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Appendix 17.3: In Combination Climate Change Impact (ICCI) Assessment

Array EIA Report

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1. INTRODUCTION

1. This technical report considers the effects of the Array in the context of anticipated future climate conditions on environmental receptors. These predicted effects on future climate change are the climate risks described in Table 3.2 of the Climate Change Risk Assessment (CCRA) Technical Report (volume 3, appendix 17.2) (and Table 2.1 below) and are considered relative to each assessed environmental receptor within the Array Environmental Impact Assessment (EIA) Report (volume 2, chapters 7 to 20). This information has then allowed for a brief assessment to be carried out on the impact of the Array to the perceived impact of future climate change on each environmental receptor. This assessment has been undertaken in accordance with the Institute of Environmental Management and Assessment (IEMA) EIA Guide to: Climate Change Resilience and Adaptation (IEMA, 2020).
2. Table 2.1 in this appendix presents the receptors, the potential impacts associated with the future climate and whether the receptors are considered sensitive, and therefore assessed within this appendix. Therefore, Table 2.1 considers the extent to which anticipated future climate change might exacerbate the effects of the Array on an identified environmental receptor (IEMA, 2020).
3. A summary assessment for each receptor considered sensitive to future climate change is included in Table 3.1 which sets out:
 - climate risks as described in Table 3.2 of the Climate Change Risk Assessment (CCRA) Technical Report (volume 3, appendix 17.2) for the assessment of the Array for the climatic effects study area defined in section 1.2 of the same technical report;
 - receptors that are likely to be sensitive to the projected climate risks during the construction, operation and maintenance and decommissioning phases of the Array, as screened in Table 2.1, based on professional judgement and/or literature reviews as noted in volume 2, chapters 7 to 19. The receptors are those within the study area defined for each EIA topic in volume 2, chapters 7 to 19;
 - a qualitative description of the identified potential in combination climate change impacts (ICCI);
 - statement on whether the ICCI is likely to be significant based on expert judgement, i.e. whether the predicted climate change risk exacerbates the effects on an environmental receptor to such a degree that effects identified in topic-specific assessment as not significant are now considered to be potentially significant, or effects identified in the topic-specific assessment as significant are found to have an exacerbated significance; and
 - an explanation of the approach to mitigation measures for predicted likely significant ICCI.

2. SCREENING

4. Note: sensitivity has not been determined in general terms, but with reference to the baseline conditions of relevance to the Array baseline and the impacts assessed in the topic chapters.

Table 2.1: Screening of EIA Receptor Groups Likely to be Sensitive to Projected Future Climate Risks¹

Reference Climate Risk ²		Receptor Groups Likely to be Sensitive to Climate Hazards (per Array EIA Report)											
		Physical Processes	Benthic Subtidal Ecology	Fish and Shellfish Ecology	Marine Mammals	Offshore Ornithology	Commercial Fisheries	Shipping and Navigation	Aviation, Military and Communications	Infrastructure and Other Users	Major Accidents and Disasters	Socio-Economics	Marine Archaeology
1	Increases in average and extreme air temperatures, both in winter and summer (Increased air temp)		a	a	a			b					a
2	Increases in sea surface temperatures and ocean acidification				Indirect c	Indirect c	Indirect c	b					
3	Changes to rainfall patterns, leading to increased annual precipitation						b	b					
4	Increased frequency and intensity of extreme weather i.e. storms			Indirect c	Indirect c								
5	Increased wind speeds and changes to wind patterns			Indirect c	Indirect c		b	b					
6	Increase in mean sea level												
7	Increased wave height												
8	Changes in the tidal range												

¹ Green: receptor is not likely sensitive to impact pathway identified (i.e. screened out); orange: receptor is likely to be sensitive to the impact pathway identified (i.e. screened in).

² As identified in the CCRA Technical Report (volume 3, appendix 17.2):

- a) The sensitivity of this receptor group to indirect effects resulting from increased sea temperatures is captured under climate risk 2;
- b) The sensitivity of this receptor group to indirect effects resulting from increased occurrence of adverse weather is captured under climate risk 4;
- c) Related to secondary effects due to impacts on habitats or prey;
- d) As no ICCI was identified for physical processes receptors (see Table 3.1), the potential for secondary impacts on this receptor group have been screened out of the assessment.

3. ICCI ASSESSMENT

Table 3.1: Consideration of ICCIs

Sensitive Receptor Group	Relevant Climate Risk(s) ³	Phase with Potential for ICCI	Potential Impact(s) Arising from the Array	Potential ICCI Identified	Discussion	ICCI Conclusion	Mitigation Measures
Physical Processes	1, 2, 3, 4, 5, 6, 7 and 8	Operation and maintenance	Impacts to seasonal stratification due to the presence of infrastructure and effects on the wind field, wave climate and tidal regime.	Potential ICCI from increased air temperatures (and possibly rainfall events) and wind patterns that increase the extent and frequency of stratification, where differences in temperature (and chemical properties) between ocean layers cause them to diverge.	The impact of the Array on the wind field, wave climate and tidal regime is considered in section 7.11 of the physical processes chapter (volume 2, chapter 7). Physical processes receptors were considered to have low to negligible sensitivity. The Array is not expected to change the wave or tidal regime and to have only a very limited effect on stratification and mixing through the water column. These highly localised effects of minor adverse significance are not likely to be increased or combine to result in an effect of greater significance. There is very limited potential for significant in combination effects. This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 7.10 of the physical processes chapter (volume 2, chapter 7).
Physical Processes	1, 2, 4, 6, 7 and 8	Operation and maintenance	Impacts on the sediment transport regime due to increased Suspended Sediment Concentrations (SSCs) and associated deposition from mooring lines or cables making contact with and moving on the seabed.	Potential ICCI from increased storm intensity and/or stronger waves and/or rising sea-levels that compound the impacts of the influence of the Array and resultant impacts.	Changes to SSCs and associated deposition and sediment transport are considered in section 7.11 of the physical processes chapter (volume 2, chapter 7). The magnitude of the increase in SSCs and associated deposition is anticipated to be low (of negligible adverse significance) and occur only during extreme storm conditions. An increase in SSCs can be expected with the projected increased frequency and intensity of extreme weather i.e. storms. As the effect is temporally isolated (as any increase in SSCs would occur intermittently for short durations of the tidal cycle, before returning to ambient values) there is very limited potential for significant in combination effects. This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 7.10 of the physical processes chapter (volume 2, chapter 7).
Benthic Subtidal Ecology	2	All phases	Temporary habitat loss and disturbance due to activities in all phases that may result in habitat structure changes, abrasion/disturbance at the seabed, penetration and/or disturbance of the substratum subsurface and/or smothering and siltation rate changes.	Potential ICCI from warming trends and acidification that either directly impact benthic receptors and/or alter living environments. This could affect the diversity and composition of benthic communities in combination with impacts from temporary habitat loss and disturbance.	Impacts on benthic subtidal ecology relating to temporary habitat loss and disturbance are considered in section 8.11 of the benthic subtidal ecology chapter (volume 2, chapter 8). For all phases, the magnitude of impacts for all receptors (including all Important Ecological Features (IEFs)) is predicated to be low, resulting in effects of minor or negligible adverse significance. Offshore, deeper-water communities are expected to have greater resilience to warming trends, than shallow subtidal communities. During construction, there is considered to be limited potential for ICCI, given the incremental onset of warming trends and medium term duration (up to eight years) of predicted impacts that are intermittent, and of high reversibility. During operation and maintenance, given the low footprint of the Array (likely to represent up to 1.47 km ² of temporary habitat loss and disturbance per year with rapid recovery) would not be amount in combination with incremental or acute temperature increases to a significant ICCI effect. This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 8.10 of the benthic subtidal ecology chapter (volume 2, chapter 8).

³ Refer to Table 2.1 for details of each numbered climate risk.

Sensitive Receptor Group	Relevant Climate Risk(s) ³	Phase with Potential for ICCI	Potential Impact(s) Arising from the Array	Potential ICCI Identified	Discussion	ICCI Conclusion	Mitigation Measures
Benthic Subtidal Ecology	2	All phases	Long term habitat loss and disturbance (representing a physical change from a predominantly sandy sedimentary habitat to a hard, artificial substratum).	Potential ICCI from warming trends and acidification that either directly impact benthic receptors and/or alter living environments. This could affect the diversity and composition of benthic communities in combination with impacts from temporary habitat loss and disturbance.	Impacts on benthic subtidal ecology relating to long term habitat loss and disturbance are considered in section 8.11 of the benthic subtidal ecology chapter (volume 2, chapter 8). For all phases, the magnitude of impacts for all receptors (including all IEFs) is predicated to be low, resulting in effects of minor to moderate adverse significance. This impact presents some measurable, but minor long term loss of and alteration to areas of seabed. Given the low footprint of long term habitat loss and disturbance (a total of 6.79 km ²) in the context of the North Sea as a whole, and widespread availability of alternative habitat, the Array is not considered to contribute a significant, or measurable contribution to an ICCI effect. This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 8.10 of the benthic subtidal ecology chapter (volume 2, chapter 8).
Benthic Subtidal Ecology	4, 5 and 7	All phases	Increased turbidity, smothering and siltation rate changes (light) from increased SSCs and associated deposition associated with activities during all phases of the Array.	Potential ICCI from projected climate hazards that result in increased SSC in the water environment (e.g. increased frequency and intensity of extreme weather i.e. storms; and/or, increased wind speeds and changes to wind patterns and/or increased wave heights (larger waves) which increase the risk of smothering and abrasions, dislodgements, breakages and abrasions. Species mortality and injury could enhance impacts from the Array from SSC related disturbances.	The effects of increased SSCs and associated deposition are discussed in section 8.11 of the benthic subtidal ecology chapter (volume 2, chapter 8). For all phases, effects of minor adverse significance are predicted given the small, isolated quantities of material with potential to be disturbed and the unlikely potential for changes to the overall sediment transport regime; effects would be restricted to the Array benthic subtidal ecology study area only. Effects will be greatest during storm conditions, but estimated to likely be below 10 mg/l during a winter storm. Seabed scouring from movement of mooring lines and cabling on the seabed during storm events will be limited due to the ongoing sediment transport processes. It is not expected therefore that increases in SSC associated with the climate projections would amount to a significant ICCI effect. This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 8.10 of the benthic subtidal ecology chapter (volume 2, chapter 8).
Benthic Subtidal Ecology	2	Operation and maintenance	Impacts due to the introduction or spread of Invasive Non-Native Species (INNS) by vessels associated with the Array during all phases: this impact is related to the impact of 'colonisation of hard substrates', which may lead to an increased risk of potential habitat that could be colonised by INNS.	Potential ICCI from INNS which could become more prevalent in warmer sea temperatures and together with the colonisation of hard structures out-compete native species alter local ecology. This could compound the negative impacts predicted for the Array from INNS.	This impact will be managed as far as practicably possible via procedures to prevent invasive species introduction, including the development of, and adherence to an Environmental Management Plan (EMP) (volume 4, appendix 21) which will require that vessels associated with the Array comply with the standards set out by International Convention for the Prevention of Pollution from Ships (MARPOL). As this impact will be controlled through designed in measures adopted as part of the Array, effects of minor adverse significance would not combine to result in an effect of greater significance. This identified ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 8.10 of the benthic subtidal ecology chapter (volume 2, chapter 8).

Sensitive Receptor Group	Relevant Climate Risk(s) ³	Phase with Potential for ICCI	Potential Impact(s) Arising from the Array	Potential ICCI Identified	Discussion	ICCI Conclusion	Mitigation Measures
Fish and Shellfish Ecology	2	All phases	Impacts arising from the combined / inter-related effects of temporary habitat loss and disturbance, long term habitat loss and disturbance, colonisation of hard structures, underwater noise, increased SSCs and associated deposition and Electromagnetic Fields (EMFs).	Potential ICCI from projected warming trends and increased frequency of acute climate events that create unfavourable/intolerable conditions that affect distribution, abundance, health, reproductive success and species resilience (directly and indirectly via impacts to prey species).	Impacts on fish and shellfish ecology are considered in the fish and shellfish ecology chapter (volume 2, chapter 9). The Array may result in pressures on some species, such as activities resulting in the temporary subtidal habitat loss/disturbance intermittently throughout the construction phase. Impacts of minor (construction) or negligible (operation and maintenance) adverse significance are predicted to occur intermittently and recover quickly. The potential for ICCI is uncertain, as the degree to which receptors may tolerate or acclimatise, or adapt to variations is unknown. Ossian OWFL will engage with stakeholders to facilitate addressing evidence gaps as appropriate. However, community scale declines in prey are not anticipated within the construction window (not more than 8 years) for the Array and impacts from the Array may be offset in the longer term by fishing management measures (e.g. spatial closures) in the region. Given the minor significance of the inter-related effects from the Array, and given the uncertainty that this effect might occur, effects would not combine to result in an effect of greater significance. This identified ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 9.10 of the fish and shellfish ecology chapter (volume 2, chapter 9).
Fish and Shellfish Ecology	4, 5 and 7	All phases	Impacts arising from the combined effects of temporary habitat loss and disturbance and long term habitat loss and disturbance, colonisation of hard structures, underwater noise, increased SSCs and associated deposition and EMFs.	Potential ICCI from projected climate hazards environment (e.g. increased frequency and intensity of extreme weather i.e. storms; and/or, increased wind speeds and changes to wind patterns and/or increased wave heights (larger waves) which increase incidences of habitat disturbance/loss and/or SSC in the water which could compound the negative impacts predicted for the Array.	Impacts on fish and shellfish ecology are considered in the fish and shellfish ecology chapter (volume 2, chapter 9). Effects of minor or negligible adverse significance are predicted in all phases that are predicted to occur intermittently and recover quickly. ICCI could manifest if the climate predictions play out. However, given the minor significance of the inter-related effects from the Array, the Array is not considered to contribute a significant, or measurable contribution to an ICCI effect. This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 9.10 of the fish and shellfish ecology chapter (volume 2, chapter 9).
Marine Mammals	2	All phases	Predicted effects of the Array from underwater noise (minor adverse) collision risk (minor adverse), EMF (minor adverse), entanglement (minor adverse) and impacts on prey species (minor adverse).	Potential ICCI related to warming trends that result in direct exposure to higher sea surface temperatures and adverse changes in living environments (pH, salinity and dissolved oxygen levels and sediment and nutrient loads). These changes represent additional stresses that reduce species resilience. Increased sea water temperature increases could also influence the distribution of fish and other prey (plankton, squid, etc), resulting in reduced foraging that could combine with the predicted effects of the Array.	Impacts on marine mammals including consideration of the future baseline scenario are considered in the marine mammals chapter (volume 2, chapter 10). It is known that climatic changes compound anthropogenic pressures, although predicting future trajectories of marine mammal populations without comprehensive data is challenging. The potential for ICCI is acknowledged, however, is expected to occur incrementally during the lifetime of the Array, when construction impacts are past. Any reduction in prey species could be offset in the long term by increases in species that benefit from warming, fishing or management measures (e.g. spatial closures) in the vicinity or the aggregation effect of infrastructure (reef effect). Due to the adaptive capacity and tolerance of marine mammals to a high range of variations and given the minor adverse significance of the inter-related effects from the Array in all phases (which are limited by designed in measures for the Array), the Array is not expected to contribute a significant, or measurable contribution to an ICCI effect. This finding has been considered in view of the potential for ICCI on fish and shellfish (as prey species). This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 10.10 of the marine mammal chapter (volume 2, chapter 10).

Sensitive Receptor Group	Relevant Climate Risk(s) ³	Phase with Potential for ICCI	Potential Impact(s) Arising from the Array	Potential ICCI Identified	Discussion	ICCI Conclusion	Mitigation Measures
Offshore Ornithology	1	All phases	Predicted effects of the Array resulting in temporary habitat loss and disturbance (negligible or minor adverse), indirect impacts from construction/decommissioning noise (minor adverse) and Unexploded Ordnance (UXO) clearance (minor adverse), disturbance and displacement from the physical presence of wind turbines and maintenance activities (negligible or minor adverse), barriers to movement (negligible or minor adverse), collision risk (negligible or minor adverse), changes to prey availability (negligible or minor adverse).	Potential ICCI from increases in average and extreme air temperatures, both in winter and summer which could combine with the impacts from the Array. Abnormally hot weather can cause stress to seabirds through issues with heat dissipation. When combined with indirect effects of climate change, such as reduced prey availability, this can critically affect chick survival (Oswald <i>et al.</i> , 2008; Hakkinen <i>et al.</i> , 2022).	The impact of the influence of the Array on offshore ornithology receptors is considered in the offshore ornithology chapter (volume 2, chapter 11). Climate change is considered to be the likely primary cause of decline in seabird populations in the future. The potential for a degree of ICCI is acknowledged, however, the predicted effects of the Array of minor or negligible adverse significance are not expected to contribute a significant, or measurable contribution to an ICCI effect, or likely to amount to a significant ICCI. The absence of the Array would further delay the transition of the UK from reliance on fossil fuels and therefore further contribute towards climate change impacts and declining seabird populations. This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 11.10 of the offshore ornithology chapter (volume 2, chapter 11).
Offshore Ornithology	2	All phases	Predicted effects of the Array resulting in temporary habitat loss and disturbance (negligible or minor adverse), indirect impacts from construction/decommissioning noise (minor adverse) and UXO clearance (minor adverse), disturbance and displacement from the physical presence of wind turbines and maintenance activities (negligible or minor adverse), barriers to movement (negligible or minor adverse), collision risk (negligible or minor adverse), changes to prey availability (negligible or minor adverse).	Potential ICCI from changes in sea temperature which have the potential to affect fish at all biological levels (cellular, individual, population, species, community and ecosystem) both directly and indirectly. As sea temperatures rise, species adapted to cold water (e.g. cod and herring) will begin to disappear while warm water adapted species will become more established. These changes will lead to changes in prey distribution and availability, which in turn will affect the seabird species that prey on these fish species. These impacts are considered in combination with the effects of the Array.	The impact of the influence of the Array on offshore ornithology receptors is considered in the offshore ornithology chapter (volume 2, chapter 11). Climate change is considered to be the likely primary cause of decline in seabird populations in the future. The potential for a degree of ICCI is acknowledged, however, the predicted effects of the Array of minor or negligible adverse significance are not expected to contribute a significant, or measurable contribution to an ICCI effect, or likely to amount to a significant ICCI. The absence of the Array would further delay the transition of the UK from reliance on fossil fuels and therefore further contribute towards climate change impacts and declining seabird populations. This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 11.10 of the offshore ornithology chapter (volume 2, chapter 11).
Offshore Ornithology	3 and 4	All phases	Predicted effects of the Array resulting in temporary habitat loss and disturbance (negligible or minor adverse), indirect impacts from construction/decommissioning noise (minor adverse) and UXO clearance (minor adverse), disturbance and displacement from the physical presence of wind turbines and maintenance activities (negligible or minor adverse), barriers to movement (negligible or minor adverse), collision risk (negligible or minor adverse), changes to prey availability (negligible or minor adverse).	Potential ICCI from changes to rainfall patterns, leading to increased annual precipitation and increased frequency and intensity of extreme weather i.e. storms. Strong winds and heavy rainfall during the breeding season can result in widespread breeding failures (Mallory <i>et al.</i> , 2009; Mitchell <i>et al.</i> , 2020). Greater energy expenditure might be required to fly and dive under high wind speeds (Kogure <i>et al.</i> , 2016), which could reduce foraging success. Furthermore, prey availability at the sea surface may be reduced during storm conditions or potentially be more difficult to see by seabirds due to increased turbidity. This can contribute to mass mortality events. Such impacts could combine with the impacts from the Array.	The impact of the influence of the Array on offshore ornithology receptors is considered in the offshore ornithology chapter (volume 2, chapter 11). Climate change is considered to be the likely primary cause of decline in seabird populations in the future. The potential for a degree of ICCI is acknowledged, however, the predicted effects of the Array of minor or negligible adverse significance are not expected to contribute a significant, or measurable contribution to an ICCI effect, or likely to amount to a significant ICCI. The absence of the Array would further delay the transition of the UK from reliance on fossil fuels and therefore further contribute towards climate change impacts and declining seabird populations. This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 11.10 of the offshore ornithology chapter (volume 2, chapter 11).

Sensitive Receptor Group	Relevant Climate Risk(s) ³	Phase with Potential for ICCI	Potential Impact(s) Arising from the Array	Potential ICCI Identified	Discussion	ICCI Conclusion	Mitigation Measures
Offshore Ornithology	4, 6, 7 and 8	All phases	Predicted effects of the Array resulting in temporary habitat loss and disturbance (negligible or minor adverse), indirect impacts from construction/decommissioning noise (minor adverse) and UXO clearance (minor adverse), disturbance and displacement from the physical presence of wind turbines and maintenance activities (negligible or minor adverse), barriers to movement (negligible or minor adverse), collision risk (negligible or minor adverse), changes to prey availability (negligible or minor adverse).	Potential ICCI from impacts to ornithology resulting from increases in mean sea level, increased wave height and changes in the tidal range which could combine with impacts from the Array. Heavy rain and storm surges can flood or wash away nests, and high winds can damage or destroy nests. Additionally, rising sea levels may reduce the habitat availability of low-lying nesting species, such as terns (<i>Ratcliffe et al., 2008</i>).	The impact of the influence of the Array on offshore ornithology receptors is considered in the offshore ornithology chapter (volume 2, chapter 11). Climate change is considered to be the likely primary cause of decline in seabird populations in the future. The potential for a degree of ICCI is acknowledged, however, the predicted effects of the Array of minor or negligible adverse significance are not expected to contribute a significant, or measurable contribution to an ICCI effect, or likely to amount to a significant ICCI. The absence of the Array would further delay the transition of the UK from reliance on fossil fuels and therefore further contribute towards climate change impacts and declining seabird populations. This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 11.10 of the offshore ornithology chapter (volume 2, chapter 11).
Offshore Ornithology	5	All phases	Predicted effects of the Array resulting in temporary habitat loss and disturbance (negligible or minor adverse), indirect impacts from construction/decommissioning noise (minor adverse) and UXO clearance (minor adverse), disturbance and displacement from the physical presence of wind turbines and maintenance activities (negligible or minor adverse), barriers to movement (negligible or minor adverse), collision risk (negligible or minor adverse), changes to prey availability (negligible or minor adverse).	Potential ICCI from increased wind speeds and changes to wind patterns. Nest destruction, limitations to flying and diving, reduced prey availability and foraging success can contribute to mass mortality events.	The impact of the influence of the Array on offshore ornithology receptors is considered in the offshore ornithology chapter (volume 2, chapter 11). Climate change is considered to be the likely primary cause of decline in seabird populations in the future. The potential for a degree of ICCI is acknowledged, however, the predicted effects of the Array of minor or negligible adverse significance are not expected to contribute a significant, or measurable contribution to an ICCI effect, or likely to amount to a significant ICCI. The absence of the Array would further delay the transition of the UK from reliance on fossil fuels and therefore further contribute towards climate change impacts and declining seabird populations. This potential ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 11.10 of the offshore ornithology chapter (volume 2, chapter 11).
Commercial Fisheries	2, 4, 5 and 7	All phases	Impacts to commercially exploited species populations.	Potential ICCI during construction, operation and maintenance, and decommissioning from warming trends and climate risks that impact marine ecosystems (habitats) and reduce the distribution and availability of commercially exploited species. This hazard could enhance potential impacts on commercially exploited species.	The impact of the influence of the Array on commercial fisheries is considered in the commercial fisheries chapter (volume 2, chapter 12). For all impacts considered, the significance of the effects was found to be of either minor, or negligible adverse significance. As for the consideration of fish and shellfish receptors, the potential for ICCI is uncertain, as the degree to which commercial species (or the industry) may tolerate or acclimatise, or adapt to variations is unknown. Ossian OWFL will engage with stakeholders to facilitate addressing evidence gaps as appropriate. However, community scale declines in species are not anticipated to be caused by the Array within the construction window (not more than 8 years). Further, impacts from the Array may be offset in the longer term by fishing management measures (e.g. spatial closures) in the region. Given the minor significance of the inter-related effects from the Array, and given the uncertainty that this effect might occur, effects would not combine to result in an effect of greater significance. This identified ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 12.10 of the commercial fisheries chapter (volume 2, chapter 12).

Sensitive Receptor Group	Relevant Climate Risk(s) ³	Phase with Potential for ICCI	Potential Impact(s) Arising from the Array	Potential ICCI Identified	Discussion	ICCI Conclusion	Mitigation Measures
Commercial Fisheries	3, 4, 5 and 7	All phases	Inter-related impacts on commercial fisheries namely, temporary loss or restricted access to fishing grounds (minor); long term loss or restricted access to fishing grounds (minor); displacement of fishing activity into other areas (minor to negligible); interference with fishing activity (minor); increased snagging risk, which could result in loss or damage to fishing gear (minor); increased steaming/vessel transit times (minor).	Potential ICCI from increased frequency and intensity of extreme weather i.e. storms; increased wind speeds and changes to wind patterns, increased annual precipitation or weather events which hinder operations and reduce fishing opportunities where grounds or access to those grounds is limited. This could compound the identified effects of the Array.	<p>The impact of the influence of the Array on commercial fisheries is considered in the commercial fisheries chapter (volume 2, chapter 12). For all impacts considered, the significance of the effects was found to be of either minor, or negligible adverse significance.</p> <p>Due to the intermittency of extreme events and the potential for adaptation strategies to account for changing weather impacts on fishing availability, it is likely that despite increased disruption and changes in available fishing hours, fisheries production will not be affected to a significant level, in combination with the Array. This identified ICCI effect is not significant.</p>	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 12.10 of the commercial fisheries chapter (volume 2, chapter 12).
Shipping and Navigation	3, 4, 5 and 7	All phases	Increased vessel to vessel collision risk resulting from displacement (third-party to third-party); displacement from adverse weather routing; increased vessel to vessel collision risk (third-party to project); vessel to structure collision risk; reduced access to local ports and harbours; loss of station; reduction of under keel clearance as a result of subsea infrastructure; anchor interaction with subsea cables (including dynamic cabling); anchor interaction with mooring lines and reduction in Search and Rescue (SAR) capability.	Potential ICCI from increased occurrences of adverse weather such as storms and heatwaves and strong winds which affect vessel distributions and access to local ports and increase the risk of vessel to vessel collision risk, vessel to structure collision risk and reduce emergency response capability.	Impacts on shipping are considered in the shipping and navigation chapter (volume 2, chapter 13). Interactions between shipping activities are regulated by designed in measures adopted as part of the Array and management plans which set out procedures to regulate all activities. Consequently, for all impacts considered, the significance of the effects was found to be tolerable and As Low As Reasonably Practicable (ALARP) or broadly acceptable. The impacts of the Array are not likely to be increased to significant effects in combination. This identified ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 13.10 of the shipping and navigation chapter (volume 2, chapter 13).
Infrastructure and Other Users	1, 2, 3, 4, 5 and 7	All phases	Displacement of recreational sailing and motor cruising, recreational fishing (boat angling) and other recreational activities (diving vessels) due to safety zones and advisory safe passing distances in the Array. Also, physical restriction on space for recreational craft/recreational fishing vessels.	Potential ICCI from increased occurrences of favourable weather (increases in air and sea surface temperatures (in- heat wave frequency and decreases in summer precipitation and wind speeds) that affect public behaviour and patterns of use leading to an increase in recreational users and pressure on the available sea space (either intermittent, short-term influxes or a long-term trend), leading to increased displacement of recreational sailing and motor cruising, recreational fishing in combination with the Array.	Due to the distance between the Array and the shore, recreational activities such as SCUBA diving, water sports (e.g. canoeing, kayaking, surfing, windsurfing and kite surfing) and beach users were scoped out of the EIA. Impacts on recreational sailing and motor cruising and recreational fishing are considered in the infrastructure and other users chapter (volume 2, chapter 15), with vessel routing in adverse weather conditions addressed in the shipping and navigation chapter (volume 2, chapter 13). The infrastructure and other users area (inner area) is not in close proximity to general boating areas associated with Royal Yacht Association Clubs). The closest general boating area is located at Montrose, approximately 97.1 km west of the infrastructure and other users study area (inner area) (NMPi, 2023). Motor cruising areas do not extend to the Array and vessel tracks are found to very rarely intersect the broad infrastructure and other users study area. Minimal levels of recreational vessels were recorded during vessel surveys. In view of this baseline and the small, localised displacement (of minor adverse significance) predicated for the Array, the effect is not considered likely to be increased to significant ICCI. This identified ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 15.10 of the infrastructure and other users chapter (volume 2, chapter 15).

Sensitive Receptor Group	Relevant Climate Risk(s) ³	Phase with Potential for ICCI	Potential Impact(s) Arising from the Array	Potential ICCI Identified	Discussion	ICCI Conclusion	Mitigation Measures
Infrastructure and Other Users	1, 4, 5 and 7	All phases	Impacts resulting from interactions between oil and gas operators inter-array/interconnector cabling within the Array, including associated safety zones and advisory safe passing distances, which may affect or restrict access to active licence blocks by oil and gas operators either temporarily or long term.	Potential ICCI from projected increases in average and extreme air temperatures (heatwaves); increased frequency and intensity of extreme weather i.e. storms; increased wave height and increased wind speeds that could combine with the effects of the Array, representing an enhanced risk to offshore infrastructure resulting in enhanced requirements for repairs (such as cable repair/reburial cause) as well as disruptions to commercial operations and personnel.	Activities associated with all phases may lead to the reduction or restriction of access to active hydrocarbon licence blocks by oil and gas operators. This is assessed in the infrastructure and other users chapter (volume 2, chapter 15). The effect is predicated to be of minor adverse significance. This impact will be controlled through designed in measures adopted as part of the Array; cable and pipeline crossing proximity agreements will be developed and implemented with each relevant cable and pipeline operator to minimise the potential for any impact and ensure close communication and planning between the affected parties to ensure disruption of activities is minimised. As a result, the effects of minor adverse significance would not combine to result in an ICCI of greater significance. This identified ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 15.10 of the infrastructure and other users chapter (volume 2, chapter 15).
Marine Archaeology	2, 4, 5 and 7	All phases	Sediment disturbance and deposition, direct damage and alteration of sediment transport regimes leading to impacts on marine archaeology receptors (including inter-related impacts).	Potential ICCI related to higher temperatures, ocean acidification and/or more turbulent seas that have the potential to exacerbate existing vulnerabilities and threats.	The current marine archaeology baseline as described in section 19.7.3 of the marine archaeology chapter (volume 2, chapter 19) is assumed to change very slowly. The effects of climate change on the marine environment may cause impacts on marine archaeology receptors in the mid to long term (Department of Energy and Climate Change (DECC), 2016). The potential for this ICCI is acknowledged. However, in view of the measures adopted as part of the Array (see section 19.10 of the marine archaeology chapter (volume 2, chapter 19)), namely the development of and adherence to a Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) (volume 3, appendix 19.2), the Array is not expected to contribute to a ICCI effect, such that effects could combine to a significant ICCI in any phase. This identified ICCI effect is not significant.	Not significant	No further mitigation measures are required in addition to those measures adopted as part of the Array set out in section 19.10 of the marine archaeology chapter (volume 2, chapter 19).

4. SUMMARY

5. An ICCI assessment has been undertaken for the Array. The potential ICCI are not greater than the likely significant effects assessed in the relevant topic chapters of the Array EIA Report or have been assessed as not being significant.

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