted to unimpacted population size	0.959	0.954	1.063	1.058	0.839	0.845

Table 1:3: Estimated median changes in the populations of EPS after 24 years with or without impacts from pile driving

	Harbour porpoise		Bottlenose dolphin		Minke whale	
	Undisturbed	Disturbed	Undisturbed	Disturbed	Undisturbed	Disturbed
Single pile driving	296,184	283,733	288	306	11,523	9,814
Concurrent pile driving	299,137	285,131	278	294	11,432	9,767

1.1.1.2 Geophysical Surveys

32. An assessment of the predicted impacts arising from geophysical surveys is presented in Chapter 8: Marine Mammals, of the EIA. It is predicted that cetaceans will not be able to detect sound from multi-beam echo sounders or sidescan sonar but will be able to detect sound from sub-bottom profilers and therefore cetaceans have the potential to be disturbed in the event geophysical surveys using sub-bottom profilers are undertaken within the Wind Farm Area.

33. The level of disturbance and number of individuals that may be impacted will depend on the equipment used, their range of impact and the species' sensitivities. The reported sound source levels from sub-bottom profilers range from between 196 and 225 dB re 1 µPa @ 1 m and at a broad range of frequencies ranging from between 0.5 and 300 kHz (King, 2013; Danson, 2005). Therefore, it is predicted that there is potential for disturbance to cetaceans to occur out to some tens of kilometres.

1.1.1.3 Cumulative impacts

34. There is potential for cumulative impacts to arise from other activities occurring within the ranges of the EPS.

35. It is recognised that the ranges of the EPS being considered are extensive and cover significant areas of the North Sea, across which there are a significant number of activities that could cause cumulative impacts that may have a detrimental impact on the Favourable Conservation Status of EPS populations. It has previously been advised that a robust framework for cumulative impact assessment and EPS licensing across UK waters as a whole should be developed by the UK regulators (SNH and JNCC, 2014). Currently, there is no such framework in place to support cumulative impact assessments across the entire range of EPS and therefore such an assessment has not been possible.

36. Cumulative impacts have been considered for proposed offshore wind farm developments in the Firths of Forth and Tay and the Moray Firth. These have been selected on the basis that it is likely that these developments will also require EPS licences. This approach is in line with the advice from statutory advisors on cumulative impacts to marine mammals (SNH and JNCC, 2014).

37. The proposed developments considered are:

- Inch Cape Offshore Wind Farm;
- Seagreen Phase 1 Alpha;
- Seagreen Phase 1 Bravo;
- Moray East Offshore Wind Farm;
- Moray West Offshore Wind Farm;
- Beatrice Offshore Wind Farm;
- Aberdeen Harbour Expansion.

38. All developments have submitted or will be submitting applications to Marine Scotland within which predicted impacts on EPS are assessed.

39. The cumulative impacts on EPS have been assessed within the EIA Chapter 8: marine mammals and in the HRA Report.

40. Table 1:4 presents a summary of the number of individual EPS predicted to be at risk of the onset of PTS or be disturbed from cumulative sequential pile driving across 11 years.

Table 1:4: Estimated number of individuals predicted to be affected by cumulative sequential pile-driving over a period of 11 years

Species	Cumulative sequential pile driving	
	PTS	Disturbed [1]
Harbour porpoise	359	3,191
Bottlenose dolphin	<8	19
white-beaked dolphin	<5	50
Minke whale	128	177
1 Note, the estimated number of individuals disturbed is the maximum number predicted to be **impacted at any one time and not the total number over a period of 11 years**		

41. The predicted differences in median ratios of impacted and unimpacted growth rates and populations after 24 years due to sequential pile driving being undertaken over 11 years are presented in Table 1:5 and the estimated median impacted and unimpacted Management Unit population sizes after 24 years are presented in Table 1:6.

Table 1:5: Estimated median ratios of impacted and unimpacted growth rate and population size after 24 years following cumulative sequential pile driving over a period of 11 years

	Harbour porpoise	Bottlenose dolphin	Minke whale
Median of the ratio of impacted to unimpacted annual growth rate	0.996	0.973	0.991
Median of the ratio of impacted to unimpacted population size	0.904	0.535	0.802

Table 1:6: Estimated median changes in the populations of EPS after 24 years with or without cumulative impacts from sequential pile driving over a period of 11 years

	Harbour porpoise		Bottlenose dolphin		Minke whale	
	Undisturbed	Disturbed	Undisturbed	Disturbed	Undisturbed	Disturbed
Cumulative sequential pile driving	294,888	266,251	256	134	11,500	9,319

1.1.5 Favourable Conservation Status

42. Favourable Conservation Status (FCS) is defined under Article 1 (i) of the Habitats Directive as follows:

Conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within its natural range.

43. The conservation status will be taken as 'favourable' when:

- Population dynamics data on the species concerned indicates that it is maintaining itself on a long-term basis as a viable component of its natural habitats,
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future,
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis.

44. Table 1:7 summarises the conservation status of cetaceans in the area of potential disturbance.

Table 1:7: Favourable Conservation Status (FCS) and regional population of cetaceans relevant to this application

Species	FCS Assessment	Management Unit Population	SCANS III Management Unit Population
Harbour porpoise	Favourable	227,298	333,808
Bottlenose dolphin	Favourable	195	195
White-beaked dolphin	Favourable	15,895	35,908
Orca	Unknown	unknown	unknown
Minke whale	Favourable	23,528	11,819

45. Management Unit population are from IAMMWG (2015) and the latest adjusted populations for each of the management units are presented. These figures are derived improved population estimates from the latest SCANS III surveys (JNCC 2017).

46. Bottlenose dolphin population is based on the Moray Firth to Tay east coast population from Cheney *et al*. (2012). The FCS is from JNCC (2010) and JNCC (2013).

1.1.6 EPS Assessment

47. Under Regulation 53(9) of the Habitats Regulations licences can only be issued where the proposed activity meets certain criteria. For the purposes of any likely application they are:

- There is a licensable purpose;
- There is no satisfactory alternative; and
- The action authorised will not be detrimental to the maintenance of the population of the species concerned at favourable conservation status in their natural range.

1.1.6.1 Test 1: Licensable Purpose

Imperative Reasons of Overriding Public Interest (IROPI)

48. The Scottish Government can only issue licenses under Regulation 44(2) of the Regulations (as amended) for specific purposes. These purposes include:

- 44(2)(e) 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; (Marine Scotland, 2012a)

49. There is guidance from the EU (EU, 2010), Scottish Government (Scottish Executive, 2000) and SNH (SNH, 2011) as to what may be considered when identifying Imperative Reasons of Overriding Public Interest (IROPI). It is clear from the guidance that only public interests, irrespective of whether they

are promoted either by public or private bodies, can be balanced against the conservation aims of the Directive. Such public interests may include human health, public safety, beneficial consequences of primary importance for the environment, and other interests of a social (e.g. employment) or economic nature.

50. The public interest must be overriding and not every kind of public interest of a social or economic nature is sufficient. Public interest can only be overriding if it is a long-term interest; short term economic interests or other interests which would only yield short-term benefits are not sufficient. Overriding interests such as long-term fundamental social interests may be properly identified beforehand by published policies, and land-use and other plans (EU, 2010).

51. IROPI, including those of a social and economic nature, refer to situations where plans or projects prove to be indispensable:

- within the framework of actions or policies aiming to protect fundamental values for the citizens' life (health, safety, environment);
- within the framework of fundamental policies for the State and the Society;
- within the framework of carrying out activities of economic or social nature, fulfilling specific obligations of public service.

52. In considering IROPI, Scottish Government and SNH (SNH, 2011) consider a number of objectives or principles relevant to the IROPI assessment:

- the interests of national security and defence;
- where there is clear and demonstrable direct environmental benefit on a national or international scale;
- where it is shown that there is a vital contribution to strategic economic development or regeneration;
- where failure to proceed would have unacceptable social and/or economic consequences;
- where the project is of national importance, or, possibly, regional importance.

53. When considering EPS licences under IROPI, SNH takes into account whether an activity or development is required to meet, or contribute to meeting a specific need, such as:

- maintaining the health, safety, education or environment (sustainable development, renewable or green energy, green transport) of Scotland's people;
- complying with national planning policies;
- supporting economic or social development (nationally important infrastructure development projects, employment, regeneration, mineral extraction, housing etc.).

54. The Project meets the criteria for the development to be considered as one of IROPI.

55. The development of the Project demonstrates a direct environmental benefit on a national and international scale and complies with international and national environmental policies. Furthermore, the life-span of the Project is predicted to be up to a 50 year period and therefore a long-term development that will contribute to ensuring the security of energy supply, with long-term environmental benefits. It is not a development for short-term economic interests.

56. The Project will have a direct national and international environmental benefit by significantly reducing carbon emissions to the atmosphere compared to other sources of non-renewable energy generation. By replacing non-renewable energy generation, e.g. coal generation, the development of the Project will reduce annual CO_2 emissions. Over the operational period of the wind turbines, the Project will displace CO_2e from other energy sources by up to 12.61 million tonnes coal equivalent.

57. Recognising the importance of reducing carbon emissions, the EU, UK and Scottish Government have all committed to reduce emissions and increase the use of renewable energy:

- In 2009 the EU introduced Directive 2009/28/EC on the *Promotion of the use of energy from renewable sources*, which set renewable energy targets for each member state. The Directive imposed on the UK a mandatory national target of deriving 15% of gross final energy consumption from renewable sources by 2020.
- The Climate Change (Scotland) Act 2009, which sets additional targets for emissions reductions in Scotland than the Climate Change Act: 80% reduction by 2050, with an additional interim target of 42% by 2020;
- The Climate Change Act 2008, which commits the UK to a net reduction in greenhouse gas emissions of 80% by 2050 and 34% by 2020.

58. The development complies with national policies and plans including:

- The National Renewable Energy Action Plan for the UK produced under Article 4 of the Renewable Energy Directive;
- The UK National Policy Statements (NPSs) on Energy, produced under Part 2 of the Planning Act 2008, which decision makers must have regard to when deciding an application for nationally significant infrastructure projects consented under that Act. As energy policy is a reserved matter for UK ministers, the Energy NPSs may be a relevant consideration in energy infrastructure decisions in Scotland. Of the 12 NPSs, EN-1 (overarching energy) sets out the policy for the delivery of major energy infrastructure and reflects the UK Low Carbon Transition Plan, and EN-3 (Renewable Energy) supports the development of renewable energy and offshore wind farms in particular
- The National Planning Framework 2 (NPF2), produced under the Planning etc. (Scotland) Act 2006, sets out a strategy for Scotland's development up to 2030. One of the main elements of the strategy is to "*realise the potential of Scotland's renewable energy resources and facilitate the generation of power and heat from all clean, low carbon sources"* (Scottish Government, 2009);
- The 2020 Routemap for Renewable Energy in Scotland, which sets further targets of renewable sources to meet the equivalent of 100% of Scotland's gross annual electricity demand by 2020 (Scottish Government, 2011);
- Scotland's Low Carbon Economic Strategy (LCES) aims to secure economic growth and includes an approach to guiding Scotland into a low carbon economy. The strategy focuses on Scotland's targets for reducing GHG emissions, and recognises that, *"By 2030 almost all of our electricity will have to come from low carbon technologies such as renewables and fossil fuelled plants fitted with carbon capture and storage technology"* (The Scottish Government, 2010);
- A sector specific marine plan, 'Blue Seas - Green Energy: A Sectoral Marine Plan for Offshore Wind in Scottish Territorial Waters' ('the Plan') (Marine Scotland, 2011) was published in March 2011 (including a SEA, HRA and an Economic Impact Assessment), and confirmed that six sites for offshore wind developments were suitable for development. Within the Plan the Neart na Gaoithe site was shortlisted as one of these sites.

59. The development of the Project identifies a direct environmental benefit and complies with both international and national policies and plans and is therefore a project of Imperative Overriding Public Interest.

1.1.6.2 Test 2: No satisfactory alternative

Existing Consent

60. It is important to note that the primary alternative to the Project is the Originally Consented Project; if the Application is not successful NnGOWL will progress the originally Consented Project. However, if

consented within the required timeframe, this Application will enable NnGOWL to take advantage of new developments in offshore wind technology, allowing the same maximum generation capacity as the Originally Consent Project but using fewer turbines. This will lead to a reduction in the potential environmental impacts, when compared to the Originally Consented Project.

61. The Consents allow for up to 75 turbines, whereas the Project will be constructed with a maximum of 54 turbines. The reduction in turbine numbers (compared with the Consents) would also result in a need for fewer foundations, plus a shorter construction period and less time installing driven piles. The environmental effects of the Project are therefore less than the Original Consented Project.

Site Selection

62. In May 2008, TCE invited expressions of interest from those companies wishing to be considered as potential developers of offshore wind farms within STW. Prior to submitting a bid for the Project, Mainstream carried out a series of desk-based assessments to determine those sites in STW with the potential to be taken from development sites to fully consented and constructed wind farms.

63. The following initial process was applied during the site selection process:

- Areas within STW of less than 60 metres (m) water depth were identified; and
- Areas were refined to those that were within an economic distance of major grid connection points and suitable ports but that avoided areas with excessive wave heights.

64. This initial process identified three large areas for further assessment:

- The outer Firth of Clyde;
- The outer Solway Firth; and
- The area to the east of the Firths of Forth and Tay.

65. These three areas were then subject to detailed environmental constraints analysis, which identified that the east coast sites were the least constrained (the outer Firth of Clyde having significant ornithology, and water depth challenges, and both west coast zones having shipping and Ministry of Defence (MOD) issues, as well as possible limitations with the geology and grid connection opportunities).

66. The east coast sites were subsequently investigated in greater detail to select the preferred sites for development. Having assessed bird, marine mammals and navigation data, further technical appraisals of six potential east coast sites were undertaken in relation to:

- wind resource and energy yield;
- environmental (incorporating ornithology and marine mammals and landscape/seascape and visual impact);
- grid; and
- geotechnical conditions and foundation design.

67. These assessments led to the selection of the Development Area.

68. In addition to these assessments, consultation was undertaken at that time with the Scottish Government, Maritime and Coastguard Agency (MCA), Chamber of Shipping, RSPB, SNH, Fisheries Research Services (FRS) (now Marine Scotland), Scottish Environmental Protection Agency (SEPA), Scottish Fishermen's Federation (SFF), Montrose Port, MOD, British Airports Authority (BAA), Civil Aviation Authority (CAA), Visit Scotland and Fife Council.

69. Following this process, the NnG site was selected as the preferred site and exclusive rights to develop the site were granted by TCE.

70. At a national level, a total of ten sites within STW were identified by different developers, with exclusive development rights granted by TCE. The sites were subject to a Strategic Environmental Assessment (SEA) by the Scottish Government, as part of the development of a draft national plan for offshore wind within STW (Scottish Government, 2010). The SEA ensured that environmental considerations were taken into account in selecting the sites to be taken forward to the development phase. A number of sites were dropped and those remaining were included in the Scottish Government's strategic plan 'Blue seas – Green Energy: A Sectoral Marine Plan for Offshore Wind Energy in Scottish Territorial Waters' (Scottish Government, 2011).

71. Of the original ten sites within STW only three remain. The other seven have been dropped; either due to environmental concerns identified through the SEA, or for technical feasibility reasons.

Foundation Design

72. Both site and market conditions have an effect on the design selection of the wind turbine and OSP foundations. Water depth and underlying geology significantly influence the selection of specific foundation types. Economics and long-term maintenance requirements are also a powerful driver. The combination of a harsh and challenging environment and the relative difficulties associated with arranging access increases the cost of a single foundation relative to the overall cost of the wind farm and can have a significant effect on the overall financial viability of the development.

73. The physical conditions at the Wind Farm Area mean that monopile and tension leg platform foundations have been discounted since the water is too deep and too shallow respectively for the use of these solutions. Insufficient sediment depth over a large part of the site means that suction caisson foundations have also been ruled out on technical grounds.

74. Table 1:8 below summarises those foundation options, which are not considered feasible for the Project.

Table 1:8: Discounted foundation types

Foundation type	Reason for unsuitability
Monopile	This type of structure is best suited to water depths ranging between 0 m to 30m. Depths on the site are between 45 – 55 m. XL monopiles could, in theory, be installed in up to 50m water depths, but monopiles of the size that would be needed are not yet commercially available. In any event the shallow bedrock at the site would render installation very challenging
Tension leg platform	Water depth under 60 m is considered too shallow.
Suction caisson	Insufficient sediment depth across the site.
Gravity base	Insufficient number of foundations needed to make it an economically viable solution.
Floating	Floating foundations have not been deployed on a major commercial scale to date although a number of demonstrator sites have utilised or are in the process of deploying floating foundation solutions. It is not anticipated that these will be commercially available for installation by the time construction commences.

75. Steel jackets with pile foundations are, therefore, considered to be the most feasible option for the Project on both a technical and economic basis.

76. The updated Project design to which this application relates enables NnGOWL to take advantage of new developments in offshore wind technology, allowing the same maximum generation capacity but using fewer turbines. The Project will be constructed with a maximum of 54 turbines. The reduction in turbine numbers results in a need for fewer foundations, plus a shorter construction period and less time installing driven piles. The environmental effects of the Project are therefore reduced overall.

Geophysical Surveys

77. A variety of geophysical surveys may be required in order to map the seabed, measure water depth or characterising layers of sediment or rock below the seabed. They are essential tools when undertaking any offshore development work and projects cannot be developed without some geophysical work being undertaken. Although there may be different types of equipment that can be used, this is often constrained by the specific purpose the geophysical survey is being undertaken and the use of alternative may not be effective. There are no alternative options to the use of the geophysical equipment.

1.1.6.3 Test 3: That the action authorised will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range

78. Regulation 44(3)(b) states that a licence cannot be issued unless the 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" (SNH and JNCC, 2014).

79. This section considers whether the proposed activities that could require licensing will be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range. The information provided is based on the assessments presented in Chapter 8: Marine Mammals of the EIA.

80. Five EPS have been recorded during three years of site specific baseline surveys. The five species are:

- Harbour porpoise;
- Bottlenose dolphin;
- White-beaked dolphin;
- Orca; and
- Minke whale.

Harbour porpoise Favourable Conservation Status

81. The North Sea Management Unit population for harbour porpoise is estimated to be 333,808 individuals (JNCC, 2017).

82. Harbour porpoise use acoustic senses to detect prey, communicate and avoid predators. Therefore, the potential impacts on hearing could be a reduction in an individual's ability to feed or communicate. Behavioural changes will vary between individuals but may include masking effects, reduced vocalisation or reduced foraging behaviour. Evidence suggests that hearing impacts on porpoise are of short duration and have been reported to be less than two hours (Kastelein *et al*. 2010) and that harbour porpoise will swim away from sound sources that could cause an effect and return to the area once the sound source ceases (e.g. Tougaard *et al.* 2006; Diederichs *et al*. 2008; GWFL, 2011; Thompson *et al.* 2010).

83. Harbour porpoise have an extensive range and the Management Unit area for this species is the whole of the North Sea. Any displaced porpoises will be able to relocate elsewhere and there will be a sufficiently large habitat to maintain the population on a long-term basis. Their natural range will not be reduced or likely to be reduced in the foreseeable future from the potential activities arising from the Project.

84. Based on the worst-case scenario of concurrent pile driving occurring, the physical impact on 144 harbour porpoise and displacement of up to 1,888 is approximately 0.56% of the North Sea Management Unit harbour porpoise population. Population modelling indicates that after 24 years median ratios of impacted and unimpacted growth rates will be 0.998 and population sizes of 0.954. A counterfactual of 99.8% and 95.4% respectively. The difference in the predicted populations with or without impacts after 24 years is 5.6% (Table 1:3).

85. Although the population modelling indicates that there could be an effect on the population of harbour porpoises the estimated level of impact is not predicted to be detrimental to the maintenance of the population of harbour porpoise at a favourable conservation status within their natural range.

86. Cumulatively, modelling suggests that the impacts from sequential pile driving over 11 years may cause a physical impact on a total of 359 harbour porpoise should all the developments go ahead. At most, 3,191 harbour porpoise may be disturbed at any one time (Table 1:4). The potential difference in the harbour porpoise population after 24 years of 9.6% (Table 1:6). If this were to occur this could have an effect on the FCS of harbour porpoise. However, the assessment is considered to be highly precautionary and the impacts presented are unrealistically high, as described in Section 8.7.2 of this EIA Report. The assessment is based on a number of precautionary assumptions including the potential for pile driving to occur continuously over a period of 11 years. This is highly unlikely to occur and impacts on harbour porpoises from pile driving across wind farm projects is likely to be intermittent; allowing possibly impacted populations to recover. It is therefore concluded that the impacted harbour porpoise population in 24 years will not be significantly different from an unimpacted population and that cumulative sequential pile driving will not affect the FCS of harbour porpoise.

Bottlenose dolphin Favourable Conservation Status

87. The Coastal East Scotland bottlenose dolphin population is estimated to be 195 (95% HDPI 162 – 253) individuals and they regularly occur in waters between the Moray Firth and Fife Ness.

88. Bottlenose dolphins occur widely in relatively shallow waters of less than 20 m from the Moray Firth to north-east England. Although there may be some displacement arising from activities relating to the Project, the extent of any impacts arising from the Project will be relatively localised. Any displaced dolphins will be able to relocate elsewhere and there will be a sufficiently large habitat to maintain the population on a long-term basis. Their natural range will not be reduced or likely to be reduced in the foreseeable future from the potential activities arising from the Project.

89. No bottlenose dolphins are predicted to be injured or suffer the onset of PTS from the proposed Project and an estimated two bottlenose dolphins may be disturbed. This is approximately 1% of the Management Unit population. Population modelling indicates that there will be no negative impact on the population of bottlenose dolphins from the proposed Project (Table 1:3).

90. Cumulatively, the impacts from sequential pile driving over 11 years may cause a physical impact on a total of no more than eight bottlenose dolphin should all the developments go ahead. At most 19 bottlenose dolphin may be disturbed at any one time (Table 1:4). Cumulatively, modelling suggests that the impacts from sequential pile driving over 11 years may cause a reduction in the current population of 52.3% (Table 1:5). This equates to a potential difference in the future population of 122 individuals (Table 1:6). This level of effect would cause a change in the favourable conservation status of this species. However, due to the highly precautionary nature of the modelling and the cumulative construction scenario, as discussed in Section 8.7.2 of this EIA Report, it is not envisaged that this level of impact would occur.

91. The modelling indicates that the proposed Project will not have a population level effect on bottlenose dolphins and therefore would not contribute to any potential and unlikely cumulative impacts predicted by the modelling. Consequently, the Project will not affect the favourable conservation status of bottlenose dolphin within their natural range.

White-beaked dolphin Favourable Conservation Status

92. The white-beaked dolphin CGNS Management Unit population is 35,908 (JNCC, 2017).

93. White-beaked dolphins occur widely across the North Sea and any individuals that may be displaced will be able to relocate elsewhere within areas beyond the zone of effect and into areas already currently utilised by white-beaked dolphins; therefore, areas where suitable habitat already exists (Anderwald and Evans 2010; Reid *et al*. 2003). Potential Project related activities will not cause a

reduction in their range and there will be sufficiently large habitat to maintain the population in the long term.

94. The results from the modelling undertaken estimate that worst-case scenario of concurrent pile driving up to 50 white-beaked dolphins may be disturbed by the proposed pile-driving activities. This is equivalent to 0.14% of the Management Unit population. The potential for cumulative impacts indicates that no more than five white-beaked dolphins could suffer the onset of PTS across six years of pile driving within the Firths of Forth and Tay area. At most 50 white-beaked dolphins may be disturbed from any single development (Table 1:4).

95. Population modelling is not able to be undertaken on white-beaked dolphin as the current version of iPCoD does not have the biological parameters required to input into the model. However, the relatively small number of white-beaked dolphins estimated to be impacted during construction activities and the localised extent that impacts are predicted to occur will not be detrimental to the maintenance of the white-beaked dolphin population at a favourable conservation status within their natural range.

Minke whale Favourable Conservation Status

96. The minke whale CGNS Management Unit population is 11,819 individuals.

97. Minke whales occur widely across UK waters, including the North Sea. Any individuals that may be displaced will be able to relocate elsewhere within areas beyond the zone of effect and into areas already currently utilised by minke whales; therefore, areas where suitable habitat already exists. Potential Project-related activities will not cause a reduction in their range and there will be sufficiently large habitat to maintain the population in the long term.

98. A total of 23 minke whales are estimated to be at risk of the onset of PTS should concurrent pile driving occur and a further 123 may be disturbed. This is equivalent to 1.0% of the management unit population. Population modelling indicates that after 24 years, median ratios of impacted and unimpacted growth rates will be 0.993 and population sizes of 0.845. A counterfactual of 99.3% and 84.5% respectively. The difference in the predicted populations with or without impacts after 24 years is estimated to be 14.5% (Table 1:2 and Table 1:3).

99. Cumulatively, the impacts from sequential pile driving over 11 years may cause a physical impact on a total of 128 minke whales should all the developments go ahead. At most 177 minke whale may be disturbed at any one time (Table 1:4). According to modelling, the impacts from sequential pile driving over 11 years may cause a difference in the population after 24 years of 19% (Table 1:6). If this were to occur this could have an effect on the FCS of minke whale. However, the assessment is based on a number of precautionary assumptions, including the assumption that minke whales are present all year round. This is known not to be the case and minke whales are not present in the area during the winter period. This would reduce the length of time minke whales are exposed to noise from pile driving and could therefore reduce the impacts predicted by the population model. The level of impact predicted by the population model is highly unlikely to occur. As noted above, the cumulative construction programme is a worst case scenario which is very unlikely to occur. Section 8.7.2 of this EIA Report sets out the precautionary nature of the assessment in greater detail.

100. Although the impacts on minke whale from displacement are unknown, displaced minke whales are able to relocate elsewhere. Little is known about movements of minke whale but there are significant inter-annual variations in areas of northeast Scotland with numbers present dependent on the availability of suitable prey (Baumgartner, 2008; Robinson *et al.* 2009). Minke whale distribution has been shown to overlap suitable habitats for sandeels, herring and sprats (Macleod *et al.* 2004; Robinson *et al.* 2009), which are their main prey items in Scottish waters (Pierce *et al*. 2004). The area is not of significant importance for these species of fish and therefore not an area likely to be of significant importance for minke whale. Minke whales are opportunistic feeders (Baumgartner, 2008) and should they be displaced they can relocate to other suitable foraging areas.

101. The potential reduction in the population predicted by the modelling of 19%, would if it were to occur be detrimental to the maintenance of the population of minke whales at a favourable conservation status within their natural range. This would be considered further in the event that an EPS licence is required.

Orca Favourable Conservation Status

102. With only a single sighting from three years of boat based surveys, orca are rare in the proposed development area. There is a very low risk of any impact on orcas from the Project and the construction activities will not be detrimental to the maintenance of the population at a favourable conservation status within their natural range.

1.1.7 Mitigation

103. To reduce the risk of a potential impact, industry best practice mitigation measures, agreed with and set out in detail in the Environmental Management Plan, will be in place prior to, and during, any piling activities. Mitigation measures may include:

- Minimising piling as far as practicable.
- Installation of piles will be carried out using the lowest amount of energy as practicably possible, thus reducing sound input into the marine environment.
- The use of 'soft start' procedures at commencement of piling to provide opportunity for EPS to move away from piling activities.
- The potential use of marine mammal observers or acoustic monitoring devices to detect EPS prior to the commencement of any piling activities
- The use of Passive Acoustic Monitoring devices during construction may reduce the risk of EPS present in the near vicinity of the piling operations

104. A number of conditions were attached to the Original Consents to manage the environmental risk associated with the Originally Consented Project. NnGOWL anticipates that any future consents issued to the Project may incorporate similar conditions to manage the risk to marine mammals commensurate with the Project design envelope where it remains necessary to do so.

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