BEFORE THE ARBITRATION TRIBUNAL

PCA Case No. 2024-45

IN THE MATTER OF AN ARBITRATION

PURSUANT TO ARTICLE 739 OF THE TRADE AND COOPERATION AGREEMENT BETWEEN THE EUROPEAN UNION AND THE EUROPEAN ATOMIC ENERGY COMMUNITY AND THE UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

- between -

THE EUROPEAN UNION

("Complainant")

- and -

THE UNITED KINGDOM OF GREAT BRITAIN AND

NORTHERN IRELAND

("Respondent", and together with the Complainant, the "Parties")

WRITTEN SUBMISSION OF THE UNITED KINGDOM

9 January 2025

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I. INTRODUCTION

1. Sandeel are small fish that are crucial to the North Sea ecosystem. They prey on plankton. They are preyed on by larger fish, marine mammals and seabirds, which do not prey principally or at all on plankton. They are thus a crucial component of the marine food web.

2. Because of this, over time the UK has taken various measures to seek to protect sandeel. These measures have included:

    2.1. closure to sandeel fishing of two areas in Scottish waters, one off the coasts of the Shetland Islands and another extending from the Firth of Forth; and

    2.2. since 2021 declining to apportion to UK vessels any of the UK's share of the total allowable catch for sandeel agreed between the UK and EU.

3. Industrial fishing of sandeel by EU vessels continued in UK waters that had not been closed to such fishing, creating concern about its adverse impact on the abundance and resilience of sandeel and the effect of that on the ecosystem of which they form part.

4. In the UK, responsibility for fisheries is largely devolved to the nations. The UK Government decided to prohibit fishing for sandeel in English waters of the North Sea. The Scottish Government decided to prohibit fishing for sandeel in all Scottish waters.

5. The objective of those measures was to improve the abundance and resilience of sandeel so as to improve the abundance and resilience of their predators within the North Sea ecosystem, including larger fish, marine mammals and seabirds.

6. The UK Government based the measure in respect of English waters principally on the following scientific advice:

    6.1. A report jointly produced by Natural England, the Centre for Environment, Fisheries and Aquaculture Science, and the Joint Nature Conservation Committee published in March 2023 titled "What are the ecosystem risks and benefits of full prohibition of industrial sandeel fishing in the UK waters of the North Sea (ICES Area IV)?", which is Exhibit C-0045; and

6.2. The response by the Technical Service of the International Council for the Exploration of the Sea to the EU-UK joint request for advice on ecosystem considerations in the provision of single-stock advice for forage fish species, which was published in November 2023 and is Exhibit C-0022.

7. The decision-making process that the UK Government followed for the English measure was in essence:

7.1. A joint Call for Evidence with the Devolved Administrations on the future management of sandeel and Norway pout, including the ecological value of the stocks, their fishery and potential management measures, found at Exhibit C-0043.

7.2. The commissioning of scientific evidence on the ecosystem risks and benefits of a prohibition of sandeel fishing in North Sea waters, as seen at Exhibit C-0045.

7.3. The development of consultation proposals on spatial management measures for sandeel fishing in English waters of the North Sea and the carrying out of that consultation over a period of 12 weeks in 2023, as seen at Exhibits R-0061 and C-0044.

7.4. The consideration of consultation responses including engagement with the EU and Denmark, as seen at Exhibits R-0055 and R-0077.

7.5. The making of a final decision to proceed with the measure following consideration of the ICES Technical Service Response, as seen at Exhibit R-0086.

7.6. The consequential amendment by the Marine Management Organisation of all fishing licences to prohibit the fishing of sandeel in English waters of the North Sea.

7.7. Post-decision notification and further engagement with the EU and Denmark, including as shown at Exhibits C-0058 and R-0085.

8. The Scottish Government prohibited fishing for sandeel in Scottish waters based principally on the following scientific advice:

8.1. The Review of Scientific Evidence on the Potential Effect of Sandeel Fisheries Management on the Marine Environment conducted by the Scottish Marine Directorate, which was published in July 2023 and is Exhibit C-0050; and

8.2. The same ICES Technical Service Response referred to above in connection with the English measure, Exhibit C-0022.

9. The decision-making process that the Scottish Government followed was in essence:

9.1. A statement in the Scottish Parliament in 2021 recognising the importance of sandeel to the wider ecosystem and committing to consider possible management measures, seen at Exhibit R-0090.

9.2. The joint Call for Evidence referred to above, Exhibit C-0043.

9.3. The Commissioning of a review of all available scientific evidence on the potential effects of sandeel fisheries management on the marine environment, as seen at Exhibit C-0050.

9.4. The development of consultation proposals for a prohibition on fishing for sandeel in Scottish waters which was also accompanied by, among other things, a formal Strategic Environmental Assessment process and on which there was consultation over a period of 12 weeks in 2023: Exhibits C-0049, C-0051 and C-0052.

9.5. Approval of the decision to prohibit sandeel fishing in Scottish waters in light of consultation responses, including engagement with the EU and Denmark, and consideration of the ICES Technical Service Response: Exhibits R-0096, R-0098 and C-0056.

9.6. The laying before the Scottish Parliament of the Sandeel (Prohibition of Fishing) (Scotland) Order 2024 which came into force on 26 March 2024, found at Exhibit CLA-0004.

9.7. Post-decision notification and further engagement with the EU and Denmark, including as seen at Exhibit C-0059.

10. The EU challenges these decisions to prohibit sandeel fishing in UK waters, alleging that they are in breach of Article 496, read with Article 494, of the Trade and Cooperation Agreement between the EU and UK ("**TCA**"). The EU considers that the UK should continue to permit vessels from EU Member States to engage in industrial trawling of sandeel in UK waters, so that factories in the EU can continue to turn those sandeel into fishmeal.

11. The EU seeks to characterise the decision of the UK Government in respect of English waters and that of the Scottish Government in respect of Scottish waters as "a single measure". That is inaccurate. The English and Scottish measures apply to different waters, were taken by different Governments, following different decision-making processes, and were implemented by different methods. Both measures are of course attributable to the UK, but they are two measures, not one, and should be analysed accordingly.

12. The EU claims a breach of **Article 496(2) of the TCA**, alleging that these measures were not based on the best available scientific advice.

13. The reasons why that claim should fail are many, and are developed below, but they include that:

    13.1. Best available scientific advice is a relative concept, yet the EU does not allege that there was any better scientific advice available on the same issues. Instead, its lawyers propose criticisms of the ecosystem model used by the relevant scientific bodies and relied on by the UK Government in respect of the English measure. Saying that scientific modelling could have been more sophisticated, which is probably true for virtually all scientific modelling, does not disqualify it from forming part of the best available scientific advice. That is all the more so where, as here, (i) the model was based on one reviewed and used by the International Council for the Exploration of the Sea, (ii) the EU has not identified any superior model of the North Sea ecosystem which was then available, because there was none, and (iii) the scientific advice openly identified a number of the limitations of the model about which the EU now complains. The EU's claim is furthermore inconsistent with the precautionary approach, which is embodied in the TCA, including in Article 494(3)(a).

13.2. Other than its criticisms of the model relied on by the UK Government in respect of the English measure, the EU does not criticise the quality of any of the scientific advice relied on in respect of the English or Scottish measures. There is thus no criticism, even by lawyers, let alone by scientists, of the great bulk of scientific advice relied on for both measures. The overall body of scientific advice relied on must evidently be considered holistically, and the EU has targeted only one part of it.

13.3. The EU accepts that there is a rational and objective relationship between the scientific advice on which the relevant decision makers relied and prohibiting sandeel fishing in UK waters within the feeding range of chick-rearing seabirds. The EU's complaint is thus ultimately only that the prohibition applies to all Scottish waters and all English waters in the North Sea, as opposed to just those waters within such a range. Among other things, this overlooks that the measures were adopted for the benefit of all relevant parts of the ecosystem, not only seabirds.

14. The EU claims a breach of **Article 496(1) of the TCA, read with Article 494(3)(f)**, alleging that these measures were adopted without having regard to the principle of applying proportionate and non-discriminatory measures.

15. The reasons why that claim should also fail are also many, and are also developed below. They include that the TCA does not restrict the Parties' regulatory autonomy by imposing tests of proportionality or non-discrimination. It simply requires the Parties to have regard to applying proportionate and non-discriminatory measures in deciding on the measures applicable to their own waters. The EU's submission acknowledges this distinction, but then ultimately ignores it, as it must, since the decision-making processes for both measures specifically considered proportionality and non-discrimination.

16. These specific defects in the EU's claims are manifestations of a broader difference in approach between the EU and the UK.

17. The UK and the EU are, under their own regulatory frameworks, both required to pursue Good Environmental Status. Although the North Sea ecosystem is by any objective measure not at Good Environmental Status, the EU remains acutely focused on maximising fishing yields pursuant to its Common Fisheries Policy. The UK in the

exercise of its regulatory autonomy as emphasised by Articles 493 and 494 of the TCA, and in accordance with other principles identified in Article 494 of the TCA, is focused on protecting the ecosystem and preserving marine biological diversity.

18. The UK considers that this difference in approach is at the root of the present dispute, and that it is entirely within its rights under the TCA, and indeed is fulfilling its obligations under the TCA, by pursuing a responsible policy objective through the measures that the EU has chosen to challenge.

19. The structure of this submission is as follows:

    19.1. Section I is this brief introduction.

    19.2. Section II explains relevant aspects of the UK's domestic legal framework.

    19.3. Section III identifies relevant rules of international law in addition to the TCA.

    19.4. Section IV describes sandeel and their role in the marine ecosystem of the North Sea.

    19.5. Section V then turns to the sandeel fishery in the North Sea and its management.

    19.6. Section VI explains the decision-making processes leading to the English and Scottish measures.

    19.7. Section VII sets out the measures themselves.

    19.8. Section VIII explains why those measures did not breach the TCA, dealing in turn with:

        19.8.1. the EU's first claim, alleging that the measures were not based on best available scientific advice,

        19.8.2. its second claim, alleging that the UK did not have regard to applying proportionate and non-discriminatory measures in its waters, and

        19.8.3. very briefly, its third claim, which depends entirely on the first two and concerns the EU's right of access to UK waters under Annex 38 of the TCA.

19.9. Section IX respectfully requests the Tribunal to dismiss each of the EU's three claims.

20. Where an exhibit or legal authority has already been provided with the EU submission, the UK does not provide it again, but just gives the reference number used in the EU submission. Where underlining is used in a quotation in this submission, that emphasis has been added for the purpose of this submission, and was not in the original, unless stated otherwise.

II. DOMESTIC LEGAL FRAMEWORK

A. UK: LEGAL FRAMEWORK

21. As a result of the UK's historical membership of the EU, aspects of domestic law targeted at the conservation of the marine environment have their roots in EU law. Since the UK's departure from the EU, the UK has developed its own domestic framework for the conservation of the marine environment that seeks to put environmental policy at the heart of the UK's domestic and international priorities.[1]

1. Marine Strategy Regulations and the UK Marine Strategy

22. The Marine Strategy Regulations 2010[2] transposed the Marine Strategy Framework Directive (Directive 2008/56/EC) and set out the duty to develop a single marine strategy for the UK's marine area and a target to achieve "good environmental status" ("**GES**"). GES is defined in Part 2 of Schedule 1 and Article 3(5) of the Directive as ecologically diverse and dynamic oceans and seas that are clean, healthy and productive, among other things allowing "ecosystems to function fully and to maintain their resilience to human-induced environmental change".[3]

23. GES is determined on the basis of 11 descriptors listed in Annex I to the Directive that describe the state of the marine environment, such as that biological diversity is maintained. Three descriptors are particularly relevant to the measures in issue: (1) biological diversity, (4) marine food webs and (3) populations of fish.[4]

24. By Regulation 5(2) of the Marine Strategy Regulations 2010 the marine strategy must apply an ecosystem-based approach to the management of human activities, which is defined at Regulation 5(4) as:

> an approach which—

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1 See A Green Future: Our 25 Year Plan to Improve the Environment (2018), **Exhibit R-0001**, p. 36.

2 Marine Strategy Regulations 2010, available at https://www.legislation.gov.uk/uksi/2010/1627/contents.

3 See also Commission Decision 2017/848 of 17 May 2017.

4 A further descriptor, (6) sea floor integrity, is also of relevance to sandeel.

(a) ensures that the collective pressure of human activities within the marine strategy area is kept within levels compatible with the achievement of good environmental status; and

(b) does not compromise the capacity of marine ecosystems to respond to human-induced changes.

25. There are three parts to the published marine strategy in the UK (UKMS), which is an adaptive strategy updated cyclically and prepared in consultation with the Devolved Administrations:

25.1. Part One is an assessment of marine waters, objectives for GES and target indicators. It was first published in December 2012 and updated in October 2019.

25.2. Part Two sets out the monitoring programmes to monitor progress against the targets and indicators. It was first published in August 2014 and updated in October 2022.

25.3. Part Three sets out the programme of measures for achieving GES. It was first published in December 2015.

26. Of particular relevance, the 2012 UKMS Part One recognised that "fishing has contributed to a reduction in sandeel availability and quality"[5] and by reference to previous assessments the 2019 update identified sandeel as "the keystone fish species".[6] The 2019 update also observed that "breeding seabird populations are not consistent with GES" and that "[t]his may be the result of lower availability of small fish (e.g. sandeels, sprat and herring)".[7]

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5 Marine Strategy Part One: UK Initial Assessment and Good Environmental Status, December 2012, **Exhibit R-0002**, para. 214, p. 69.

6 Marine Strategy Part One: UK updated assessment and Good Environmental Status October 2019, **Exhibit C-0069**, p. 100.

7 Marine Strategy Part One: UK updated assessment and Good Environmental Status October 2019, **Exhibit C-0069**, pp. 68-69.

2. Conservation of Habitats and Species Regulations 2017

27. In England and Wales, the Conservation of Habitats and Species Regulations 2017[8] (for inshore waters) and the Conservation of Offshore Marine Habitats and Species Regulations 2017[9] (for offshore waters) transposed the Wild Birds Directive (Directive 2009/147/EC) and the Habitats Directive (Directive 92/43/EEC) and provide for the designation of protected habitats and for the protection of wild and migratory birds, marine mammals and certain other species at favourable conservation status. They remain in force.

3. The Common Fisheries Policy and the Fisheries Act 2020

28. Prior to the Fisheries Act 2020, the UK was a party to the Common Fisheries Policy (Regulation (EU) No 1380/2013) ("**CFP**").[10] Under the CFP, the EU has exclusive competence to manage the conservation of marine biological resources. The CFP maintains an approach whereby fishing opportunities are allocated according to the principle of "relative stability".[11] The CFP notes "the precautionary approach to fisheries management" as well as the aim to keep exploited resources above the level that can produce "maximum sustainable yield".[12] As regards "the ecosystem-based approach to fisheries management", Article 2(3) provides:

> The CFP shall implement the ecosystem-based approach to fisheries management so as to ensure that negative impacts of fishing activities on the marine ecosystem are minimised, and shall endeavour to ensure that aquaculture and fisheries activities avoid the degradation of the marine environment.

29. A weakness of the CFP is that it is not subject to, or fully integrated with, laws on nature conservation. This is an issue that has to some extent been recognised by the EU Commission itself , which has stated that the CFP needs to be strengthened, including as regards "the contribution to the implementation of environmental legislation and the

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8 Conservation of Habitats and Species Regulations 2017 available at https://www.legislation.gov.uk/uksi/2017/1012/contents.

9 Conservation of Offshore Marine Habitats and Species Regulations 2017, available at https://www.legislation.gov.uk/uksi/2017/1013/contents.

10 Regulation (EU) 1380/2013 on the Common Fisheries Policy, **Exhibit CLA-0005**.

11 Regulation (EU) 1380/2013 on the Common Fisheries Policy, **Exhibit CLA-0005**, Art 16(1).

12 Regulation (EU) 1380/2013 on the Common Fisheries Policy, **Exhibit CLA-0005**, Art 2(2).

related governance system".[13] In June 2024, the EU Commission launched a consultation on, among other things, the extent to which the CFP has achieved long-term sustainability of fisheries and contributed to the protection of the marine environment.[14]

30. There is limited scope within the CFP for conservation measures to be taken: Article 11 allows Member States to take unilateral conservation measures but only in relation to their own fishing vessels; Articles 12-13 relate to serious threats or emergency measures; and Article 18 provides more widely for conservation measures, but subject to the agreement of joint recommendations by all Member States with direct fishery management interests.

31. The Fisheries Act 2020[15] reflected the desire of the UK as a coastal state with regulatory autonomy following its exit from the EU to establish a new UK framework for fisheries management.[16] Among other things, the Fisheries Act 2020 extended powers in the Marine and Coastal Access Act 2009 to allow for the regulation of fishing activity to protect the marine environment both in the inshore and offshore zones.

32. Section 1 of the Fisheries Act 2020 establishes eight objectives which are intended to underpin fisheries management. In addition to (a) the sustainability objective, these comprise (b) the precautionary objective, (c) the ecosystem objective, (d) the scientific evidence objective, (e) the bycatch objective, (f) the equal access objective, (g) the national benefit objective and (h) the climate change objective. These objectives are

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13 Communication from the Commission to the European Parliament and the Council of 21 February 2023: The common fisheries policy today and tomorrow: a Fisheries and Oceans Pact towards sustainable, science-based, innovative and inclusive fisheries management, COM(2023) 103 final, **Exhibit R-0003**, pp. 18-19. See also p 8 ("More coherence is needed between the implementation of the CFP and EU environmental legislation, notably the Marine Strategy Framework Directive and the Birds and Habitats Directives").

14 European Commission, Commission launches consultation on the common fisheries policy, 20 June 2024, **Exhibit R-0004**.

15 Fisheries Act 2020, **Exhibit CLA-0006**.

16 See speech of Lord Gardiner of Kimble introducing the Fisheries Bill in the House of Lords at Second Reading (Hansard, 11 February 2020, col 2167-2171) available at https://hansard.parliament.uk/Lords/2020-02-11/debates/F1D340E5-8EB8-4B77-ABD3-0A83120A349C/FisheriesBill(HL) ("This Bill takes and reforms the EU's sustainable fishing objectives and commits to a new, ambitious set of UK objectives, which are in the Bill").

central to the Joint Fisheries Statement[17] and fisheries management plans which underpin decision-making on fisheries.[18]

33. The "sustainability objective" is defined in the following terms at section 1(2):

> (a) fish and aquaculture activities are—
>
> (i) environmentally sustainable in the long term, and
>
> (ii) managed so as to achieve economic, social and employment benefits and contribute to the availability of food supplies, and
>
> (b) the fishing capacity of fleets is such that fleets are economically viable but do not overexploit marine stocks.

34. The "precautionary objective" is defined at section 1(3) as:

> (a) the precautionary approach to fisheries management is applied, and
>
> (b) exploitation of marine stocks restores and maintains populations of harvested species above biomass levels capable of producing maximum sustainable yield.

35. By section 1(10) the "precautionary approach to fisheries management" "means an approach in which the absence of sufficient scientific information is not used to justify postponing or failing to take management measures to conserve target species, associated or dependent species, non-target species or their environment."

36. The "ecosystem objective" is defined in section 1(4) as follows:

> (a) fish and aquaculture activities are managed using an ecosystem-based approach so as to ensure that their negative impacts on marine ecosystems are minimised and, where possible, reversed, and
>
> (b) incidental catches of sensitive species are minimised and, where possible, eliminated.

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17 Joint Fisheries Statement (Defra, Welsh Government, Scottish Government, DAERA), November 2022, **Exhibit R-0005**. The Joint Fisheries Statement among other things emphasises the ecosystem based approach to managing fisheries (para. 4.1.10) and the precautionary approach to fisheries management (para. 4.1.11).

18 Fisheries Act 2020, **Exhibit CLA-0006**, s 10.

37. An "ecosystem-based approach" means by section 1(10) an approach which "(a) ensures that the collective pressure of human activities is kept within levels compatible with the achievement of good environmental status within the meaning of the Marine Strategy Regulations 2010, and (b) does not compromise the capacity of marine ecosystems to respond to human-induced changes".

38. By section 1(5), the "scientific evidence objective" is that:

> (a) scientific data relevant to the management of fish and aquaculture activities is collected,
>
> (b) where appropriate, the fisheries policy authorities work together on the collection of, and share, such scientific data, and
>
> (c) the management of fish and aquaculture activities is based on the best available scientific advice.

4. Environmental targets and the Environment Act 2021

39. In 2018 the UK Government published for England *A Green Future: Our 25 Year Plan to Improve the Environment* (the "**25 Year Plan**"). The Foreword to the 25 Year Plan stated:

> Beyond our coastlines, we must do more to protect the seas around us and marine wildlife. Leaving the EU means taking back control of the waters around these islands. We will develop a fishing policy that ensures seas return to health and fish stocks are replenished. We will also extend the marine protected areas around our coasts so that these stretches of environmentally precious maritime heritage have the best possible protection.

40. The Plan set goals relevant to the marine environment of

> • Reversing the loss of marine biodiversity and, where practicable, restoring it.
>
> • Increasing the proportion of protected and well-managed seas, and better managing existing protected sites.
>
> • Making sure populations of key species are sustainable with appropriate age structures.

- Ensuring seafloor habitats are productive and sufficiently extensive to support healthy, sustainable ecosystems.[19]

41. The ambition in the 25 Year Plan was subsequently put on a statutory footing by the Environment Act 2021, which provides for environmental targets and a statutory Environmental Improvement Plan (EIP), published in January 2023. The EIP notes the need to "[a]pply an ecosystem-based approach to marine and fish stock management".[20]

42. The Environmental Targets (Biodiversity) (England) Regulations 2023 and the EIP also set out targets on species' extinction risk and species' abundance. The species extinction risk target is to reduce the risk of species' extinction by 2042 against a baseline for all species on the 2022 Red List Index for England. The species' abundance targets are to halt the decline in overall species' abundance by 31 December 2030 and thereafter to increase species' abundance by 10% by 2042, in both cases by reference to 'indicator' species.[21]

43. The Environment Act 2021 also represented a desire of the UK to ensure a high level of environmental protection within the UK and its waters once it departed from the EU.[22]

5. Fisheries management

44. Under the Fisheries Act 2020, fishing by UK or foreign vessels must be authorised by a licence, which as regards English waters is issued by the Marine Management Organisation ("**MMO**"), subject to any appropriate limitations on the area in which fishing is authorised, the periods during which fishing is permitted, the types and quantities of fish caught, and the method of fishing.[23]

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19 A Green Future: Our 25 Year Plan to Improve the Environment (2018), **Exhibit R-0001**, p 26.

20 Environmental Improvement Plan 2023 First revision of the 25 Year Environment Plan (Defra), 2023, **Exhibit R-0006**, p. 177 (the text refers to sandeel and Norway pout management on p. 178).

21 The species abundance index is calculated by reference to the geometric mean of the relative species abundance indices for the species listed in Schedule 2 for that year. Black-legged kittiwakes are included in the list.

22 Defra, Environment Bill 2020 Policy Statement, 30 January 2020, **Exhibit R-0007** (the bill is "part of the wider government response to the clear and scientific case, and growing public demand, for a step-change in environmental protection and recovery").

23 Fisheries Act 2020, ss. 15 and 17.

45. Section 5(1) of the Sea Fish (Conservation) Act 1967 sets out a power for the appropriate national authority to make an order:

> (a) prohibiting, in any area specified in the order and either for a period so specified or without limitation of time—
>
> (i) all fishing for sea fish;
>
> (ii) fishing for any description of sea fish specified in the order;
>
> (iii) fishing for sea fish, or for any description of sea fish specified in the order, by any method so specified;
>
> (b) restricting, in any area specified in the order and either for a period so specified or without limitation of time, the amount of sea fish, or sea fish of a description specified in the order, that may, in any period so specified, be taken by—
>
> (i) any person;
>
> (ii) any fishing boat.

46. Any person who contravenes a prohibition or restriction imposed by an order, or the master, charterer or owner of a vessel that does so, will be guilty of an offence.[24]

47. Section 5A confirms that the above power may be used to restrict fishing for environmental purposes.

B. SCOTLAND: LEGAL FRAMEWORK

1. General

48. The Scottish legal framework, whilst similar to that governing the rest of the UK, is nevertheless distinct, as the management of fishing within Scottish waters is largely a devolved matter.[25]

49. Relevant aspects of the framework governing England and Wales that also apply in Scotland include:

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[24] Sea Fish (Conservation) Act 1967, s. 5(1), (1A).

[25] Scotland Act 1998 s 30(1), Sch 5.

49.1. The Marine Strategy Regulations 2010.

49.2. The Conservation (Natural Habitats, &c.) Regulations 1994 and the Conservation of Offshore Marine Habitats and Species Regulations 2017.

49.3. The Fisheries Act 2020 and the Joint Fisheries Statement.

50. The ecosystem importance of sandeel has also been recognised in Scotland in the past by their addition in 2014 as a Scottish priority marine feature.[26]

51. In addition, the following apply to Scotland only.

2. Scotland's Marine Plan and Fisheries Management Strategy

52. The Marine (Scotland) Act 2010 provided for the preparation of a national marine plan for the entire Scottish marine area and regional marine plans. The National Marine Plan was published in 2015 and refers to the CFP.

53. In December 2020 the Scottish Government published a Fisheries Management Strategy 2020-2030, which sets out its approach to managing Scotland's sea fisheries. This promoted an "ecosystem-based approach" and noted a focus, among other things, on:

> Where appropriate, restricting fishing activity and prohibiting fishing for species which are integral components of the marine food web, such as sandeels.[27]

54. Annex A to the Fisheries Management Strategy, on its rationale and impact, notes that fisheries management in Scotland is derived from the Common Fisheries Policy, and that:

> Following EU Exit there is an opportunity to take stock and consider the approach we wish to take to fisheries management in the future and where changes can be made to improve the way in which we manage our fisheries in a sustainable and responsible way.[28]

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[26] See Nature Scot, Priority Marine Features in Scotland's Seas – The List, 2020, available at https://www.nature.scot/doc/priority-marine-features-scotlands-seas-list.

[27] Scotland's Fisheries Management Strategy 2020 – 2030, **Exhibit R-0009**, p. 10.

[28] Scotland's Fisheries Management Strategy 2020 – 2030, Annex A Rationale and Impact, **Exhibit R-0122**, p. 1.

55. The Fisheries Management Strategy is discussed further below at paragraphs 163-165.

3. Conservation measures

56. Section 1 of the Sea Fisheries (Wildlife Conservation) Act 1992 requires Scottish Ministers and relevant public authorities to "have regard to the conservation of marine flora and fauna" in making decisions.

57. The powers in sections 5 and 5A of the Sea Fish (Conservation) Act 1967, discussed at paragraphs 45-47, also apply to the Scottish Ministers.

III. RELEVANT RULES OF INTERNATIONAL LAW OTHER THAN THE TCA

A. INTRODUCTION

58. A number of international obligations and standards inform the action the UK takes at a domestic level, including the sandeel fishing prohibitions at issue in this dispute. This section outlines the most significant of these obligations and standards. The extent to which any such obligations are relevant to the interpretation of applicable provisions of the TCA is dealt with separately further below.

B. UNITED NATIONS CONVENTION ON THE LAW OF THE SEA

59. The United Nations Convention on the Law of the Sea ("**UNCLOS**")[29] sets out a framework for the governance of oceans and seas, including the living resources within them. Both the UK and the EU are parties.

60. The waters subject to the measures challenged in the present case include both the UK's territorial sea and exclusive economic zone ("**EEZ**").

61. The sovereignty of the UK extends to its territorial sea, stretching the first 12 nautical miles ("**NM**") off the coast.[30] Vessels of other States enjoy a right of innocent passage through the territorial sea,[31] but this expressly excludes "fishing activities".[32]

62. Article 56 covers the basic rights, jurisdiction and duties of a coastal State in its EEZ, extending beyond the territorial sea up to 200 NM from the coast.[33] Article 56(1)(a) sets out that in its EEZ, the coastal State has:

> sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds.

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29 **Exhibit CLA-00023**.

30 UNCLOS, **Exhibit CLA-00023**, Article 2(1) and Article 3.

31 UNCLOS, **Exhibit CLA-0023**, Article 17.

32 UNCLOS, **Exhibit CLA-0023**, Article 19(2)(i).

33 UNCLOS, **Exhibit CLA-00023**, Article 57 deals with the breadth of the EEZ.

63. Article 56(1)(b)(iii) specifies that in its EEZ a coastal State has "jurisdiction as provided for in the relevant provisions of this Convention with regard to: … the protection and preservation of the marine environment".

64. Article 56(2) of UNCLOS provides that "[i]n exercising its rights and performing its duties under this Convention in the exclusive economic zone, the coastal State shall have due regard to the rights and duties of other States and shall act in a manner compatible with the provisions of this Convention." In this regard, Article 58(1) specifies the rights that States have in a coastal State's EEZ, namely the "freedoms … of navigation and overflight and of the laying of submarine cables and pipelines, and other internationally lawful uses of the sea related to these freedoms". These freedoms do not include fishing, which is a sovereign right reserved to the coastal State under Article 56(1)(a). Article 58(3) provides that States operating in another State's EEZ "shall have due regard to the rights and duties of the coastal State and shall comply with the laws and regulations adopted by the coastal State in accordance with the provisions of this Convention and other rules of international law".

65. Article 61 of UNCLOS sets out the coastal State's jurisdiction as regards the conservation of the living resources in its EEZ. It states that the "coastal State shall determine the allowable catch of the living resources in its exclusive economic zone".[34] It places an obligation on each coastal State to adopt "proper conservation and management measures" that take into account the best scientific evidence available to it and ensure that the maintenance of the living resources in the EEZ is not endangered by over-exploitation.[35] Measures adopted must be designed to maintain or restore populations of harvested species at levels which can produce the maximum sustainable yield, taking into account both relevant environmental and economic factors.[36] The obligations of the coastal State are not limited to species that are harvested, but also require taking into consideration the effects of measures on species associated with or dependent upon

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34 UNCLOS, **Exhibit CLA-0023**, Article 61(1).

35 UNCLOS, **Exhibit CLA-0023**, Article 61(2). See Article 119 in respect of conservation of the living resources of the high seas.

36 UNCLOS, **Exhibit CLA-0023**, Article 61(3).

harvested species, with a view to maintaining or restoring populations above levels at which their reproduction may become seriously threatened.[37]

66. Article 62 requires the coastal state to "promote the objective of optimum utilization of the living resources in the exclusive economic zone". It is specified that this is "without prejudice to article 61".[38] Article 62(4) provides that: "Nationals of other States fishing in the exclusive economic zone shall comply with the conservation measures and with the other terms and conditions established in the laws and regulations of the coastal State". Such laws and regulations are to be consistent with UNCLOS. Article 62(4) further specifies that such laws and regulations may relate, *inter alia*, to "determining the species which may be caught".[39]

67. Part XII of UNCLOS covers the "protection and preservation of the marine environment". Within this, Article 192 records in general terms that States "have the obligation to protect and preserve the marine environment". Article 193 provides that "States have the sovereign right to exploit their natural resources pursuant to their environmental policies and in accordance with their duty to protect and preserve the marine environment." Part XII then deals in large part with pollution of the marine environment, but Article 197 provides more generally for co-operation between States on a global or regional basis for the protection and preservation of the marine environment.

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37 UNCLOS, **Exhibit CLA-0023**, Article 61(4).

38 UNCLOS, **Exhibit CLA-0023**, Article 62(1).The EU mentions Article 62(2) in connection with what it refers to as "the rights of other States to access any surplus" of allowable catch of the living resources in another State's EEZ (EU submission, paras. 296 and 299). Article 62(2) obliges the coastal state to determine its capacity to harvest the living resources of the EEZ, and where it does not have capacity to harvest the entire allowable catch, it shall, through agreements and arrangements, give other States access to the surplus of the allowable catch, having regard to certain factors. Article 62(2) provides no general right of access to another State's surplus catch, nor does it provide a right to any particular State to access the surplus of allowable catch. Any "right" of access to the surplus catch in another State's EEZ is dependent on consent from that coastal State, consistent with the coastal State's sovereign right over the exploitation of such resources.

39 UNCLOS, **Exhibit CLA-0023**, Article 62(4)(b).

C. CONVENTION FOR THE PROTECTION OF THE MARINE ENVIRONMENT OF THE NORTH EAST ATLANTIC (OSPAR CONVENTION)

68. The Convention for the Protection of the Marine Environment of the North-East Atlantic ("**OSPAR Convention**")[40] is the primary treaty on regional co-operation to protect the marine environment in the North Sea and wider area. Both the UK and the EU are contracting parties.

69. Its Annex V concerns protection and conservation of the ecosystems and biological diversity of the maritime area. Article 2 of Annex V specifies that in fulfilling their obligation under the Convention to protect the maritime area against the adverse impacts of human activities, contracting parties shall take the necessary measures to protect and conserve the ecosystems and the biological diversity of the maritime area, and to restore, where practicable, marine areas which have been adversely affected.[41] Article 4 of Annex V, however, provides that "no programme or measure concerning a question relating to the management of fisheries" shall be adopted under Annex V. That Article records that this is in accordance with the penultimate recital of the OSPAR Convention, which recognises "that questions relating to the management of fisheries are appropriately regulated under international and regional agreements dealing specifically with such questions".

70. Although the OSPAR Commission could therefore not adopt a fisheries management measure under Annex V of the OSPAR Convention, both that Annex and OSPAR more generally are relevant in the present context insofar as they oblige the UK and the EU to "take the necessary measures to protect the maritime area against the adverse effects of human activities", including so as "to conserve marine ecosystems".[42] The OSPAR Convention is also explicit that none of its provision shall be interpreted as preventing the contracting parties from taking, individually or jointly, more stringent measures with respect to the protection of the maritime area against the adverse effects of human activities.[43]

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40 OSPAR Convention, **Exhibit RLA-0002**.

41 OSPAR Convention, **Exhibit RLA-0002**, Annex V, Article 2(a).

42 OSPAR Convention, **Exhibit RLA-0002**, Article 2(1)(a).

43 OSPAR Convention, **Exhibit RLA-0002**, Article 2(5).

71. Annex V of the OSPAR Convention adopts the same definitions of "biological diversity" and "ecosystem" as in the Convention on Biological Diversity, discussed immediately below.

72. Pursuant to the OSPAR Convention, the OSPAR Commission promotes a strong articulation of the ecosystem approach[44] and the precautionary principle.[45] The 2010 Bergen Statement of the OSPAR Commission emphasised the ecosystem approach as the overarching concept and basis for its work[46] and emphasised the significance of the ecosystem approach for fisheries management.[47]

73. The OSPAR Commission's North-East Atlantic Environment Strategy ("**NEAES**") 2030[48] was adopted on 1 October 2021. This states the need for "urgent action" on marine biodiversity and ecosystems.[49] Strategic objective 5 is to:

> Protect and conserve marine biodiversity, ecosystems and their services to achieve good status of species and habitats, and thereby maintain and strengthen ecosystem resilience.

D. THE CONVENTION ON BIOLOGICAL DIVERSITY

74. The objectives of the Convention on Biological Diversity ("**CBD**") are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.[50] The CBD entered into force on 29 December 1993. Both the UK and EU are parties.

75. Biological diversity is defined in the CBD as the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the

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44 OSPAR Commission, Ecosystem Approach, **Exhibit RLA-0003**.

45 OSPAR Commission, Precautionary Principle, **Exhibit RLA-0004**.

46 OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, Meeting of the OSPAR Commission, Bergen (20-24 September 2010), Bergen Statement, **Exhibit RLA-0005**, para. 8.

47 OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, Meeting of the OSPAR Commission, Bergen (20-24 September 2010), Bergen Statement, **Exhibit RLA-0005**, para. 23, see also paras. 24 and, on climate change, 31.

48 Strategy of the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic 2030, **Exhibit RLA-0006**.

49 Strategy of the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic 2030, **Exhibit RLA-0006**, p. 3.

50 Convention on Biological Diversity, **Exhibit RLA-0007**, Article 1.

ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.[51]

76. Ecosystem is defined as a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.[52]

77. The CBD recognises the sovereign right of States to exploit their own resources pursuant to their own environmental policies.[53] It also requires each State, as far as possible and appropriate, to regulate or manage biological resources important for the conservation of biological diversity;[54] promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;[55] and rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, *inter alia*, through the development and implementation of plans or other management strategies.[56] The CBD specifies that it shall be implemented consistently with the rights and obligations of States under the law of the sea.[57]

78. In addition to the relevant aspects of the CBD, the Conference of the Parties has adopted two decisions of particular relevance to the measures taken by the UK and challenged by the EU in this case.

79. First, at its Fifth Meeting, almost 25 years ago,[58] the Conference of the Parties endorsed a description of the ecosystem approach in Decision V/6. This description explains that "ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way[59] OBJ. With regard to management measures, it adds that:

> The ecosystem approach requires adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete

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51 CBD, **Exhibit RLA-0007**, Article 2.

52 CBD, **Exhibit RLA-0007**, Article 2.

53 CBD, **Exhibit RLA-0007**, Article 3.

54 CBD, **Exhibit RLA-0007**, Article 8(c).

55 CBD, **Exhibit RLA-0007**, Article 8(d).

56 CBD, **Exhibit RLA-0007**, Article 8(f).

57 CBD, **Exhibit RLA-0007**, Article 22(2).

58 In Nairobi, Kenya, 15-26 May 2000.

59 Conference of the Parties, Decision V/6 Ecosystem Approach, **Exhibit RLA-0008**, Annex, para. 1.

> knowledge or understanding of their functioning. Ecosystem processes are often non-linear, and the outcome of such processes often shows time-lags. The result is discontinuities, leading to surprise and uncertainty. Management must be adaptive in order to be able to respond to such uncertainties and contain elements of 'learning-by-doing' or research feedback. Measures may need to be taken even when some cause-and-effect relationships are not yet fully established scientifically.[60]

80. As well as endorsing that narrative description, the Conference of the Parties endorsed twelve principles of the ecosystem approach. Of particular relevance are principles 1, 4 and 5:

> **Principle 1**: The objectives of management of land, water and living resources are a matter of societal choice.
>
> **Principle 4:** Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Any such ecosystem-management programme should: (a) Reduce those market distortions that adversely affect biological diversity; (b) Align incentives to promote biodiversity conservation and sustainable use; (c) Internalize costs and benefits in the given ecosystem to the extent feasible.
>
> **Principle 5**: Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.

81. Second, at its Fifteenth Meeting, spread over 2021 and 2022,[61] the Conference of the Parties adopted the Kunming-Montreal Global Biodiversity Framework.[62] That Framework sets a number of biodiversity targets to be achieved by 2030 and 2050, and it is to be implemented applying the ecosystem approach.[63] The most significant are:

> **Section G (Global Targets for 2050) Goal A:** The integrity, connectivity and resilience of all ecosystems are maintained, enhanced, or restored, substantially increasing the area of natural ecosystems by 2050; Human induced extinction of known threatened species is halted, and, by 2050, the extinction rate and risk of all species are reduced tenfold and the abundance of native wild species is increased to healthy and resilient levels; The genetic

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60 Conference of the Parties, Decision V/6 Ecosystem Approach, **Exhibit RLA-0008**, Annex, para. 4.

61 In Kunming, China, 11-15 October 2021 and Montreal, Canada, 7-19 December 2022.

62 The Framework is annexed to Conference of the Parties, Decision 15/4.

63 Kunming-Montreal Global Biodiversity Framework, **Exhibit RLA-0009**, Section C(7)(m).

> diversity within populations of wild and domesticated species, is maintained, safeguarding their adaptive potential.
>
> **Section H (Global Targets for 2030) Target 5:** Ensure that the use, harvesting and trade of wild species is sustainable, safe and legal, preventing overexploitation, minimizing impacts on non-target species and ecosystems, and reducing the risk of pathogen spillover, applying the ecosystem approach, while respecting and protecting customary sustainable use by indigenous peoples and local communities.

82. The UK's commitment to honouring these targets is recognised, among other places, in the Environmental Improvement Plan 2023.[64]

E. FAO CODE OF CONDUCT FOR RESPONSIBLE FISHERIES 1995

83. Through Article 404(2)(a) of the TCA, the Parties have committed to acting consistently and complying with the 1995 United Nations Food and Agriculture Organisation Code of Conduct for Responsible Fisheries.[65]

84. Article 6 sets out the general principles of the Code of Conduct. Article 6.1 specifies that: "States and users of living aquatic resources should conserve aquatic eco-systems. The right to fish carries with it the obligation to do so in a responsible manner so as to ensure effective conservation and management of the living aquatic resources."

85. Article 6.2 expands upon this and identifies that "[f]isheries management should promote the maintenance of the quality, diversity and availability of fishery resources in sufficient quantities for present and future generations in the context of food security, poverty alleviation and sustainable development. Management measures should not only ensure the conservation of target species but also of species belonging to the same ecosystem or associated with or dependent upon the target species."

86. Article 7 sets out principles relating to fisheries management. Article 7.5 provides in relevant part as follows:

> **Article 7.5.1** States should apply the precautionary approach widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment. The absence of

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64 Environmental Improvement Plan 2023 First revision of the 25 Year Environment Plan (Defra), 2023, **Exhibit R-0006**, pp. 37-38.

65 FAO Code of Conduct for Responsible Fisheries, **Exhibit CLA-0033**.

adequate scientific information should not be used as a reason for postponing or failing to take conservation and management measures.

Article 7.5.2 In implementing the precautionary approach, States should take into account, inter alia, uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as well as environmental and socio-economic conditions.

IV. SANDEEL AND THEIR ROLE IN THE NORTH SEA ECOSYSTEM

A. TERMINOLOGY

87. The UK begins this section by defining scientific terminology used in this submission and in the scientific advice relied upon by the UK.

87.1. **Abundance:** A measure of the number of individuals of a species in a particular ecosystem or area at a given time.

87.2. **Availability:** The presence and quantity of suitable food items available to a predator at a given time in a given area. This has three aspects: (i) abundance of suitable food in an area that is accessible by a predator (e.g. for seabirds, this requires sandeel to be within their foraging distance and within their dive depth and occurring at appropriate densities); (ii) timing, because the food must be available at a time that coincides with when predators need to access that specific type of food during their life cycle (e.g. in the immediately period after hatching, sandeel larvae need copepod prey to be available in the water column); and (iii) suitability (e.g. sandeel that are too small or too large to be predated are not effectively available for predation).

87.3. **Biomass:** The total mass of a species in a particular ecosystem or area at a given time. Sandeel biomass in the North Sea, for example, is a function of both the number of individual sandeel in the North Sea and the mass of each sandeel.

87.4. **Body condition:** A measure which is used to evaluate the health and nutritional status of an animal. This can be assessed using various metrics, including weight, length and fat (lipid) content.

87.5. **Breeding success:** A measure of the reproductive success of an organism. For example, breeding success for birds is commonly measured by counting either the proportion of eggs that hatch or the proportion of chicks that fledge (i.e. have wing feathers large enough for flight) per breeding pair or nest in a colony.

87.6. **Demersal:** Living on or near the seabed.

87.7. **Displacement:** Refers to a change in fishing practice following a restriction on previous practices. This includes spatial displacement to a new fishing area (or intensification of fishing effort in areas where the restriction does not apply) and/or target displacement where a different species is fished.

87.8. **Ecosystem:** The complex of living organisms, their physical environment, and all their interrelationships in a particular unit of space.

87.9. **Ecosystem resilience:** The capacity of an ecosystem to absorb disturbances (natural or anthropogenic), recover from stress or change, and maintain essential structure, functions and processes. It reflects the ability of an ecosystem to adapt to variability and external pressures over time.

87.10. **Ecosystem services:** The role played by a species in the functioning of an ecosystem. This includes the flow/cycling of energy and other resources within the ecosystem, as well as other processes (e.g. the modification by a species of a habitat such as through reef-building).

87.11. **Maximum Sustainable Yield:** The highest theoretical equilibrium yield that can be continuously taken on average from a marine stock under existing environmental conditions without significantly affecting the reproductive process.[66]

87.12. **Pelagic:** Present in the water column as opposed to near the seabed.

87.13. **Productivity:** The rate of generation of biomass of a species. The factors that affect productivity of a species includes its birth, growth and death rates.

87.14. **Recovery:** The return of a population or ecosystem to a pre-defined status after a disturbance or decline.

87.15. **Recruitment:** The number of individuals in a population that reach a specified stage of an organism's life cycle. In the context of sandeel, this generally refers to the number of sandeel which survive to settlement stage, which is when sandeel larvae metamorphose into juveniles, become attached to the sandbank (see

[66] The UK agrees with the EU's definition at EU submission, para. 35.

section VI.2 below) and begin to appear in commercial catches (around 6 months old[67]).

87.16. **Spawning Stock Biomass:** The total mass of fish in a stock that have reached sexual maturity and are capable of reproducing.

87.17. **Species resilience:** The ability of a species to withstand, adapt to, and recover from environmental changes (natural or anthropogenically derived), while ensuring populations remain viable and the ecological role of the species in the wider ecosystem is maintained.

87.18. **Synchrony:** The coordination or alignment of processes or events. In the context of this case, synchrony generally refers to the overlap in time or space of key predator and prey events.

87.19. **Trophic levels:** A level or position in a food chain or web.

B. INTRODUCTION TO SANDEEL

88. Sandeel are small eel-like fish. The most abundant species of sandeel in the North Sea is the lesser sandeel (*Ammodytes marinus*), which is the species that supports the North Sea fishery.[68] Sandeel are 'forage fish', which refers to small to intermediate sized fish, occurring in schools or aggregations, that serve as a major food source for other fish, marine mammals and seabirds. Sandeel have a high lipid content, which means they are a high energy source of food for predators.[69] Sandeel feed on phyto- and zooplankton, including copepods (small aquatic crustaceans), as well as some larger planktonic organisms.[70] They are a relatively short-lived species, with few sandeel surviving beyond 3 to 4 years.[71]

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67 While the fishery does not specifically target sandeel aged under 1 year, they do appear in catches. Sandeel aged under 1 year are referred to as age-0 sandeel. Sandeel age is measured by counting the rings in the ear-bone (otolith).

68 Scottish Scientific Report, **Exhibit C-0050**, p. 1.

69 Scottish Scientific Report, **Exhibit C-0050**, p. 73.

70 Fishbase, Food items reported for Ammodytes marinus, **Exhibit R-0104**.

71 Arnott, S. A., & Ruxton, G. D. (2002). Sandeel recruitment in the North Sea: demographic, climatic and trophic effects. Marine Ecology Progress Series, 238, 199-210., **Exhibit C-0020**, p. 200.

89. Sandeel spawn in winter.[72] The life-cycle of sandeel comprises the following stages:

89.1. **Overwintering period (Autumn/Winter)**: Sandeel remain buried in the sand day and night during this period, except to emerge between December and January to spawn.[73] Sandeel eggs are demersal, which means they are laid in sticky clumps which are attached to the seabed. During the overwintering period, sandeel rely on their energy reserves to survive.[74]

89.2. **Hatching (February to April)**: Sandeel larvae hatch from eggs and begin a short phase in which they are present in the water column, before they metamorphose into juveniles.[75]

89.3. **Feeding period (Spring/Summer)**: Adult sandeel emerge from the sand to forage during daylight hours in pelagic feeding schools (targeted by marine predators).[76] At night, they bury into the sediment.[77] Sandeel tend to forage in the vicinity of the sandbanks in which they bury themselves at night.[78]

89.4. **Settlement period (May to June)**: The settlement period starts after the feeding period has begun and ends before the feeding period has ended. It is a key transition in the sandeel life cycle, with juvenile sandeel settling into the sandy substrate with the adult segment of the population.[79] After settlement, juvenile sandeel adopt adult behaviour, including the formation of pelagic feeding schools

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72 Scottish Scientific Report, **Exhibit C-0050**, p. 1.

73 Scottish Scientific Report, **Exhibit C-0050**, p. 1; Régnier et al. (2017) Importance of trophic mismatch in a winter-hatching species: evidence from lesser sandeel. Mar. Ecol. Prog. Ser. 567: 185-19, **Exhibit R-0010**, p. 186.

74 Henriksen et al. (2021a) Temperature and body size affect recruitment and survival of sandeel across the North Sea. ICES J. Mar. Sci. 78: 1409-1420, **Exhibit R-0011**, p. 1410.

75 Scottish Scientific Report, **Exhibit C-0050**, p. 1; Henriksen et al. (2021a) Temperature and body size affect recruitment and survival of sandeel across the North Sea. ICES J. Mar. Sci. 78: 1409-1420, **Exhibit R-0011**, p. 1410.

76 Scottish Scientific Report, **Exhibit C-0050**, p. 1.

77 Scottish Scientific Report, **Exhibit C-0050**, p. 1.

78 Scottish Scientific Report, **Exhibit C-0050**, p. 4.

79 Scottish Scientific Report, **Exhibit C-0050**, p. 1.

during daylight and nocturnal burying.[80] As explained below, sandeel show high site fidelity to the specific sandbanks in which they have settled.

90. As a result of this life-cycle in which sandeel are buried in the sand during the overwinter period and at night during the feeding period, they are highly reliant on the availability of suitable sandy substrates.[81]

91. An important characteristic of sandeel is that they have a life-long attachment to the sandbank in which they initially settled.[82] After settlement, sandeel movements are limited.[83] Very little to no exchange of adult sandeel populations has been found between sandeel aggregations that are separated by more than 28km, even if those aggregations are connected by continuous stretches of suitable sandy habitat.[84]

92. Given the limited movement of juveniles and adults, the exchange of sandeel between different sandeel grounds arises overwhelmingly from dispersal during the larval stage.[85] Such larval dispersal is mostly driven by oceanographic processes, principally ocean currents.[86] Whilst some larval mixing occurs between neighbouring sandeel grounds

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80 Henriksen et al. (2021a) Temperature and body size affect recruitment and survival of sandeel across the North Sea. ICES J. Mar. Sci. 78: 1409-1420, **Exhibit R-0011**, p. 1410.

81 Scottish Scientific Report, **Exhibit C-0050**, p. 1, citing Wright et al. (2000) The influence of sediment type on the distribution of the Lesser Sandeel, Ammodytes marinus. J. Sea Res. 44: 243-256, **Exhibit R-0012**, Holland et al. (2005) Identifying sandeel Ammodytes marinus sediment habitat preferences in the marine environment. Mar. Ecol. Prog. Ser. 303: 269-282, **Exhibit R-0013**, Tien et al. (2017) Burrow distribution of three sandeel species relates to beam trawl fishing, sediment composition and water velocity, in Dutch coastal waters. J. Sea Res. 127: 194-202, **Exhibit R-0014**; Langton et al. (2021) A verified distribution model for the lesser sandeel Ammodytes marinus. Mar. Ecol. Prog. Ser. 667: 145-159, **Exhibit R-0015**.

82 Scottish Scientific Report, **Exhibit C-0050**, p. 1.

83 Scottish Scientific Report, **Exhibit C-0050**, p. 5, citing Jensen et al. (2011), Inferring the location and scale of mixing between habitat areas of lesser sandeel through information from the fishery. ICES J of Mar Sci. 68(1): 43-51, **Exhibit C-0023**; Gauld. (1990) Movements of lesser sandeels (Ammodytes marinus Raitt) tagged in the northwestern North Sea. Journal du Conseil. 46(3): 229-231, **Exhibit R-0017**; Wright et al. (2019) Integrating the scale of population processes into fisheries management, as illustrated in the sandeel, Ammodytes marinus. ICES J. Mar. Sci. 76: 1453-1463, **Exhibit R-0018**.

84 Scottish Scientific Report, **Exhibit C-0050**, p. 5, citing Jensen et al. (2011), Inferring the location and scale of mixing between habitat areas of lesser sandeel through information from the fishery. ICES J of Mar Sci. 68(1): 43-51, **Exhibit C-0023**.

85 Scottish Scientific Report, **Exhibit C-0050**, p. 6, citing Wright et al. (2017a) Impact of rising temperature on reproductive investment in a capital breeder: The lesser sandeel. J. Exp. Mar. Biol. Ecol. 486: 52-58, **Exhibit R-0019**; Wright et al. (2019) Integrating the scale of population processes into fisheries management, as illustrated in the sandeel, Ammodytes marinus. ICES J. Mar. Sci. 76: 1453-1463, **Exhibit R-0018**; Gibb et al. (2017) Connectivity in the early life history of sandeel inferred from otolith microchemistry. J. Sea Res. 119: 8-16, **Exhibit R-0021**.

86 Scottish Scientific Report, **Exhibit C-0050**, p. 7.

(i.e. over a limited spatial range),[87] there is limited exchange of larvae across the different ICES sandeel stock assessment areas (i.e. over broader distances).[88] Further, properties of oceanographic currents in the North Sea mean that some sandeel grounds, such as those in the Firth of Forth, are more isolated than others.[89]

93. The exchange of larvae, juveniles or adults of a species across a particular area (connectivity) is key to the ability to repopulate local depletions and is therefore closely linked with resilience.[90] For sandeel, the recovery of a depleted area depends, among other things, on the proximity of that ground to sources of sandeel larvae and on oceanographic processes.[91] It may take several years after a local depletion for recovery to occur, with observational data indicating that some grounds have not recovered after more than 8 years.[92] The recovery process is also likely to be affected by environmental conditions such as climate change.[93]

C. DRIVERS OF SANDEEL ABUNDANCE

94. Sandeel experience high levels of natural fluctuation.[94] This fluctuation is driven by both top down processes (such as mortality by predators) as well as bottom up processes (such as the amount of food available to sandeel and the effects of hydroclimatic factors).[95] In addition to those natural causes, a further source of sandeel mortality arises from removal

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87 Scottish Scientific Report, **Exhibit C-0050**, p. 6, citing Wright et al. (2017a) Impact of rising temperature on reproductive investment in a capital breeder: The lesser sandeel. J. Exp. Mar. Biol. Ecol. 486: 52-58, **Exhibit R-0019**; Wright et al. (2017b) Warming delays ovarian development in a capital breeder. Mar. Biol. 164(80): 1-9, **Exhibit R-0020**; Wright et al. (2019) Integrating the scale of population processes into fisheries management, as illustrated in the sandeel, Ammodytes marinus. ICES J. Mar. Sci. 76: 1453-1463, **Exhibit R-0018**, Gibb et al. (2017) Connectivity in the early life history of sandeel inferred from otolith microchemistry. J. Sea Res. 119: 8-16, **Exhibit R-0021**.

88 Scottish Scientific Report, **Exhibit C-0050**, pp. 6-7. For sandeel stock assessment areas, see para. 117 below.

89 Scottish Scientific Report, **Exhibit C-0050**, p. 7; Gibb et al. (2017) Connectivity in the early life history of sandeel inferred from otolith microchemistry. J. Sea Res. 119: 8-16, **Exhibit R-0021**, p. 14.

90 Gibb et al. (2017) Connectivity in the early life history of sandeel inferred from otolith microchemistry. J. Sea Res. 119: 8-16, **Exhibit R-0021**, p. 8.

91 Scottish Scientific Report, **Exhibit C-0050**, p. 7.

92 Scottish Scientific Report, **Exhibit C-0050**, p. 7, citing Johannessen et al. (2015) Demographically disconnected subpopulations in lesser sandeel (Ammodytes marinus) as basis of a high resolution spatial management system. ICES CM. 2015/E, **Exhibit R-0022**.

93 Scottish Scientific Report, **Exhibit C-0050**, pp. 7-8, citing Clausen et al. (2018) Shifts in North Sea forage fish productivity and potential fisheries yield. J. App. Ecol. 55: 1092-1101, **Exhibit R-0023**.

94 English Scientific Report, **Exhibit C-0045**, p. i.

95 Scottish Scientific Report, **Exhibit C-0050**, p. 24.

by the fisheries (fishing mortality). Thus sandeel abundance is affected by both natural and anthropogenic forces.[96] In the fisheries management context, this is expressed using the formula $Z = F + M$, where Z is total mortality, F is fishing mortality and M is natural mortality.

95. Sandeel are highly sensitive to environmental variation. In particular, ocean temperature[97] has been linked with sandeel abundance through two main mechanisms:

95.1. **Direct effects:** Sandeel are particularly sensitive to temperature increases in the winter as a result of the long overwintering period in which they remain inactive in the sand, and their need to build up energy reserves ahead of that period.[98] Higher temperatures during winter have been linked with decreased overwinter survival, increased weight loss, delay in ovarian development, and a shorter egg development period.[99]

95.2. **Indirect effects:** Changes in temperature have been linked with changes in sandeel spawning and hatching dates, which can lead to a mismatch between when sandeel hatch and need to feed, and when sandeel prey is available (described as "trophic mismatch").[100] Using climate predictions from the IPCC, this mismatch is predicted to significantly worsen in the future.[101]

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96 English Scientific Report, **Exhibit C-0045**, p. 11; Review of Scientific Evidence, **Exhibit C-0050**, p. 37.

97 Climate-change induced increases in ocean acidification and decreases in dissolved oxygen are also likely to play an important role: English Scientific Report, **Exhibit C-0045**, pp. 12-13.

98 Scottish Scientific Report, **Exhibit C-0050**, p. 8.

99 Scottish Scientific Report, **Exhibit C-0050**, pp. 8-9, citing van Deurs et al. (2011) Critical threshold size for overwintering sandeel (Ammodytes marinus). Mar. Biol. 158: 2755-2764, **Exhibit R-0024**; Wright et al. (2017a) Impact of rising temperature on reproductive investment in a capital breeder: The lesser sandeel. J. Exp. Mar. Biol. Ecol. 486: 52-58, **Exhibit R-0019**; Wright et al. (2017b) Warming delays ovarian development in a capital breeder. Mar. Biol. 164(80): 1-9, **Exhibit R-0020**. See also English Scientific Report, **Exhibit C-0045**, p. 38, citing Henriksen et al. (2021a) Temperature and body size affect recruitment and survival of sandeel across the North Sea. ICES J. Mar. Sci. 78: 1409-1420, **Exhibit R-0011**; Henriksen et al. (2021b) Get up early: Revealing behavioral responses of sandeel to ocean warming using commercial catch data. Ecology and Evolution. 11(23): 16786-16805, **Exhibit R-0125**.

100 Scottish Scientific Report, **Exhibit C-0050**, citing Wright & Bailey. (1996) Time of hatching in Ammodytes marinus from Shetland waters and its significance to early growth and survivorship. Mar. Biol. 126: 143-152, **Exhibit R-0026**; Régnier et al. (2017) Importance of trophic mismatch in a winter-hatching species: evidence from lesser sandeel. Mar. Ecol. Prog. Ser. 567: 185-19, **Exhibit R-0010**; Régnier et al. (2019) Understanding temperature effects on recruitment in the context of trophic mismatch. Sci. Rep. 9: 15179, **Exhibit R-0126**; English Scientific Report, **Exhibit C-0045**, p. 39.

101 Scottish Scientific Report, **Exhibit C-0050**, p. 10, citing Régnier et al. (2019) Understanding temperature effects on recruitment in the context of trophic mismatch. Sci. Rep. 9: 15179, **Exhibit R-0126**.

96. The fact that sandeel experience high levels of natural fluctuation means that even without the additional pressure of fishing, sandeel abundance can vary significantly from year to year.[102] A modelling study has found that even with a low level of fishing pressure, there remains a risk that sandeel populations will "crash".[103]

D. SANDEEL IN THE NORTH SEA ECOSYSTEM

97. Sandeel play a critical role in the North Sea ecosystem. As explained above, sandeel is a forage fish, which means that it functions as a main pathway for energy to be transferred from lower trophic levels to higher trophic levels. The main forage fish in the North Sea are sandeel, sprat, Norway pout and herring.

98. The structure of the North Sea ecosystem is such that it has very few species of forage fish forming the intermediate link between a large diversity of primary and secondary producers (phytoplankton and zooplankton) and a large diversity of marine predators, such as seabirds, marine mammals and species of predatory fish.[104]

99. The consumption of sandeel in the North Sea by different predators as estimated for 1991 (the start of the Ecopath with Ecosim model run[105]) is shown in Figure 1 below. As shown in that figure, the natural predators estimated to consume the largest proportion of sandeel biomass were whiting, rays, mackerel and baleen whales.[106] Sandeel constitutes different percentages of the overall diets of its predators. Species which depend heavily on sandeel

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102 Scottish Scientific Report, **Exhibit C-0050**, p. 21.

103 Poloczanska et al. (2004) Fishing vs. natural recruitment variation in sandeel as a cause of seabird breeding failure at Shetland: a modelling approach. ICES J. Mar. Sci. 61: 788-797, **Exhibit R-0027**, cited in the English Scientific Report, **Exhibit C-0045**, p. 11 and Scottish Scientific Report, **Exhibit C-0050**, pp. 25-26.

104 Scottish Scientific Report, **Exhibit C-0050**, p. 1.

105 For an explanation of the Ecopath with Ecosim modelling, see paras. 235-237 below. 1991 represented the last comprehensive study of marine fish diets (one of the two "Years of the Stomach", the other being 1981). Under this ICES initiative, the stomachs of over 200,000 animals in the North Sea were sampled and analysed, see ICES Fish stomach contents dataset, **Exhibit R-0127**. This dataset is the major contributor of diet information to the models that have been reviewed and approved by ICES for use in ICES advice, including the North Sea Ecopath with Ecosim Key Run, see Report of the Working Group on Multispecies Assessment Methods (WGSAM), 9-13 November 2015, **Exhibit R-0108**, p. 102 (stomach data). The ICES Key Run is explained at paras. 238-239 below.

106 English Scientific Report, **Exhibit C-0045**, pp. 22-23.

as a core component of their diet include baleen whales, gurnards, rays, seals, seabirds, toothed whales, haddock and whiting.[107]

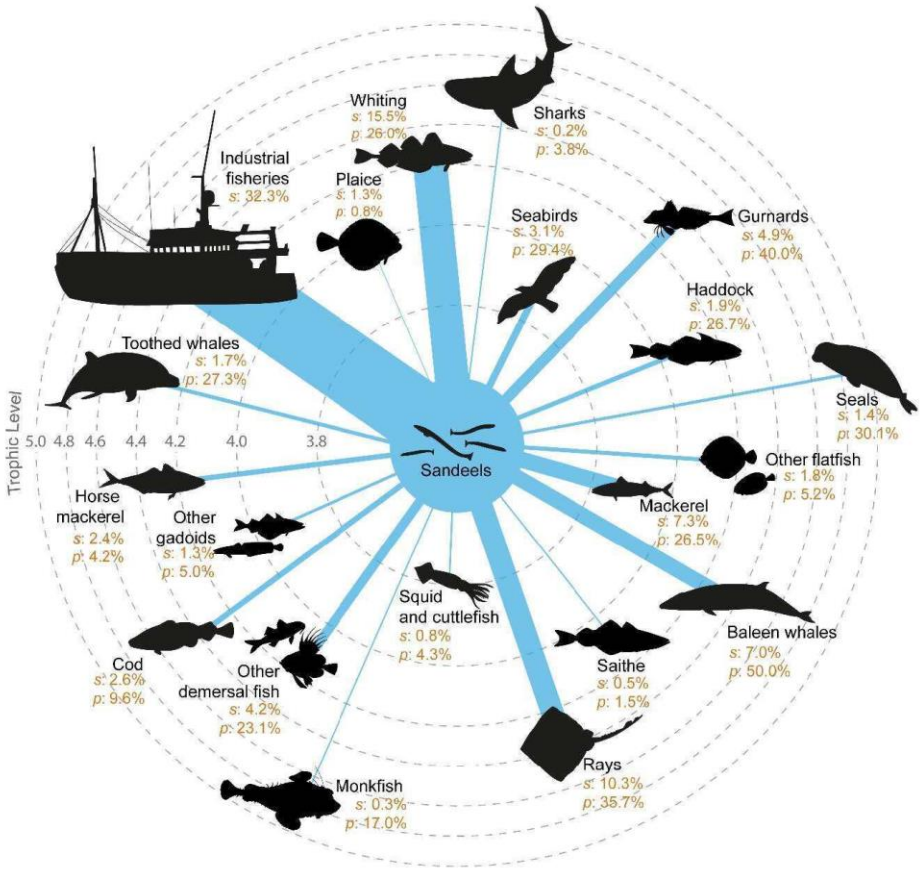

Figure 1:[108] Biomass flow in the North Sea calculated using Ecopath with Ecosim base estimates in 1991. Values indicate the percentage of sandeel biomass consumed by each type of predator/fishing as a proportion of all sandeel predators and fishing (*s*) and the contribution of sandeel to the total consumption of each type of predator (*p*). Links between sandeel and food web and fishery components are proportional to the flow of biomass from sandeel. Sequential rings highlight the trophic level of the predators which consume sandeel.

107 English Scientific Report, **Exhibit C-0045**, pp. 22-23.

108 English Scientific Report, **Exhibit C-0045**, Figure 4.

E. PREDATORS OF SANDEEL

100. Sandeel are a key prey species for a number of predators in the North Sea. This section is intended to provide only a high-level summary of some of the substantiated links between sandeel and their predators, with more fulsome information set out in the scientific advice relied upon by the UK.[109]

1. Seabirds

101. A large number of internationally important breeding colonies for sandeel-dependent seabirds lie along the UK coastline.[110] Certain of these seabirds are vulnerable or endangered:

101.1. The black-legged kittiwake ("**kittiwake**") has been on the OSPAR List of Threatened and/or Declining Species since 2008.[111] OSPAR has identified the key pressures on kittiwake in the Greater North Sea as (i) the over-exploitation of small forage fish (sandeel and herring) by fishing and (ii) climate change impacts, including the indirect effects of climate change on kittiwake food supply.[112] Under International Union for Conservation of Nature ("**IUCN**") criteria, kittiwake is considered "endangered" in the North Sea and "critically endangered" in Arctic Waters.[113]

101.2. Atlantic puffin has been listed by the IUCN as "vulnerable" to global extinction.[114]

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109 For the best available scientific advice relied upon by the UK in respect of the English and Scottish measures, see paras. 226-260 below.

110 English Scientific Report, **Exhibit C-0045**, p. 12, citing Mitchell et al. (2004) Seabird Populations of Britain and Ireland (JNCC), **Exhibit R-0028**; Dunn. (2021) Revive our Seas: The case for stronger regulation of sandeel fisheries in UK waters (RSPB), **Exhibit R-0029**; Scottish Scientific Report, **Exhibit C-0050**, p. 36.

111 OSPAR, Status Assessment 2023 – Black-legged Kittiwake, **Exhibit R-0030**.

112 OSPAR, Status Assessment 2023 – Black-legged Kittiwake, **Exhibit R-0030**.

113 OSPAR, Status Assessment 2023 – Black-legged Kittiwake, **Exhibit R-0030**. Region I comprises Arctic Waters. Region II comprises the Greater North Sea.

114 IUCN Red List, Atlantic Puffin, 2018, **Exhibit R-0031**.

101.3. OSPAR's 2023 Marine Birds Thematic Assessment found that in the Greater North Sea, kittiwake, Great skua and Arctic tern were not in "good status".[115]

101.4. The UK's Red List for birds lists kittiwake, Great skua, Arctic tern, Arctic skua, Atlantic puffin on the red list, and European shag, Common guillemot, razorbill and Sandwich tern on the amber list.[116]

102. Sandeel are important in the diets of many seabird species, particularly during the chick-rearing season.[117] The ability of seabirds to prey on sandeel depends on both the abundance and availability of sandeel.[118] Seabirds have different constraints when it comes to searching for prey:[119]

102.1. One constraint is the extent to which seabirds can dive down into the water column to obtain prey at different depths, which varies greatly among species.[120] Surface-feeding seabirds such as terns and kittiwake for example can only take fish very close to the surface.[121]

102.2. During chick-rearing, seabirds are constrained in the distance from nest sites in which they can forage.[122] The foraging range of different seabirds varies greatly.[123] Chick-rearing also requires temporal availability, i.e. the availability of the prey needs to coincide with the chick-rearing season.[124]

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115 OSPAR, Quality Status Report (2023), Marine Birds Thematic Assessment, **Exhibit R-0032**.

116 Stanbury et al. (2024) The status of the UK's breeding seabirds: An Addendum to the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds. 117: 471-487, **Exhibit R-0033**.

117 English Scientific Report, **Exhibit C-0045**, p. 12, citing Frederiksen et al. (2004) The role of industrial fisheries and oceanographic change in the decline of North Sea black-legged kittiwakes. J. App. Ecol. 41(6): 1129-1139, **Exhibit R-0034**.

118 Scottish Scientific Report, **Exhibit C-0050**, p. 36.

119 Other factors such as limited ability to switch diet, limited foraging time, and high cost of foraging per unit of time can also affect different seabirds' dependency on sandeel, see Scottish Scientific Report, **Exhibit C-0050**, p. 41, citing Furness & Tasker. (2000) Seabird-fishery interactions: quantifying the sensitivity of seabirds to reductions in sandeel abundance, and identification of key areas for sensitive seabirds in the North Sea. Mar. Ecol. Prog. Ser. 202: 253-264, **Exhibit R-0035**.

120 Scottish Scientific Report, **Exhibit C-0050**, pp. 36-37.

121 Scottish Scientific Report, **Exhibit C-0050**, p. 37.

122 Scottish Scientific Report, **Exhibit C-0050**, p. 36.

123 Addressed below, see paras. 297-298 below.

124 Scottish Scientific Report, **Exhibit C-0050**, p. 45.

103. Sandeel are a key prey for seabirds for various reasons, including because they are a high-energy and therefore high-quality prey, and because during the chick-rearing season they are available in the water column (other than at night when they are buried in the seabed) and form pelagic feeding schools which seabirds can target more easily than other prey. Based on various factors including diving ability, foraging range and proportion of sandeel in their diet, kittiwake and puffin have been identified as particularly sensitive to changes in sandeel abundance and availability.[125]

104. Numerous studies have shown a link between, on the one hand, breeding success of seabirds and, on the other, sandeel abundance and availability.[126] Conversely, for kittiwake at least, breeding success has been found to be negatively correlated with the amount of fishing undertaken by industrial sandeel fisheries.[127]

2. Marine mammals

105. The UK holds internationally important numbers of marine mammals, with 17 different species regularly occurring in UK waters.[128] The UK is home to around 35% of the world's population of grey seals and 32% of European harbour seals.[129] OSPAR's 2023 Marine Mammals Thematic Assessment found that in the Greater North Sea, the status of seals overall is "not good".[130]

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125 Scottish Scientific Report, **Exhibit C-0050**, p. 43.

126 See the numerous other papers cited at Scottish Scientific Report, **Exhibit C-0050**, pp. 44-45; English Scientific Report, **Exhibit C-0045**, pp. 15-18.

127 English Scientific Report, **Exhibit C-0045**, p. 13, citing Frederiksen et al. (2008) Differential effects of a local industrial sand lance fishery on seabird breeding performance. J. Ecol. App. 18(3): 701-710, **Exhibit R-0037**; Daunt et al. (2008) The impact of the sandeel fishery closure on seabird food consumption, distribution, and productivity in the northwestern North Sea. Can. J. Fish. & Aq. Sci. 65(3): 362-381, **Exhibit R-0038**; Scottish Scientific Report, **Exhibit C-0050**, citing Rindorf et al. (2000) Effects of changes in sandeel availability on the reproductive output of seabirds. Mar. Ecol. Prog. Ser. 202: 241-252, **Exhibit R-0039**; Scottish Scientific Report, **Exhibit C-0050**, p. 51, citing the same papers as well as Searle et al. (2023) Effects of a fishery closure and prey abundance on seabird diet and breeding success: Implications for strategic fisheries management and seabird conservation. Biol. Conserv. 281: 1-15, **Exhibit R-0040**.

128 Scottish Scientific Report, **Exhibit C-0050**, p. 61.

129 Natural Environment Research Council Special Committee on Seals, Scientific Advice on Matters Related to the Management of Seal Populations, 2022, **Exhibit R-0041**, pp. 8, 9, 35.

130 OSPAR, Quality Status Report (2023), Marine Mammals Thematic Assessment, **Exhibit R-0042**.

106. Sandeel are a key prey species for marine mammals, and comprise a large proportion of the diet of seals and some cetaceans.[131] There are various substantiated links between marine mammals and sandeel abundance and availability:

106.1. A number of marine mammals show a preference for sandeel in their diets, including grey seals and harbour seals.[132] A correlation has been found between regional declines of sandeel stocks and declining populations of harbour seals in those regions.[133] The condition of grey seals has also been linked with sandeel abundance.[134]

106.2. Harbour porpoise feed predominantly on sandeel and whiting.[135] The distribution of harbour porpoise in the North Sea has been strongly linked to sandeel availability.[136] Better body condition of harbour porpoise has also been linked to sandeel availability.[137]

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131 Scottish Scientific Report, **Exhibit C-0050**, p. 57; English Scientific Report, **Exhibit C-0045**, Figure 4. Cetacea is a category including whales, dolphins and porpoises.

132 English Scientific Report, **Exhibit C-0045**, p. 12, citing Hammond et al. (1994) The diet of grey seals around Orkney and other island and mainland sites in north-eastern Scotland. J. App. Ecol. 31(2): 340-350, **Exhibit R-0043**; Thompson et al. (1996) Comparative distribution, movements and diet of harbour and grey seals from Moray Firth, NE Scotland. J. App. Ecol. 33: 1572-1584, **Exhibit R-0044**; Scottish Scientific Report, **Exhibit C-0050**, p. 57.

133 Scottish Scientific Report, **Exhibit C-0050**, p. 59, citing Wilson & Hammond. (2019) The diet of harbour and grey seals around Britain: Examining the role of prey as a potential cause of harbour seal declines. Aquatic Conserv. Mar. Freshw. Ecosyst. 29(51): 71-85, **Exhibit R-0045**; English Scientific Report, **Exhibit C-0045**, p. 15, citing the same paper.

134 English Scientific Report, **Exhibit C-0045**, p. 15, citing Smout et al. (2020) Environment-sensitive mass changes influence breeding frequency in a capital breeding marine top predator. J. App. Ecol. 89(2): 384-396, **Exhibit R-0046**.

135 Scottish Scientific Report, **Exhibit C-0050**, p. 59, citing Santos & Pierce. (2003) The diet of harbour porpoise (Phocoena phocoena) in the northeast Atlantic. Oceanography Mar. Biol. Ann. Rev. 41. 355-390, **Exhibit R-0047**.

136 English Scientific Report, **Exhibit C-0045**, p. 12; Scottish Scientific Report, **Exhibit C-0050**, p. 73.

137 English Scientific Report, **Exhibit C-0045**, pp. 12 and 15, citing MacLeod et al. (2007) Linking sandeel consumption and the likelihood of starvation in harbour porpoises in the Scottish North Sea: could climate change mean more starving porpoises? Biology letters 3(2): 185-188, **Exhibit R-0049**; Scottish Scientific Report, **Exhibit C-0050**, p. 73, citing the same study.

106.3. Diet studies have shown that sandeel dominate the diet of minke whales in the North Sea.[138] The redistribution of minke whale within the North Sea may be related to a decline in sandeel availability elsewhere in the North Sea.[139]

3. Predatory fish

107. As noted above, sandeel constitute a large proportion of the diet of predatory fish in the North Sea.[140] Some of those species, including cod, haddock and whiting, are fished for human consumption.[141] Predatory fish tend to be generalist feeders, meaning that they consume a greater diversity of prey and have a greater ability to switch between prey species based on availability.[142] For that reason they are regarded as less critically reliant on sandeel as a food source than other predators.[143] That assumes, however, that alternative prey are readily available to substitute for sandeel; a lack of available sandeel may force predatory fish to target suboptimal prey with a lower calorific value, leading to worse body condition.[144] Indeed, a number of predatory fish, including cod, whiting plaice, gurnards, lesser weaver and haddock have shown better body condition or growth in years of high sandeel abundance.[145]

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138 Scottish Scientific Report, **Exhibit C-0050**, p. 60, citing Pierce et al. (2004) Diet of minke whales Balaenoptera acutorostrata in Scottish (UK) waters with notes on strandings of this species in Scotland 1992–2002. J. Mar. Biol. Assoc. UK. 84(06):1241-1244, **Exhibit R-0050**.

139 English Scientific Report, **Exhibit C-0045**, p. 12, citing de Boer. (2010) Spring distribution and density of minke whale Balaenoptera acutorostrata along an offshore bank in the central North Sea. Mar. Ecol. Prog. Ser. 408: 265-274, **Exhibit R-0053**.

140 See also Scottish Scientific Report, **Exhibit C-0050**, pp. 26-27.

141 Engelhard et al. (2013) Body condition of predatory fishes linked to the availability of sandeels. Mar. Biol. 160(2): 299-308, **Exhibit R-0054**, p. 299.

142 Scottish Scientific Report, **Exhibit C-0050**, p. 35.

143 English Scientific Report, **Exhibit C-0045**, p. 13, citing Trenkel et al. (2005) Spatial and temporal structure of predator–prey relationships in the Celtic Sea fish community. Mar. Ecol. Prog. Ser. 299: 257-268, **Exhibit R-0055**; Pinnegar et al. (2003) Does diet in Celtic Sea fishes reflect prey availability? J. Fish. Biol. 63: 197-212, **Exhibit R-0056**.

144 Engelhard et al. (2008) Fishing mortality versus natural predation on diurnally migrating sandeel Ammodytes marinus. Mar. Ecol. Prog. Ser. 369: 213-277, **Exhibit R-0057**.

145 English Scientific Report, **Exhibit C-0045**, p. 13, citing Mackinson. (2007) Multi-species fisheries management: a comprehensive impact assessment of the sandeel fishery along the English east coast (Cefas report for Defra), **Exhibit R-0058**, Engelhard et al. (2013) Body condition of predatory fishes linked to the availability of sandeels. Mar. Biol. 160(2): 299-308, **Exhibit R-0054**, Rindorf et al. (2008) Growth, temperature, and density relationships of North Sea cod (Gadus morhua). Can. J. Fish. & Aq. Sci. 65(3): 456-470, **Exhibit R-0059**; Scottish Scientific Report, **Exhibit C-0050**, citing the same sources.

F. SANDEEL COMPARED TO OTHER FORAGE FISH IN THE NORTH SEA

108. The most abundant forage fish in the North Sea are sandeel, Norway pout, sprat and herring.

109. Sandeel are disproportionately important in the North Sea ecosystem relative to the role of other forage fish, and have been identified as the most "universally important" forage fish to predators in the North Sea.[146] There are key differences between sandeel and the other forage fish in the North Sea:

109.1. As acknowledged by the EU, a unique trait of sandeel is their strong site attachment, patchy distribution and high habitat specificity,[147] to which can be added their limited movement.[148] Such concentrated aggregations of sandeel are particularly vulnerable to local depletion compared to other forage fish which can move more freely in search of suitable habitat or food.

109.2. Forage fish such as Norway pout exist at far greater depths in the water column than sandeel and are therefore inaccessible to surface-feeding seabirds such as kittiwake.[149]

109.3. Sandeel are a particularly high energy prey. Consequently, even in respect of "generalist" predators that consume a variety of prey, their condition can be strongly influenced by the availability of sandeel.[150]

109.4. Sandeel are more associated with a specific habitat type (sandy sediment) than most other forage fish in UK waters, making them a more predictable food source (in space and time) for predators, which may be particularly critical during

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146 English Scientific Report, **Exhibit C-0045**, p. 11, citing Engelhard, G. H., Peck, M. A., Rindorf, A., Smout, S. C., van Deurs, M., Raab, K., Andersen, K. H., Garthe, S., Lauerburg, R. A. M., Scott, F., Brunel, T., Aarts, G., van Kooten, T., and Dickey-Collas, M. Forage fish, their fisheries, and their predators: who drives whom? – ICES Journal of Marine Science, (2014), 71: 90–104 (2014), **Exhibit C-0019**, p. 100.

147 EU submission, para. 60.

148 See paras. 91-92 above.

149 Fishbase, Lesser Sandeel, **Exhibit R-0129** (depth range 10-150m); Fishbase, Norway Pout, **Exhibit R-0130** (depth range usually 100-200m).

150 Engelhard et al. (2013) Body condition of predatory fishes linked to the availability of sandeels. Mar. Biol. 160(2): 299-308, **Exhibit R-0054**.

specific periods of the year (e.g. breeding season), thereby reducing the energy required to locate prey.[151]

109.5. Sandeel are significantly more efficient at converting energy from plankton to fish biomass than other forage fish such as sprat and herring.[152] This has implications at the ecosystem level because energy transfer in a system dominated by sandeel is more efficient than in a system dominated by other forage fish, i.e. for a given amount of resources in lower trophic levels, a system dominated by sandeel allows more energy to be transferred to higher tropic levels enabling the system to sustain more or larger predators.[153]

110. The combination of availability, habitat association and calorific value make sandeel a particularly important forage fish within the North Sea ecosystem.

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151 Wright et al. (2000) The influence of sediment type on the distribution of the Lesser Sandeel, Ammodytes marinus. J. Sea Res. 44: 243-256, **Exhibit R-0012**.

152 van Deurs et al. (2013) Patchy zooplankton grazing and high energy conversion efficiency: Ecological implications of sandeel behavior and strategy. Mar. Ecol. Prog. Ser. 487: 123-133, **Exhibit R-0131**, p. 131. This is likely due to the energy-saving behaviour of sandeel, which spend significant periods burrowed and motionless in the seabed.

153 van Deurs et al. (2013) Patchy zooplankton grazing and high energy conversion efficiency: Ecological implications of sandeel behavior and strategy. Mar. Ecol. Prog. Ser. 487: 123-133, **Exhibit R-0131**, p. 131.

V. THE SANDEEL FISHERY AND ITS MANAGEMENT

A. THE SANDEEL FISHERY

111. Sandeel are industrially fished in the North Sea to produce fish oil and fishmeal, especially to feed farmed fish and shrimp (aquaculture).[154] Denmark, Norway, Sweden and Germany participate in the sandeel fishery in the North Sea[155] (as explained below, no UK vessel has been allocated any quota to fish sandeel in UK waters since prior to 2021[156]). Denmark is the primary holder of EU-allocated sandeel quota and the main contributor to sandeel "landings" from the UK waters of the North Sea, meaning the bringing of caught sandeel into port.[157]

112. The sandeel fishery in the North Sea is strictly seasonal, taking place only between 1 April and 31 July when sandeel feed in the water column. As noted above, between around August to April, adult sandeel enter their overwintering fasting period during which they bury themselves in the seabed sediment (apart from a brief emergence in December-January to spawn).[158]

113. Industrial sandeel fishing is typically done by large vessels using highly-specific gear, usually large otter trawls, which are weighted funnel-shaped nets with trawl "doors" that are towed along or near to the seabed.[159] Through the use of small mesh (< 16 mm) nets,

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154 English Scientific Report, **Exhibit C-0045**, p. 2; Andersen, J. L., & Nielsen, M. (2024). The economics of the Danish sandeel fishery and fishmeal and fish oil factories. Department of Food and Resource Economics, University of Copenhagen. IFRO Commissioned Work No. 2024/16, **Exhibit C-0025**, p. 10. The term "industrial" sandeel fishing is used in this submission to describe this form of commercial fishing, even if a small proportion of the sandeel fished is not used for industrial purposes.

155 Scottish Scientific Report, **Exhibit C-0050**, p. 16.

156 See paras. 132-133 below.

157 Scottish Scientific Report, **Exhibit C-0050**, p. 16; English Scientific Report, **Exhibit C-0045**, p. 3; The Sandeel (Prohibition Of Fishing) (Scotland) Order 2024: Business and Regulatory Impact Assessment – final, January 2024, **Exhibit C-0066**, section 2.1.2 (p. 3).

158 De Minimis Assessment (DMA) for Defra's Consultation on Spatial Management Measures for Industrial Sandeel Fishing, 1 February 2022, **Exhibit C-0044**, p. 10; Boulcott, P., & Wright, P. J. (2008). Critical timing for reproductive allocation in a capital breeder: evidence from sandeels. Aquatic Biology, 3(1), **Exhibit C-0024**, p. 32. The EU refers to **Exhibit C-0044** as the "Defra consultation document", but that is not correct. The Defra consultation document is "Consultation on Spatial Management Measures for Industrial Sandeel Fishing - Consulting on management measures for industrial sandeel fishing in English waters of the North Sea", March 2023, **Exhibit R-0061**.

159 English Scientific Report, **Exhibit C-0045**, p. 3; Seafish, Demersal Trawl – General, **Exhibit R-0062**.

the fishery targets sandeel aged 1 year and above, although catching some younger fish is unavoidable.[160]

114. Annual landings of sandeel have varied considerably, peaking at over 1 million tonnes from the North Sea in the late 1990s. For the period 2003-2016, an average of 300,000 tonnes of sandeel per year were landed.[161]

115. Even with low fishing exploitation rates, a risk of stock collapse exists owing to the high sensitivity of sandeel to factors such as environmental variation (including the effects of climate change) and additional pressures (including natural mortality, predator mortality and fishing mortality).[162] The risk of stock collapse increases with increases in fishing exploitation pressure,[163] which is the only variable that can be directly controlled by fisheries management.

B. GREATER NORTH SEA SANDEEL STOCK ADVICE

116. The regulation of industrial sandeel fishing in the Greater North Sea[164] is informed by, among other things,[165] scientific advice produced by ICES in response to requests from public authorities.[166] ICES is an intergovernmental marine science organisation of nearly

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160 Searle, K. R., Regan, C. E., Perrow, M. R., Butler, A., Rindorf, A., Harris, M. P., Newell, M. A., Wanless, S., & Daunt, F. (2023). Effects of a fishery closure and prey abundance on seabird diet and breeding success: Implications for strategic fisheries management and seabird conservation. Biological Conservation, 281, Article 109990, **Exhibit C-0040**, p. 3.

161 Scottish Scientific Report, **Exhibit C-0050**, p. 16; English Scientific Report, **Exhibit C-0045**, p. 6.

162 English Scientific Report, **Exhibit C-0045**, p. 6; De Minimis Assessment (DMA) for Defra's Consultation on Spatial Management Measures for Industrial Sandeel Fishing, 1 February 2022, **Exhibit C-0044**, p. 18. See also ICES Technical Service Response, (28 November 2023), **Exhibit C-0022**, p. 1 ("It is possible that exploitation levels consistent with [ICES' precautionary] framework would result in a high enough biomass required to sustain ecosystem services. However, it is also possible that the resulting biomasses may be too low").

163 English Scientific Report, **Exhibit C-0045**, p. 11; Scottish Scientific Report, **Exhibit C-0050**, p. 26; De Minimis Assessment (DMA) for Defra's Consultation on Spatial Management Measures for Industrial Sandeel Fishing, 1 February 2022, **Exhibit C-0044**, p. 18.

164 The Greater North Sea ecoregion extends from Brittany (France) in the south, the Danish straits in the east, to Vestland (Norway) and the Orkney and Shetlands archipelagos (Scotland) in the north (ICES, "Greater North Sea ecosystem description", undated, https://www.ices.dk/advice/ESD/Pages/North-Sea-Ecoregion-description.aspx.

165 Cf. EU submission, para. 40 to the extent it suggests that the EU and the UK base themselves *only* on ICES scientific advice when agreeing TACs, which would not be correct.

166 ICES, "How we work – Advisory process", undated, https://www.ices.dk/about-ICES/how-we-work/Pages/Advisory_process.aspx.

6,000 scientists from over 700 marine institutes in 20 member countries (including the UK and certain EU Member States).[167]

117. ICES divides the oceans and seas of the world into areas for the purposes of its work. The Greater North Sea is ICES Division 4.[168] For the purpose of producing advice on sandeel specifically, ICES has divided the Greater North Sea into seven sandeel stock assessment areas ("**SAs**"): 1r, 2r, 3r, 4, 5r, 6 and 7r.[169] Sandeel in the North Sea was previously managed as a single stock.[170] However, in 2011, ICES reviewed the North Sea sandeel stock structure and created the seven stock assessment areas (which were further revised in 2016) after a review of evidence on habitat, larval drift, and regional growth differences indicated that there were seven subpopulation regions that differed in their vulnerability to exploitation.[171]

118. English waters of the North Sea fall within SAs 1r, 3r and 4. Scottish waters of the North Sea fall within SAs 3r, 4, 5r and 7r. The SAs are illustrated below:[172]

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167 ICES, "Who we are", undated, https://www.ices.dk/about-ICES/who-we-are/Pages/Who-we-are.aspx#:~:text=The%20International%20Council%20for%20the%20Exploration%20of%20the,and%20sustainable%20use%20of%20our%20seas%20and%20oceans.

168 For the purpose of statistical work, ICES divides the Greater North Sea into different statistical areas. English waters of the North Sea are located within ICES aeras 4b, 4c, 7d and 7e. Scottish waters of the North Sea are located within ICES areas 4a and 4b. See ICES Ecoregions including ICES Statistical Areas, ices.dk. Dec 2017, **Exhibit C-0009**. This explains the reference to areas 4a and 4b on ICES sandeel stock advice, which is a reference to ICES statistical areas not Sandeel Assessment areas.

169 Scottish Scientific Report, **Exhibit C-0050**, p. 13. The EU repeatedly refers to the ICES stock assessment areas as "management areas" or areas for the "management" of sandeel (e.g. EU submission paras. 47, 56 and see also para. 31). This is not accurate. Management areas or units are different to stock assessment areas (illustrated, for example, by TCA, Article 504).

170 Scottish Scientific Report, **Exhibit C-0050**, p. 13.

171 Lynam et al. (2013), **Exhibit C-0018**, p. 540; Scottish Scientific Report, **Exhibit C-0050**, p. 13.

172 Scottish Scientific Report, **Exhibit C-0050**, p. 14. The red marking is the closure of an area of Scottish waters in SA4, discussed at para. 129 below.

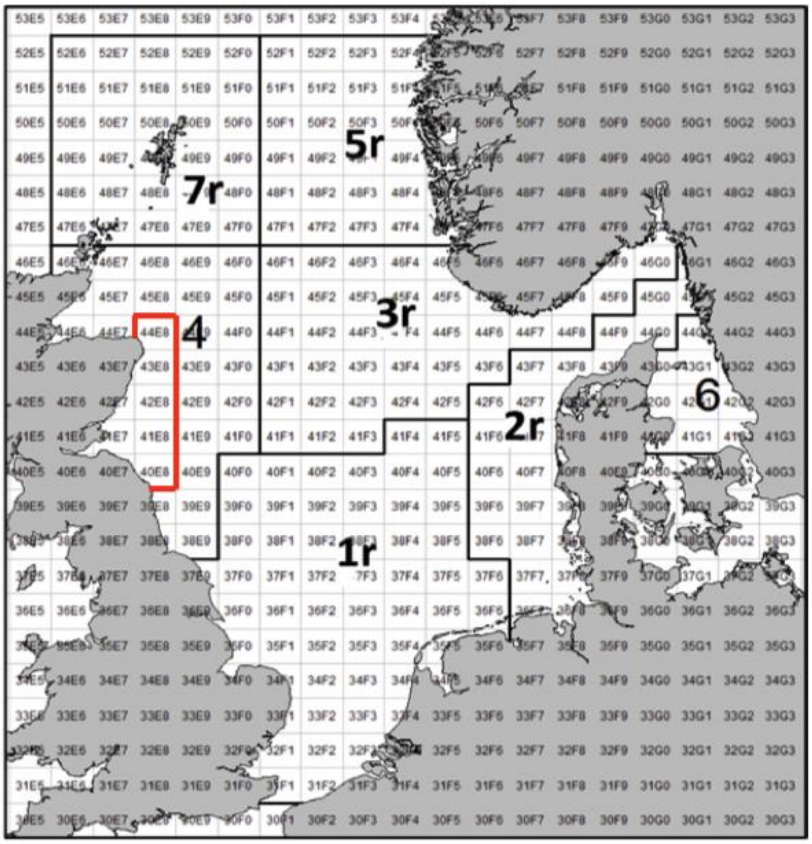

Figure 9: Division of the seven current sandeel management areas in the North Sea, the Scottish closed area within SA4 is indicated in red.

119. Prior to the UK closures, industrial sandeel fishing took place in five of the seven SAs: 1r, 2r, 3r, 4 and 6.[173] ICES issues separate advice on sandeel stocks (as requested[174]) for each of the different SAs. ICES' approach pursues an overall objective of achieving maximum sustainable yield (MSY), i.e. "the highest yield over the long term", integrated with a precautionary approach directed to ensuring stock sustainability.[175]

120. As a short-lived species, with the majority being sexually mature after 2 years, and few surviving beyond 3-4 years, sandeel stock size is highly dependent on successful annual

173 Scottish Scientific Report, **Exhibit C-0050**, p. 16.

174 See, e.g., the bottom of the first page of each of the ICES stock advices where it states "ICES advice, as adopted by its Advisory Committee (ACOM), is developed upon request by ICES advice requesters (European Union, Iceland, NASCO, NEAFC, Norway, and United Kingdom)": see e.g., **Exhibit C-0011**.

175 ICES (2023) Advice on fishing opportunities. In Report of ICES Advisory Committee, 2023. ICES Advice 2023, **Exhibit C-0036**, p. 1; see also ICES Glossary, **Exhibit C-0005**.

recruitment.[176] This, coupled with the fact that sandeel are highly sensitive to environmental variation (including that caused by climate change, which is negatively impacting the North Sea[177]), means that the biomass of sandeel can fluctuate significantly from year to year.[178]

121. In preparing advice on sandeel fishing opportunities, ICES therefore applies what is called an "escapement" approach. That is an approach directed towards ensuring that a minimum size of adult (spawning) stock ($B_{escapement}$) remains in the SA every year after the fishing season to reduce the risk of poor recruitment in the following year. To do this, ICES uses, among other things, two biomass reference points: one is B_{lim} which is the size of adult (spawning) stock below which there is a high risk of reduced recruitment; and the second is B_{pa} which is a precautionary size of adult (spawning) stock that builds in a safety margin above B_{lim} to account for uncertainty in ICES stock estimates.[179] ICES sets the minimum stock size at the precautionary level ($B_{escapement} = B_{pa}$).[180]

122. Despite this precautionary approach, ICES estimated that the adult (spawning) stock was below the precautionary threshold (B_{pa}) in SA 4 in 2015, 2019, 2022, 2023 and 2024.[181] In respect of SA1r, ICES estimated that the adult (spawning) stock was below the precautionary threshold (B_{pa}) in 2015, 2021 and 2022, and below the lower limit (B_{lim}) in 2014, 2019 and 2020.[182] For SA 3r, ICES estimated that the adult (spawning) stock was below the lower limit (B_{lim}) in 2013, and below the precautionary threshold (B_{pa}) in

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176 Arnott, S. A., & Ruxton, G. D. (2002). Sandeel recruitment in the North Sea: demographic, climatic and trophic effects. Marine Ecology Progress Series, 238, 199-210, **Exhibit C-0020**, p. 200. On the meaning of "recruitment" see para. 87.15 above.

177 Call for Evidence on future management of Sandeels and Norway pout published by the UK Fisheries Administrations on 22 October 2021, **Exhibit C-0043**, p. 4; "What are the ecosystem risks and benefits of full prohibition of industrial sandeel fishing in the UK waters of the North Sea (ICES Subarea 4)?" ('Natural England/Cefas/JNCC advice'), March 2023, **Exhibit C-0045**, pp. 1 and 24-25.

178 ICES (2023) Advice on fishing opportunities. In Report of ICES Advisory Committee, 2023. ICES Advice 2023, **Exhibit C-0036**, p. 4.

179 ICES (2023) Advice on fishing opportunities. In Report of ICES Advisory Committee, 2023. ICES Advice 2023, **Exhibit C-0036**, p. 4; see also ICES Glossary, **Exhibit C-0005**.

180 See, e.g., ICES (2017) Sandeel (Ammodytes spp.) in divisions 4.b–c, Sandeel Area 1r (central and southern North Sea, Dogger Bank), September 2017, **Exhibit C-0030**, p.1 ("B_{pa} = MSY $B_{escapement}$"). This is also evident from the Reference Tables on ICES advice.

181 See ICES Sandeel Advice for SA4, 2020, **Exhibit R-0066**, 2022 (**Exhibit R-0067**), 2023 (**Exhibit R-0068**) and 2024 (**Exhibit C-0014**). Cf. EU submission, para. 72.

182 See ICES advices for SA1r for 2016 (**Exhibt C-0028**), 2017 (**Exhibt C-0030**), 2019 (**Exhibit C-0034**), 2020 (**Exhibt Exhibit R-0065**), 2021 (**Exhibit C-0033**), 2022 (**Exhibt C-0029**). Cf. EU submission, para. 72.

2014, then stable at higher levels until the 2024 advice noted low estimated recruitment and declining adult (spawning) biomass.[183]

123. In light of the estimated spawning stock size, ICES advises on the maximum number of tonnes of sandeel that can be caught in an SA in a given year. The UK and the EU take ICES' maximum catch advice into account (among other things) in setting the TAC under the TCA.[184]

124. The high inter-annual variability of sandeel stocks in the North Sea is evident from a comparison of the catch advice issued by ICES since 2011 for SAs 1r, 3r and 4 in Table 1 below:

183 See ICES advice for SA 3r for 2017 (**Exhibit R-0069**) and 2024 (**Exhibit C-0013**) (but still above the precautionary threshold in 2024).

184 TCA, Article 495(1)(d) and 498(1).

Advised and actual landings of sandeel in SAs 1r, 3r and 4 from 2011-2024						
Year	**SA1r catch advice (t)**	**SA1/1r[185] actual catch (t)**	**SA3r catch advice (t)**	**SA3/3r[186] actual catch (t)**	**SA4 catch advice (t)**	**SA4 actual catch (t)**
2011	320,000	312,000	0	95,000	5,000-10,000	272
2012	23,000	46,000	5,000	46,000	5,000	2,585
2013	224,544	210,000	78,331	39,000	2,041	5,225
2014	57,000	99,000	270,000	143,000	5,000	4,414
2015	133,000	163,000	370,000	122,000	5,000	4,392
2016	5,000	12,751 SA1 15,407 SA1r	123,135	50,737 SA3 44,074 SA3r	6,000	6,232
2017	255,956	242,069	74,176	115,642	54,043	18,474
2018	134,461	131,898	108,365	75,143	59,345	42,298
2019	91,916	86,723	133,610	136,901	5,000	6,666
2020	113,987	108,944	155,072	247,411	39,611	20,116
2021	5,464	16,615	161,335	157,524	77,512	51,448
2022	0*	5,195*	85,559	84,240	0*	5,541*
2023	120,428	88,581**	30,570	18,955**	35,020	17,269**
2024	132,315	pending	0*	pending*	0*	pending*

Table 1: compiled from the relevant ICES advices for the respective areas for 2024, which provide the historical data: **Exhibits C-0011**, **C-0013** and **C-0014**. The * denotes a monitoring TAC of 5,000 having been advised and agreed. The ** denotes preliminary figures of ICES catch estimates. The actual catch figures are estimated by ICES. Shading highlights those areas and years for which actual landings exceeded advised landings.

125. As is evident from the shaded cells in Table 1, catches have often exceeded the recommended amounts, sometimes significantly so.[187]

126. ICES' recommended maximum catch advice operates at the whole-of-stock level within a given SA; it does not function at the level of individual localised sandeel sub-

185 Figures are for SA1 for 2011-2016, and for SA1r for 2016-2023: see ICES advice for 2024 for SA 1r (**Exhibit C-0011**), p. 6. The "r" denotes that the stock assessment area has been revised, which occurred for SA1 in 2016.

186 Figures are for SA3 for 2011-2016 and for SA3r for 2016-2023: see ICES advice for 2024 for SA 3r (**Exhibit C-0013**), p. 6. The "r" denotes that the stock assessment area has been revised, which occurred for SA3 in 2016.

187 For at least some of these, the excessive catch was due to 'banking' and/or 'borrowing' practices which permitted unused quota to be used in subsequent years and in different SAs. See, e.g., ICES (2022). Sandeel (Ammodytes spp.) in divisions 4.b–c, Sandeel Area 1r (central and southern North Sea, Dogger Bank), February 2022, **Exhibit C-0029**, p. 2. From 2023, a new arrangement was introduced whereby up to 10% of unused quota could be used in the following year only, and in the same SA only: Written Record of Fisheries Consultations between the United Kingdom and the European Union for 2023, **Exhibit R-0070**, para. 13(a).

populations[188] or predator feeding grounds.[189] It also does not take into account any closed areas within an SA.[190] Whilst it does take into account some ecosystem considerations as regards their impact on the stock (including mortality due to predators), it does not consider whether the recommended maximum exploitation levels would produce a biomass high enough to sustain and where necessary restore ecosystem services (such as whether sandeel biomass is kept high enough for specific predator requirements).[191] ICES has confirmed upon a joint request from the EU and UK that sustaining ecosystem services, and determining the role that stock management plays in that regard, is something that should occur at the level of national regulation.[192] The EU is therefore wrong to state, as it does in paragraphs 71 and 73 of its submission, that ICES' approach to sandeel management "seeks to prioritise ecosystem needs over the fishery" and "ensure[s] that ecosystem needs are given priority". ICES has explained, to the contrary, that it does not directly account for, let alone prioritise, ecosystem needs.[193]

C. UK SANDEEL FISHERIES MANAGEMENT

127. Immediately prior to the introduction of the prohibitions on sandeel fishing, industrial sandeel fishing in UK waters was confined to the North Sea.[194] Industrial sandeel fishing in the UK waters of the North Sea had been partly closed on two separate occasions due to concerns about the impacts on the breeding success of seabirds.

188 See paras. 91-92 above.

189 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1.

190 ICES. 2024d. Herring Assessment Working Group for the Area South of 62° N (HAWG). ICES Scientific Reports, **Exhibit C-0037**, p. 543 ("the assessment model does not consider that a significant part of SA 4 … is closed to fishing. Accordingly, the estimated TAC would in practice be achieved in a much smaller region than the whole SA 4 which raises concerns of local depletion").

191 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1. As regards restoring ecosystem services, it is recalled that GES is failing to be met in respect of a number of marine ecosystem descriptors (see para. 392.5 above).

192 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1.

193 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1.

194 Dunn. (2021) Revive our Seas: The case for stronger regulation of sandeel fisheries in UK waters (RSPB), **Exhibit R-0029**, p. 4.

128. The first closure was during the mid to late 1990s, when a small sandeel fishery off Shetland in Scottish waters was closed following declines in breeding success of seabirds including Arctic tern, great skua and kittiwake.[195]

129. The second was a precautionary closure of sandeel fishing in southeast Scottish waters within SA4 (shown on the figure shown in paragraph 18) introduced in 2000 under EU regulations, which was continued by the UK following its exit from the EU.[196] Prior to 2000, the sandeel fishery had expanded off the north-east coast of the UK, following which there was an observed decline in the breeding success of seabirds. The closure was introduced in response to such a decline.[197] The closure covered about 27% of SA4 fishing grounds historically targeted for sandeel fishing.[198] The area covered by the SA4 closure is shown on the figure below, reproduced from the Scottish Scientific Report.[199] The scientific studies that have analysed the effects of the 2000 closure are addressed at paragraph 256 below.

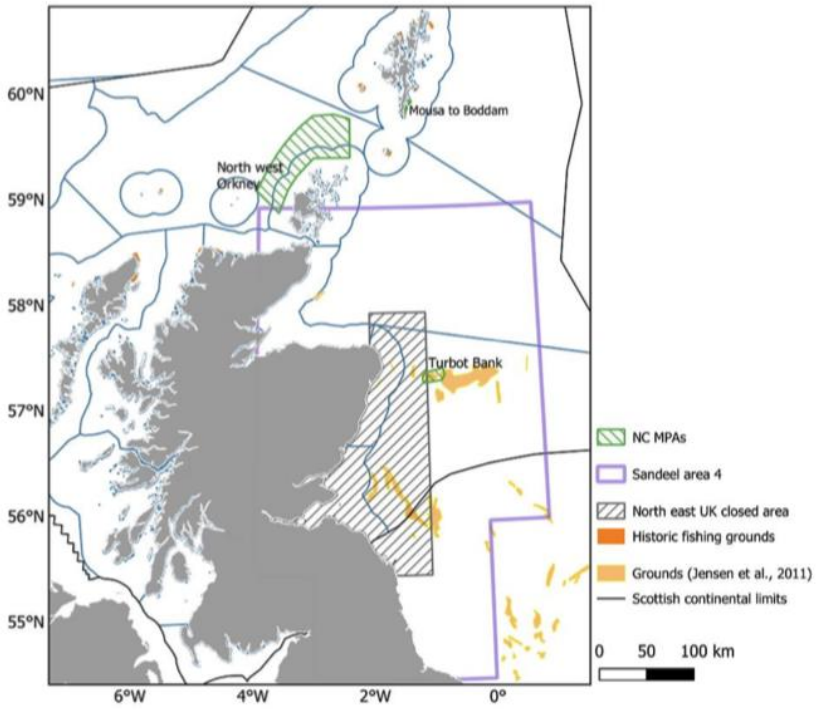

Figure 12: Map of Sandeel Area 4 and the various spatial measures for sandeel within Scottish waters. Blue lines show Scottish Marine and Offshore Regions for context.

195 Scottish Scientific Report, **Exhibit C-0050**, p. 48.

196 As set out in EU submission, paras. 84-90.

197 Scottish Scientific Report, **Exhibit C-0050**, p. 48.

198 Scottish Scientific Report, **Exhibit C-0050**, p. 18.

199 Scottish Scientific Report, **Exhibit C-0050**, p. 19.

VI. DECISION-MAKING PROCESSES

A. BACKGROUND TO THE MEASURES

1. UK concerns regarding the impact of fisheries on sandeels

130. As noted at paragraphs 127-129, prohibiting the fishing of sandeel in UK waters has been done in the past in specific areas. Further recognition of the particular importance of sandeel to the marine food web is found in successive drafts of the UKMS from 2012 (see paragraph 26).

131. Statements by Government were accompanied by evidence from specialist environmental NGOs, in particular the report, *Revive our Seas: The case for stronger regulation of sandeel fisheries in UK waters*, published by the RSPB in June 2021.[200] This report advocated the closure of all UK waters to industrial sandeel fishing on account of the need to protect and build resilience in seabird populations.

2. Non-allocation of UK sandeel quota since 2021

132. Consistent with its concerns regarding the impact of sandeel fisheries on the marine ecosystem, in March 2021 the UK advocated for a zero TAC for sandeel in the first bilateral negotiations with the EU under the TCA. Whilst the TAC ultimately agreed for 2021 set a UK quota for sandeel at 2,534 tonnes,[201] the UK determined not to allocate sandeel fishing opportunities to its own fleet, and a revised version of the UK Quota Management Rules was published on 22 April 2021 setting this out.[202]

133. The UK also declined to allocate any of its own sandeel fishing quota in 2022 or 2023.[203]

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200 Dunn. (2021) Revive our Seas: The case for stronger regulation of sandeel fisheries in UK waters (RSPB), **Exhibit R-0029**.

201 Written record of fisheries consultations between the United Kingdom and the European Union for 2021, **Exhibit C-0001**, p. 29.

202 Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs [2023] CSOH 16; 2023 SLT 369, **Exhibit RLA-0010**, para. 10.

203 Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs [2023] CSOH 16; 2023 SLT 369, **Exhibit RLA-0010**, paras. 11-12 (referring to determinations that set the UK quota for 2022 and 2023 at zero ahead of annual consultations with the EU on TAC).

3. October 2021 Joint Call for Evidence and responses

134. On 22 October 2021, the UK Government issued a joint Call for Evidence on the future management of sandeel and Norway pout, with particular reference to fishing pressure on North Sea sandeel stocks.[204] The Foreword to the document referenced ongoing concerns about the limited evidence of recovery both for the relevant stocks and the wider ecosystem, despite the management measures taken to date and stated that this "is hindering the United Kingdom's ability to achieve Good Environmental Status for seabirds and marine food webs …".[205] The Foreword added:

> As an independent coastal state, the UK Fisheries Administrations will consider new management measures such as fishing restrictions to provide additional resilience and protection for the North Sea sandeel and Norway pout stocks and the wider ecosystem. We want to gather further evidence to better understand the interaction between these stocks and the ecosystem, whether new measures (including restrictions on fishing these stocks) would be beneficial and if so, what the most appropriate measures would be.[206]

135. On sandeel, the Call for Evidence sought information about the ecological value of sandeel, about sandeel fishing and its social and economic impacts, and about future management of the sandeel fishery. On this last topic, questions 8b and 8c sought evidence on all types of potential measures and the text added:

> We are particularly looking for evidence in relation to different types of restriction, the geographical scope of restrictions and the timing of restrictions. For example, a ban on sandeel fishing in UK waters, a phased reduction in sandeel fishing in UK waters or additional area closures of the sandeel fisheries.[207]

136. There were 36 responses to the Call for Evidence, including from fishing industry producer organisations. Most respondents acknowledged the high ecological value of sandeel and Norway pout to the entire marine ecosystem and were in favour of

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204 Call for Evidence on future management off Sandeels and Norway pout (22 October 2021), **Exhibit C-0043**.

205 Call for Evidence on future management off Sandeels and Norway pout (22 October 2021), **Exhibit C-0043**, p. 4.

206 Call for Evidence on future management off Sandeels and Norway pout (22 October 2021), **Exhibit C-0043**, p. 4.

207 Call for Evidence on future management off Sandeels and Norway pout (22 October 2021), **Exhibit C-0043**, p. 8.

implementing new management measures.[208] Careful consideration was given to the responses and this informed subsequent decisions in both England and Scotland on new management measures.[209]

B. THE SUNBEAM LITIGATION

137. The impact of the UK Government's non-allocation of sandeel fishing opportunities to UK vessels was challenged in the Scottish courts by the owners and operators of the MFV Sunbeam, which had participated in the sandeel fishery since 1987 and was equipped with specialist gear for that purpose. The petitioner argued that the Secretary of State's decision not to apportion quota was contrary to Article 1 of Protocol 1 to the European Convention on Human Rights.[210]

138. The petitioner accepted that it had been open to the Secretary of State to find an evidential basis for the general conclusion that prohibiting sandeel fishing would produce environmental benefit.[211] However, it argued that the decision was essentially futile and therefore disproportionate given that it prohibited fishing only for the UK's 2.8% of the EU/UK TAC for sandeel, leaving the remaining fishery unaffected. It furthermore argued that there had been no consideration of A1P1 rights or attempt to balance any benefit with the adverse impact on the petitioner.[212]

139. The Lord Ordinary (Lord Sandison) concluded on the first of these issues that the prohibition had more than "symbolic value":

> In consequence of it being made, up to 2,541 tonnes of sandeel - amounting to many thousands of fish - will remain in the sea which might otherwise have been caught, making a contribution of some kind to the future population and to the food chain which cannot be assumed to have no practical value at all. I

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208 Call for Evidence Outcome, Summary of Responses, updated 18 March 2022, **Exhibit R-0071**.

209 Call for Evidence Outcome, Summary of Responses, updated 18 March 2022, **Exhibit R-0071**.

210 Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs [2023] CSOH 16; 2023 SLT 369, **Exhibit RLA-0010**.

211 Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs [2023] CSOH 16; 2023 SLT 369, **Exhibit RLA-0010**, para. 20. See also the summary of the policy and scientific background set out in the judgment at paras. 13-20.

212 Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs [2023] CSOH 16; 2023 SLT 369, **Exhibit RLA-0010**, para. 21.

conclude that the Secretary of State's determination has some, albeit limited, environmental benefit.[213]

140. On the second issue, Lord Sandison observed that there is no general right to fish, since fishing is subject to regulatory control,[214] and that a commercial operator "can be expected to display a high degree of caution in the pursuit of its activities, and to take special care in assessing the risks that may attach to those activities".[215] He concluded that the Secretary of State's determination "may properly be regarded as a modest but meaningful contribution to valuable maritime conservation and ecological goals" and that its effect was not disproportionate or excessive.[216]

C. PROHIBITION OF SANDEEL FISHING IN ENGLISH WATERS OF THE NORTH SEA

1. Further scientific advice

141. In light of the call for evidence, and recognising that further action was required to protect sandeel, Defra commissioned further advice from scientific experts at Natural England, JNCC and Cefas.[217]

142. This led to the publication of advice prepared in October 2022 entitled "What are the ecosystem risks and benefits of full prohibition of industrial Sandeel fishing in the UK waters of the North Sea (ICES Area IV)?" ("**the English Scientific Report**").[218] The aim of the English Scientific Report was to understand better the risks and benefits of applying a maximum level of protection for sandeel, which was considered to be the most important forage fish species in ecosystem terms in the North Sea. The analysis is divided into two main sections: a review of evidence concluding with a tabulated summary[219]

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213 Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs [2023] CSOH 16; 2023 SLT 369, **Exhibit RLA-0010**, para. 39.

214 Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs [2023] CSOH 16; 2023 SLT 369, **Exhibit RLA-0010**, para. 40.

215 Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs [2023] CSOH 16; 2023 SLT 369, **Exhibit RLA-0010** para. 41, citing O'Sullivan McCarthy Mussel Development Ltd v Ireland (2019) 68 EHRR 6.

216 Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs [2023] CSOH 16; 2023 SLT 369, **Exhibit RLA-0010**, para. 45.

217 See para. 229 below as to the role and nature of these organisations.

218 English Scientific Report, November 2022, **Exhibit C-0045**.

219 English Scientific Report, November 2022, **Exhibit C-0045**, pp. 7-20.

and the results of ecosystem modelling undertaken (discussed in detail below at paragraphs 230-252) and caveats applied.[220]

143. Prior to its publication, the English Scientific Report was the subject of review by the UK Fisheries Science Advisory Panel ("**UKFSAP**"),[221] an expert consultative forum bringing together chief fisheries scientists (or suitable alternative appointees) from the four administrations (England, Scotland, Wales and Northern Ireland).[222] After providing comments, the UKFSAP approved the report for publication in the form that was taken forward to consultation.[223]

2. Consultation on management measures for industrial sandeel fishing in English waters

144. Following Ministerial approval,[224] Defra ran a public consultation from 7 March 2023 to 30 May 2023 to gather views on proposed spatial management measures for industrial sandeel fishing in the English waters of the North Sea. The consultation document[225] was issued together with a De Minimis Assessment ("**DMA**")[226] and the English Scientific Report.

145. The consultation document and the DMA set out the issue and the rationale for Government intervention, by reference to the ecosystem importance of sandeel, the impact of industrial fishing on sandeel biomass, and declining stocks. The ecosystem

220 English Scientific Report, November 2022, **Exhibit C-0045**, pp. 21-34.

221 UK Fisheries Science Advisory Panel: Advice Output Sheet, 8 November 2022, **Exhibit R-0073**.

222 UK Fisheries Science Advisory Panel: Advice Output Sheet, 8 November 2022, **Exhibit R-0073**.

223 UK Fisheries Science Advisory Panel: Advice Output Sheet, 8 November 2022, **Exhibit R-0073**.

224 See Ministerial submission of 15 February 2023, **Exhibit R-0074**. This document is misdated 16 January 2023, which is the date of an earlier version of the document (see para. 14).

225 Defra, Consultation on Spatial Management Measures for Industrial Sandeel Fishing - Consulting on management measures for industrial sandeel fishing in English waters of the North Sea, March 2023, **Exhibit R-0061**.

226 De Minimis Assessment (DMA) For Self-Certified Measures in Defra regarding Consultation on Spatial Management Measures for Industrial Sandeel Fishing, **Exhibit C-0044**; the date of the draft assessment is incorrectly given as "01/02/22", it should be "01/02/23". De Minimis Assessments are produced to support policy formulation as part of the Better Regulation Framework, and are intended to be an integral part of the process which can be used to analyse different options and act as a focus for external comment during any consultation.

benefits of the proposed option of full closure were summarised in the below table in the DMA, which is reproduced below:

Benefit	Summary of ecosystem benefit
Increased sandeel resilience	Fluctuations in sandeel stocks are largely driven by extraneous factors (e.g., hydroclimatic factors). Even if fishery exploitation rates are low, the risk of stock collapse exists. However, the risk of collapse increases with increasing exploitation pressure. Reducing exploitation by prohibiting fishing in English waters may increase sandeel resilience.
Increased seabird resilience	Increased population resilience for seabirds for which increased sandeel availability can positively impact on reproductive success (e.g., kittiwakes).
Increased occurrence of marine mammals within English waters	Previous studies have linked the abundance of sandeels to the distributions of marine mammals in the North Sea. Therefore, if management actions led to an increase of sandeels in the English waters, we might expect to observe an increased occurrence of marine mammals in English waters.
Improved condition of other commercial fish	Predatory fish have flexible diets and are likely to compensate for declines in sandeel availability. However, increased sandeel availability and consumption has been shown to positively correlate with the body condition of some commercial fish (e.g., whiting, haddock, and plaice), which impacts growth, reproduction, and survival chances. The increased stock reliability of commercially valuable fish may also entail indirect benefits to the fishing industry.
Progress towards GES	Several substantiated links have been made between the abundance of sandeels and the survival and breeding success of birds, mammals, and commercial fish, linking to the targets and indicators of the UKMS and GES descriptors (D1, D3, D4).

146. Adverse impacts of the proposed measure were also discussed, including the impacts on non-UK businesses.[227]

147. The consultation document and the DMA considered three alternative spatial management measures:

[227] See esp. the consultation document **Exhibit R-0061**, p. 7 and DMA, **Exhibit C-0044**, pp. 12-15 and 22 (Annex 1).

147.1. Closure of English waters within the North Sea to industrial sandeel fishing.

147.2. Closure of English waters within SA4 and SA3r.

147.3. Closure of English waters within SA1r.

148. The consultation document considered other partial closures, such as of the Dogger Bank. It observed that partial closures would be likely to lead to displacement of fishing effort, which would increase activity outside of the closed area and create a risk of greater sandeel depletion in other locations.[228] The consultation document and the DMA also addressed alternative technical measures, alternative temporal measures, and voluntary measures.[229]

3. Consideration of consultation responses

149. The 2023 consultation received 340 responses from various stakeholders, including environmental non-governmental organisations ("**e-NGOs**"), commercial fishing companies, and the public.[230] The vast majority (95.5%) supported full spatial closure of sandeel fishing in the North Sea, citing reasons such as "protecting the seabirds" (41.9%) and "supporting the marine wildlife that depend on sandeels" (35%). Other reasons given, albeit with lower percentages, included preventing displacement, addressing climate change threats, and meeting environmental targets.[231]

150. 64.7% of respondents disagreed with the option of partial closure of English waters within SA4 and SA3r, with 30.3% of respondents citing insufficient protection for the marine environment.[232] Other reasons given for disagreement with a partial closure, with lower percentages, were "partial closure could lead to displacement" and "harder to

228 Consultation document, **Exhibit R-0061**, p. 9.

229 Consultation document, **Exhibit R-0061**, p. 10; DMA, **Exhibit C-0044**, pp. 2, 7-10.

230 Defra, Summary of responses to Consultation on Spatial Management Measures for Industrial Sandeel Fishing, updated 31 January 2024, **Exhibit R-0075**, p. 4. Defra also received over 32,000 co-ordinated emails from members of the Royal Society of the Protection of Birds and a Greenpeace petition with 138,890 signatures, which were acknowledged in the summary of responses.

231 Defra, Summary of responses to Consultation on Spatial Management Measures for Industrial Sandeel Fishing, updated 31 January 2024, **Exhibit R-0075**, p. 6.

232 Defra, Summary of responses to Consultation on Spatial Management Measures for Industrial Sandeel Fishing, updated 31 January 2024, **Exhibit R-0075**, pp. 7-8.

enforce". Similar responses were generated for the option of partial closure of English waters within SA1r of the North Sea.[233]

151. When asked for recommendations on alternative measures not included in the consultation, 54.5% of respondents stated that there were no alternative management measures, while 23.1% suggested a full ban across all waters of the North Sea. Other suggestions, with lower percentages, were to "include Scottish and Welsh waters", "introducing fines", and "changes in fishing equipment".[234]

152. A draft summary of responses was provided to the relevant Minister on 13 June 2023. On 19 June 2023 a summary review of scientific elements of the responses, prepared by Natural England, Cefas and the JNCC, was provided to Defra.[235] This 19 June 2023 review responded to technical points made in the 2023 consultation responses – many of which are reiterated in the EU's submission – including as to the link between sandeel and seabirds (more generally than just kittiwakes), the use of ecosystem models, ICES stock assessments and the proportionality of a full closure.

153. The consultation responses, together with the available scientific advice, were considered in a Ministerial submission of 14 September 2023 which recommended the prohibition of sandeel fishing in English waters of the North Sea for all vessels. The recommendation acknowledged the degree of uncertainty, but noted that "[t]his decision on sandeel management is the first opportunity taken to introduce significant fisheries measures based on ecosystem advice."[236] On alternatives, the submission set out that "[t]here are currently no known alternative management interventions that could produce the same potential beneficial effect as closing the sandeel fishery."[237]

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233 62.9% of respondents disagreed. The two main reasons were "full closure preferred" (53.1%) and "limited benefits" (25%). Other reasons with lower percentages were "concerns of displacement fishing" and "harder to enforce". See Defra, Summary of responses to Consultation on Spatial Management Measures for Industrial Sandeel Fishing, updated 31 January 2024, **Exhibit R-0075**, pp. 8-9.

234 Defra, Summary of responses to Consultation on Spatial Management Measures for Industrial Sandeel Fishing, updated 31 January 2024, **Exhibit R-0075**, p. 10.

235 Natural England, Cefas and JNCC, Summary review of the evidence presented by respondents to the consultation to prohibit industrial fishing in UK waters, **Exhibit R-0076**.

236 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 15.

237 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 16.

4. Engagement with the EU and Denmark

154. The relevant EU Commissioner responded to the consultation on 30 May 2023, raising the impact on the EU fleet and onshore processing industry as well as issues of compliance with the TCA.[238] The EU Commissioner also argued that "proper consideration" should be given to "[o]ther options such as partial amendments to existing closures".[239]

155. On 26 May 2023, the Danish Ministry of Food, Agriculture and Fisheries provided a consultation response[240] drawing attention to the economic value of sandeel and making various arguments, including that ICES advice already follows an ecosystem approach.[241] The response annexed an economic summary[242] and a review of the English Scientific Report prepared by Danish scientific institute DTU Aqua.[243]

156. The EU and Danish responses both emphasised the importance of waiting for a response to the joint EU and UK request to ICES Technical Service for further information on how ecosystem considerations are factored into the provision of single stock advice by ICES.[244]

157. There was further engagement between the UK Minister and the Danish Minister by way of a meeting on 19 September 2023 at which Minister Jensen of Denmark emphasised the economic importance of the sandeel fishery to Danish fishermen. On 19 October

238 European Commission letter of 30 May 2023, **Exhibit C-0055**.

239 European Commission letter of 30 May 2023, **Exhibit C-0055**, p. 3.

240 Response from the Ministry of Food, Agriculture and Fisheries of Denmark to the Consultation on Spatial Management Measures for Industrial Sandeel Fishing, 26 May 2023, **Exhibit R-0078**.

241 A similar point was made by Danish producer organisations in their consultation responses. For example, Marine Ingredients Denmark responded that "[t]he closure of English waters for sandeel fishing would only be necessary if the current management system fails to implement adequate precautionary measures and address the needs of the ecosystem."

242 Annex I, **Exhibit R-0079**, note for completeness the correction in the subsequent letter of 30 January 2024, **Exhibit R-0080**.

243 Annex II, dated 12 May 2023, **Exhibit R-0081**.

244 European Commission letter of 30 May 2023, **Exhibit C-0055**, p. 3, Response from the Ministry of Food, Agriculture and Fisheries of Denmark to the Consultation on Spatial Management Measures for Industrial Sandeel Fishing, 26 May 2023, **Exhibit R-0078**, p. 3.

2023, Minister Spencer of the UK informed Minister Jensen that he was content to wait for the ICES Technical Service Response before making a final decision.[245]

158. The responses from the EU and Denmark were considered in the 14 September 2023 Ministerial submission[246] and the 19 June 2023 review by Natural England, Cefas and the JNCC.[247] In response to the suggestion that a partial closure might have fewer negative impacts, the Ministerial submission – relying upon the 19 June 2023 review – maintained that "a full closure would be the best available option in order to support delivery on its aims".[248] There was further correspondence on the measure between Minister Jensen and Minister Spencer on 1 February 2024[249] and 27 February 2024[250] discussing the justification and legal basis for the English measure. Minister Spencer stated among other things that "I am satisfied that the decision is neither discriminatory nor disproportionate having regard to the important aim that the ban seeks to achieve."[251]

5. Consideration of the ICES Technical Service Response

159. The ICES Technical Service Response[252] is considered in detail below at paragraphs 261-272. As noted above, the UK Government committed to waiting for the ICES Technical Service Response before making a final decision on the measure. ICES acknowledged the joint request on 18 September 2023 and provided the advice on 28 November 2023. This was reviewed by Defra and the ALBs, and a supplementary note was prepared and sent to the Minister on 4 December 2023.[253] Among other things the note stated:

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245 Letter from UK Minister of State for Food, Farming and Fisheries to Danish Minister for Food, Agriculture and Fisheries, 19 October 2023, **Exhibit R-0082**.

246 Ministerial submission of 14 September 2023, **Exhibit R-0077**, paras. 19-27.

247 Natural England, Cefas and JNCC, Summary review of the evidence presented by respondents to the consultation to prohibit industrial fishing in UK waters, **Exhibit R-0076**, which was also included as Annex A to the Ministerial submission of 14 September 2023, **Exhibit R-0077**.

248 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 24.

249 Letter from Danish Minister for Food, Agriculture and Fisheries to UK Minister of State for Food, Farming and Fisheries, 1 February 2024, **Exhibit R-0084**.

250 Letter from UK Minister of State for Food, Farming and Fisheries to Danish Minister for Food, Agriculture and Fisheries, 27 February 2024, **Exhibit R-0085**.

251 Letter from UK Minister of State for Food, Farming and Fisheries to Danish Minister for Food, Agriculture and Fisheries, 27 February 2024, **Exhibit R-0085**, p. 1.

252 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**.

253 Supplementary note to sandeel submission: Sandeel management in English waters of the North Sea, 4 December 2023, **Exhibit R-0086**.

> Last week ICES published its response. It confirms predator needs are not fully accounted for. The response supports the use of national regulation and suggests that the annual advice should be only part of an overall management regime to ensure that local food availability is preserved. It advocates for local regulation to ensure management delivers for ecosystem needs. This supports our strategy for a more precautionary approach to sandeel management such as the introduction of spatial closures.[254]

6. Final approval of the English measure

160. The final decision to prohibit sandeel fishing in English waters of the North Sea was taken by the Minister on 6 December 2023 and was announced publicly on 31 January 2024, together with an updated summary of consultation responses[255] and a formal Government response to the consultation, which also addressed the ICES Technical Service Response.[256] The Government response to the consultation concluded:

> Measures to increase food availability will therefore improve the resilience of marine life for which sandeels are a crucial source of nutrients. We acknowledge the responses from some stakeholders who will be directly affected by a prohibition and recognise the impact it could have on their businesses. However, there is sufficient evidence supporting an increase of benefits to the marine ecosystem to introduce a spatial closure.
>
> The UK government has therefore decided to prohibit the fishing of sandeels within English waters of ICES Area 4 (North Sea). This measure will apply to all vessels of any nationality, and it will be effective from 26 March 2024, before the start of the next sandeel fishing season.

161. The English measure was introduced by amending all fishing licences – UK and non-UK – issued by the Marine Management Organisation ("**MMO**") to prohibit the fishing of sandeel in English waters of the North Sea.[257] The effective date of the prohibition was initially intended to be from 1 April 2024, but this was altered to 26 March 2024 so as to ensure a common date for English and Scottish waters, given the entry into force of the Scottish measure.[258]

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254 Supplementary note to sandeel submission: Sandeel management in English waters of the North Sea, 4 December 2023, **Exhibit R-0086**.

255 Defra, Summary of responses to Consultation on Spatial Management Measures for Industrial Sandeel Fishing, updated 31 January 2024, **Exhibit R-0075**.

256 Defra, Consultation outcome, Government response, updated 31 January 2024, **Exhibit R-0087**.

257 As was envisaged in the 14 September 2023 submission, **Exhibit R-0077**, para. 31.

258 See Email from Defra to the MMO, 2 February 2024, **Exhibit R-0088**.

162. The UK Government sent further letters to the EU Commissioner and the Danish Minister on 30 January 2024,[259] after the final decision was made.

D. PROHIBITION OF SANDEEL FISHING IN ALL SCOTTISH WATERS

1. Commitment to protecting sandeel as part of an ecosystem approach

163. The importance of protecting sandeel to achieve ecosystem benefits has been recognised for many years in Scotland, going back to closures in the 1990s and 2000s (see paragraphs 128-130 above). The Scottish Government's December 2020 Fisheries Management Strategy set out an "ecosystem-based approach" which marked a departure from "a system of marine management focussed on individual features", towards adopting "the principles of ecosystem-based management".[260] The approach is summarised as follows:

> We believe that supporting biodiversity in our seas is vitally important, alongside taking account of the wider ecosystem when developing and delivering policies and in our decision making processes. This also reflects the value we place in the sea's natural capital, which forms a vital building block underpinning the wellbeing and sustainability of Scotland's fisheries and the other marine industries that share and depend on the health of the marine environment in which they operate. This holistic approach, which sees our marine natural capital delivering multiple benefits in terms of natural biodiversity and economic productivity, lies at the heart of our Blue Economy thinking.[261]

164. As noted at paragraph 53 above, as part of this approach, the Fisheries Management Strategy contemplated taking stronger action, including prohibitions on fishing, for key species that are integral components of the marine food web such as sandeel.[262]

165. This is reinforced by Point 11 of the 12-point action plan provided for by the Fisheries Management Strategy, which declared that the Scottish Government:

> WILL work with our stakeholders to deliver an ecosystem-based approach to management, including considering additional protections for spawning and juvenile congregation areas and restricting fishing activity or prohibiting

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259 Defra letters of 30 January 2024, **Exhibit C-0058** and **Exhibit R-0083**.

260 Scotland's Fisheries Management Strategy 2020 – 2030, **Exhibit R-0009**, p. 10.

261 Scotland's Fisheries Management Strategy 2020 – 2030, **Exhibit R-0009**, p. 10.

262 Scotland's Fisheries Management Strategy 2020 – 2030, **Exhibit R-0009**, p. 10.

fishing for species which are integral components of the marine food web, such as sandeels.[263]

166. This approach can be seen in, among other things:

166.1. The publication of the UKMS and the Scottish Government's support of an ecosystem-based and precautionary approach to fisheries management in the JFS (see paragraphs 25 and 32).

166.2. The Scottish Government's active participation in the joint Call for Evidence on future management of sandeel and Norway pout (see paragraphs 134-136).

166.3. The Scottish Government's support for the UK Secretary of State's decision not to allocate the UK sandeel quota from 2021 (see paragraphs 132-133).

166.4. A statement in the Scottish Parliament on 9 June 2021 by the Cabinet Secretary for Rural Affairs and Islands ("**the Cabinet Secretary**") recognising the importance of sandeel to the wider ecosystem and committing to consider what management measures could be put in place to better manage the North Sea sandeel fisheries in Scottish waters.[264]

167. The importance of taking action to protect seabirds was brought into additional focus by the outbreak of Highly Pathogenic Avian Influenza in 2021-2022. Between 4 April and 11 September 2022, approximately 20,500 dead seabirds across 160 locations in Scotland were reported to the statutory nature conservation body NatureScot.[265]

2. Review of scientific evidence

168. To support any regulatory action, the Scottish Marine Directorate sought a review of the available scientific evidence: the Review of Scientific Evidence on the Potential Effects of Sandeel Fisheries Management on the Marine Environment ("**the Scottish Scientific Report**").[266] Consistently with its title, the stated aim of the Scottish Scientific Report was "a review of the available scientific evidence on the potential effects of sandeel

263 Scotland's Fisheries Management Strategy 2020 – 2030, **Exhibit R-0009**, p. 27.

264 Oral Parliamentary Question, Willie Rennie, 9 June 2021, S6O-00016, **Exhibit R-0090**.

265 See Ministerial submission of 6 February 2023, **Exhibit R-0091**, para. 13.

266 Scottish Scientific Report, **Exhibit C-0050**.

fisheries management on the marine environment", with no particular focus on whether fisheries management measures should be put in place. The review provided a detailed discussion of the following topics:

168.1. Sandeel, including their distributions and movements, the impact of climate change, and the impact of fisheries and management measures, including previous fisheries closures in Scottish waters.[267]

168.2. Fisheries and sandeel, i.e. (principally) the relationship between sandeel and the sandeel fishery with other fish, including fish that prey on sandeel.[268]

168.3. Seabirds and sandeel, including seabird diets, the vulnerability of seabirds to declines in sandeel abundance, and the impact on seabirds of sandeel fisheries.[269]

168.4. Marine mammals and sandeel, including in particular discussion of harbour seals, grey seals and harbour porpoises.[270]

169. In broad terms, the Scottish Scientific Report confirmed the significance and vulnerability of sandeel in the marine food web, and the importance of enhancing their resilience.[271] The significance of fostering such resilience in the context of other fisheries was emphasised.[272] In relation to seabirds and marine mammals, the Scottish Scientific Report noted uncertainties in the available evidence but concluded that:

> maximising abundance and availability of sandeel stocks as prey for seabirds in Scotland remains a key mechanism by which resilience in seabird populations might be achieved[273] and
>
> any increase in sandeel abundance that might result from a reduction in fisheries pressure might be beneficial to several populations of marine mammals given their dependence on sandeel as a prey source.[274]

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267 Scottish Scientific Report, **Exhibit C-0050**, section 2.

268 Scottish Scientific Report, **Exhibit C-0050**, section 3.

269 Scottish Scientific Report, **Exhibit C-0050**, section 4.

270 Scottish Scientific Report, **Exhibit C-0050**, section 5.

271 Scottish Scientific Report, **Exhibit C-0050**, section 2.2.4.

272 Scottish Scientific Report, **Exhibit C-0050**, section 3.4.

273 Scottish Scientific Report, **Exhibit C-0050**, section 4.13, p. 56.

274 Scottish Scientific Report, **Exhibit C-0050**, section 5.4.

170. The Scottish Scientific Report was prepared by the Marine Directorate's Science Evidence, Data and Digital ("**SEDD**") Portfolio. A working draft was produced on 21 April 2023 and the document was published in its final form to accompany the public consultation in July 2023.

3. Consultation on proposals to prohibit fishing for sandeel in all Scottish waters

171. Following the decision by Scottish Ministers to consult on the prohibition of sandeel fishing in Scottish waters,[275] the Scottish Government's intention to consult was announced on 18 May 2023 by way of a written statement in Parliament.[276] The consultation documents were considered and approved by the Cabinet Secretary[277] and comprised:[278]

171.1. a consultation document;[279]

171.2. a draft Partial Business and Regulatory Impact Assessment ("**BRIA**");[280]

171.3. a draft Environmental Report prepared in accordance with a Strategic Environmental Assessment ("**SEA**"); and[281]

171.4. the Scottish Scientific Report.[282]

172. The consultation was also supported by the outcome of the 2021 Call for Evidence – see paragraphs 134-136 above.

173. The consultation document concluded by stating that:

> Sandeel play an important role in the North Sea food web as a key resource for predatory fish, seabirds and marine mammals. Declines in sandeel

275 Ministerial submission of 6 February 2023, **Exhibit R-0091**. See also Ministerial submission of 27 April 2023, **Exhibit R-0092**.

276 Written Parliamentary Question, Ariane Burgess, 18 May 2023, S6W-18244, **Exhibit R-0093**.

277 Ministerial submission of 28 June 2023, **Exhibit R-0094**.

278 In addition to a Data Protection Impact Assessment.

279 Scottish consultation document, July 2023, **Exhibit C-0049**.

280 Partial BRIA, July 2023, **Exhibit C-0051**.

281 Scottish environmental assessment, July 2023, **Exhibit C-0052**.

282 Scottish Scientific Report, **Exhibit C-0050**.

availability and abundance may negatively impact the survival and reproduction of ecologically important species, therefore closure of the sandeel fishery has the potential to bring about wider ecosystem benefits to a range of species as well as improving resilience to changes in the marine environment. For example, restricting sandeel fishing may lead to an increase in sandeel abundance, survival and potentially availability, thereby providing benefits to other North Sea top predators, including key whitefish species, seabirds and marine mammals.

Previous sandeel closures on the east coast of Scotland have shown how breeding success in some seabird species is influenced by the abundance and availability of sandeel. Furthermore, improved body condition in some marine mammal species has also been linked to the proportion of sandeel in their diet. Therefore, any increase in sandeel abundance that might result from a reduction in fishing pressure could be beneficial to several marine predators given their dependence on sandeel as a prey source.

However, the extent to which these benefits could be realised for predatory fish, seabirds and marine mammals is unpredictable due to variation in sandeel abundance and availability which is driven by fishing mortality and, to a large extent, by natural mortality which is influenced by prevailing environmental conditions (including climate change) and predation. Any benefits, if realised, would not be immediate and would vary with location and species. In the case of seabirds, many global populations are declining with breeding seabirds in the UK not meeting GES. Seabirds face a range of pressures including habitat loss, biosecurity, infectious disease (such as Highly Pathogenic Avian Influenza), climate change, storm events, human disturbance to breeding birds and predation of both chicks and adult seabirds. Maximising the abundance and availability of sandeel stock as prey for seabirds (through the introduction of management measures in Scottish waters) therefore remains a key mechanism by which resilience in seabird populations might be achieved.[283]

174. The consultation on proposals to prohibit fishing for sandeel in Scottish waters ran from 21 July to 13 October 2023.

175. Consideration of alternatives to the proposals was facilitated in a number of ways.

175.1. First, consultation question 2 asked for "any views on alternative or complementary measures that could be considered in the longer-term for the protection of sandeel in Scottish waters".

283 Scottish consultation document, July 2023, **Exhibit C-0049**, pp. 23-24.

175.2. Second, alternatives were assessed in the SEA,[284] which were (i) extension of the existing closure to Sandeel Area 4 only, (ii) seasonal closure of the sandeel fishery, (iii) voluntary closure of the sandeel fishery, and (iv) no action taken.

175.3. Third, the same options were also assessed in the BRIA, with reference, among other things, to the impact on EU vessels catching sandeel in Scottish waters.[285]

4. Consideration of consultation responses

176. A total of 494 written representations were received from individuals and organisations including the fishing sector, renewable energy developers and recreational interests, as well as 9,815 campaign submissions.[286]

177. The Scottish Government's summary of responses noted that there was "overwhelming support" for the proposal to prohibit fishing for sandeel in all Scottish waters, with 97% in support and 3% in opposition, and that "[i]n particular" supporters "emphasised that closing fishing for sandeel had the potential to bring benefits to a range of species as well as improving sandeel resilience to changes in the marine environment, noting the range of pressures acting on populations, including climate change".[287] Many respondents did not offer views on alternative or complementary measures, but some argued that lesser measures were incompatible with the goal of increasing sandeel stock resilience. An alternative that was suggested was to set TAC at zero or to adopt "the Norwegian model (including real-time monitoring and adaptative management) of sandeel stock management".[288]

5. Engagement with the EU and Denmark

178. On 8 June 2023, the Scottish Cabinet Secretary met with EU Commission officials in Brussels and discussed the Scottish Government's proposals as regards sandeel

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284 SEA Screening and Scoping Report, May 2023, **Exhibit R-0095**, which addresses alternatives at section 4.5.1.

285 Scottish environmental assessment, July 2023, **Exhibit C-0052**, p. 13.

286 Scottish Government response to the consultation analysis report, January 2024, **Exhibit R-0096**, p. 2.

287 Scottish Government response to the consultation analysis report, January 2024, **Exhibit R-0096**, p. 3.

288 Scottish Government response to the consultation analysis report, January 2024, **Exhibit R-0096**, p. 3.

management in Scottish waters. On 24 July 2023 the Cabinet Secretary wrote to the EU Fisheries Commissioner directing attention to the consultation.[289]

179. The EU Commissioner's response of 1 August 2023 noted the recognition of impacts on the EU fishing fleet in the BRIA and that "full closure will not only have substantial impacts on these fisheries but also on the onshore processing industry".[290] The response did not suggest any alternative measures, but argued that "wider ecological needs are already considered in ICES catch advice".[291]

180. Both the EU Commissioner's response and the response of the Danish Minister for Food, Agriculture and Fisheries[292] referred to the outstanding information request submitted to ICES Technical Service.

6. Consideration of the ICES Technical Service Response

181. The ICES Technical Service Response[293] is considered in detail below at paragraphs 285-296. The ICES Technical Service Response was reviewed by experts in the Marine Directorate's SEDD Portfolio, which informed the Scottish Government's published response to the consultation. This noted: The ICES Technical Service Response was reviewed by experts in the Marine Directorate's SEDD Portfolio, which informed the Scottish Government's published response to the consultation. This noted:

> While the ICES advice framework is an important part of the fisheries management process which includes provision to keep stocks above a given precautionary level, there is no analysis which we are aware of which demonstrates that this precautionary level is sufficient to provide adequate food levels for predator populations that rely on sandeel.[294]

182. The Scottish Government interpreted the ICES Technical Service Response in that regard as supporting "the justification for a bespoke approach to sandeel management at a national level when considering the wider ecosystem and ensuring that local food

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289 Scottish Cabinet Secretary letter of 24 July 2023, **Exhibit C-0056**.

290 European Commission letter of 1 August 2023, **Exhibit C-0057**.

291 Insofar as this is an alternative, it is the "no action taken" alternative assessed in the SEA.

292 Letter from Danish Minister for Food, Agriculture and Fisheries to Scottish Cabinet Secretary for Rural Affairs, Land Reform and Islands, 9 October 2023, **Exhibit R-0097**.

293 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**.

294 Scottish Government response to the consultation analysis report, January 2024, **Exhibit R-0096**, p. 4.

availability is preserved for predator populations."[295] The response to the consultation added that "[w]hen considering the wider ecosystem and specific prey species, it is incumbent on Ministers to consider the best available scientific evidence which includes scientific evidence specific to those prey species."[296]

183. The Scottish Government's response to the consultation noted the importance of considering best available scientific evidence and stated that:

> We acknowledge that the evidence base demonstrating the effect of the sandeel fishery on sandeel abundance is not definitive and that the subsequent benefits to the marine environment, or specific components of the marine environment are uncertain. It should be acknowledged however, that this uncertainty is not due to a lack of information or data but is due to the degree of variability in the system, compounded by multiple interacting large scale environmental processes (e.g., climate change) affecting the various component[s] of the foodweb. This complexity and variability mean that predictions of the benefits of closing fishing for sandeel on the wider marine environment will have a degree of uncertainty. However, our assessment is that the precautionary approach adopted from our scientific evidence base which takes account of this uncertainty remains valid.[297]

7. Final approval of the Scottish measure

184. The closure of Scottish waters to sandeel fishing was approved by the Cabinet Secretary on 26 January 2024 in line with a detailed submission.[298] The submission and its annexes addressed all key matters raised in the consultation process, including the responses from the EU and Denmark. The summary in the main body of the submission was that "the recommended approach is appropriate and proportionate given the current evidence base and the precautionary principle".[299]

185. The final BRIA was published on 31 January 2024[300] together with a Policy Note.[301] The Sandeel (Prohibition of Fishing) (Scotland) Order 2024 ("**the 2024 Order**")[302] was made

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295 Scottish Government response to the consultation analysis report, January 2024, **Exhibit R-0096**, p. 4.

296 Scottish Government response to the consultation analysis report, January 2024, **Exhibit R-0096**, p. 4.

297 Scottish Government response to the consultation analysis report, January 2024, **Exhibit R-0096**, p. 5.

298 Ministerial submission of 26 January 2024, **Exhibit R-0098**.

299 Ministerial submission of 26 January 2024, **Exhibit R-0098**, para. 9.

300 Final BRIA, January 2024, **Exhibit C-0066**.

301 Policy Note: The Sandeel (Prohibition of Fishing) (Scotland) Order 2024, **Exhibit C-0065**.

302 Sandeel (Prohibition Of Fishing) (Scotland) Order 2024, **Exhibit CLA-0004**.

on 1 February 2024, laid before the Scottish Parliament on 5 February 2024, and came into force on 26 March 2024. Article 2(1) of the 2024 Order prohibits fishing for sandeel by all boats within all waters adjacent to Scotland up to the 200 NM limit.[303]

186. The Scottish Government sent further letters to the EU Commissioner and the Danish Minister on 2, 12 and 21 February 2024[304] regarding the Scottish measure.

187. The SEA process concluded with the publication of a Post Adoption Statement on 26 April 2024.[305] This summarised the SEA process, including consultation responses and the assessment of reasonable alternatives, and the Scottish Government's conclusions.

VII. THE MEASURES

A. THE ENGLISH MEASURE

1. Legal basis

188. The English measure was introduced by the MMO, at the request[306] of Defra, making amendments to all sea fishing licences under paragraph 2 of Schedule 3 to the Fisheries Act 2020 so as to add sandeel in English waters of the North Sea to the condition listing which stocks may not be fished.

2. Objectives

189. The policy objectives and intended effects of the English measure are set out at paragraph 10 of the DMA that accompanied the 2023 consultation as follows:

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303 i.e. "the Scottish zone", as defined in s. 22(1) of the Sea Fish (Conservation) Act 1967 by reference to s. 126(1) of the Scotland Act 1998.

304 Letter from the Scottish Cabinet Secretary for Rural Affairs, Land Reform and Islands to the Directorate-General for Maritime Affairs and Fisheries of the European Commission, of 2 February 2024, **Exhibit C-0059**; 12 February 2024 letter to Danish Minister, **Exhibit R-0134**; 21 February 2024 letter to EU Commissioner, **Exhibit R-0135**.

305 Scottish Government, Strategic Environmental Assessment of proposals to close fishing for sandeel in all Scottish waters Post Adoption Statement, 26 April 2024, **Exhibit R-0099**.

306 The Secretary of State has a power of direction under s. 37 of the Marine and Coastal Access Act 2009, which it was not necessary to use in this case.

> To increase the biomass of sandeel stocks and therefore increase the food availability for higher trophic level predators such as seabirds within the wider ecosystem within English waters of the North Sea.[307]

B. THE SCOTTISH MEASURE

1. Legal basis

190. The Scottish measure was made by way of an order under section 5 of the Sea Fish (Conservation) Act 1967, see paragraphs 45-47 above.

2. Objectives

191. The policy objectives of the Scottish measure are set out in the Policy Note accompanying the statutory instrument[308] as follows:

> The purpose of the Sandeel (Prohibition of fishing) (Scotland) Order 2024 is to prohibit fishing for sandeel in all Scottish waters with the aim of bringing about wider environmental and ecosystem benefits, which include potential benefits to sandeel, seabirds, marine mammals, and other fish species.[309]

192. The aims of the Scottish measure are set out in the final BRIA as:

> a) To seek effective protection of sandeel, as a contribution to the wider marine ecosystem.
>
> b) To provide the opportunity for wider ecosystem benefits to a range of species in addition to sandeel, including commercial fish species, seabirds and marine mammals, that will also improve resilience to changes in the marine environment.
>
> c) To complement, as far as possible, existing sandeel management measures in Scottish waters, including those under development in Scotland's [Marine Protected Areas ("**MPAs**")] network.[310]

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307 DMA, March 2023, **Exhibit C-0044**, para. 10 (p. 7).

308 Policy Note: The Sandeel (Prohibition of Fishing) (Scotland) Order 2024, **Exhibit C-0065**, paras. 1-5.

309 Policy Note: The Sandeel (Prohibition of Fishing) (Scotland) Order 2024, **Exhibit C-0065**, para. 4.

310 Final BRIA, January 2024, **Exhibit C-0066**, section 2.2, p. 6.

VIII. THE MEASURES DID NOT BREACH THE TCA

A. PRELIMINARY MATTERS

193. As recognised in Article 4(1), the provisions of the TCA fall to be interpreted in accordance with the customary rules of treaty interpretation reflected in the Vienna Convention on the Law of Treaties ("**VCLT"**). This includes having regard to relevant rules of international law applicable in the relations between the parties, as specified by Article 31(3)(c) of the VCLT. Both Recital 20 and Article 493 of the TCA specifically refer to UNCLOS as part of the principles of international law which inform the exercise of the sovereign rights of coastal States exercised by the Parties. This demonstrates an intention that special regard be had to UNCLOS when interpreting Heading Five of the TCA on fisheries.

194. The EU has the onus of establishing that the UK has breached the TCA. Each Party has the burden of proving the facts relied upon to support its claim or defence.[311]

195. Under Article 742(a) of the TCA the Tribunal is obliged to "make an objective assessment of the matter before it, including an objective assessment of the facts of the case and the applicability of, and conformity of the measures at issue with, the covered provisions".

B. THE RIGHT TO REGULATE UNDER THE TCA

196. The TCA is clear and explicit that the Parties shall have regulatory autonomy.

196.1. Recital 7 "recognises":

> the Parties' respective autonomy and rights to regulate within their territories in order to achieve legitimate public policy objectives such as the protection and promotion of public health, social services, public education, safety, the environment including climate change, public morals, social or consumer protection, animal welfare, privacy and data protection and the promotion and protection of cultural diversity, while striving to improve their respective high levels of protection …

311 Procedural Order No. 1, para. 8.1.

196.2. Article 1 provides that the TCA "establishes the basis for a broad relationship between the Parties, within an area of prosperity and good neighbourliness characterised by close and peaceful relations based on cooperation, respectful of the Parties' autonomy and sovereignty."

196.3. Article 391(1) provides that:

> The Parties affirm the right of each Party to set its policies and priorities in the areas covered by this Chapter, to determine the environmental levels of protection and climate level of protection it deems appropriate and to adopt or modify its law and policies in a manner consistent with each Party's international commitments, including those under this Chapter.

196.4. "Environmental levels of protection" is defined in Article 390(1) as "the levels of protection provided overall in a Party's law which have the purpose of protecting the environment", which includes "nature and biodiversity conservation" (sub-paragraph c) and the "protection and preservation of the marine environment" (sub-paragraph f).

196.5. Article 391(5) states that "The Parties shall continue to strive to increase their respective environmental levels of protection or their respective climate level of protection referred to in this Chapter."

196.6. Article 494(1) specifies that the Parties:

> shall cooperate with a view to ensuring that fishing activities for shared stocks in their waters are environmentally sustainable in the long term and contribute to achieving economic and social benefits, while fully respecting the rights and obligations of independent coastal States as exercised by the Parties.

196.7. Article 494(3)(f) specifies that regard must be had to applying proportionate and non-discriminatory measures "while preserving the regulatory autonomy of the Parties".

196.8. Article 496(1) specifies that "Each party shall decide on any measures applicable to its waters …".

196.9. Article 770 provides that "While preserving their decision-making autonomy, and without prejudice to other provisions of this Agreement or any supplementing agreement, the Parties shall endeavour to cooperate on current and global issues of common interest such as … environmental protection".

196.10. Recital 1 to Annex 38 affirms the "sovereign rights and obligations of independent coastal States exercised by the Parties".

197. It follows from the above that the UK has autonomy to decide for itself the legitimate public policy objectives it intends to pursue in respect of the environment, including its desired level of environmental protection. Likewise, it has autonomy to decide how to pursue those objectives. This is consistent with the provisions of UNCLOS discussed above at paragraphs 58-67 concerning the sovereignty of the coastal State in its territorial sea and its sovereign rights and jurisdiction in its EEZ.

198. The UK agrees with the EU that it is not the role of the Tribunal to form its own view as to what level of environmental protection either Party to the TCA should be pursuing.[312] The Appellate Body of the World Trade Organization ("**WTO**") held in a similar context that "in principle, determination of the appropriate level of protection is a *prerogative* of the Member concerned, and not of a panel or of the Appellate Body."[313] Consistently with this approach, in the *Whaling Case*, the International Court of Justice ("**ICJ**") explained that in determining the purpose of the killing of whales under Japan's JARPA II programme, it "need not pass judgment on the scientific merit or importance of [the programme's] objectives … Nor is it for the Court to decide whether the design and implementation of a programme are the best possible means of achieving its stated objectives."[314]

312 EU submission, para. 455.

313 Appellate Body Report, *Australia – Salmon*, para. 199 (emphasis in the original).

314 Whaling in the Antarctic (Australia v. Japan: New Zealand intervening), Judgment, I.C.J. Reports 2014, p. 226, **Exhibit RLA-0012** at p. 258, para. 88 ("**Whaling Case"**).

C. RELATIONSHIP BETWEEN ARTICLES 494 AND 496

199. Article 494(3) of the TCA requires Parties to 'have regard to' the various principles set out therein. The EU does not allege that there has been any freestanding breach of Article 494(3).[315]

200. Article 496(1) requires that each Party shall decide on any measures applicable to its waters in pursuit of the objectives in Articles 494(1) and (2) and 'having regard to' the principles referred to in Article 494(3). Thus the relevant obligation under Article 496(1), read with Article 494(3), is an obligation to have "regard to". The meaning of this phrase is set out at paragraphs 321-328 below.

201. Article 496(2) requires that a Party "shall base the measures referred to in paragraph 1 on the best available scientific advice". This is a more demanding obligation than 'having regard to' specified principles. It is discussed at paragraphs 215-225 below.

202. One of the principles that the Parties are obliged to 'have regard to' under Article 494(3) is "basing conservation and management decisions for fisheries on the best available scientific advice, principally that provided by the International Council for the Exploration of the Sea (ICES)". This means that the TCA contains both an obligation in Article 496(1) to have 'regard to' basing decisions on the best available scientific advice pursuant to Article 494(3)(c), and a more demanding obligation positively to 'base' the measure on the best available scientific advice under Article 496(2). Where no breach of the latter obligation is established, it necessarily means that there will also be no breach of the former.

D. THE EU'S CLAIM 1: THE UK HAS NOT BREACHED ARTICLES 496(2) OR 496(1) (READ WITH 494(3)(C)) OF THE TCA

1. Applicable legal standard

1. Meaning of "best available scientific advice"

203. 'Best' is a comparative term; it indicates that something is being compared to something else. In the phrase 'best available scientific advice', the comparison is to other available

315 EU submission, para. 782.

scientific advice. On its ordinary meaning, Article 496(2) requires that compared to other scientific advice which is available, the advice on which the relevant measure is based must be the 'best'. Whilst the EU's written submission acknowledges that 'best' is a superlative term,[316] it then proceeds to apply it as if it were an absolute, rather than comparative, standard. The EU asserts, for example, that 'best available scientific advice' requires "exclusion of advice that is incomplete or which is not based on the most recent available scientific data."[317] That is wrong.

203.1. Scientific research on a topic as complex as the North Sea ecosystem does not have a fixed endpoint. With unlimited time and resources, there is an infinite amount of research that could be done and data which could be obtained and analysed. Even material that the EU appears to consider the 'best', such as ICES advice, can be described as 'incomplete' on the basis that ICES stock advice does not include any analysis of whether forage fish biomass is high enough for predator requirements.[318] Advice does not cease to be the 'best available' at the time of decision-making simply because there is further work which could be done.[319] The relevant obligation under the TCA is to base measures on the 'best available' scientific advice, rather than the best possible scientific advice given unlimited time and resources.

203.2. Further, to interpret 'best' as excluding 'incomplete' evidence is directly contrary to the precautionary principle, which is reaffirmed in the TCA and forms part of the interpretive 'context' of the applicable provisions.[320] Pursuant to that principle, uncertainty in the form of an absence of adequate scientific information does not justify postponing or failing to take measures.[321]

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316 EU submission, para. 408.

317 EU submission, para. 462.

318 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1. See paras. 264-272 below.

319 As the WTO Appellate Body observed in a different context, a body of scientific evidence "can always be supplemented with additional information. Indeed, the nature of scientific inquiry is such that it is always possible to conduct more research or obtain additional information. The possibility of conducting further research or of analyzing additional information, by itself, should not mean that the relevant scientific evidence is or becomes insufficient." Appellate Body Reports, *US/Canada – Continued Suspension*, **Exhibit CLA-0032**, para. 702.

320 See further, paras. 204-205 and 303-317 below.

321 Article 495(1)(b) of the TCA.

203.3. The proposition that only the most recent available scientific data is to be used to the exclusion of advice based on any other data is also wrong.

203.3.1. First, the WTO panel in the case cited by the EU in support of the proposition, *EU and Certain Member States – Palm Oil (Malaysia)*, does not articulate any such blanket rule.[322] The Panel in that case was simply observing that in certain contexts, such as where a measure relies on information regarding past trends which are "subject to dynamic changes", it is important to rely on the most recent available data.[323]

203.3.2. Second, the proposition ignores the various reasons why experts might consider it desirable to use data other than the most recent, e.g. if it is of higher quality or involved a larger sample size. It naturally all depends on the facts and circumstances. The case of *EU and Certain Member States – Palm Oil (Malaysia)* does not suggest to the contrary. The UK would agree that if there were two datasets that were otherwise equal, but one was more recent than the other, the more recent data would be considered the "best" applying the comparative standard in the TCA, unless there were a reasoned justification for preferring the older data. As addressed below, such a scenario does not arise on the facts of this case.

204. As noted above, an important aspect of the context of Article 496(2) is Article 494(3)(a), which contains an obligation to have regard to "applying the precautionary approach to fisheries management".[324] The precautionary approach to fisheries management is defined in Article 495(1)(b) of the TCA as:

> [A]n approach according to which the absence of adequate scientific information does not justify postponing or failing to take management

322 EU submission, para. 458.

323 Panel Report, *EU and Certain Member States – Palm Oil (Malaysia)*, para. 7.566, **Exhibit CLA-0045**.

324 See also Article 356: "The Parties acknowledge that, in accordance with the precautionary approach, where there are reasonable grounds for concern that there are potential threats of serious or irreversible damage to the environment or human health, the lack of full scientific certainty shall not be used as a reason for preventing a Party from adopting appropriate measures to prevent such damage." A footnote to that provision states: "in relation to the implementation of this Agreement in the territory of the Union, the precautionary approach refers to the precautionary principle."

measures to conserve target species, associated or dependent species and non-target species and their environment.

205. The final words of the provision are particularly relevant as they make clear the Parties' intention to afford protection not only to the shared fish stocks, but also to the species which are associated with or dependent on them. This is a clear acknowledgement of the relevance of the precautionary approach to ecosystem-based measures. The precautionary approach under the TCA does not obviate the need to base decisions on the 'best available scientific advice'. It does, however, recognise that in some circumstances, the 'best' scientific advice 'available' to a Party may be limited, imperfect or otherwise contain or generate uncertainty, and that such circumstances do not justify failure by that Party to take management measures.

206. In addition to Articles 494(3)(c) and 496(2), the phrase "best available scientific advice" is used in Articles 498(2)(a)[325] and 508[326] of the TCA. Neither of those provisions indicates any different interpretation from that articulated above.

207. As for the term "available", the UK agrees with the EU that it means 'at one's disposal'.[327] This requires that the advice was in existence at the time the measure was decided upon. The EU is wrong on other aspects of its interpretation of this term:

207.1. It is incorrect that "available" means that advice must be "published or peer reviewed"[328] and "publicly available".[329] That is not stated in the TCA. Nor is it the ordinary meaning or a necessary implication of the term "available"; advice may be at a State's disposal without being in the public domain or having been peer reviewed. The UK does not deny the value of peer review, however the process of peer review and publication can take months or even years. It would run counter to the ordinary meaning of the word "available", and to the

325 Article 498(2)(a): "The Parties shall agree those TACs … on the basis of the best available scientific advice, as well as other relevant factors, including socio-economic aspects".

326 Article 508(1)(e): "The Specialised Committee on Fisheries may in particular … consider approaches to the collection of data for science and fisheries management purposes, the sharing of such data (including information relevant to monitoring, controlling and enforcing compliance), and the consultation of scientific bodies regarding the best available scientific advice".

327 EU submission, para. 409.

328 EU submission, para. 409.

329 EU submission, para. 464.

precautionary approach, to require a State to wait until that process had been completed before it could use such advice as a basis for a measure. The ICJ in the *Whaling Case* rejected the contention that "scientific research" must by definition be the subject of peer review.[330] The same is true of best available scientific advice. On the facts of this case, the scientific advice relied upon by the UK was published and publicly available, and the scientific papers relied on by it were peer-reviewed; however, those are not requirements imposed by the TCA.

207.2. The contradictions in the EU's interpretation of "best available scientific advice" become apparent when it later argues, for example, that the UK should have relied on "a more scientifically rigorous model"[331] than the EwE model, despite no such model existing at the time, much less one which was peer-reviewed and/or published.

207.3. Whilst the UK accepts that there are obligations of cooperation under the TCA,[332] the EU is wrong to assert that the Parties are under an "obligation to cooperate to obtain scientific research or acquire relevant scientific data before taking conservation and management decisions that are required to be based on resulting scientific advice".[333] There is no such obligation in the TCA. The relevant procedural obligation under Article 496 is the one in sub-paragraph (3) to notify and consult in respect of new measures to be applied.[334] Likewise, Article 12.3 of the FAO Code of Conduct for Responsible Fisheries, cited by the EU, lends no support to its argument. It contains no duty to cooperate in obtaining scientific

330 *Whaling Case*, **Exhibit RLA-0012**, p. 257, para. 84: "As to the criterion of peer review advanced by Australia, even if peer review of proposals and results is common practice in the scientific community, it does not follow that a programme can be said to involve scientific research only if the proposals and the results are subjected to peer review. The Convention takes a different approach (while certainly not precluding peer review)."

331 EU submission, para. 480.

332 For example Article 494(1): "The Parties shall cooperate with a view to ensuring that fishing activities for shared stocks in their waters are environmentally sustainable in the long term and contribute to achieving economic and social benefits, while fully respecting the rights and obligations of independent coastal States as exercised by the Parties." Article 494(3)(g) requires that due regard be had to ensuring the "collection and timely sharing" of data relevant to the conservation of shared stocks and for the management of fisheries, but contains no obligation to cooperate in the collection of the data.

333 EU submission, para. 463.

334 Article 496(3): "Each Party shall notify the other Party of new measures as referred to in paragraph 1 that are likely to affect the vessels of the other Party before those measures are applied, allowing sufficient time for the other Party to provide comments or seek clarification."

research.[335] The EU's interpretation would radically transform Article 496(2) into an obligation to refrain from taking measures unless and until both Parties had cooperated to obtain scientific research or data. This would in practice create a veto and run counter to the regulatory autonomy of each Party emphasised by the TCA. Whilst in this case, the Parties did cooperate in obtaining scientific advice by submitting the joint request to ICES,[336] and the UK waited until that advice was received before implementing any measures,[337] the UK was under no legal obligation pursuant to the TCA to refrain from taking measures until having engaged in such cooperation.

208. The UK's interpretation is supported by relevant rules of international law applicable in the relations between the Parties, thus forming part of the interpretive exercise under the rule reflected in Article 31(3)(c) of the VCLT. UNCLOS refers to the "best scientific advice available" or "best available scientific evidence" in a number of provisions, namely Articles 61(2),[338] 119(1)(a)[339] and 234.[340] The Virginia Commentary explains in respect of Article 119(1)(a) that:

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335 Article 12.3 provides: "States should ensure that data generated by research are analyzed, that the results of such analyses are published, respecting confidentiality where appropriate, and distributed in a timely and readily understood fashion, in order that the best scientific evidence is made available as a contribution to fisheries conservation, management and development. In the absence of adequate scientific information, appropriate research should be initiated as soon as possible."

336 See para. 261 above.

337 See paras. 159 and 181 above.

338 Article 61(2): "The coastal State, taking into account the best scientific evidence available to it, shall ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation. As appropriate, the coastal State and competent international organizations, whether subregional, regional or global, shall co-operate to this end."

339 Article 119(1)(a): "In determining the allowable catch and establishing other conservation measures for the living resources in the high seas, States shall … take measures which are designed, on the best scientific evidence available to the States concerned, to maintain or restore populations of harvested species at levels which can produce the maximum sustainable yield, as qualified by relevant environmental and economic factors, including the special requirements of developing States, and taking into account fishing patterns, the interdependence of stocks and any generally recommended international minimum standards, whether subregional, regional or global".

340 Article 234: "Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence."

> While conservation measures are to be based on the best scientific evidence available, this principle does not preclude measures being determined on some other basis where, due to lack of sufficient data, an estimate of allowable catch is not possible with any degree of accuracy. This is reinforced by the reference to 'available' evidence, which indicates that measures should be based on whatever evidence is at hand or reasonably obtainable. It does not suggest that no measures should be taken until the best scientific evidence or otherwise adequate information is available or obtainable. This reflects a precautionary approach to fisheries management when scientific data is not available or is inadequate to enable comprehensive decision making.[341]

That passage broadly aligns with the UK's interpretation of the phrase "best available scientific advice" in the TCA.

209. Furthermore, ITLOS observed in the *SRFC Advisory Opinion* in respect of Article 61 of UNCLOS that States must ensure that "conservation and management measures are based on the best scientific evidence available to the SRFC Member States and, when such evidence is insufficient, they must apply the precautionary approach, pursuant to article 2, paragraph 2, of the MCA Convention".[342] The same approach was adopted in the *Climate Change Advisory Opinion* in which ITLOS addressed the relationship between scientific information and measures to prevent, reduce and control pollution of the marine environment under Article 194(1) of UNCLOS:

> The Tribunal wishes to add at this juncture that in determining necessary measures, scientific certainty is not required. In the absence of such certainty, States must apply the precautionary approach in regulating marine pollution from anthropogenic GHGs. While the precautionary approach is not explicitly referred to in the Convention, such approach is implicit in the very notion of pollution of the marine environment, which encompasses potential deleterious effects. In this regard, the Tribunal recalls the observation of the Seabed Disputes Chamber in *Responsibilities and Obligations of States with Respect to Activities in the Area* (hereinafter '*the Area Advisory Opinion*') that:
>
> > the precautionary approach has been incorporated into a growing number of international treaties and other instruments, many of which reflect the formulation of Principle 15 of the Rio Declaration. In the view of the Chamber, this has initiated a trend towards making this approach part of customary international law. (*Responsibilities and obligations of States*

341 Nordquist (ed), United Nations Convention on the Law of the Sea 1982: A Commentary, **Exhibit R-0136**, para.119.7(c) ("**Virginia Commentary**").

342 Request for Advisory Opinion submitted by the Sub-Regional Fisheries Commission, Advisory Opinion, 2 April 2015, ITLOS Reports 2015, **Exhibit R-0137**, p. 4, p. 59, para. 208(ii) ("**SRFC Advisory Opinion**").

with respect to activities in the Area, Advisory Opinion, 1 February 2011, ITLOS Reports 2011, p. 10, at p. 47, paragraph. 135).[343]

210. As noted in the EU's submission,[344] the language of 'best available science' (and other slight variations of this phrase) is also used in a number of other instruments. However, none of those sheds light on its interpretation.

211. The ordinary meaning of "scientific" is "1. relating to or based on science. 2. Systematic; methodical".[345] As to the EU's further arguments in relation to that term:

211.1. The EU contends that in order to be considered "scientific", the advice must have "methodological rigour"[346]—language it has taken from WTO jurisprudence.[347] The EU does not attempt to explain what it means by "methodological rigour" in the context of scientific advice on ecosystem considerations. In the *Whaling Case*, the ICJ rejected Australia's contention that in order to constitute "scientific research" under the International Convention for the Regulation of Whaling, the

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343 ITLOS, Request for an advisory opinion submitted by the Commission of Small Island States on Climate Change and International Law (Request for Advisory Opinion submitted to the Tribunal), Advisory Opinion, 21 May 2024, **Exhibit CLA-0021**, paras. 213-214 ("***Climate Change Advisory Opinion***").

344 EU's written submission, paras. 431-441.

345 The Concise Oxford English Dictionary (12th edn), "scientific adj.", **Exhibit R-0138**.

346 EU submission, para. 466.

347 The EU cites the Panel Report in *Australia – Tobacco Plain Packaging*, **Exhibit CLA-0031**, at para. 7.627, which in turn refers to the Appellate Body Reports in *US/Canada – Continued Suspension*, **Exhibit CLA-0032**, paras. 591 and 592. However, the Panel in the *Tobacco Plain Packaging* case was evaluating the measures under Article 2.2 of the TBT Agreement, which does not contain wording comparable to Article 496(2) of the TCA. In relevant part, Article 2.2 provides that "technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective, taking account of the risks non-fulfilment would create." Article 2.2 of the TBT Agreement therefore requires an evaluation of the degree to which (if at all) the technical regulation contributes to the legitimate objective: Panel Report, *Australia – Tobacco Plain Packaging*, para. 7.423. Article 496(2) of the TCA, on the other hand, merely requires a measure to be "based on the best available scientific advice". As for *US/Canada – Continued Suspension*, in the passages referred to by the EU, the Appellate Body was addressing the standard of review applicable to the Panel's assessment of the scientific evidence upon which a risk assessment under Article 5.1 of the SPS Agreement is based. Unlike Article 496(2) of the TCA, Article 5.1 of the SPS Agreement requires that measures be "based on an assessment, as appropriate to the circumstances, of the risks to human, animal or plant life or health, taking into account risk assessment techniques developed by the relevant international organizations." It is clear that Article 2.2. of the SPS Agreement (which includes a threshold of "sufficiency" of scientific evidence) has directly influenced the interpretation of Article 5.1 of the SPS Agreement. See, e.g., in para. 591 of *US/Canada – Continued Suspension*, **Exhibit CLA-0032**, on which the EU relies, citation to Appellate Body Report, *EC – Hormones*, **Exhibit CLA-0043**, para. 193, which says: "We believe that Article 5.1, when contextually read as it should be, in conjunction with and as informed by Article 2.2. of the *SPS Agreement*, requires that the results of the risk assessment must sufficiently warrant – that is to say, reasonably support – the SPS measure at stake." Both the overall context and the terms of the specific relevant instruments are thus materially different in the WTO jurisprudence on which the EU relies when compared to any question before the Tribunal in this case.

research had to meet specific characteristics.[348] The Court noted that the criteria identified by Australia might reflect what could be described as "well-conceived scientific research", but did not serve as an interpretation of the term "scientific research" as it was used in the Convention.[349] The Court did not consider it necessary to devise alternative criteria or to offer a general definition of "scientific research".[350] That approach is also appropriate in the present fisheries context.

211.2. Even if the standard in WTO jurisprudence of "methodological rigour" were relevant to interpreting Article 496(2) of the TCA, that expression would have to be understood in the context in which it is used in that jurisprudence. In *US/Canada – Continued Suspension*, the WTO Appellate Body explained that:

> Although the scientific basis need not represent the majority view within the scientific community, it must nevertheless have the necessary scientific and methodological rigour to be considered reputable science. In other words, while the correctness of the views need not have been accepted by the broader scientific community, the views must be considered to be legitimate science according to the standards of the relevant scientific community.[351]

Thus the standard of "scientific and methodological rigour" simply serves to distinguish between science which is reputable/legitimate and science which is disreputable/illegitimate.

211.3. The EU is also wrong to suggest that 'scientific' advice should be interpreted according to the "usual practice" of science in the context of fisheries, which the EU posits involves "large amounts of data and the ability to create and apply models so as to arrive at objectively verifiable and valid conclusions".[352]

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348 *Whaling Case*, **Exhibit RLA-0012**, p. 258, para. 86.

349 *Whaling Case*, **Exhibit RLA-0012**, p. 258, para. 86.

350 *Whaling Case*, **Exhibit RLA-0012**, p. 258, para. 86.

351 Appellate Body Report, *US/Canada – Continued Suspension*, **Exhibit CLA-0032**, para. 591.

352 EU submission, paras. 413-414.

211.3.1. As a matter of treaty interpretation, the EU has not made any attempt to establish "subsequent practice" within the meaning of Article 31(3)(b) of the VCLT.

211.3.2. In any event, as a matter of principle, the character of the scientific advice that would be relied upon in any particular case is necessarily tied to the measures that are under consideration. There may be circumstances in which scientific advice does not require "large amounts of data" or where it would not be feasible to obtain such quantities of data before making a decision. In some cases it would be inconsistent with the precautionary approach to wait to obtain a large dataset before taking action. ICES itself does not refrain from providing advice in respect of what it terms "data-limited" stocks.[353]

211.3.3. Modelling is certainly not a pre-requisite for advice to be considered "scientific" under the TCA. Whilst in certain circumstances modelling may be one useful tool (among others), in other contexts it might not be relevant to the measures under consideration or modelling may not be feasible, practicable or necessary. For instance, ICES recognises the importance and legitimacy of multiple forms of scientific knowledge in ecosystems-based decision-making.[354] According to ICES:

> [E]cosystem-informed advice may involve (i) qualitative and expert-based syntheses of the available knowledge and information, (ii) an empirical data-mining approach, and/or (iii) the development of full ecosystem models. Each of these

353 ICES, Advice on fishing opportunities, 23 April 2024, **Exhibit R-0100**. See, e.g. ICES catch advice for cod in Division 6.b, 30 June 2023, **Exhibit R-0102** It provides catch advice for those stocks by using a precautionary approach (in recognition of the fact that the stock status is poorly known) and applying alternative methodologies, including, e.g., relying on data pertaining to different but comparable species.

354 ICES Framework for Ecosystem-Informed Science and Advice (FEISA), March 2024, **Exhibit R-0103**, p. 9 ("Scientific evidence in support of EBM covers a wide range of disciplines and includes various types of data, knowledge, and information that may differ greatly in format, precision, availability, spatial and temporal scale, quality, and confidence" and "Indicator values and trends may be defined and monitored in qualitative and semi-quantitative space using expert, stakeholder, traditional, indigenous, and local (ILK) knowledge (experiential evidence) or in quantitative space through empirical data acquisition (e.g. laboratory studies), time-series development (empirical evidence; e.g. trawl surveys), or using outputs from analytical models and simulated forecasts (mechanistic evidence; e.g. climate projections)").

> steps and approaches will have advantages and limitations considering the time frame and lifespan of the advice.[355]

In the context of this case, ecosystem modelling was conducted for the English Scientific Report, but no primary modelling was conducted for the Scottish Scientific Report.[356] Modelling is not in any sense a mandatory component of "scientific advice" under the TCA.

211.3.4. The EU's suggestion that modelling allows one to arrive at "objectively verifiable and valid conclusions" also reflects a misunderstanding of the output derived from modelling. Ecosystem models are tools that can be used to try to assess and predict the impact of drivers on biodiversity and ecosystems under certain conditions. They are complex and deal with a large number of parameters and uncertainties. There can never be certainty that the results of a model will predict with accuracy what would happen in the real world. As was recognised in the English Scientific Report, "models are not infallible".[357] Thus the EU's assertion that models can provide "objectively verifiable and valid conclusions" is inaccurate. To the extent the EU is suggesting that only science which produces quantifiable results (such as that produced by modelling) constitutes "scientific advice", that is wrong for the reasons given in para. 211.3.3 immediately above.

212. The term '<u>advice</u>' means "guidance or recommendations offered with regard to future action".[358] The UK agrees with the EU that in the context of the TCA, 'advice' consists of all the different items of scientific evidence which are collectively relied upon as the basis for a measure,[359] and that these fall to be considered "as a whole".[360] In the context

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355 ICES Framework for Ecosystem-Informed Science and Advice (FEISA), March 2024, **Exhibit R-0103**, p. 9.

356 See para. 226 above for the English measure and para. 253 above for the Scottish measure.

357 English Scientific Report, **Exhibit C-0045**, p. 48.

358 The Concise Oxford English Dictionary (12th edn), "advice", **Exhibit R-0139**.

359 EU submission, para. 478.

360 EU submission, para. 455. See also para. 478.

of this case, therefore, "advice" includes the reports, evidence, information, scientific papers and modelling relied upon by the UK.

213. Article 494(3)(c) stipulates that the best available scientific advice on which decisions are to be based is to be "principally that provided by" ICES. No such statement is found in Article 496(2). The UK agrees with the EU that, in respect of Article 494(3)(c), that stipulation "presupposes that ICES has issued relevant advice" and that "the term 'principally' does not preclude reliance on other advice."[361] Indeed it plainly permits it. The EU states that "scientific bodies should be understood as best placed to provide such advice".[362] It is not clear what the EU means by a "scientific body" or what point it seeks to make on the basis of any such qualification. If the EU is attempting to distinguish between advice from ICES and advice emanating from domestic bodies associated with the government (whether independent or not), such a distinction would find no support in the text of the TCA.[363] The TCA does not prescribe from whom the scientific advice must come, nor contain any hierarchy of scientific advisors (beyond the stipulation that if ICES has given relevant advice, it is "principally" that advice that is to be considered under Article 494(3)(c)).

214. On the applicable standard of review, the EU asserts that the Tribunal must "determine whether [the] evidence has the attributes necessary to support the factual propositions asserted by a Party".[364] That is only correct insofar as the Tribunal has to review the scientific material in order to determine whether the measures were "based on" the "best available scientific advice". That inquiry does not require the Tribunal to engage in any review of the merits of the underlying scientific information, resolve any scientific controversies, or to evaluate the degree to which the scientific advice supports the measures. The EU appears to share this view, citing jurisprudence to the effect that the

361 EU submission, para. 415.

362 EU submission, para. 465.

363 A number of the scientists who work for ALBs within the UK and for the Scottish Marine Directorate (and who contributed to the UK's scientific advice in respect of sandeel) contribute, in an independent capacity, to the work of ICES.

364 EU submission, para. 442.

role of a panel or tribunal is not to present its own scientific judgement[365] or to "conclusively assess the scientific evidence".[366]

2. Meaning of to "base … on"

215. The UK agrees with the EU that 'to base' means to "place on a foundation of"[367] and that this entails "a rational or objective relationship between the best available scientific advice on one hand and any conservation and management measures adopted pursuant to it on the other."[368]

216. On the interpretation of "to base", the UK makes five further points.

217. First, to "base" a measure on the best available scientific advice does not mean that the scientific advice must be the only driver for the measure or the sole consideration underpinning it. Parties are entitled to take into account other matters in the decision-making process. That is clear, for example, from the fact that the Parties are obliged to have "regard to" various principles under Article 494(3), of which basing decisions on the best available scientific advice is one of nine listed principles.

218. More fundamentally, the Parties' regulatory autonomy, which is emphasised in the TCA as discussed above at paragraphs 196-197, means that whilst a measure must undoubtedly be "based on" best available scientific advice, Parties are entitled also to take other considerations into account. That interpretation accords with the object and purpose of the TCA. In a treaty as comprehensive as the TCA, there is necessarily more than one object and purpose pursued by the Parties. One of those purposes is to preserve the Parties' regulatory autonomy in respect of the environment. This can be seen from the

365 EU submission, para. 455.

366 EU submission, para. 466 citing *Southern Bluefin Tuna (New Zealand* v. *Japan; Australia* v. *Japan), Provisional Measures, Order of 27 August* 1999, ITLOS Reports 1999, **Exhibit CLA-0027**, p. 280 at recital 80. However, the EU appears to suggest at para. 442 of its written submission that notwithstanding that express statement, ITLOS may in fact have engaged in some more thorough review of the evidence, citing the Joint Declaration of Vice-President Wolfrum and Judges Caminos, Marotta Rangel, Yankov, Anderson and Eiriksson which stated that "the scientific evidence presented to the Tribunal indicates that the stock has been severely depleted and is presently in a poor state". That statement does not support the EU's proposition since, as recorded in recital 71 of the Order, it was an agreed fact between the parties that the stock of southern bluefin tuna was severely depleted and was at its historically lowest levels, which was a cause for serious biological concern.

367 EU submission, paras. 306-308, 314.

368 EU submission, paras. 313-314.

preamble to the TCA, which refers to the preservation of the "Parties' respective autonomy and rights to regulate within their territories in order to achieve legitimate public policy objectives such as the protection and promotion of … the environment including climate change … while striving to improve their respective high levels of protection".[369] The preamble likewise refers to the benefits of a predictable commercial environment with the caveat that this must be in a "manner conducive to sustainable development in its economic, social and environmental dimensions".[370] The preamble also refers to an economic partnership which is "underpinned by … a commitment to uphold their respective high levels of protection in the areas of … environment, [and] the fight against climate change".[371]

219. The UK's interpretation is also consistent with ITLOS' Advisory Opinion on Climate Change, in which the Tribunal held in a different context that in determining which measures would be "necessary to prevent, reduce and control pollution of the marine environment" under Article 194(1):

> the science undoubtedly plays a crucial role, as it is key to understanding the causes, effects and dynamics of such pollution and thus to providing the effective response. However, this does not mean that the science alone should determine the content of necessary measures. In the Tribunal's view, as indicated above, there are other relevant factors that should be considered and weighed together with the best available science.[372]

220. It is also consistent with WTO jurisprudence which draws a distinction between an obligation to "base" measures on international standards, guidelines or recommendations and an obligation to conform measures to such standards. The WTO Appellate Body in *EC – Hormones* held, when interpreting Article 3.1 of the SPS Agreement which requires members to "base" their sanitary or phytosanitary measures on international standards, guidelines or recommendations, that:[373]

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369 Recital 7.

370 Recital 8.

371 Recital 9.

372 *Climate Change Advisory Opinion*, **Exhibit CLA-0021**, para. 212.

373 Article 3.1 provides: "To harmonize sanitary and phytosanitary measures on as wide a basis as possible, Members shall base their sanitary or phytosanitary measures on international standards, guidelines or recommendations, where they exist, except as otherwise provided for in this Agreement, and in particular in paragraph 3."

> [T]he ordinary meaning of 'based on' is quite different from the plain or natural import of 'conform to'. A thing is commonly said to be 'based on' another thing when the former 'stands' or is 'founded' or 'built' upon or 'is supported by' the latter. In contrast, much more is required before one thing may be regarded as 'conform[ing] to' another: the former must 'comply with', 'yield or show compliance' with the latter. The reference of 'conform to' is to 'correspondence in form or manner', to 'compliance with' or 'acquiescence', to 'follow[ing] in form or nature'.[374]

221. Second, a measure may be "based on" the best available scientific advice notwithstanding a lack of "adequate scientific information".[375] That is a result of a straightforward application of the relative sense of the word "best", and of the precautionary approach to fisheries management under Articles 494(3)(a) and 495(1)(b) of the TCA. In a case where there was no relevant scientific advice, more difficult questions may arise, but that is not this case.

222. Third, measures can be "based" on best available scientific advice even where there are divergent views on the matter within the scientific community (as the EU accepts[376]). In this regard, the WTO Appellate Body in *EC – Hormones*, when considering Article 5.1 of the SPS Agreement which provides that members shall ensure their sanitary or phytosanitary measures are "based on" a risk assessment, explained:[377]

> The requirement that an SPS measure be 'based on' a risk assessment is a substantive requirement that there be a rational relationship between the measure and the risk assessment.
>
> We do not believe that a risk assessment has to come to a monolithic conclusion that coincides with the scientific conclusion or view implicit in the SPS measure. The risk assessment could set out both the prevailing view representing the 'mainstream' of scientific opinion, as well as the opinions of scientists taking a divergent view. Article 5.1 does not require that the risk assessment must necessarily embody only the view of a majority of the relevant scientific community. … In most cases, responsible and representative governments tend to base their legislative and administrative

374 Appellate Body Report, *EC – Hormones*, **Exhibit CLA-0043**, para. 163. Citations omitted. See also Appellate Body Report, *US/Canada – Continued Suspension*, **Exhibit CLA-0032**, para. 528 (in respect of Article 5.1 of the SPS Agreement).

375 The phrase used in Article 495(1)(b) of the TCA.

376 EU submission, para. 454.

377 Article 5.1 provides: "Members shall ensure that their sanitary or phytosanitary measures are based on an assessment, as appropriate to the circumstances, of the risks to human, animal or plant life or health, taking into account risk assessment techniques developed by the relevant international organizations."

> measures on 'mainstream' scientific opinion. In other cases, equally responsible and representative governments may act in good faith on the basis of what, at a given time, may be a divergent opinion coming from qualified and respected sources. By itself, this does not necessarily signal the absence of a reasonable relationship between the SPS measure and the risk assessment, especially where the risk involved is life-threatening in character and is perceived to constitute a clear and imminent threat to public health and safety.[378]

223. Fourth, whilst the UK does not consider that categorisation of the obligation in Article 496(2) as one of either means or result is one that is apposite or likely to advance the analysis, the obligation in Article 496(2) is not apt to be categorised as an obligation of result as the EU asserts.[379] Article 496(2) does not require the realisation of any specific result. To the contrary, the Parties are entitled to decide for themselves the outcomes they seek to achieve and the means by which they will seek to do so, i.e. the measures (if any) they choose to apply with respect to living resources in their waters. Article 496(2) merely provides a qualification on the manner in which each Party does so. It is not an obligation that could meaningfully be described as an obligation of result in the ordinary sense of that term.

224. Fifth, the UK notes that the EU has cited WTO jurisprudence which refers to a need for "sufficient scientific evidence".[380] Those cases arise under the SPS Agreement and must be treated with care in the present context. That is because Article 2.2 of the SPS Agreement provides that:

> Members shall ensure that any sanitary or phytosanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, is based on scientific principles and is not maintained without sufficient scientific evidence, except as provided for in paragraph 7 of Article 5.

225. Equivalent language is not used in the different context of Article 496 of the TCA. Notwithstanding this, the EU's submission proceeds as if "sufficiency" were the requisite standard for the TCA.[381] The question for the Tribunal does not involve whether the UK acted based on "sufficient" evidence, but whether the EU has established that the

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[378] EU submission, paras. 193-194. See also Appellate Body Report, *US/Canada – Continued Suspension*, **Exhibit CLA-0032**, para. 529.

[379] EU submission, paras. 310, 313.

[380] EU submission, paras. 456-457, 459.

[381] E.g. EU submission, paras. 459, 479.

UK's measures were not "based on the best available scientific advice". Whilst the UK does not deny that assistance in interpreting the TCA may in some circumstances be derived from WTO jurisprudence (see, e.g. paragraph 222 above), this does not mean that concepts from that jurisprudence can be imported wholesale into provisions of the TCA dealing with quite different subject matter, i.e. vessels of one Party fishing in the waters of the other. The relevant provisions use different terms, in different contexts, and create different rights and obligations.

2. Application

1. The UK's measures in respect of English waters were based on the best available scientific advice

226. The best available scientific advice that the UK relied upon in respect of the English measure comprised:

226.1. The English Scientific Report by Natural England, Cefas and JNCC titled "What are the ecosystem risks and benefits of full prohibition of industrial sandeel fishing in the UK waters of the North Sea (ICES Area IV)?"; and

226.2. The ICES Technical Service Response to the EU-UK joint request for advice on ecosystem considerations in the provision of single-stock advice for forage fish species.

227. Save for specific criticisms of the modelling (addressed at paragraphs 282-288 below), the EU does not deny that the scientific advice relied on by the UK in respect of the English measure represents the 'best available scientific advice'.[382]

228. This section will explain the English Scientific Report. The ICES Technical Service Response is addressed at paragraphs 261-272 below.

229. The authors of the English Scientific Report were as follows:

229.1. **Natural England**: a statutory non-departmental public body established under Part 1 of the Natural Environment and Rural Communities Act 2006[383] with the

382 EU written submission, para. 491.

383 www.legislation.gov.uk/ukpga/2006/16/part/1.

general purpose under section 2(1) of that Act of conserving, enhancing and managing the natural environment for the benefit of future generations. Natural England's functions include undertaking research in support of its general purpose and of providing independent advice to public authorities.

229.2. **Cefas**: an executive agency of the Department for Environment, Food & Rural Affairs (**Defra**), which operates as an independent body, with separate staffing and financial arrangements from Defra. Cefas provides impartial scientific evidence and advice that supports policy development on matters including the marine environment, fisheries management, climate change and biodiversity loss.[384]

229.3. **JNCC**: a UK-wide statutory non-departmental public body under Part 2 of the Natural Environment and Rural Communities Act 2006 that operates in collaboration with Natural England and its equivalent bodies in Scotland, Wales and Northern Ireland. The JNCC is responsible for providing impartial scientific evidence and advice relating to the natural environment to the UK Government and the Devolved Administrations.[385]

230. The English Scientific Report had two components:

230.1. A review of scientific literature; and

230.2. Ecosystem modelling which was used to simulate effects of a prohibition on sandeel fishing in UK waters of the North Sea. Two types of models were used: (i) Ecopath with Ecosim ("**EwE**") modelling; and (ii) Ensemble modelling.

231. The English Scientific Report expressly stated that the modelling was to be viewed together with the evidence provided in the wider literature.[386]

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384 Cefas, Framework Document, 25 January 2023, **Exhibit R-0105**, para. 4.1; Research at Cefas, accessible at: www.gov.uk/government/organisations/centre-for-environment-fisheries-and-aquaculture-science/about/research.

385 JNCC, Framework Document, July 2022, **Exhibit R-0106**, para. 3.2.

386 English Scientific Report, **Exhibit C-0045**, p. 33.

a. Literature review

232. The English Scientific Report summarised the scientific literature on:

232.1. Sandeel dynamics, including the link between fishing exploitation pressure and risk of population collapse;[387]

232.2. The influence of environmental variation, including temperature rise, on sandeel;[388]

232.3. The links between sandeel and marine mammals, including the dietary preferences of certain marine mammals for sandeel, and the evidence relating to sandeel availability and the distribution, occurrence and body condition of certain marine mammals in the North Sea;[389]

232.4. The importance of sandeel to the diets of many seabird species, particularly during their breeding season, and the detrimental effects on seabird populations of an active sandeel fishery;[390]

232.5. The science linking higher sandeel availability or higher sandeel consumption with improved body condition of certain other fish.[391]

233. The scientific papers which are referred to in the English Scientific Report (and the Scottish Scientific Report) form part of the best available scientific advice relied upon by the UK. They are included as part of the Respondent's exhibits.[392]

387 English Scientific Report, **Exhibit C-0045**, p. 11.

388 English Scientific Report, **Exhibit C-0045**, pp. 38-40.

389 English Scientific Report, **Exhibit C-0045**, pp. 12, 15-18.

390 English Scientific Report, **Exhibit C-0045**, pp. 12-13, 15-18.

391 English Scientific Report, **Exhibit C-0045**, pp. 13-18.

392 See Annex I, Annex II.

b. <u>EwE modelling</u>

234. EwE modelling is one of the most widely used ecosystem modelling tools. It seeks to represent all components of an ecosystem and their interconnected dependencies.[393] The "Ecopath" component of the model contains information about how many of each species are in the ecosystem (in terms of biomass), how productive they are (i.e. their turnover rate), what they eat and how much they eat. Thus Ecopath represents a static, "snapshot image" of the trophic structure and energy flow within a system at a particular point in time.

235. The "Ecosim" component adds temporal dynamics to the model.[394] In basic terms, the Ecosim component integrates into the model key drivers of the system – such as fishing effort – enabling the model to predict how the system will react over time to changes in those drivers, e.g. a reduction in fishing effort.

236. The initial EwE model of the marine food web of the North Sea was developed over the course of six years and was peer-reviewed and published in 2007 by scientists Mackinson and Daskalov.[395] The model includes 69 functional groups (species or trophic groups) within the North Sea ecosystem, representing fish, benthic invertebrates, zooplankton, marine mammals, seabirds, and detritus. The parameters and empirical information used to construct the model were based on survey data, stock assessments, literature sources and information about fish landings.[396]

237. ICES Working Group for Multispecies Assessment Methods ("**ICES WGSAM"**) has a quality assurance procedure for reviewing models and accepting them as appropriate for

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393 Mackinson & Daskalov. (2007) An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep. No. 142 (Cefas), **Exhibit R-0107**, p. 11.

394 Mackinson & Daskalov. (2007) An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep. No. 142 (Cefas), **Exhibit R-0107**, p. 60.

395 Mackinson & Daskalov. (2007) An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep. No. 142 (Cefas), **Exhibit R-0107**, p. 9.

396 Mackinson & Daskalov. (2007) An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep. No. 142 (Cefas), **Exhibit R-0107**, p. 19.

use by ICES in providing advice.[397] A model that has been agreed and accepted as a standard by ICES WGSAM is called a "Key Run".[398] A Key Run serves "as a quality assured source for scientific input to ICES advice"[399] and thus represents the pinnacle of EwE model quality and validation.

238. In 2015, a version of Mackinson and Daskalov's model was reviewed and granted Key Run status by the ICES WGSAM.[400] That version of the model had been updated and calibrated using data from 1991 to 2013.[401] As part of the process for being granted Key Run status, the model underwent rigorous evaluation by ICES, involving a full review of all of the model's underlying assumptions, input data quality and parameterisation.[402] The ICES Key Run version of the North Sea EwE model was used for the analysis in the English Scientific Report.

239. The purpose of the EwE modelling in the English Scientific Report was to simulate the impacts of sandeel depletion on the marine food web in the North Sea, assessing its impact on seabirds, marine mammals, commercially important fish, benthos, and zooplankton. The key steps involved in the modelling were as follows:

    239.1. As the Key Run version of the model was only updated to 2013, it was necessary to update the model to extend it to 2020 (the most recent year for which data was available when the modelling was undertaken in 2022). This involved making minor adjustments to a small number of input parameters to reflect up-to-date

397 Report of the Working Group on Multispecies Assessment Methods (WGSAM), 9-13 November 2015, **Exhibit R-0108**, Annex 6: Report on Key Run for the North Sea Ecopath with Ecosim Ecosystem Model 1991-201, p. 103.

398 Report of the Working Group on Multispecies Assessment Methods (WGSAM), 9-13 November 2015, **Exhibit R-0108**, Annex 6: Report on Key Run for the North Sea Ecopath with Ecosim Ecosystem Model 1991-201, p. 104.

399 Report of the Working Group on Multispecies Assessment Methods (WGSAM), 9-13 November 2015, **Exhibit R-0108**, Annex 6: Report on Key Run for the North Sea Ecopath with Ecosim Ecosystem Model 1991-201, p. 104.

400 Report of the Working Group on Multispecies Assessment Methods (WGSAM), 9-13 November 2015, **Exhibit R-0108**, Annex 6: Report on Key Run for the North Sea Ecopath with Ecosim Ecosystem Model 1991-2013.

401 Report of the Working Group on Multispecies Assessment Methods (WGSAM), 9-13 November 2015, **Exhibit R-0108**, Annex 6: Report on Key Run for the North Sea Ecopath with Ecosim Ecosystem Model 1991-2013, p. 102.

402 Report of the Working Group on Multispecies Assessment Methods (WGSAM), 9-13 November 2015, **Exhibit R-0108**, Annex 6: Report on Key Run for the North Sea Ecopath with Ecosim Ecosystem Model 1991-2013.

data.[403] The data that was used for the update was derived from the same sources used in the Key Run, e.g. ICES stock assessments. No changes were made to the model's structure, function, foundational parameter settings or sources of information. Thus the model followed the Key Run which had been reviewed and approved by ICES WGSAM.

239.2. The proportion of sandeel fished from within the UK's EEZ in the North Sea (compared to outside its EEZ in the North Sea) was calculated based on historical fishing effort distributions in the North Sea (from 2003 to 2020).[404] The purpose of calculating this figure was to determine the reduction in sandeel fishing that might be expected to occur in the event of a full prohibition of sandeel fishing in UK waters. The proportion of sandeel fished from UK waters during the 2003 to 2020 period was found to average at 58%. The upper (95^{th} percentile) and lower (5^{th} percentile) estimated proportions of sandeel fishing from UK waters were 73% and 38% respectively.

239.3. The updated EwE model was used to simulate a range of scenarios of sandeel depletion in the North Sea, ranging from 0% depletion (no fishing) to 50% depletion. The simulations showed the impacts of different levels of sandeel depletion on the relative biomass of other species or trophic groups within the EwE model, e.g. how different levels of sandeel depletion in the North Sea would be predicted to impact on the biomass of seabirds, whales, etc. Those impacts are illustrated in Figure 2 below.

403 English Scientific Report, **Exhibit C-0045**, p. 21.

404 English Scientific Report, **Exhibit C-0045**, pp. 9-10.

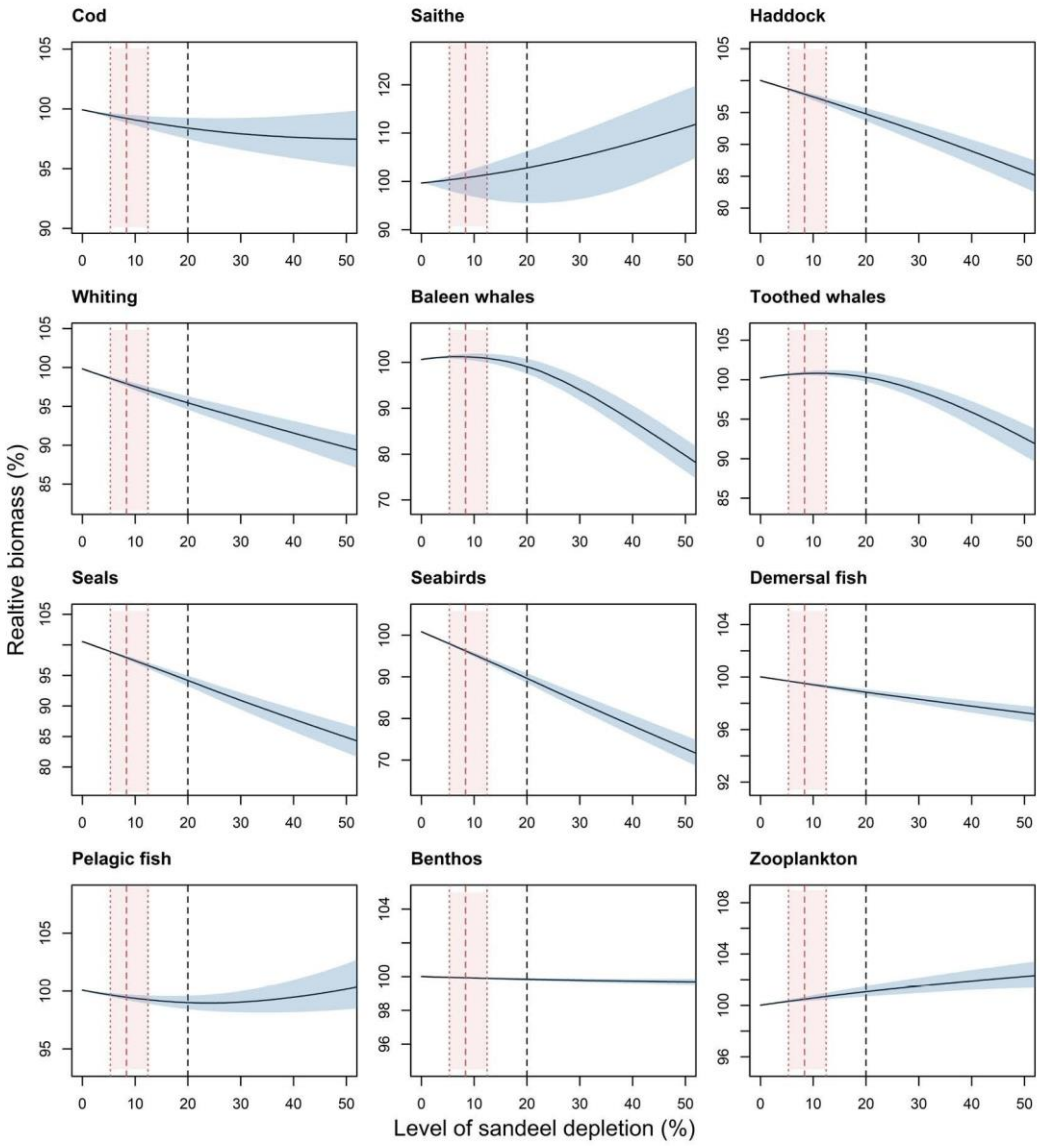

Figure 2[405]: Impacts of sandeel depletion on the relative biomass of different species or trophic groups in the North Sea (represented as the change in biomass compared to a scenario with no sandeel exploitation). The vertical black dashed line indicates the fishing mortality depletion in 2020. The red shaded area represents how the level of depletion might reduce if sandeel fishing in UK waters was prohibited. Three scenarios are presented for reductions in sandeel fishing in UK waters. The first is based on a reduction reflecting the average percentage of all North Sea sandeel fishing occurring in UK waters between 2003 and 2020, which is 58% (middle red line). The upper (95th percentile) and lower (5th percentile) estimated proportions of sandeel fishing from UK waters were 73% and 38% respectively. The second scenario reflects a 73% reduction in North Sea sandeel fishing in UK waters (left red line). The third scenario reflects a 38% reduction in North Sea sandeel fishing in UK waters (right red line). The blue shaded area represents the biomass response confidence interval (95%). The scale on the Y axis is not the same for every graph.

405 English Scientific Report, **Exhibit C-0045**, Figure 6 on p. 26 (wrongly labelled Figure 5 in the Report).

240. From those simulations, one can compare the relative biomass of, e.g. seabirds, at the 2020 level of sandeel depletion (which is 20%[406]) to their biomass at a reduced level of sandeel depletion. The English Scientific Report quantifies (in Table 3) the simulated biomass response of different species and trophic groups to a reduction in sandeel fishing in the North Sea of 58% (reflecting the proportion of sandeel fishing in the North Sea taking place in UK waters from 2003 to 2020),[407] as well as the biomass response of the upper (73%) and lower (38%) estimated proportions of fishing from UK waters (representing 95% confidence intervals).[408]

241. The modelling undertaken for the English Scientific Report assumed constant prevailing environmental conditions, i.e. it did not seek to predict how environmental variation such as climate change could affect the results.[409]

242. To account for uncertainty, a Monte Carlo simulation was used, which is a type of computational algorithm that uses repeated random sampling from within the confidence interval of each of the parameters of the model to obtain the likelihood of a range of results occurring.[410] Simulations were generated using sets of alternative parameters to produce a range of plausible outputs.[411] Figure 2 above illustrates this uncertainty in the form of a 95% credible interval (blue shading).

243. The results of the EwE modelling indicated that a prohibition on sandeel fishing in UK waters of the North Sea would be expected to lead, in the North Sea as a whole,[412] to a:

243.1. 7% increase in the biomass of seabirds;

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406 English Scientific Report, **Exhibit C-0045**, p. 25.

407 English Scientific Report, **Exhibit C-0045**, third column from the left.

408 English Scientific Report, **Exhibit C-0045**, Table 3, right hand column. The English Scientific Report also sets out the predicted biomass response of different species and trophic groups to a closure of the entire North Sea to sandeel fishing (i.e. a 0% fishing depletion scenario), however that information is not directly relevant to this dispute which only concerns closure of UK waters to sandeel fishing.

409 English Scientific Report, **Exhibit C-0045**, p. 34.

410 The input parameters were assigned credible intervals based on the origin of the data, with higher quality being assigned a smaller credible interval than data of lesser quality (which are considered more uncertain): English Scientific Report, **Exhibit C-0045**, p. 24.

411 English Scientific Report, **Exhibit C-0045**, p. 24.

412 The North Sea EwE model operates at the level of the North Sea. Thus these results reflect the predicted effects in the North Sea of a closure of fishing in the UK waters of the North Sea.

243.2. 4% increase in the biomass of seals;

243.3. 3% increase in the biomass of haddock;

243.4. 2% increase in the biomass of baleen whales;

243.5. 2% increase in the biomass of whiting;

243.6. 1% increase in the biomass of cod; and

243.7. 1% increase in the biomass of demersal fish (including, among others, cod, haddock and whiting, mentioned separately above).[413]

244. Simulations showed no increase in biomass for toothed whales, pelagic fish and benthos. Saithe and zooplankton were predicted to have reductions of 2% and 1% in biomass respectively.

245. The English Scientific Report transparently identified and explained the caveats to the modelling.[414] These principally pertained to limitations of the current North Sea EwE model, namely that it doesn't account for indirect effects of reduction in sandeel fishing such as bycatch (caveat 1); that it doesn't account for the fact that different predators and the fishery may target sandeel of different sizes (caveat 2); that it doesn't account for the spatial distribution of sandeel within the North Sea (caveat 3); and that it doesn't account for how environmental variation may impact the expected benefits of reduced fishing mortality (caveat 4). There was no ecosystem model of the North Sea available to the UK which could account for all or any of those factors. In respect of caveat 4, the English Scientific Report makes clear, based on information in the literature review, that environmental variation as a result of climate change has negative implications for sandeel abundance.[415]

c. Ensemble Modelling

246. Ensemble modelling combines several different ecosystem models, all of which have different structures, make different assumptions and have different strengths and

413 English Scientific Report, **Exhibit C-0045**, Table 3.

414 English Scientific Report, **Exhibit C-0045**, pp. 33-34.

415 English Scientific Report, **Exhibit C-0045**, pp. 34, 38-40.

weaknesses, and identifies where those different models produce similar patterns in their results. Where different models produce similar patterns in their results, one can have greater confidence in those results.

247. In the English Scientific Report, ensemble modelling was used as a "sense check" on the results of the EwE modelling. The English Scientific Report relied on the ensemble model developed by Spence et al (2018).[416] This is a sophisticated ensemble model that uses statistical analysis to compare the different models with data from empirical studies, i.e. "real world" data (such as stock assessments of sandeel) to identify the strengths and weaknesses of the different models.[417]

248. The North Sea EwE model is the only available model that deals with the whole food web of the North Sea. There are, however, other multispecies models that are more specialised. They focus on certain aspects of the North Sea food web, e.g. FishSUMs which is a partial ecosystem model that includes 10-15 species. For the English Scientific Report, ensemble modelling was undertaken to evaluate the impact of sandeel fishing on commercial fish, on the one hand, and the impact on mammals and seabirds, on the other. The ensemble modelling for commercial fish (which included haddock, cod, saithe and whiting) used empirical information from stock assessments and four multispecies models (FishSUMs, LeMans, Mizer and EwE).[418] To evaluate the impact of sandeel fishing on seabirds and mammals, the ensemble used EwE and empirical estimates from a species distribution model.[419] Fewer models were included in the latter ensemble because there are fewer available models of the North Sea that include mammals and seabirds compared to those available in respect of commercial fish.

249. The results of the ensemble modelling indicated that a scenario involving no fishing of sandeel in the North Sea led to a greater increase in the biomass of seabirds over time than maintaining the status quo (i.e. sandeel fishing at the 2019 level).[420] The results of

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416 Spence et al. (2018) A general framework for combining ecosystem models. Fish and Fisheries. 19(6): 1031-1042, **Exhibit R-0109**

417 Spence et al. (2023) EcoEnsemble: A general framework for combining ecosystem models in R, R. Methods in Ecology and Evolution. 14: 2011–2018, **Exhibit R-0063**, p. 2012.

418 English Scientific Report, **Exhibit C-0045**, p. 30.

419 English Scientific Report, **Exhibit C-0045**, p. 30.

420 English Scientific Report, **Exhibit C-0045**, p. 32. The ensemble model used data to 2019 because it used data from a published study that covered those years.

the ensemble modelling also indicated that the EwE model's projections in respect of seabirds had a higher degree of certainty than its projections for mammals.[421] The ensemble modelling indicated that prohibiting sandeel fishing would have a limited impact on the biomasses of commercial fish, consistent with the results of the EwE modelling.[422]

d. Conclusions

250. The English Scientific Report concluded that seabirds would be the greatest beneficiaries of a prohibition on sandeel fishing in UK waters of the North Sea,[423] with seals the next greatest beneficiaries.[424] Whilst the English Scientific Report concluded that there would be benefits for some commercial fish, overall it considered that the impacts on commercial fish would be limited and complex, with a mixture of positive and negative responses.[425]

251. The English Scientific Report summarised the key risks arising from a full prohibition on sandeel fishing in UK waters.[426] These included the risks of displacement of fishing effort.[427] It also acknowledged the risk that environmental variation (including climate change) could prevent the realisation of all the benefits that might be expected to arise from a prohibition on sandeel fishing in UK waters of the North Sea, but that the measure would dampen such negative impacts by removing an additional source of sandeel mortality.[428]

252. The scientific advice relied upon in respect of the English measure was the "best available". It was methodical, thorough and objective, with areas of uncertainty clearly identified. The EwE model that was used for the modelling has previously been the subject of rigorous review by ICES WGSAM which accepted it for use in ICES products,

421 English Scientific Report, **Exhibit C-0045**, p. 32.

422 English Scientific Report, **Exhibit C-0045**, p. 31.

423 English Scientific Report, **Exhibit C-0045**, p. i.

424 English Scientific Report, **Exhibit C-0045**, p. 29.

425 English Scientific Report, **Exhibit C-0045**, p. i.

426 English Scientific Report, **Exhibit C-0045**, pp. 43-48.

427 English Scientific Report, **Exhibit C-0045**, pp. 34-38, 43-45.

428 English Scientific Report, **Exhibit C-0045**, pp. 39-40, 46.

meaning it has met the highest standards of quality-control. Recent literature has advocated for greater use of such models in fisheries management decisions.[429] The EU has not identified any scientific advice on the same subject that it considers to be better than that relied on by the UK in respect of the English measure.

2. Scotland's measures were based on the best available scientific advice

253. The scientific advice that Scotland relied upon was principally:

253.1. The Scottish Scientific Report titled Review of Scientific Evidence on the Potential Effect of Sandeel Fisheries Management on the Marine Environment;

253.2. The SEA; and

253.3. The ICES Technical Service Response (addressed in paragraphs 261-272 below).

254. The EU has expressly stated that it does not challenge that the scientific advice relied on for the Scottish measure represents the "best available scientific advice".[430]

255. The Scottish Scientific Report comprises a detailed exposition of studies relevant to sandeel in the North Sea, canvassing over 170 scientific papers. It addressed the following topics:

255.1. The scientific evidence concerning sandeel distribution and movements, including their highly specific habitat requirements, the limited exchange of sandeel across different sandeel grounds, and the significant period of time required for a depleted ground to recover;[431]

255.2. The effects of climate change on sandeel abundance and availability, including the effects of warmer temperatures on the survival and physiology of sandeel, as

429 Craig & Link. (2023) It is past time to use ecosystem models tactically to support ecosystem-based fisheries management: Case studies using Ecopath with Ecosim in an operational management context. Fish and Fisheries. 24(3): 1-26, **Exhibit R-0110**.

430 EU's written submission, para. 491. See also fn. 312.

431 Scottish Scientific Report, **Exhibit C-0050**, pp. 1-8.

well as indirect effects such as increased trophic mismatch between sandeel and their predators and prey;[432]

255.3. The data regarding the 2000 closure of part of SA4 (addressed further immediately below);[433]

255.4. The evidence regarding the effect of sandeel depletion on predatory fish (which was found to be unclear);[434]

255.5. The links between sandeel and seabirds, including the influence of sandeel biomass, abundance and availability on seabird breeding success;[435] and

255.6. The differing levels of vulnerability of marine mammal species to declines in sandeel abundance.[436]

256. A particularly important aspect of the Scottish Scientific Report is its analysis of the scientific evidence concerning the 2000 closure of part of SA4. In summary:

256.1. Despite an initial increase in sandeel biomass in the years immediately following the closure, sandeel biomass has subsequently declined to levels that are comparable to those observed when the fishery in the area was active.[437]

256.2. Even with particularly strong recruitment of sandeel in certain years (2009 and 2020), this did not lead to an increase in sandeel abundance greater than what was observed in the years immediately following the closure.[438]

256.3. Age 1 sandeel appear to have a higher survival rate in the closed area compared to sandeel in management areas in which the fishery continues to operate.[439]

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432 Scottish Scientific Report, **Exhibit C-0050**, pp. 8-12.

433 Scottish Scientific Report, **Exhibit C-0050**, pp. 16-26, 48-49, 55.

434 Scottish Scientific Report, **Exhibit C-0050**, pp. 26-36.

435 Scottish Scientific Report, **Exhibit C-0050**, pp. 36-50.

436 Scottish Scientific Report, **Exhibit C-0050**, pp. 57-73.

437 Scottish Scientific Report, **Exhibit C-0050**, p. 20.

438 Scottish Scientific Report, **Exhibit C-0050**, p. 21.

439 Scottish Scientific Report, **Exhibit C-0050**, pp. 22-23, 25.

256.4. A 2008 study found that for kittiwake colonies that foraged in the closed area, breeding success was significantly lower when the fishery was active compared to when the fishery was closed.[440] In contrast, kittiwake colonies that foraged in areas subject to the fishery showed no significant change in breeding success over that same period.[441]

256.5. The design of the 2008 study was repeated in a 2023 paper by Searle et al. which looked at data from 1986 to 2018. That study likewise found a significant decrease in kittiwake breeding success which was attributable to the sandeel fishery.[442] After the fishery was closed, kittiwake colonies that foraged in the closed area showed a small (10%) but statistically significant increase in breeding success.[443] In contrast, kittiwake colonies that foraged in areas subject to the fishery continued to show declines in breeding success.[444] The partial closure of the sandeel fishery did not enable kittiwake breeding success to recover to pre-fishery levels.[445]

256.6. The data did not show positive or negative effects of the partial closure of the fishery on the breeding success of puffin, razorbill and guillemot.[446] Searle et al. could not, however, discount the possibility that the fishery closure may have benefited breeding success of these species, i.e. without the closure the declines in those populations could have been even more marked.[447]

256.7. Fishing effort in the closed area was associated with a decreased proportion of sandeel in puffin diet, suggesting that when fishing is more intensive, fewer sandeel are captured by puffins.[448] Fishing effort in the closed area was also

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440 Scottish Scientific Report, **Exhibit C-0050**, p. 49.

441 Scottish Scientific Report, **Exhibit C-0050**, p. 49.

442 Scottish Scientific Report, **Exhibit C-0050**, pp. 49, 55.

443 Scottish Scientific Report, **Exhibit C-0050**, p. 49.

444 Scottish Scientific Report, **Exhibit C-0050**, p. 49.

445 Scottish Scientific Report, **Exhibit C-0050**, pp. 49, 55.

446 Scottish Scientific Report, **Exhibit C-0050**, pp. 49, 54-55.

447 Searle et al. (2023), **Exhibit C-0040**, p. 11.

448 Scottish Scientific Report, **Exhibit C-0050**, p. 47.

associated with a decrease in the relative proportion of age 0/age 1+ sandeel in the diet of kittiwake, razorbill and puffin.[449]

257. The Scottish Scientific Report emphasises the difficulty in identifying and quantifying the effects of the partial closure on sandeel abundance since those effects could have been concealed by other sources of sandeel mortality e.g. changes to the environment arising from climate change.[450] Indeed, the fact that sandeel abundance has continued to decline in the area despite the partial closure of the fishery indicates that other causes of sandeel mortality (i.e. natural mortality, including as a result of environmental change) played a more prominent role than fishing mortality in shaping sandeel abundance in at least some Scottish waters.[451] Despite the difficulty of observing the effect of a fishery closure in a changing environment, the Scottish Scientific Report concluded that sandeel are likely to benefit from measures aimed at reducing fishing mortality due to their life-long attachment to particular sand banks and limited dispersal and movements, and that a closure may promote sandeel resilience to climate change.[452]

258. Scotland's scientific advice did not rely on primary modelling (such as the EwE modelling in the English Scientific Report).[453] Whilst the English Scientific Report contains scientific advice which supports both the English and the Scottish measure (since it evaluated the effects of a prohibition on sandeel fishing in all UK waters in the North Sea), Scotland prepared and relied upon its own scientific advice.

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449 Scottish Scientific Report, **Exhibit C-0050**, p. 47.

450 Scottish Scientific Report, **Exhibit C-0050**, pp. 22, 25.

451 Scottish Scientific Report, **Exhibit C-0050**, p. 25.

452 Scottish Scientific Report, **Exhibit C-0050**, p. 25.

453 However, many of the peer-reviewed papers that were analysed in the Scottish Scientific Report were based on modelling, e.g. Christensen et al. (2008), Sandeel (Ammodytes marinus) larval transport patterns in the North Sea from an individual-based hydrodynamic egg and larval model. Can. J. Fish Aquat. Sci. 65: 1498-1511, **Exhibit R-0064**; Gilles et al. 2016, Seasonal habitat-based density models for a marine top predator, the harbor porpoise, in a dynamic environment. Ecosphere 7 (6), **Exhibit R-0101**; Lahoz-Monfort et al. (2011) A capture–recapture model for exploring multi-species synchrony in survival. Methods in Ecology and Evolution, 2: 116-124, **Exhibit R-0132**; Langton et al. (2021) A verified distribution model for the lesser sandeel Ammodytes marinus. Mar. Ecol. Prog. Ser. 667: 145-159, **Exhibit R-0015**; Poloczanska et al. (2004) Fishing vs. natural recruitment variation in sandeel as a cause of seabird breeding failure at Shetland: a modelling approach. ICES J. Mar. Sci. 61: 788-797, **Exhibit R-0027**; Ransijn et al. (2021) Integrating disparate datasets to model the functional response of a marine predator: A case study of harbour porpoises in the southern North Sea. Ecology and Evolution. 11(23): 17458-17470, **Exhibit R-0133**.

259. The scientific analysis contained in the SEA is largely the same as the Scottish Scientific Report, with additional detail on some issues.[454] The SEA draws on that scientific analysis to identify and compare the anticipated environmental benefits of different proposals under consideration, namely: (i) a full closure of sandeel fishing in Scottish waters; (ii) closure of only SA4; (iii) seasonal closures of Scottish waters to sandeel fishing; (iv) voluntary measures; and (v) doing nothing. A full closure was assessed as having the potential to bring about the greatest beneficial effects on the marine environment.[455]

260. The Scottish Scientific Report and the SEA represented the "best available scientific advice". The aim of the Scottish Scientific Report was to provide a neutral review of the available scientific evidence on the potential effects of sandeel fisheries management measures on the marine environment.[456] It was scrupulously objective, identifying areas of uncertainty,[457] results which should be treated with particular caution,[458] and the limitations of certain studies (including where they support a prohibition on sandeel fishing).[459] The EU has not identified any errors or omissions in the scientific advice relied upon by Scotland, suggested any lack of scientific or methodological rigour in that advice,[460] nor identified any scientific advice on the same subjects that it says is better.

3. The ICES Technical Service Response

261. As noted above, the UK and EU made a joint request to the ICES Technical Service for advice on how ecosystem considerations are factored in and applied in the provision of single-stock advice for forage fish species. The ICES Technical Service Response to the

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454 More detailed information is provided in respect of the current population and distribution of seabirds (paras. 4.2.4-4.211), the impact of climate change on predatory fish (para. 4.3.15), the impact of avian influenza (HPAI) on seabirds (paras. 4.2.25-4.2.26) and the pressures that can affect cetacean populations (Table 7).

455 Strategic Environmental Assessment of proposals to close fishing for sandeel in all Scottish waters, July 2023, **Exhibit C-0052**, pp. 85-86, 93-97.

456 Scottish Scientific Report, **Exhibit C-0050**, p. 1.

457 E.g. Scottish Scientific Report, **Exhibit C-0050**, pp. 20-21.

458 E.g. Scottish Scientific Report, **Exhibit C-0050**, p. 23.

459 E.g. Scottish Scientific Report, **Exhibit C-0050**, pp. 20-21.

460 EU's written submission, para. 491.

joint request was relied upon both by the UK Government in respect of English waters and by the Scottish Government as part of the best available scientific advice.

262. The Technical Service offered by ICES involves the provision of scientific information upon request by a client for use by managers and policy-makers.[461] Whilst the Technical Service may include recommendations by individual or groups of scientists, "it does not include a recommendation on behalf of ICES" and thus ICES Technical Service responses "do not constitute ICES approved advice".[462] The ICES Technical Service Response that was provided in response to the UK-EU joint request was drafted by two anonymous reviewers and reflects their views.

263. The specific question that was posed by the UK and EU to the Technical Service was "to clarify and describe how ecosystem considerations are factored in and applied in the provision of single stock advice for forage fish species."[463]

264. In response, the ICES Technical Service confirmed that: "[w]hat is not conducted in the [ICES stock] assessments is specific analysis of whether the forage fish biomass is kept high enough for specific predator requirements."[464] ICES stock assessments consider the impact of predation for the purpose of determining the maximum sustainable yield of the stock being assessed. They do not, however, assess matters from the perspective of conserving and restoring populations of the predators that prey on that stock.

265. Five more specific points arise in respect of the ICES Technical Service Response.

266. First, the ICES Technical Service Response confirmed that ICES stock advice has a single species focus which aims to maximise sustainable yield for that species and prevent overfishing i.e. the primary focus is maintaining the state of the assessed stock.[465] The escapement strategy applied by ICES for the purposes of sandeel stock advice is designed to ensure that a sufficient proportion of the sandeel population "escapes" fishing pressure to ensure that the fishery can be continued in a sustainable manner. Whilst

461 ICES Technical Guidelines, 16 December 2016, **Exhibit C-0054**, p. 1.

462 ICES Technical Guidelines, 16 December 2016, **Exhibit C-0054**, p. 1.

463 ICES Technical Guidelines, 16 December 2016, **Exhibit C-0054**, p. 2.

464 ICES Technical Service Response (28 November 2023), **Exhibit C-0022,** p. 1

465 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1.

sustainably exploited stocks might support the needs of predators dependent on those stocks, that is not explicitly considered nor simulated by ICES:

> [ICES] advice is consistent with the maximum sustainable yield approach, the aim of which is to have high stock sizes producing pretty good yields. It is possible that exploitation levels consistent with this framework would result in a high enough biomass required to sustain ecosystem services. However, it is also possible that the resulting biomasses may be too low.[466]

267. Accordingly, when one of the reviewers stated that "[i]f [ICES quotas for forage fish] are followed, this advice should ensure healthy levels of these stocks",[467] that is referring to 'healthy' levels of those specific stocks for the purposes of exploitation by the associated fisheries, not healthy levels of species that prey on those stocks or a healthy ecosystem generally.

268. Second, the ICES Technical Service Response stated that although the quota advice is set with "an element of precautionarity to avoid going into recruitment overfishing",[468] that precautionary buffer is not fixed by reference to predator needs or ecosystem considerations:

> Although the ICES advice framework includes a provision to keep the stocks above a given precautionary level, there is no analysis of whether this precautionary level is sufficient to provide adequate food levels for individual predator populations.[469]

269. Consequently, the precautionary buffer "may or may not be high enough to ensure the provision of the ecosystem services associated with a given stock and a given predator".[470]

270. Third, the ICES Technical Service Response noted that advice on whether forage fish biomass is high enough for specific predator requirements would require analysis of the specifics of individual predator populations, and that local abundance of forage fish (at

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466 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1.

467 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 2.

468 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 2.

469 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1. See also p. 2.

470 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 2.

specific times of the year) will matter more for some predators than others.[471] ICES advice on fishing opportunities "is given at a stock level and cannot function at the level of individual feeding grounds, which goes beyond the detail level of the stock assessment models."[472] One reviewer explained that "it is never going to be feasible for ICES to provide catch advice at a sufficiently fine scale to account for this local food requirement".[473] Thus, the ICES Technical Service Response concluded that "a large part of the question of whether management is supporting ecosystem functions should occur at the level of national regulations".[474]

271. Fourth, the ICES Technical Service Response stated that the current ICES advice for forage fish species "does include ecosystem effects on the assessed stocks through both variable predation mortality and qualitative ecosystem considerations".[475]

271.1. Variable predation mortality refers to changes in predation pressure on forage fish over time, e.g. if the stock of a predatory fish increases in the North Sea, other things being equal this will likely cause a decrease in sandeel stock in the North Sea. All ICES stock annexes document natural mortality.[476] For ICES stock advice on forage fish in the North Sea, that natural mortality is informed by data on predation mortality, which is estimated using a multispecies model (which is not the North Sea EwE model).[477] As explained by the ICES Technical Service Response:

> [Including predation mortality estimated from multispecies models or other sources] better accounts for mortality on managed stocks (forage and otherwise) but does not account for prey effects on predators. … [P]redation mortality is not a measure of importance of the forage species in the predator's diet. Including predation mortality is not intended to evaluate the amount of prey needed by predators, only the amount removed by predators.[478]

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471 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1.

472 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1.

473 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 2.

474 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1.

475 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1. See also, pp. 6-7.

476 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 8.

477 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 9.

478 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 9.

Thus, ICES estimates the amount of sandeel directly consumed by predators to inform catch advice for sandeel designed to achieve the sustainable exploitation of the sandeel fishery, not to account for how much sandeel its predators need to consume to maintain or increase the abundance of those predators. Predator populations could be starving and in decline, but the model will only estimate the mass of sandeel that this declining population will consume.

271.2. The reference to ICES stock advice including "*qualitative* ecosystem considerations" refers to the fact that ICES advice contains descriptive paragraphs which explain the role of that stock in the ecosystem, e.g. their predator-prey interactions.[479] Thus ICES stock advice includes *observations* regarding the role that sandeel (and other forage fish) play in the North Sea ecosystem, but does not quantitatively factor such considerations into its calculation of the amount of a fish stock that it considers may be extracted by the fishing industry each year.

272. Fifth, one reviewer opined that for sandeel, the spatial structure of the management advice is likely sufficient to ensure that "small-scale local depletion"[480] can be reversed by recruitment from elsewhere in the same stock assessment area.[481] That assertion is based on the fact that the seven stock assessment areas for sandeel have been divided based on larval connectivity.[482] Thus that reviewer explained that "provided that assessment area as a whole remains in good status"—an important caveat—it is assumed that larvae can be "transported within the assessment area and can thus re-colonize any depleted section".[483] Whilst that reviewer asserted that such recovery of small-scale depletion "should occur within a year or two (given the short lifespan of the fish)",[484] the Scottish Scientific Report notes that direct observation from commercial data showed that some depleted grounds had not recovered after periods more than 8 years, and that

479 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, pp. 1, 8.

480 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 4.

481 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 2.

482 As noted at paras. 91-92 above, there is limited exchange of larvae across different stock assessment grounds.

483 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 4.

484 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 4.

delays in recovery can also result from environmental changes (neither of which was addressed by the reviewer).[485]

4. The EU's contention that the scientific advice on which the UK relied was not the "best available scientific advice"

a. The premise of the EU's argument

273. The EU's argument begins with the proposition that the scientific advice relied on "must provide a basis for the full extent of the measure in question".[486] It contends that only one piece of advice – the EwE model and the simulations generated based on that model – is "sufficient to justify the full spatial scope of the sandeel fishing prohibition covering all UK waters of the North Sea."[487] The EU then advances four specific criticisms of the EwE model, claiming that those criticisms establish that the model lacks the "necessary scientific and methodological rigor to be considered reputable science".[488]

274. Before addressing those unfounded criticisms, the UK first explains why the premise of the EU's argument is wrong.

275. First, the EU has stated that it does "not challenge the scientific and methodological rigour of: (i) the ICES Technical Service; (ii) the remainder of the Natural England/Cefas/JNCC advice; and (iii) the Scottish scientific literature review".[489] The EU only challenges the EwE modelling, which is one component of the Natural England/Cefas/JNCC advice (which the UK has further abbreviated for the purposes of this submission as the English Scientific Report). That is not consistent with the need to evaluate the "best available scientific advice as a whole".[490] Even if the EU's criticisms of the modelling were valid (which they are not) the measures would still be "based on" the best available scientific advice because they are supported by the unchallenged scientific evidence in both the UK and Scotland's literature reviews. The EU cannot succeed by impugning only one part of the scientific foundation of one measure. The UK

485 Scottish Scientific Report, **Exhibit C-0050**, pp. 7-8.

486 EU submission, para. 479.

487 EU submission, paras. 479, 491.

488 EU submission, para. 480.

489 EU submission, para. 491.

490 See para. 212.

did not base its decision in respect of the English measure on the modelling alone,[491] as is clear from the "core advice" at the start of the English Scientific Report which relies on both the research referred to in the literature review and the results of the modelling.[492] It is wrong for the EU to proceed as if it had. Since the Scottish measure was based on scientific advice which did not involve EwE modelling, the EU's criticisms of the modelling are of no relevance in respect of that measure.

276. Further, by isolating the modelling from the rest of the evidence base, the EU ignores how, in respect of the English measure, the modelling and the evidence in the literature review support and reinforce one another. The conclusions drawn from the modelling are strengthened when viewed in the context of the literature review (and vice versa) because the two are aligned. For example, both the literature and the modelling support the conclusion that sandeel are particularly important for seabirds. As stated in the English Scientific Report, the modelling was always intended to be "viewed in unison with the evidence provided by the wider literature".[493]

277. Second, the EU justifies disregarding all scientific advice other than the EwE modelling by claiming that the modelling was the only advice which "support[ed] the full spatial scope of the sandeel fishing prohibition".[494] The EU does not explain why that is the case. In particular, it does not explain why the scientific evidence in the literature review does not support the "full spatial scope" of the measure. The EU appears to be suggesting that only scientific advice which is capable of quantifying the intended benefits of one measure compared to another can constitute the "best available scientific advice". That is not what the TCA states. Article 496(2) requires only that the relevant measure be based on the best available scientific advice. As the EU has accepted, this means there is "a rational or objective relationship" between the advice and the measure.[495]

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491 See paras. 226-252 above.

492 English Scientific Report, **Exhibit C-0045**, p. i.

493 English Scientific Report, **Exhibit C-0045**, p. 33.

494 EU submission, para. 491. See also para. 479 ("only [the EwE model] and the simulations generated based on that updated model – is sufficient to justify the full spatial scope of the sandeel fishing prohibition covering all UK waters of the North Sea").

495 EU submission, paras. 313-314.

278. Scientific advice does not need to be quantitative in order to be considered the "best available scientific advice". The effect of the EU's submission is that for ecosystems-based measures, nothing short of full scientific modelling would suffice, since it is not possible to test in a controlled laboratory experiment how a full prohibition of sandeel fishing in UK waters of the North Sea would compare to a prohibition applicable to some part of those waters. As noted at paragraph 211.3.3 above, ICES recognises that ecosystem-informed advice may involve qualitative and expert-based syntheses of the available knowledge and information, empirical information or the use of full ecosystem models.[496]

279. In the present case, Scotland's scientific advice did not rely on primary modelling.[497] The scientific basis of its measure was a literature review that synthesised decades of research on sandeel in the North Sea ecosystem (including literature that used modelling[498]). It was "rational" to conclude, based on that scientific advice, that a full closure would confer greater ecosystem benefits than a partial closure. No primary modelling was required to reach that conclusion.

280. Third, while the EU asserts that the UK's modelling could have been improved in various ways, it does not identify any existing alternative scientific model (or other scientific advice) which was "available" to the UK dealing with ecosystem effects of sandeel fishing in the North Sea, including the needs of species that prey on sandeel, and which was "better" than the scientific advice that the UK relied upon. That alone means that the EU's claim fails.

b. The EU's criticisms of the modelling

281. None of the EU's criticisms of the UK's modelling withstands scrutiny.

282. First, the EU takes issue with the assumption that the average proportion of sandeel fishing occurring in UK waters of the North Sea, as opposed to the rest of the North Sea, was 58%.[499] The EU notes that the 58% figure was calculated using fishing data from

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496 ICES Framework for Ecosystem-Informed Science and Advice (FEISA), March 2024, **Exhibit R-0103**, p. 9.

497 See para. 211.3.3 above.

498 See fn. 453 above.

499 EU submission, para. 484.

2003-2020, whereas from 2011 the sandeel fishery in the North Sea was managed according to an escapement strategy. According to the EU, this means that the 58% figure is likely an overestimation of the proportion of sandeel caught in UK waters.[500] That is wrong.

282.1. The method by which the proportion of North Sea sandeel landings taken from UK waters was calculated is set out in the English Scientific Report at pages 9-10. The data that was used to calculate this figure was the real (yearly) sandeel landing data published by the European Commission's Scientific, Technical and Economic Committee for Fisheries (STECF) from 2003-2020.[501] If the same calculation is repeated using only the STECF data from the 2011-2020 period, as the EU argues should have been done, the average proportion of sandeel taken from UK waters is 58.7%, as shown in Table 2 below. Thus, limiting the data range leads to no material change in result.

282.2. That is unsurprising. The fact that an escapement strategy was implemented from 2011 is irrelevant to the proportion of sandeel fished in the North Sea within UK waters compared to outside UK waters.[502] The implementation of the escapement strategy from 2011 onwards may have led ICES to issue different catch advice than it would have under the previous strategy, but this would not itself cause a different proportion of sandeel fishing to take place in UK waters compared to non-UK waters. The escapement strategy has no inherent link with the location of fishing.

282.3. Further, it should be recalled that the EwE modelling in the English Scientific Report simulated a range of depletion scenarios. In addition to setting out the biomass response of predators of sandeel to a 58% reduction in sandeel fishing in the North Sea, it also set out the biomass response of each such predator to a 73% reduction and a 38% reduction in sandeel fishing in the North Sea.[503] Those percentages were chosen because they reflect, within a 95% confidence interval,

500 EU submission, para. 484.

501 That data is accessible at: https://data.jrc.ec.europa.eu/dataset/00ae6659-ddde-4314-a9da-717bb2e82582.

502 For an explanation of the escapement strategy, see para. 121 above.

503 English Scientific Report, **Exhibit C-0045**, Table 3, right hand column. See also Figure 6 on p. 26 (mislabelled as Figure 5) which uses red lines to show the three scenarios, i.e. 38%, 58% and 73%.

the lower and upper bounds of the average proportion of sandeel fished from UK waters of the North Sea from 2003 to 2020. The average is 58% using the available data. On the basis of a confidence level in that data of 95%, the range within which the true average can be said to fall with 95% confidence is 38% to 73%.

Year	All sandeel landings	Sandeel landings from outside UK EEZ	Sandeel landings from within UK EEZ	Proportion of all sandeel landings from within UK EEZ
2003	295548	134057	161491	0.5464
2004	323232	191283	131949	0.4082
2005	160798	80213	80585	0.5012
2006	288162	82799	205363	0.7127
2007	155190	60726	94465	0.6087
2008	267044	78078	188965	0.7076
2009	330127	156266	173862	0.5267
2010	254676	101353	153324	0.6020
2011	233100	48445	184654	0.7922
2012	57456	15819	41637	0.7247
2013	226289	71099	155190	0.6858
2014	169953	118390	51564	0.3034
2015	202184	59032	143152	0.7080
2016	31915	14075	17840	0.5590
2017	381473	160139	221335	0.5802
2018	194462	70334	124128	0.6383
2019	108543	55506	53036	0.4886
2020	196180	119464	76717	0.3911
2003-2010: Average proportion of landings from within UK EEZ:				0.5767
2011-2020: Average proportion of landings from within UK EEZ:				0.5871
2003-2020: Average proportion of landings from within UK EEZ:				0.5825

Table 2: Average proportion of all sandeel landings from within the UK's EEZ

283. Second, the EU contends in respect of the ensemble modelling that the use of a fixed fishing pressure until 2100 fails to reflect the escapement strategy in which fishing pressure is reduced in years when sandeel stock size is estimated to be lower.[504] This shows a misunderstanding of the methodology of ecosystem modelling.

284. This modelling convention isolated the effects of a specific management change, namely a change to sandeel fishing pressure (with fishing pressure on other stocks kept at the *status quo*). Using fixed fishing pressure in a model is not a literal prediction or management proposal through to 2100. It is a convention that allows for a comparison of ecosystem dynamics if the current sandeel fishing pressure were to be maintained versus a scenario in which sandeel fishing were to be prohibited (and all other variables were held constant). The fact that the current management system uses an escapement strategy to manage the fishery is irrelevant to the model because the simulations were not intended to predict the annual management adjustments that might be advised by ICES in respect of sandeel or any other stock in the model, but to explore how changes in sandeel fishing pressure may affect the North Sea ecosystem.

285. Simulations are forecast into the future (in this case 2100) because after a variable has been adjusted (e.g. a decrease in sandeel fishing pressure), the system will initially be in a state of flux before becoming stable (i.e. attaining equilibrium). Projecting into the future therefore allows for estimation of how the adjustment would affect the system after that initial adjustment period has elapsed.

286. Third, the EU criticises the model for simulating the biomass response of all seabirds that prey on sandeel taken as a group, which it says is likely to under- or overestimate the biomass response of specific types of seabirds.[505] As to this:

    286.1. The EU does not explain why it would be necessary for the EwE model to disaggregate the seabird data into different species. The purpose of the EwE model was to simulate the ecosystem-wide impacts of sandeel depletion, not to provide fine-scale predictions for individual species of seabird.[506] The unstated premise of the EU's criticism is that it does not suffice to show a clear benefit to

504 EU submission, para. 485.

505 EU submission, para. 486.

506 English Scientific Report, **Exhibit C-0045**, p. 21.

seabirds as a group; the benefit to individual seabird species must be quantified, for reasons that are unexplained.[507] That is not the UK's position. The UK's objectives were to achieve Good Environmental Status and to conserve and restore populations of seabirds, marine mammals, predatory fish and the North Sea ecosystem as a whole.[508]

286.2. Nor does the EU offer any explanation of why aggregating seabirds together means that the model lacks the "necessary scientific and methodological rigor to be considered reputable science".[509] As explained at paragraphs 239-242 above, the UK retained the parameters and structure of the ICES Key Run in order to ensure the quality of its modelling.[510] The ICES Key Run does not disaggregate seabirds into species. In effect the EU is suggesting that the UK should have deviated from the quality-assured ICES Key Run. It has not explained how that would reflect "best available scientific advice".

286.3. In any event, there was no ecosystem model in existence at the time the UK took the decision in respect of the measures which could disaggregate the seabird data into individual species and predict impacts on those species. This is not a case in which there was a parameter or variable that was built into the existing model that the UK elected not to test. The existing EwE model simply did not have that capability. What the EU is in fact suggesting is that the UK should have developed a new model with new capabilities. That is not "best available scientific advice", nor is it compatible with the precautionary approach under the TCA.

286.4. In any event, the EU's criticism of the modelling ignores the rest of the scientific evidence in the English Scientific Report. The modelling results were not presented in isolation but were integrated with a comprehensive literature review. That literature review identified that certain seabird species, such as kittiwakes,

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507 As noted above, nor does the EU explain how this is relevant to whether the modelling constitutes 'best available scientific advice'.

508 See paras. 189 and 191-192 above.

509 EU submission, para. 480.

510 English Scientific Report, **Exhibit C-0045**, p. 21.

are heavily dependent on sandeel and are therefore expected to benefit disproportionately from reduced fishing pressure.[511]

287. Fourth, the EU reproduces two caveats of the EwE model that were expressly and transparently identified in the English Scientific Report. As a matter of principle, it cannot be the case that scientific studies can have no limitations or caveats in order to constitute "best available scientific advice". No meaningful scientific advice could meet that standard.

287.1. The first caveat relied upon by the EU is that the EwE model is not a size-structured model.[512] A size-structured model is one in which the population of a species (in this case sandeel) is divided into different size classes. Since the fishery does not target small, juvenile sandeel, the EU reasons that it was necessary for the EwE model to be size-structured.

287.1.1. The EU has not identified any such ecosystem model of the North Sea which was "available" at the time of the UK's decision-making. There was none. The precautionary approach applicable under the TCA means that the UK did not need to, and indeed would not have been justified in, postponing measures until such a model was developed.[513]

287.1.2. In support of its argument, the EU refers to the fact that kittiwake generally switch from feeding on older sandeel at the start of breeding to juvenile sandeel as the season progresses.[514] What this actually shows is that sandeel of all sizes are important to kittiwake depending on the time of the year. Further, the fact that the fishery targets adult sandeel does not mean that the fishery has no impact on the availability of juvenile sandeel for kittiwake; a reduction of adult sandeel by the fishery may mean a reduction in spawning and consequently fewer

511 English Scientific Report, **Exhibit C-0045**, pp. 13, 39.

512 EU submission, para. 488.

513 Three of the models of commercial fish species in the North Sea (LeMans, Mizer and FishSUMs) are size-structured. Those models were used in the ensemble modelling forming part of the English Scientific Report, **Exhibit C-0054**, p.33. See paragraphs 246-249 above for a description of the ensemble modelling. To the extent size-structured models were available, therefore, they were utilised.

514 EU submission, para. 488.

juvenile sandeel available the following season. Kittiwake were not, in any event, intended to be the sole or primary beneficiaries of the measures.[515] The UK was pursuing broader ecosystem-wide objectives.

287.2. The second caveat is that the models did not account for the spatial distribution of sandeel.[516] Again, this limitation was openly acknowledged in the English Scientific Report.[517] The EU contends that it was necessary for the EwE model to account for the spatial distribution of sandeel because of the alleged limited spatial overlap between the feeding range of chick-rearing seabirds and the sandeel fishery. As to this:

287.2.1. The EU repeats the same error identified above of assuming that the sole objective of the measures is to benefit individual populations of seabirds. As noted above, the purpose of the EwE modelling was never to provide fine-scale predictions for individual seabird species.[518] The absence of a spatial component in the EwE model does not undermine its utility in exploring the broader ecosystem impacts of a sandeel fishing prohibition.

287.2.2. The EU has also not established that there was any existing model available to the UK which was capable of accounting for spatial distribution of sandeel in the North Sea, still less one matching such distribution to the range of chick-rearing seabirds—recalling that different species have different ranges. There was no such model. Nor would the UK have been required to or justified in postponing measures until such a model was developed.

287.2.3. This same limitation applies to ICES stock assessments (seemingly considered by the EU to represent "best available scientific advice"[519]).

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515 See paras. 189 and 191-192 above.

516 EU submission, para. 489.

517 English Scientific Report, **Exhibit C-0045**, p. 33.

518 English Scientific Report, **Exhibit C-0045**, p. 21.

519 EU submission, para. 494.

ICES has acknowledged that stock assessments "cannot function at the level of individual feeding grounds, which goes beyond the detail level of the stock assessment models."[520] The first reviewer in the ICES Technical Service Response discussed above at paragraphs 261-272 explained, in the context of ensuring local abundance of sandeel for nesting seabirds, that "it is never going to be feasible for ICES to provide catch advice at a sufficiently fine scale to account for this local food requirement".[521] The second reviewer noted that there is "a lack of comprehensive data for many localities" and that "site- and species-specific studies would be required to ascertain what food supply is required in each case."[522] That reviewer also noted that for some predators such as nesting seabirds, "it is the local concentration of prey that matters, at a scale below any feasible stock assessment."[523] Thus, the EU's criticism amounts to a suggestion that the UK should have done something that ICES did not do and considered not to be feasible.

288. Finally, the EU claims that the UK did not disclose how it updated the North Sea EwE model. However, the published English Scientific Report contains an explanation of the updates made.[524]

5. The EU's contention that the measure was not "based … on" the best available scientific advice

289. The EU advances an alternative argument as to why the UK's measures were not "based on the best available scientific advice". It contends that even if the UK's advice was the "best available scientific advice" —and here it must be recalled that the EU accepts that other than its four criticisms of the modelling the UK's advice was the best available

520 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1.

521 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 2.

522 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 3.

523 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 3.

524 English Scientific Report, **Exhibit C-0045**, p. 21.

scientific advice[525]—the measures were nonetheless not "based on" that advice.[526] In particular, it claims that there was no "rational or objective relationship" between the scientific advice relied upon and the full prohibition on fishing sandeel in all UK waters of the North Sea.[527]

290. The EU makes five arguments in support of that proposition, none of which shows a lack of relationship between the advice and the measures.

291. First, the EU contends that the sandeel fishery is "currently exploited in a manner that ensures the healthy level of the sandeel stock" in the North Sea.[528] The EU relies on out-of-context quotes from the ICES Technical Service Response which, properly understood, lend no support to its argument.

291.1. As explained above,[529] when the ICES Technical Service Response refers to "healthy levels of these stocks" it is referring only to levels of sandeel stocks, and it is referring to those levels for the purposes of advising on maximum sustainable yield of those stocks in the fisheries context. This does not imply that these stocks are at a level that would sustain populations of sandeel predators, let alone support recovery of those predators, which were objectives of the measures.

291.2. The EU refers to the escapement strategy that is used by ICES in stock assessment.[530] That strategy aims to ensure that fishing does not bring sandeel biomass below a certain threshold. As the Technical Service acknowledges, that threshold is not determined by reference to ecosystems considerations and contains "no analysis of whether this precautionary level is sufficient to provide adequate food levels for individual predator populations."[531]

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525 See EU submission, para. 491 for the EU's concession that it only challenges the scientific and methodological rigour of the modelling.

526 EU submission, para. 493.

527 EU submission, para. 493.

528 EU submission, para. 494.

529 See paras. 266-267 above.

530 EU submission, para. 495.

531 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1.

291.3. The EU relies on the comment by one reviewer in the ICES Technical Service Response that the spatial structure of the management advice is likely sufficient to ensure that local depletions can be reversed by recruitment from elsewhere.[532] What the EU omits is that, as explained at paragraph 272 above, this can only occur if the depletion is at a "small-scale" and the assessment area as a whole is otherwise in good status.[533] Further, the unchallenged evidence in Scotland's Review of Scientific Evidence is that recovery of local depletion of sandeel aggregations depends on several factors and may take several years to be achieved.[534] In any event, the fact that localised depletions might eventually be repopulated does not undermine the scientific basis of the UK's measures, which seek to reduce one source of sandeel mortality (by prohibiting fishing) with the aim of increasing sandeel populations and their resilience.

291.4. There is no inconsistency between the UK's measures and the information in the ICES Technical Service Response. To the contrary, the Technical Service affirms that management measures to support ecosystem functions should occur at the level of national regulations.[535]

292. Second, the EU explains that fluctuations in the North Sea sandeel stock are principally attributable to natural sandeel mortality rather than mortality as a result of fishing pressure.[536] That is true, but contrary to the EU's contention, it strongly supports the UK's measures.

292.1. Natural mortality of sandeel is not a matter directly within human control. Fishing mortality is. Consequently, the most obvious and rational means of pursuing the UK's objectives is to control the variables that it can, i.e. anthropogenic causes of sandeel mortality within UK waters of the North Sea.

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532 EU submission, para. 494.

533 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 4.

534 Scottish Scientific Report, **Exhibit C-0050**, pp. 5-6. See also pp. 7-8.

535 ICES Technical Service Response (28 November 2023), **Exhibit C-0022**, p. 1.

536 EU submission, para. 496.

292.2. As the EU notes,[537] the drivers of natural mortality which cause variation in sandeel abundance include environmental factors such as climate change, as well as mortality from predators. Since sandeel stocks experience high levels of natural fluctuation, increasing sandeel abundance in the North Sea will "offer some resilience at times of adverse natural conditions".[538] Such adverse conditions include ocean warming as a result of climate change, with higher temperatures linked to a number of negative consequences for sandeel, including a decline in the abundance of age-1 sandeel and an increasing mismatch between when sandeel hatch and when their prey become available.[539]

292.3. Increasing sandeel abundance can likewise be expected to contribute to an increase in the resilience of sandeel predators to natural phenomena. For example, if there were greater numbers of Great Skua, a seabird species whose breeding success is influenced by local sandeel abundance,[540] then avian flu (H5N1) might not have been so devastating for that species, which saw a 76% decrease in overall count in the UK following the outbreak.[541]

292.4. All of the above underscores the undeniable "rational and objective relationship" between the scientific advice on which the UK relied and the measures it adopted.

293. Third, the EU states that there "may be instances where the sandeel fishery has an impact on localised sandeel abundance within a management area."[542] The EU quotes from the ICES Technical Service Response, which states that "advice which maintains a high overall biomass could still result in local depletion depending on other management measures".[543] Again, this is a factor that supports the UK's measures, since it indicates

537 EU submission, para. 496(a).

538 English Scientific Report, **Exhibit C-0045**, p. i.

539 English Scientific Report, **Exhibit C-0045**, pp. 38-39; Scottish Scientific Report, pp. 8-13.

540 English Scientific Report, **Exhibit C-0045**, p. 15, citing Furness. (2007) Responses of seabirds to depletion of food fish stocks. J. Ornith. 148(2): 247-252, **Exhibit R-0112**.

541 RSPB, UK seabird colony counts in 2023 following the 2021-22 outbreak of Highly Pathogenic Avian Influenza, February 2024, **Exhibit R-0113**, p. 35.

542 EU submission, para. 498.

543 EU submission, para. 498.

that a high overall biomass on its own is not enough to prevent local depletion. That is important because many predator species are reliant on local sandeel stocks.[544]

294. The EU's fourth and fifth points go together. The EU refers to correlation between the "insufficient localised abundance of sandeel and breeding success of chick-rearing seabirds for which sandeel comprises a substantial proportion of their diet."[545] The EU expressly states that it does not contest that there is a rational and objective relationship between the scientific advice relied upon by the UK and a prohibition on sandeel fishing in areas that coincide spatially with the feeding range of chick-rearing seabirds.[546] That is an important concession. By making that concession, the EU is necessarily recognising that the scientific advice relied upon in respect of the English measure establishes that a sandeel fishing prohibition contributes to sandeel abundance, which in turn contributes to the conservation and restoration of at least one type of dependent predator (seabirds). The EU has not explained why the same logic would not hold true for other species that prey on sandeel beyond the foraging range of chick-rearing seabirds.

295. Whilst the EU accepts that the scientific advice supports a partial closure coinciding with the foraging range of chick-rearing seabirds, it contends that there is no "rational or objective relationship" between the scientific advice and a full closure of the UK's waters in the North Sea because it claims that the scientific advice does not show "additional positive environmental effects" of a full closure.[547] As explained at paragraph 286.1 above, the very premise of the argument is wrong. The UK's measures were not solely or primarily intended to benefit seabirds. The EU ignores this and ignores all of the scientific advice relied on by the UK regarding the broader ecosystem benefits to be derived from the measures. For this reason alone, the EU's argument fails.

296. Further, the EU attempts to reverse its burden by requiring the UK to prove "additional positive environmental effects" of a broader prohibition.[548] The onus is not on the UK to prove that a full prohibition would be more effective than any other conceivable

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544 See, e.g. English Scientific Report, **Exhibit C-0045**, Table 1.

545 EU submission, para. 499.

546 EU submission, para. 500.

547 EU submission, para. 501.

548 EU submission, para. 501.

measure.[549] The onus is on the EU to establish that the measures were not based on the best available scientific advice. If the EU's position is that the best available scientific advice only supports a partial closure coinciding with seabird foraging distance, it should have identified the scientific advice which was "available" at the time of decision-making showing that a partial closure would have been just as likely to achieve the UK's objectives as a full closure. It has not done so.[550]

297. The EU has in any event not established that a closure limited to the foraging range of chick-rearing seabirds would result in a meaningfully smaller closure than a full closure. Some chick-rearing seabirds in the North Sea have large foraging ranges: gannet (509.4 km); black-legged kittiwake (300.6 km); puffin (265.4 km); razorbill (122.2 km); and guillemot (95.2 km) (values listed are mean maximum + 1 standard deviation). Those are the foraging ranges which the statutory nature conservation body in Scotland (NatureScot) uses to determine connectivity between seabird breeding colonies and development proposal sites.[551] Those foraging ranges are based on up-to-date tracking data for breeding seabirds (determined using GPS trackers), analysed and summarised in scientific papers.[552]

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549 The UK accepts that it had an obligation to have "regard to" the principle of "applying proportionate and non-discriminatory measures" under Article 494(3)(f). That is a distinct obligation addressed at Section VIII.E. below. It has no bearing on the burden of proof in respect of the claim under Article 496(2) of the TCA.

550 If the EU were held to its own interpretation of 'best available scientific advice', it should have produced such evidence by relying on ecosystems modelling. On the EU's case, those results ought to be generated using a model that does not have the same limitations as the North Sea EwE model, i.e. it should have been an ecosystem-wide model that is size-structured and accounts for the spatial distribution of predators and prey in the North Sea.

551 NatureScot, Guidance Note 3: Guidance to support Offshore Wind Applications: Marine Birds – Identifying theoretical connectivity with breeding site Special Protection Areas using breeding season foraging ranges, 1 January 2023, **Exhibit R-0114**.

552 NatureScot, Guidance Note 3: Guidance to support Offshore Wind Applications: Marine Birds – Identifying theoretical connectivity with breeding site Special Protection Areas using breeding season foraging ranges, 1 January 2023, **Exhibit R-0114**, citing Woodward et al. (2019). Desk-based revision of seabird foraging ranges used for HRA screening. BTO Research Report 724, **Exhibit R-0115**; Thaxter et al. (2013) Modelling the effects of prey size and distribution on prey capture rates of two sympatric marine predators. PLOS ONE. 8(11): 1-10, **Exhibit R-0116**. The EU in footnote 60 (and by cross-reference, footnote 354) relies on predicted density maps published in Waggitt et al. (2020), **Exhibit C-0039**. The EU refers to Figure 4(b) (which may be mistaken as seabirds are shown on Figure 5). The Waggitt et al. paper combines data from at-sea surveys to establish predicted densities of specific species spatially at sea. There is no data describing the colony of origin of any adult seabirds, without which the foraging range cannot be determined. The Waggitt et al. paper estimates seabird density in a spatial and temporal context, not a foraging range. In any event, the predicted densities of seabirds shown on the maps in Figure 5 indicate that in January and July certain seabirds, especially black-legged kittiwake, common guillemot, northern gannet and Atlantic puffin are present throughout the UK's EEZ.

298. The gannet foraging range fully encompasses and extends beyond the UK's EEZ, as shown on Figure 3 below. Kittiwake and puffin, the two seabirds which have the highest sensitivity of breeding success to sandeel abundance,[553] have the second and third largest foraging ranges. The kittiwake's foraging range covers most of the UK's EEZ, as shown on Figure 4.

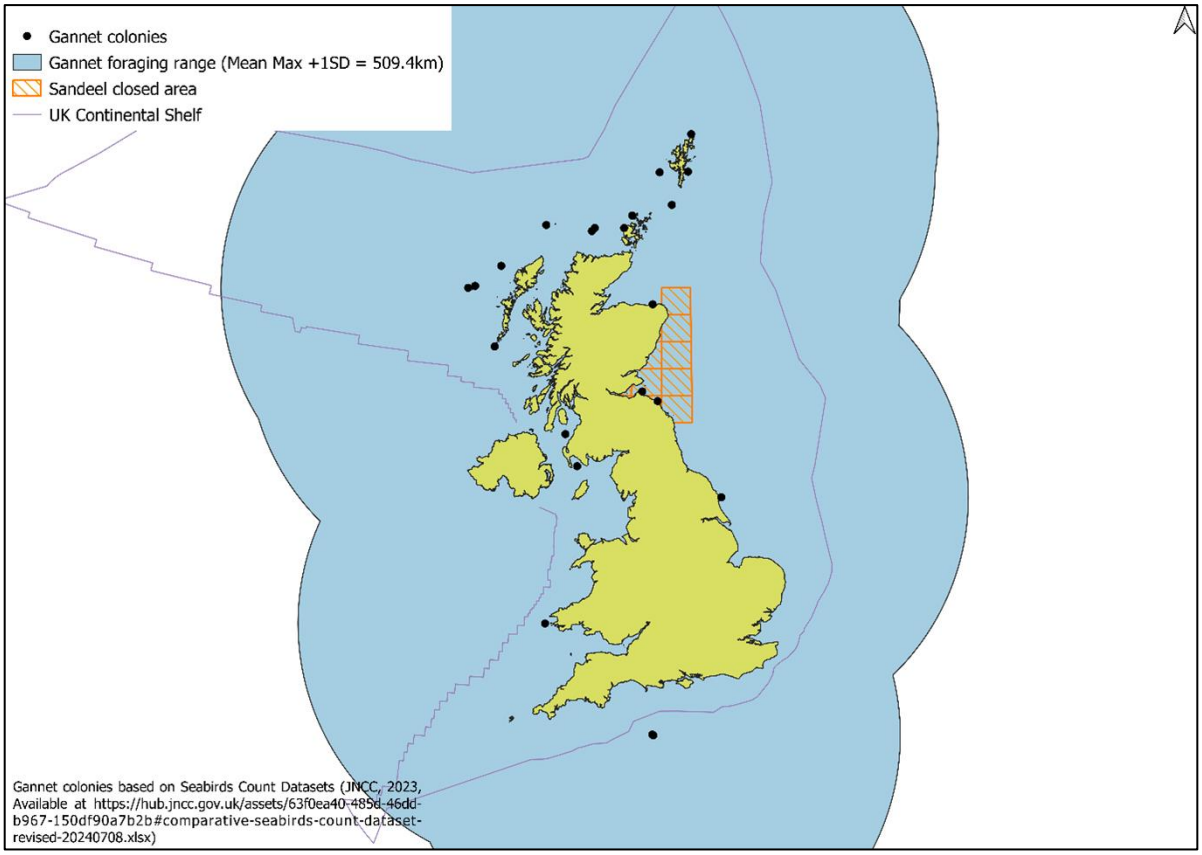

Figure 3: Gannet foraging range shaded in light blue (mean maximum + 1 Standard Deviation) projected from breeding colonies in the UK (based on the Seabirds Count Dataset[554]). The limits of the UK EEZ are shown with a purple line (mislabelled as continental shelf in the left hand corner key).

553 Scottish Scientific Report, **Exhibit C-0050**, p. 43.

554 The Seabirds Count Dataset 2023 is the fourth census of Britain and Ireland's internationally important populations of breeding seabirds. Available at: https://hub.jncc.gov.uk/assets/63f0ea40-485d-46dd-b967-150df90a7b2b

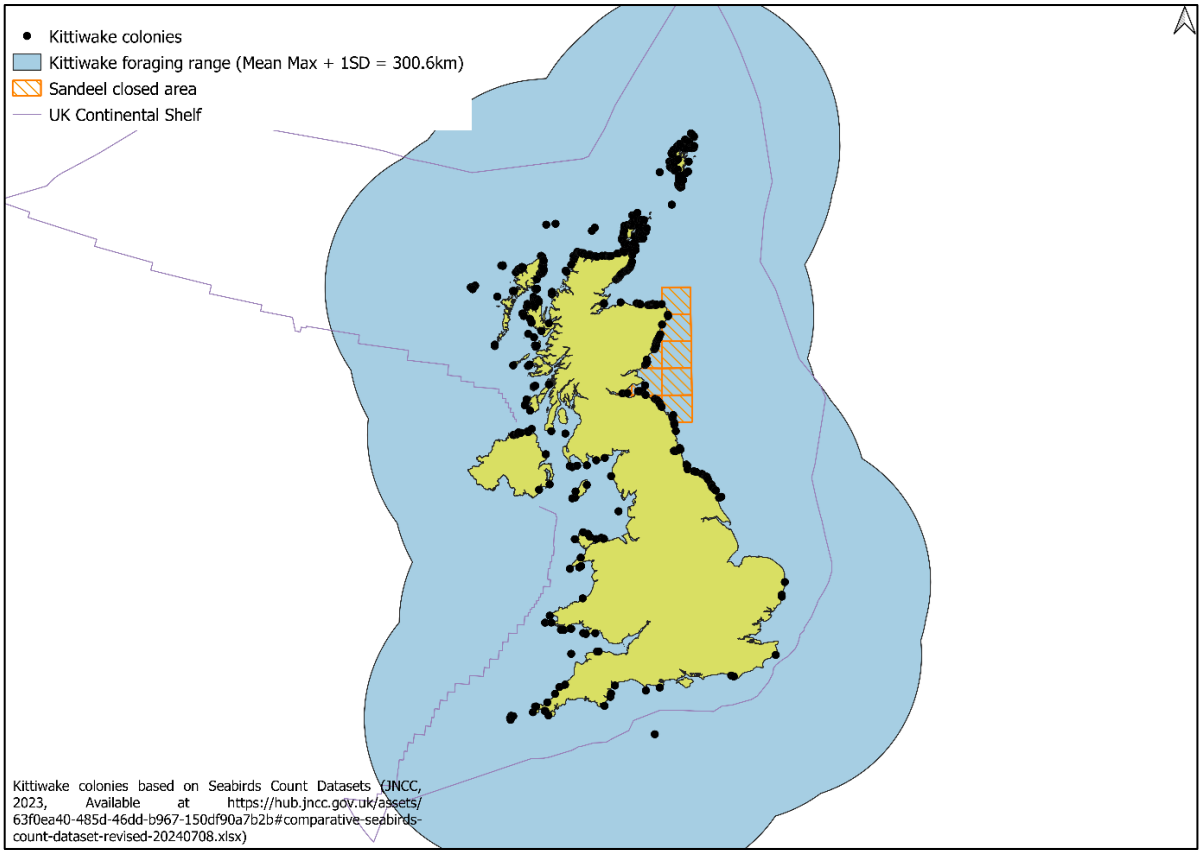

Figure 4: Black-legged kittiwake foraging range (mean maximum + 1 Standard Deviation) projected from breeding colonies in the UK (based on the Seabirds Count Dataset). The limits of the UK EEZ are shown with a purple line (mislabelled as continental shelf in the left hand corner key).

299. There are two further reasons why the EU's argument fails in its premise:

299.1. The EU appears to assume that seabirds require sandeel only during chick-rearing, such that there is no need to take measures to protect sandeel located outside their breeding-season foraging range. This ignores that during the non-breeding period, maintaining sufficient levels of energy is challenging for seabirds and that sandeel may provide an important source of food during this period.[555]

299.2. A significant risk that would arise from a prohibition on sandeel fishing covering only part of UK waters in the North Sea is displacement of fishing effort to the parts of UK waters of the North Sea that would remain open to fishing. This risk

555 Scottish Scientific Report, **Exhibit C-0050**, p. 53.

is particularly acute because ICES' practice is to advise on sandeel catch without taking into account zones that are closed to sandeel fishing. In respect of SA4, for example, catch limits have been set by ICES as if the closed area remained open to fishing, meaning that the whole of the TAC for SA4 may be harvested from the fraction of SA4 which remains open, raising concerns about localised sandeel depletion.[556] The EU fails to address this obvious risk.

300. The EU advances a number of sub-arguments in favour of a spatially limited closure aligned with the foraging ranges of chick-rearing seabirds. These are addressed below, but none can overcome the flawed premises of the EU's argument set out above.

300.1. The EU refers to the 2000 closure and the fact that it was justified at the time by the correlation between localised abundance of sandeel and breeding success of seabirds.[557] The rationale for a spatially limited closure in 2000 has no relevance to the current measures because unlike the 2000 closure, the objectives of the current measures are not limited to restoration of seabird populations. In any case, if the EU wishes to rely on the 2000 closure as a precedent for a partial closure, it should establish that this partial closure was effective in achieving its objectives. The scientific advice relied upon by the UK indicates that while the 2000 closure did have positive impacts on kittiwake, it "did not enable kittiwake breeding success to recover to pre-fishery levels."[558] This supports a broader closure.

300.2. The EU repeats the point that fluctuations in the North Sea sandeel stock are principally due to natural mortality, which it relies upon to support the contention that the scientific advice "does not indicate that a spatially broader prohibition would increase the abundance and resilience of sandeel".[559] That is a surprising proposition. As explained above, both natural and anthropogenic factors drive sandeel mortality. As a matter of logic, the fact that natural factors may be a more

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556 English Scientific Report, **Exhibit C-0045**, pp. 41, 44; Scottish Scientific Report, **Exhibit C-0050**, pp. 15, 36. See also Figure 11 (p. 18) and its description on p. 17, which illustrates the issue of concentrated fishing near the boundary of a closed area by reference to the "westward shift" of sandeel fishing vessels in SA4, closer to the boundary of the closed area than in previous years.

557 EU submission, paras. 499 and 503.

558 Scottish Scientific Report, paras. 4.7.4 and 4.13. See also para. 256.

559 EU submission, para. 502.

significant contributor to mortality does not mean that a reduction in anthropogenic contributors would have no material effect on sandeel abundance and resilience. Further, for the reasons given above, the significance of natural factors as drivers of sandeel stock fluctuation supports the "rational and objective relationship" between the scientific advice and the measure, because the UK is acting on the factor within its direct control.

300.3. The EU also contends that the scientific advice does not establish that a full versus partial closure would "benefit further the breeding success" of chick-rearing seabirds.[560] This ignores the results of the UK's EwE modelling which shows that greater reductions in fishing are predicted to give rise to greater increases in seabird biomass.[561] The EU's only answer to that is to reiterate its misguided criticisms of the EwE model and simulations,[562] which have already been addressed above.

300.4. The EU also attempts to impugn the anticipated benefits for marine mammals.[563]

300.4.1. Here, the EU seizes on the fact that the Scottish Scientific Report states that an increase in sandeel abundance "might" be beneficial to populations of marine mammals.[564] The use of that term (as opposed to something stronger, such as "will") acknowledges that this is an assessment about the future involving a degree of uncertainty. That is unsurprising given the complexity of species-interactions in an ecosystem such as the North Sea and the lack of data on the effects of sandeel abundance on marine mammal population sizes.[565] An acknowledgement of uncertainty cannot be equated to, and does not indicate, a lack of a "rational or objective" link with the measure.[566] To

560 EU submission, para. 503.

561 English Scientific Report, **Exhibit C-0045**, p. 27, Table 3.

562 EU submission, para. 505.

563 EU submission, para. 507.

564 EU submission, para. 507.

565 Scottish Scientific Report, **Exhibit C-0050**, p. 74.

566 The absurdity of the EU's argument is illustrated by its assertion that it is "too speculative" to suggest that "the sandeel fishing prohibition 'might result' in a reduction in fishing pressure": see EU submission,

refrain from acting based on that uncertainty would not be compatible with the precautionary approach under the TCA.

300.4.2. The EU fails to address the substantiated links between marine mammals and sandeel biomass set out in the scientific advice, drawing on numerous scientific studies.[567] Indeed, sandeel constitute a large portion of the diets of marine mammals, as illustrated in Figure 4 of the English Scientific Report (see Figure 1 above).[568]

300.4.3. Nor does the EU address the results of the EwE modelling which predicts for seals a biomass response of +4% across the North Sea from a prohibition on sandeel fishing in UK waters of the North Sea.

300.4.4. Finally, the EU again refers to the fact that fluctuations in the abundance of sandeel are principally due to natural sandeel mortality,[569] but that simply has no bearing on whether an increase in sandeel abundance caused by a prohibition on fishing could lead to an increase in the biomass of marine mammals that feed on sandeel.

300.5. The EU attempts to deny any link between increased sandeel abundance and benefits for predatory fish. As to this:

300.5.1. The EU principally refers to the fact that predatory fish are less critically dependent on sandeel than other predators.[570] The fact that some species (e.g. seabirds) may stand to benefit more from a prohibition on sandeel fishing does not mean that predatory fish that consume sandeel do not stand to benefit at all. That is particularly so since sandeel constitute a large proportion of the diet of certain fish in

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para. 507. The EU does not explain how a prohibition on sandeel fishing could do anything other than reduce fishing pressure on sandeel.

567 See English Scientific Report, **Exhibit C-0045**, p. 12, Table 1 at pp. 15-18, p. 19; Scottish Scientific Report, **Exhibit C-0050**, pp. 57-74.

568 See also Scottish Scientific Report, **Exhibit C-0050**, p. 57.

569 EU submission, para. 509.

570 EU submission, paras. 508 and 510.

the North Sea, such as gurnards (40%), haddock (26.76%) and whiting (26%).[571]

300.5.2. Even for sandeel predators that can consume a variety of prey, greater availability of sandeel can contribute to improved body condition (since sandeel are a particularly high energy source of food compared to other forage fish).[572] Indeed, the scientific advice shows a link between higher sandeel availability and better body condition in a number of fish that prey on sandeel, including cod, whiting, plaice, gurnards, lesser weaver and haddock.[573] Nor has the EU rebutted any of the other substantiated links between certain species of fish that prey on sandeel and sandeel biomass set out in the scientific advice.[574]

300.5.3. The EU has also not addressed the results of the EwE modelling which predicted increases in the biomass of whiting (2%) and haddock (3%) across all of the North Sea if sandeel fishing were prohibited in UK waters of the North Sea.[575]

300.5.4. The EU repeats its same argument about natural fluctuations in sandeel abundance.[576] For the reasons given above, the notion that this constitutes an argument against a prohibition on sandeel fishing is a *non sequitur*.

301. For all the reasons above, the EU has failed to establish its alternative argument that the measures were not "based on" the best available scientific advice. The fact that there may

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571 English Scientific Report, **Exhibit C-0045**, Figure 4, p. 22-23. See also Scottish Scientific Report, **Exhibit C-0050**, pp. 26-29.

572 See paras. 100-110 above.

573 English Scientific Report, **Exhibit C-0045**, p. 13, citing Mackinson. (2007) Multi-species fisheries management: a comprehensive impact assessment of the sandeel fishery along the English east coast (Cefas report for Defra), **Exhibit R-0058**; Engelhard et al. (2013) Body condition of predatory fishes linked to the availability of sandeels. Mar. Biol. 160(2): 299-308, **Exhibit R-0054**; Rindorf et al. (2008) Growth, temperature, and density relationships of North Sea cod (Gadus morhua). Can. J. Fish. & Aq. Sci. 65(3): 456-470, **Exhibit R-0059**.

574 English Scientific Report, **Exhibit C-0045**, pp. 13-14, Table 1 at pp. 15-18, p. 20; Scottish Scientific Report, **Exhibit C-0050**, pp. 26-35.

575 English Scientific Report, **Exhibit C-0045**, p. 27, Table 3, p. 28.

576 EU submission, para. 510.

be some uncertainty as to the degree of benefit likely to accrue to certain species does not undermine the existence of a "rational and objective relationship" between the scientific advice and the measures. That is so even before one has regard to the precautionary approach (addressed below) which further bolsters the UK's position. Likewise, the fact that sandeel and other species in the North Sea ecosystem experience mortality due to causes other than fishing—e.g. as a result of climate change and natural predation—does not mean that the UK has no "rational or objective" basis for seeking to minimise fishing mortality. To the contrary, the existence of environmental pressures only underscores the pressing need to improve sandeel abundance and resilience through measures within the UK's direct control.

302. As the EU has failed to show that the UK has breached its obligation under Article 496(2) of the TCA to base the measures on the best available scientific advice, the EU has necessarily failed to establish a breach of the obligation to "have regard" to the best available scientific advice under Article 496(1) read with Article 494(3)(c) of the TCA.

6. Any lack of scientific information or certainty does not justify postponing or failing to take fisheries management measures

303. As set out above, the UK measures were based on the best available scientific advice, and there is accordingly no breach of Article 496(2) of the TCA. That conclusion is further confirmed once regard is had to the precautionary approach, which is of relevance to the UK's measures and finds expression in the TCA itself.

304. The precautionary approach to fisheries management is set out in Article 494(3)(a) and Article 495(1)(b) TCA. It is articulated in broad terms, consistent with the definition in the FAO Code of Conduct for Responsible Fisheries Article 7.5.1.[577] It expressly extends to "associated or dependent species and non-target species and their environment",[578]

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577 FAO Code of Conduct for Sustainable Fisheries, **Exhibit CLA-0033**. See also UNFSA, **Exhibit CLA-0028**, Article 6(2)

578 Which reflects the language in FAO Code of Conduct for Sustainable Fisheries, **Exhibit CLA-0033**, Articles 6.2 and 7.5.2 as well as UNFSA Article 6(3), **Exhibit CLA-0028**. Similar wording is also reflected in the definition in s. 1(10) of the Fisheries Act 2020 (see para. 35 above) (""precautionary approach to fisheries management" means an approach in which the absence of sufficient scientific information is not used to justify postponing or failing to take management measures to conserve target species, associated or dependent species, non-target species or their environment"), **Exhibit CLA-0006**.

which would include the seabirds, marine mammals, other fish and wider environment (marine food web) that are the target of the UK measures.

305. The UK agrees that there is a necessary relationship between the precautionary approach under Heading Five of the TCA and the "best available scientific advice", so that when when applying the precautionary approach the Parties must take into account the "best available scientific advice".[579] It also agrees that the precautionary approach does not displace the role of the best available scientific advice.[580]

306. This simply recognises that where the scientific position is sufficiently clear, the precautionary approach may not need to be applied: the evidence justifies taking measures to protect the environment.[581] As set out above, that is the position here: the irresistible conclusion to be drawn from the scientific advice as a whole is that the prohibition would lead to ecosystem benefits.

307. Insofar as there is uncertainty as to any of the specific conclusions of the best available scientific advice relied upon by the UK, a straightforward application of the precautionary approach clearly justifies the measures, and whether the measures are "base[d] … on the best available scientific advice" must be understood in that light. The precautionary approach in this regard is not a separate stage, but informs what amounts to basing measures on best available scientific advice in the circumstances of an individual case.[582] The UK makes four supplementary points in this regard.

308. First, the definition in Article 495(1)(b) invokes "the absence of adequate scientific information". As a matter of ordinary meaning, this does not mean absence of any relevant scientific information. There might be relevant scientific information, but it may not be "adequate". In such a case, the precautionary principle as expressed in the TCA

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579 EU submission, para. 330.

580 EU submission, para. 334.

581 See in this respect the position taken by the UK in the climate change context with regard to obligations under UNCLOS, UK written statement to ITLOS, 16 June 2023, **Exhibit C-0073**, para. 78.

582 See in this regard the assessment of ITLOS on Articles 61 and 119 of UNCLOS in the climate change context in the 21 May 2024 Advisory Opinion, Exhibit CLA-0021, para. 418 ("Conservation and management measures must be informed by the best available science. States Parties are required to take into account relevant environmental and economic factors, including the impact of climate change and ocean acidification. This entails the application of the precautionary approach and an ecosystem approach." In referring to this advisory opinion at para. 428 of its submission, the EU omits any reference to the content of the last sentence of this quote.

will be engaged. That expression also falls to be understood by reference to relevant rules of international law applicable in relations between the Parties (Article 31(3)(c) of the VCLT and Article 4(1) of the TCA). Of relevance for the conservation and management measures in this case is the preamble of the CBD ("where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimise such a threat").[583] On this basis, it is clear that absence of adequate scientific information should be taken to include uncertainty or gaps in scientific information. Were that not the case, the precautionary approach could be negated by the production of some relevant scientific information even where there were unresolved concerns about the impact of a measure, as alleged here.

309. Second, the EU's criticisms of the scientific advice relied upon by the UK amount to no more than that there are inadequacies in the scientific information, which in the UK's submission justifies applying the precautionary approach.

310. The EU's first overarching criticism is that the modelling evidence relied upon in the English Scientific Report lacked "scientific and methodological rigour"[584] on the basis that it makes assumptions or caveats.[585] On that basis, as the report itself acknowledges, it may underestimate or overestimate certain impacts. To the extent that this uncertainty was acknowledged, it is the kind of situation where the precautionary approach may be considered. In the absence of better information, the UK was not only entitled to rely upon the conclusions subject to those caveats and assumptions, it was positively encouraged to do so in accordance with the precautionary approach.

311. The EU's second overarching criticism is that there was "no rational or objective relationship" between the scientific advice relied upon and the full spatial scope of the

583 Convention on Biological Diversity, **Exhibit RLA-007**. See also Article 3 of the Framework Convention on Climate Change (1992) ("The Parties should take precautionary measures to anticipate, prevent or minimise the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures …").

584 EU submission, paras. 469, 480.

585 EU submission, paras. 483-490.

prohibition.[586] A main reason given for this depends on the recognition, for example, in the Scottish Scientific Report that:

> complex environmental interactions, including dynamics in predatory fish populations, competition for food sources, cannibalism and climate change may also affect the abundance of sandeel in the North Sea, making prediction of sandeel stock development following fishery closure difficult.[587]

312. Again, any absence of adequate scientific information concerning the extent of benefits that will be realised from the prohibition on sandeel fishing engages the precautionary approach.

313. Third, the above approach aligns with that taken by UK authorities in this case: i.e. to recognise there is uncertainty and to the extent necessary invoke the precautionary principle as justifying the prohibition of sandeel fishing in Scottish waters and English waters in the North Sea.

314. As regards the English measure, the relevant advice on which the Minister decided to impose the prohibition included this statement:

> Notwithstanding the evidential difficulties, the [English Scientific Report] is the best available evidence about the likely ecosystems benefits of full closure and introducing this measure is consistent with the JFS aim of taking an ecosystem-based, precautionary approach to fisheries management and adopt a balanced, proportionate approach to achieving, or contributing to the achievement of, the fisheries objectives in a manner that contributes towards achieving and maintaining GES. (A 'precautionary approach' means one in which 'the absence of sufficient scientific information is not used to justify postponing or failing to take management measures to conserve target species, associated or dependent species, non-target species or their environment'.) There are currently no known alternative management interventions that could produce the same potential beneficial effect as closing the sandeel fishery.[588]

315. As regards the Scottish measure, the relevant advice on which the Minister decided to take forward the prohibition included this statement:

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586 Going beyond the feeding range of chick-rearing seabirds for which sandeels comprise a substantial proportion of their diet; EU submission, paras. 493, 501.

587 **Exhibit C-0050**, p. 35, quoted at EU submission, para. 496(b). See also Scottish Scientific Report, **Exhibit C-0050**, Figure 27 on p. 46.

588 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 16.

> We note the view from Denmark that the evidence base demonstrating the effect of the sandeel fishery on sandeel abundance is not definitive (as rarely is the case in the marine environment), and therefore that the subsequent benefits to the marine environment, or specific components of the marine environment such as seabirds or marine mammals is uncertain. We acknowledge this; however, it should be noted that this is not due to a lack of information or data but is due to the high degree of variability in the system, compounded by multiple interacting large scale environmental processes such as climate change. This complexity and variability mean that predictions of the benefits of closing fishing for sandeel on the wider marine environment will have a high degree of uncertainty, although it should be noted that a likely benefit of the preferred option is an increased resilience of predators to other (environmental) causes of variation in sandeel abundance. Furthermore, there is a high likelihood that additional data collection would not enable our predictions on the benefits of a closure to be made with more certainty. Therefore, our assessment is that the precautionary approach adopted in our scientific evidence base which takes account of this uncertainty remains valid. In conclusion, while we recognise the views put forward by Denmark and the Commission, we do not agree that there is no basis for additional management measures.[589]

316. Fourth, in the end, the issue pursued by the EU in this case concerns not so much the scientific basis for the UK measures – which is clear – but the UK's chosen level of protection for sandeel, in light of its particular concerns about the significance of that species to the marine food web and the impact of the fishery. In that regard, the UK recalls the EU's own guidance on the precautionary principle that observes:

> Whether or not to invoke the Precautionary Principle is a decision exercised where scientific information is insufficient, inconclusive, or uncertain and where there are indications that the possible effects on the environment, or human, animal or plant health may be potentially dangerous and inconsistent with the chosen level of protection.[590]

317. In this case, it is also relevant that the UK is pursuing an ecosystem approach to fisheries management (see paragraphs 32 and 36-37 above) as endorsed by the Conference of the Parties to the CBD, which recognises the complex and dynamic nature of ecosystems and observes that "[m]easures may need to be taken even when some cause-and-effect relationships are not yet fully established scientifically."[591]

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589 Ministerial submission of 26 January 2024, **Exhibit R-0098**, Annex F.

590 COM(2000) 1 final, **Exhibit RLA-0015** p. 7.

591 Conference of the Parties, Decision V/6 Ecosystem Approach, **Exhibit RLA-0008**, Annex 4 para. 4. See para. 79 above.

E. THE EU'S CLAIM 2: THE UK HAS NOT BREACHED ARTICLE 496(1) READ WITH 494(3)(F) OF THE TCA

1. Applicable legal standard

318. Article 496(1) provides that "Each Party shall decide on any measures applicable to its waters in pursuit of the objectives set out in Article 494(1) and (2), and having regard to the principles referred to in Article 494(3)."

319. The EU does not dispute that the sandeel fishing prohibitions are measures that were decided on in pursuit of the objectives set out in Article 494(1) and (2).[592] The core interpretive issues on the EU's case on breach of Article 496(1) are therefore the meaning of "having regard to"[593] and of the principle set out in Article 494(3)(f).[594]

320. These are addressed in turn below in accordance with the applicable rules of treaty interpretation.[595]

1. Meaning of "having regard to"

a. Ordinary meaning

321. The phrase "having regard to" is not defined in the TCA. The EU defines "having regard to" the principles in Article 494(3) as "tak[ing] these principles actively into account".[596] The EU does not explain how "actively" taking a principle into account is different from just taking it into account, but in any event the EU then develops its position by reference to the dictionary definition of "regard" as meaning simply to "take into account" or to "heed".[597] Leading dictionaries define "heed" as "to give consideration or attention

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592 EU submission, para. 698 (and see more generally, paras. 690-698).

593 This is substantively similar to the language in the chapeau to Article 494(3) requiring the Parties to "have regard to" the principles listed therein. The EU agrees: see EU submission, para. 516, cross referring to section V.3.1.2.

594 For completeness it is noted that the UK agrees with the EU's interpretation of other terms in Article 496(1) as set out in EU submission in the following specific paras.: 274 ("in pursuit of"), 275 ("objectives set out in Article 494(1) and (2)"), 283-284 ("decide"), 285 ("Each Party", i.e. the UK and EU), 286 ("waters") and 290-291 ("and").

595 Article 4(1) of the TCA referring principally to the customary rules reflected in Articles 31-33 of the VCLT. See also EU submission, paras. 194-196.

596 EU submission, para. 255.

597 EU submission, paras. 255 and 516; see also para. 290-292.

to",[598] but reference to the word "heed" does not materially assist in arriving at the ordinary meaning of the words "having regard to", which just mean what they say.

322. So far as any meaning beyond the plain words is necessary, the UK accepts that the ordinary meaning of "having regard to" is "taking into account" or "giving consideration to". This is consistent with the French language text of the TCA, which is equally authentic:[599] "*compte tenu des principes visés à l'article 494, paragraphe 3*" ("having taken into account the principles referred to in Article 494, paragraph 3").[600]

b. Context

323. That "having regard to" means "taking into account" or "giving consideration to" is also consistent with the context in which the words appear. In particular:

324. Article 496(1) concerns a decision-making process, which necessarily involves taking into account certain considerations. The EU agrees, recognising that the duty to "hav[e] regard to" the principles in Article 494(3) "informs the considerations that must be taken into account by the decision-maker".[601]

    324.1. Those considerations to be taken into account as listed in Article 494(3) are framed as "principles", not as "obligations" or any other term that could suggest a duty actually to apply any particular principle such that a measure could not be "decide[d] on" consistently with Article 496(1) unless it adhered to the substance of the principles in Article 494(3).

    324.2. Confirmation that the principles in Article 494(3) must be considered, but not necessarily themselves applied, comes from Article 496(2). As discussed above,[602] it states that Parties "shall base the measures referred to in paragraph 1 on the best available scientific advice". That provision would be superfluous if Article 496(1) required adherence to, as opposed to consideration of, the Article

598 Merriam Webster Dictionary, "heed, v.", **Exhibit R-0117**. See also Oxford English Dictionary, "heed, v.", Oxford English Dictionary, "heed, v.", **Exhibit R-0118** ("To care for, concern oneself about; to take notice of, give attention to, to mind, to regard").

599 TCA, Article 780.

600 See also the French of the chapeau to Article 494(3): "*Les Parties tiennent compte des principes suivants*".

601 EU submission, para. 289.

602 See paras. 215-225 above.

494(3) principles. This because one of the principles is "basing conservation and management decisions for fisheries on the best available scientific advice".[603]

324.3. Furthermore, the objectives to be pursued in deciding on measures under Article 496(1) include "fully respecting the rights and obligations of independent coastal States".[604] Similarly, Article 493, at the start of Heading Five on Fisheries, affirms the sovereign rights of coastal States.[605] Consistent with this reservation of regulatory autonomy and emphasis on sovereign rights, although the Parties are obliged ("shall"[606]) to take the Article 494(3) principles into account in deciding on measures applicable to their waters, the Parties are not required to adopt measures that conform to those principles, and the Tribunal is not mandated to review their conduct by applying those principles. The Tribunal may determine whether the relevant Party had regard to any relevant principle, but not conduct any more intensive review than that.

c. Object and purpose of the TCA

325. An examination of the TCA's objects and purpose points towards the same conclusion. A principal objective of the TCA is preserving each Party's sovereign rights and regulatory autonomy. In this respect, Article 1 states that the treaty "establishes the basis for a broad relationship between the Parties … respectful of the Parties' autonomy and sovereignty".[607] Similarly, the preamble to the TCA records the Parties' recognition of their "respective autonomy and rights to regulate within their territories in order to achieve legitimate public policy objectives such as the protection and promotion of … the environment …", including "conserving and managing the living resources in their waters".[608]

603 Article 494(3)(c).

604 TCA, Article 494(1). See also Article 494(3)(f) "preserving the regulatory autonomy of the Parties".

605 See also recital 1 to Annex 38 ("AFFIRMING the sovereign rights and obligations of independent coastal States exercised by the Parties").

606 TCA, Article 496(1) and 494(3).

607 TCA, Article 1.

608 TCA, Preamble, recitals. 7 and 20. See also recital. 18.

326. The EU accepts that giving expression to each Party's regulatory autonomy is a principal objective of the TCA.[609] It is consistent with this object that "having regard to" means "taking into account" the specified principles, rather than adopting measures that conform to those principles, which would be a greater restraint on the Parties' regulatory autonomy.

d. Conclusion on the meaning of "having regard to" applying the rule in Article 31 of the VCLT

327. The words "having regard to" do not require any further elaboration. Their meaning is plain. To the extent that an interpretive exercise is undertaken, the ordinary meaning of "having regard to", in context and in light of the object and purpose of the TCA, is "taking into account" or "giving consideration to".

328. Nonetheless, in light of the EU's position, four further points arise in this context.

329. First, it is clear from the terms of Article 496(1) that it is the *Party* that must have regard to the principles in Article 494(3) when adopting a measure. It is not that the *measure* itself must somehow have regard to the principles. The EU appears to accept this,[610] but then strays into error when it subsequently states that the UK has an obligation "to ensure that a *measure* … has regard to" the principles in Article 494(3).

330. Second, as is evident from the above discussion, the obligation to "hav[e] regard to" is one of conduct, not of result.[611] The duty is to take into account or to give consideration to the principles in Article 494(3) when deciding on measures referred to in Article 496(1). It is not an obligation to conform with those principles in arriving at the measure, or a basis for review of the measure by the Tribunal applying those principles. The EU accepts that language of "taking into account" in other treaties (i.e. UNCLOS) establishes an obligation of conduct.[612]

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609 EU submission, paras. 221 and 230-235.

610 EU submission, paras. 284 and 289-290.

611 The distinction is well-accepted in international law: see, e.g., Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v. Serbia and Montenegro), Judgment, I.C.J. Reports 2007, p. 221, para. 430.

612 EU submission, para. 312 ("Article 61(2) UNCLOS thus establishes an obligation of conduct"), referring to UNCLOS, **Exhibit CLA-0023**, Article 61(2) ("The coastal State, taking into account the best scientific

330.1. This interpretation is also consistent with how international courts have understood the ordinary meaning of words such as "take into account". In the *Whaling Case* for example, the ICJ considered a resolution of the International Whaling Committee which recommended that "Contracting Governments … take into account whether: (1) the objectives of the research are not practically and scientifically feasible through non—lethal research techniques".[613] The Court rejected an argument relying on that resolution that Japan could only grant permits for scientific research using lethal means where equivalent objectives could not be achieved by non-lethal means, stating:

> as a matter of substance, the relevant resolutions and Guidelines [that were relied on for the argument] … call upon States parties to take into account whether research objectives can practically and scientifically be achieved by using non-lethal research methods, but they do not establish a requirement that lethal methods be used only when other methods are not available.[614]

330.2. Thus, for the purpose of Article 496(1), when deciding on a measure, it would be permissible for the decision-making process not to comply with one or more of the principles in Article 494(3), so long as the State had regard to the relevant principles in that process (although in this case, the decision making processes are in any event compliant with the relevant principles of proportionality and non-discrimination, as addressed below).

331. Third, it is relevant that four other Articles of the TCA impose in different contexts an obligation on each Party to "ensure" that certain domestic rules or laws are proportionate and non-discriminatory or are applied in a proportionate or non-discriminatory manner.[615] That same language could easily have been used by the Parties if the intention were to impose a requirement under Article 496(1) that the measures adopted actually be

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evidence available to it, shall ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation").

613 IWC Resolution 1986-2 Resolution on Special Permits for Scientific Research, 38th Annual Meeting, 1986, available at https://archive.iwc.int/pages/download.php?ref=2061&ext=pdf&alternative=3171&noattach=true.

614 *Whaling Case*, **Exhibit RLA-0012**, p. 257, para. 83.

615 TCA, Articles 75(5), 104(1)(c), 104(1)(d) and 304(3).

proportionate and non-discriminatory, but it was not; the quite different language of "having regard to" was chosen. That language must be given meaning and effect.

332. Fourth, there is no qualifier in respect of the "regard" that is to be had to the principles in Article 494(3). The obligation is only to have regard; it is not to have serious regard, reasonable regard, due regard, or any other elevated or specific form of regard.[616] This again reflects the emphasis placed on the coastal State's sovereign rights and regulatory autonomy in the TCA. The UK accepts that the obligation to "hav[e] regard", like all obligations, must be performed in good faith,[617] but once the Parties have had regard to applying the principles of proportionality and non-discrimination, they are free under the TCA to adopt measures that do not accord with them.

333. Taking these points together, the EU is therefore wrong when (without explanation, and exceeding its own definition of "having regard to") it states that the UK has "the obligation to ensure that any measure … is consistent with the … principles" in Article 494(3).[618] This error is carried over to its application of the test, for example, in respect of proportionality:

> the sandeel fishing prohibition is not a 'proportionate (…) measure'. Therefore, in deciding on the sandeel fishing prohibition, the UK acted in a

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616 For the avoidance of doubt, the UK does not accept that cases interpreting a higher "due regard" standard in particular contexts are determinative of the interpretation of a good faith obligation to "hav[e] regard" under Articles 496(1) and 494(3) of the TCA. To the extent that the EU suggests otherwise (EU submission, paras. 576 and 582-583), it is wrong. In the case relied upon by the EU, *Chagos Marine Protected Area Arbitration (Mauritius v. United Kingdom)*, PCA Case No 2011-03, Award of 18 March 2015, **Exhibit CLA-0048**, the UK had undertaken a binding obligation to "ensure" that fishing rights "would remain available" to Mauritius in the territorial sea of the Chagos Archipelago (territory that the UK had separated from Mauritius in 1965 when it was a British colony) (see paras. 451-455). This included an obligation on the UK to exercise its discretion in fisheries management in a manner that would ensure such fishing rights remained available to Mauritius (para. 455). The Tribunal described Mauritius' rights as "significant" (para. 521). Those were the relevant "rights" that the UK had agreed, through UNCLOS, to have "due regard to" and to "refrain from unjustifiable interference with" (Articles 56(2), 194(4) and see also Article 2(3)). The present situation is very different. Article 496(1) of the TCA requires "having regard to" certain principles. The qualifier "due" and the duty to "refrain from unjustifiable interference with" rights does not appear in the TCA. Moreover, the relevant right of access to waters under Annex 38 is qualified by the coastal State's right to implement fisheries management measures.

617 VCLT, Article 26. The duty of *pacta sunt servanda* is customary: Nuclear Tests (New Zealand v. France), Judgment, I.C.J. Reports 1974, **Exhibit RLA-0016**, p. 473, para. 49 ("One of the basic principles governing the creation and performance of legal obligations, whatever their source, is the principle of good faith. … [T]he very rule of *pacta sunt servanda* in the law of treaties is based on good faith").

618 EU submission, para. 563.

> manner that is inconsistent with its obligation to have regard to the principle that the measure must be proportionate.[619]

This *non sequitur* is an attempt to impose on the UK an obligation and accompanying standard of review to which it did not agree and which is not contained in or consistent with the applicable provisions of the TCA.

334. The position is not changed by the EU's argument that the Article 494(3) principles must be construed in light of the "verb that is used to denote their function", which varies from principle to principle, the relevant verb for Article 494(3)(f) being "applying".[620] Whatever verb may commence each paragraph of Article 494(3) (variously "applying", "promoting", "basing", "ensuring", "taking due account of and minimising"), they all come under the umbrella of the obligation in Article 496(1) being to decide "having regard to" the principles referred to in Article 494(3), which in turn lists the principles to which the Parties "shall have regard". The relevant obligation is thus for each Party in deciding on measures applicable to its waters to have regard to "applying proportionate and non-discriminatory measures…". It is not to adopt measures that conform with those principles. The initial verbs are simply part of what it is to which the Parties must have regard. The EU accordingly goes too far when stating that the principle to be taken into account is "that measures applied … must be 'proportionate and non-discriminatory'".[621] Such an approach is nowhere to be found in Articles 496 or 494.

e. Supplementary means: Article 32 of the VCLT

335. This meaning is confirmed by the *travaux préparatoires* of the TCA, in particular the draft agreements that were exchanged by the Parties and tabled in their negotiations

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619 EU submission, para. 684.

620 EU submission, para. 258. The EU's reference to the *US – Gasoline* case (EU submission, fn 245, referring to **Exhibit CLA-0022**, pp. 17-18) is inapposite. That case concerned the interpretation of the general exception provision in the GATT, Article XX, which reads, in relevant part, that "nothing in this Agreement shall be construed to prevent the adoption of … measures" and then the first word of each sub-paragraph describes the "degree or connection" between the measure and the non-trade interest being pursued. The requisite degree of connection therefore changes depending on each sub-paragraph at issue. In contrast, the connection between the duty in Article 496(1) and the principles in 494(3) is always expressed through single phrase, "having regard to" in Article 496(1).

621 EU submission, para. 513. See also para. 519. See further paras. 538-539 ("by requiring that measures … are 'proportionate and non-discriminatory'", "measures must comply") and para. 649 ("to limit or constrain the types of measure that may be applied in accordance with Article 496 TCA").

leading to the TCA.[622] The EU's Draft TCA, which was transmitted to the UK (in amended form) on 18 May 2020,[623] included in a Chapter on "Conservation and Sustainable exploitation of fisheries resources", Article FISH.5(2), which stated:

> New technical measures, or changes to existing technical measures shall be based on the best available scientific advice and shall be proportionate, non-discriminatory and effective to attain the objectives set out in Article FISH.1 [Objectives].[624]

336. It also contained in Article FISH.6 a provision that permitted emergency conservation measures to be taken which "shall be proportionate, non-discriminatory and effective to attain the objectives set out in Article FISH.1 [Objectives]".[625]

337. The change from these draft provisions, which would have required fisheries measures to be proportionate and non-discriminatory, to an obligation requiring that the Parties simply "hav[e] regard to", as a "principle", "applying proportionate and non-discriminate measures", confirms the correctness of the UK's interpretation.

338. Moreover, the UK's draft for what became Heading Five of the TCA (its draft Fisheries Framework Agreement, which was transmitted to the EU and then published on 19 May 2020[626]) contained draft Article 4 on "Fisheries management" which stated in paragraph 1: "Each Party shall manage its own fisheries independently and may take such measures in its relevant waters as it considers appropriate to ensure rational and sustainable management of fisheries."[627] That broad right to take fisheries management

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622 VCLT, Article 32. The EU Submission at para. 528 is wrong where it says that the rule in Article 31 is "without prejudice to the possibility for the Tribunal to have recourse to supplementary interpretive guidance in accordance with Article 32 VCLT." Recourse to Article 32 is only permitted for specific purposes: to confirm the meaning deriving from Article 31 or to determine the meaning where the application of the Article 31 rule leaves the meaning ambiguous or obscure or leads to manifestly absurd or unreasonable results. In any event the EU points to no Article 32 materials.

623 UK House of Commons, Parliamentary Briefing Paper No. 8923, UK House of Commons, Parliamentary Briefing Paper No. 8923, The UK-EU future relationship: the March 2020 EU draft treaty and negotiations update, 27 May 2020, **Exhibit R-0119**, pp. 19-20, 24 and 32.

624 Draft text of the Agreement on the New Partnership with the United Kingdom, 18 March 2020, **Exhibit R-0120**, p. 95.

625 Draft text of the Agreement on the New Partnership with the United Kingdom, 18 March 2020, **Exhibit R-0120**, p. 96. See also Article FISH.4(3).

626 UK House of Commons, Parliamentary Briefing Paper No. 8923, The UK-EU future relationship: the March 2020 EU draft treaty and negotiations update, 27 May 2020, **Exhibit R-0119**, pp. 19-20 and 24.

627 Draft Working Text for a Fisheries Framework Agreement Between the United Kingdom of Great Britain and Northern Ireland and the European Union, published 19 May 2020, **Exhibit R-0121**, Article 4.

measures was not qualified in any obligation to ensure that such measures conformed with any particular principles, such as those of proportionality and non-discrimination.

2. Meaning of "proportionate"

339. Article 496(1) read with Article 494(3)(f) requires measures to be decided upon having regard to "applying proportionate and non-discriminatory measures for the conservation of marine living resources and the management of fisheries resources, while preserving the regulatory autonomy of the Parties".

a. Applicable rules of treaty interpretation

340. The term "proportionate" is not defined in Heading Five to the TCA.[628] Its use in Article 494(3)(f) falls to be interpreted in accordance with the applicable rules of treaty interpretation reflected in Article 31 of the VCLT and Article 4 of the TCA.[629]

341. The EU, however, takes the position that the domestic law of both Parties provides the content for the term "proportionate" as used in Article 494(3)(f).[630] It says that the domestic law of the Parties "inform[s] the interpretation",[631] provides a "source of interpretative guidance which the Tribunal may take into account"[632] and "has a bearing on the 'ordinary meaning'" of the term "proportionate" in Article 494(3)(f).[633]

342. This is not correct as a matter of treaty interpretation. According to the customary rule reflected in Article 31 of the VCLT and Article 4(1) of the TCA, domestic law has no role to play in the interpretation of a treaty unless (i) the parties have subsequently agreed on the interpretation of the treaty by reference to domestic law;[634] or (ii) domestic law constitutes subsequent practice of the parties in implementing the treaty such that it

628 Nor is it defined elsewhere in the TCA.

629 Which the EU appears to accept in principle: EU submission, paras. 526-528. See also fn. 622.

630 EU submission, paras. 529 and 641; and see also paras. 616 and 619.

631 EU submission, para. 529.

632 EU submission, para. 616.

633 EU submission, para. 619.

634 VCLT, Article 31(3)(a) ("any subsequent agreement between the parties regarding the interpretation of the treaty or the application of its provisions").

establishes their agreement as to its interpretation[635] — neither of which is the case here.[636] The EU makes no credible case for the relevance of domestic law as a matter of the applicable rules of treaty interpretation that the Tribunal is bound to apply.

343. Of course, it makes good sense that the rules on treaty interpretation do not provide for domestic law principles simply to be transplanted to inter-State treaties because of the very different context in which domestic law principles arise and the very different considerations that apply in that context.

b. Ordinary meaning of the term, in its context and in light of the object and purpose of the TCA

344. Based on the dictionary definition of "proportionate", the EU posits an ordinary meaning of that term in Article 494(3)(f): "a measure which is in due proportion to the objective of the 'conservation of marine living resources and the management of fisheries resources' in the sense that is appropriate in its quantity, extent and degree and commensurate to that objective." [637] It then develops that definition by reference to domestic law principles, and considers that a "proportionate" measure for the purpose of Article 494(3)(f) has four elements:

344.1. First, a relationship between the ends and means in the sense that the measure was adopted for the "conservation of marine living resources and the management of fisheries resources".[638]

344.2. Second, the measure must be apt or appropriate to secure or contribute to that objective in the sense of being not incapable of contributing to the objective.[639]

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635 VCLT, Article 31(3)(b) ("any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation").

636 For completeness, it is noted that domestic law is not "international law applicable in the relations between the parties", and that insofar as rules applicable to Member States of the European Union because of their membership of the European Union are rules of international law, they are not applicable to the United Kingdom, and so cannot be taken into account under Article 31(3)(c) of the VCLT.

637 EU submission, para. 535.

638 EU submission, para. 636.

639 EU submission, para. 637.

344.3. Third, that the measure be the least restrictive alternative available.[640]

344.4. Fourth, that there be a weighing of the benefits (or contribution to the objective) of the measure against its adverse impacts.[641]

345. The UK accepts that the first, second and fourth elements as stated here form part of the ordinary meaning of "proportionate" for the purpose of Article 494(3)(f), but not the third. Each of the elements requires further comment.

i. THE FIRST AND SECOND ELEMENTS AS REGARDS THE OBJECTIVE

346. The EU accepts that the measures were adopted for "the conservation of marine living resources and the management of fisheries resources"[642] and that they are apt to contribute to this objective.[643] The satisfaction of the first and second elements therefore do not raise any interpretative (or application) questions for the Tribunal. However, it is necessary to correct two aspects of the EU's position in respect of the "ends" or objective of the measure.

347. First, under a subheading titled "[o]bject and purpose of the term 'proportionate measure'",[644] the EU states that "by requiring that measures applied for fisheries management and conservation on the basis of Article 496 TCA are 'proportionate…', the Parties intended to limit their respective regulatory autonomy when deciding on such measures", and that "[f]or this reason, 'proportionate' must be interpreting [*sic*] as imposing a standard with which such measures must comply and hence against which they must be assessed".[645] The UK makes three further observations on this aspect of the EU's position:

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640 EU submission, para. 640(d). The EU wraps this up with the fourth element in para. 640, but from the domestic law principles relied on (paras. 625 and 627) and the position taken at para. 614 that "proportionate" is simply a necessity test plus a balancing exercise, it is clear that the putative third limb should be separated out from the fourth. Its different nature confirms the appropriateness of that separation.

641 EU submission, para. 640.

642 EU submission, paras. 692, 694 and 698.

643 EU submission, para. 699.

644 EU submission, heading VIII1.3. before para. 537. The same approach is taken at heading VIII.2. before para. 648 in respect of non-discrimination.

645 EU submission, paras. 538-539.

347.1. First, according to the customary rules of treaty interpretation, the "object and purpose" to which regard is had under the rule in Article 31 of the VCLT is of the treaty as a whole.[646]

347.2. Second, the EU states that the "objectives and purpose of the term 'proportionate (…) measure' have been outlined in section V.3 above."[647] That section addresses Part Two, Heading Five of the TCA on Fisheries generally[648] and mentions the word "proportionate" only once, when quoting Article 494(3)(f).[649]

347.3. Third, the EU wrongly states that the TCA requires that "measures … are 'proportionate…'". Its logic appears to be that that the objective of "proportionate … measures" in Article 494(3)(f) is that such measures be proportionate, and therefore any measures decided on under Article 496(1) must be proportionate. This wrongly divorces the words "proportionate … measures" in Article 494(3)(f) from their proper context. For the reasons explained *in extenso* at paragraphs 321-328 above, and as a matter of the correct application of the applicable rules of treaty interpretation, this is plainly not what the Parties have agreed in either Article 496 or 494; the duty is only to have "regard to" "applying proportionate … measures", not to decide on fisheries management measures only if they are in fact proportionate. The EU's attempted recourse to the "object and purpose" of "proportionate measures" does not overcome this key difficulty for its case.

348. The second aspect of the EU's position in respect of the "ends" or objective of the measure concerns the EU's treatment of other principles in Article 494(3), in particular, the principle in Article 494(3)(e).

348.1. To contextualise the point, the UK notes that the relevance of the "objective", "purpose" or "ends" of a measure is that:

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646 VCLT, **Exhibit CLA-0016**, Article 31(1). Other treaty terms can serve as "context" for the words being interpreted.

647 EU submission, para. 537.

648 See EU submission, paras. 237-393.

649 EU submission, para. 259, third bullet.

348.1.1. Article 496(1) requires that the measure be in pursuit of the objectives set out in Articles 491(1)-(2) (which the EU accepts is met in respect of the measures at issue[650]);

348.1.2. the Party in deciding on the measure must have "regard to" the principles in Article 494(3), which may contain more specific articulations of the Article 491(1)-(2) objectives, such as the objective in Article 494(3)(f) of "conservation of marine living resources and management of fisheries resources", and Article 494(3)(e) of "minimising harmful impacts of fishing on the marine ecosystem and taking due account of the need to preserve marine biological diversity"; and

348.1.3. when "having regard to … applying … proportionate … measures" in Article 494(3)(f), the objective of the measure is relevant to the different elements or stages in the proportionality analysis in that the measure must be for marine conservation and fisheries management, it must be apt to contribute to that objective, and the importance of the objective can be taken into account in the weighing exercise.[651]

348.2. The EU attempts to subordinate the principle in Article 494(3)(e) quoted above to proportionality in Article 494(3)(f) by pointing out that: (i) the importance of conserving marine biological diversity and the marine ecosystem (mentioned in Article 494(3)(e)) also happens to be recognised in Article 404(1), in a different Heading of the TCA titled "Trade", and that (ii) Article 404 is "without prejudice to the provisions of Heading Five" titled "Fisheries".[652] The EU states that "[t]herefore, the TCA is structured to reflect that this legitimate objective [in Article 494(3)(e)] must be reconciled with all other relevant principles" in particular that of Article 494(3)(f) on proportionality.[653]

650 EU submission, para. 698.

651 See paras. 346-348 above.

652 EU submission, paras. 564-565, referring to Article 404(4).

653 EU submission, para. 566.

348.3. The UK does not accept that the duty to have "regard to" the principle in Article 494(3)(e) is subordinated to or otherwise compromised so that it "must be reconciled" with the duty to have "regard to" the principle in Article 494(3)(f). The principles are expressed on equal footing (which the EU accepts[654]) and a provision from a different part of the TCA dealing with different subject matter does not alter that. Moreover, the without prejudice clause in Article 404(4) would operate only to the extent that there is inconsistency between Article 404 and Heading Five, which in respect of this case there is not: both Article 404(1) and Article 493(e) recognise the importance of preserving marine biological diversity and the marine ecosystem, and Article 496(1) requires regard to be had to the principle in Article 494(3)(e). The main relevance for the EU's Claim 2 of Article 494(3)(e) and its reference to preserving the marine ecosystem and marine biological diversity is that it reinforces the <u>importance of</u> marine conservation objectives, in particular the ecosystem approach. The importance of such objectives can be taken into account in considering proportionality (as explained under the fourth element at paragraphs 351-354 below).

ii. THE THIRD ELEMENT: NECESSITY

349. The UK does not accept that the word "proportionate" in Article 494(3)(f) of the TCA involves a requirement that the measure be the least restrictive alternative, that is, a measure that restricts or interferes with other rights or interests only so far as is strictly necessary. That is a test of necessity. The EU rightly acknowledges that necessity is not the same as proportionality and that the Parties have <u>not</u> adopted a standard of necessity in Article 494(3)(f).[655] The EU nonetheless submits that "proportionate" is a broader concept which includes necessity.[656] That is not correct. The ordinary meaning of "proportionate" in Article 494(3)(f) of the TCA does not include any test of necessity for a number of reasons.

349.1. First, whilst it is true that proportionality may in some contexts involve a test of necessity, this is not inherent in the word proportionate, but rather a function of

654 EU submission, para. 257.

655 EU submission, paras. 611-613.

656 EU submission, para. 614.

the particular context in which such applications of the term arise. For example, proportionality features in domestic human rights and other public law as a means to judge the lawfulness of restrictions the State can place on individuals' rights, which rights the State has committed to ensuring except where, and only insofar as, restrictions are necessary.[657] Similarly in EU law, Article 5(4) of the Treaty on the European Union provides that: "Under the principle of proportionality, the content and form of Union action shall not exceed what is necessary to achieve the objectives of the Treaties".[658] These applications of proportionality principles expressly incorporate a necessity test. That they do so is a reflection of the function that proportionality serves in the vertical relationships between State and individual, and the EU and its Member States, in light of the rights and obligations of those actors. That is very different from the horizontal relationship of equality between the Parties to the TCA, in which the Parties have not committed to guaranteeing rights except where strictly necessary,[659] nor adopted a test of necessity to govern decision-making under Article 496(1). The references that the EU makes to UNCLOS and international economic law do not affect this analysis: neither concerns proportionality.[660]

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657 *Bank Mellat v. HM Treasury (No 2)* [2013] UKSC 39; [2014] AC 700, **Exhibit CLA-0064**, para. 74 (Lord Reed). The cases relied upon by the EU at paras. 621-625 of the EU submission all concern situations where human rights were in play or specific statutory provisions (instead of or as well as human rights). Proportionality applies differently in different contexts, there is no uniform rule (see R (Lumsdon) v Legal Services Board [2015] UKSC 41; [2016] AC 697, **Exhibit RLA-0018**, para. 26 (Lord Reed) ("It is also important to appreciate, at the outset, that the principle of proportionality in EU law is neither expressed nor applied in the same way as the principle of proportionality under the Convention for the Protection of Human Rights and Fundamental Freedoms. Although there is some common ground, the four-stage analysis of proportionality which was explained in *Bank Mellat v HM Treasury (No 2)* [2014] AC 700, **Exhibit CLA-0064**, pp. 720-721, 790-791, paras 20, 72-76, in relation to the justification under domestic law (in particular, under the Human Rights Act 1998) of interferences with fundamental rights, is not applicable to proportionality in EU law"). The EU omits to exhibit reported versions of the UK authorities on which it relies. They are at Exhibits **Exhibit RLA-0017, Exhibit RLA-0018, Exhibit RLA-0014, Exhibit RLA-0025.**

658 Quoted in EU submission, para. 626.

659 The relevant right that (on the EU's case) is impaired by the prohibition (the right of access in Article 2(1)(a) of Annex 38 of the TCA to access UK waters to fish sandeel: EU submission, para. 733) is in any event subject to the UK's right to take fisheries management measures, as the EU accepts and as explained in connection with Claim 3 below (see paras. 424-429 below). The social and economic benefits that are recognised to flow from that access (Recital 3 to Annex 38) are not individual "rights" that the UK has agreed to respect subject only to necessary limitation (cf. EU submission, para. 544 referring to "economic rights").

660 The EU accepts that the GATT and TBT provisions it refers to concern a test of necessity, not proportionality (EU submission, para. 603). As regards UNCLOS, leaving aside the EU's inapposite reference to maritime delimitation cases, which do not apply any relevant UNCLOS provisions (see EU

349.2. Second, there are types of proportionality that operate in the more analogous context of horizontal relationships of equality between States that do not involve necessity, or which treat necessity as a separate criterion, thus demonstrating that it does not form an inherent part of the concept of proportionality. Examples are to be found in the law on counter-measures (which does not involve a requirement of necessity[661]), self-defence (which requires that conduct meet tests of necessity and proportionality which are separate[662]), the duty to make restitution unless it is out of all proportion to the benefit deriving from restitution (which does not require necessity[663]), and equitable adjustment in maritime delimitation (which does not require necessity[664]).

349.3. Third, other provisions of the TCA refer expressly to "necessary and proportionate" measures where those two requirements are intended by the Parties.[665] That indicates that the TCA does not treat necessity as part of proportionality. Equivalent terms, requiring both necessity and proportionality, are not used in Article 494(3)(f). This is relevant context for the purpose of the interpretive exercise required by the rule in Article 31 of the VCLT.

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submission, paras. 571-573, and see para. 358 below), the UNCLOS provisions surveyed make no reference to proportionality. The EU's conclusion that "an analytical approach equivalent to a proportionality analysis may be applied" when examining those provisions is inexplicable, and wrong. UNCLOS does not apply a proportionality test in the provisions referred to by the EU (Articles 2(3), 56(2), 58(3), 121(3), 192-193 and 194(4) discussed in EU submission, paras. 574-584).

661 See, e.g., Gabçikovo-Nagymaros Project (Hungary/Slovakia), Judgment, I.C.J. Reports 1997, **Exhibit RLA-0019**, p. 56, para. 85 ("the effects of a countermeasure must be commensurate with the injury suffered, taking account of the rights in question", i.e. not the least restrictive measure in light of the rights in question).

662 See, e.g. Oil Platforms (Islamic Republic of Iran v. United States of America), Judgment, I.C.J. Reports 2003,, **Exhibit RLA-0020**, p. 198, para. 76 ("The conditions for the exercise of the right of self-defence are well settled …. self-defence would warrant only measures which are proportional to the armed attack and necessary to respond to it"). The EU exhibited a printout of the case information page for *Oil Platforms* on the ICJ's website as **Exhibit CLA-00020**. The UK has exhibited the judgment.

663 See, e.g., *Pulp Mills on the River Uruguay (Argentina* v. *Uruguay), Judgment, I.C.J. Reports 2010*, **Exhibit CLA-0029**, p. 103, para. 273 ("where restitution is materially impossible or involves a burden out of all proportion to the benefit deriving from it, reparation takes the form of compensation or satisfaction, or even both").

664 *Maritime Delimitation in the Black Sea (Romania* v. *Ukraine), Judgment, I.C.J. Reports 2009*, **Exhibit CLA-00047**, p. 129, para. 210 ("it is disproportion rather than any general principle of proportionality which is the relevant criterion or factor . . . there can never be a question of completely refashioning nature . . . it is rather a question of remedying the disproportionality and inequitable effects produced by particular geographical configurations or features").

665 See, e.g., including variations in the specific language, TCA, Articles 73(3), 176(2), 319(1), 366(1), 374(8), 411(2), 427(5), 525(d)-(e), 561(2), 571(1), 597, 636(1)(a) and 656(5).

349.4. Fourth, a number of further contextual factors support an interpretation of "proportionate" for the purpose of Article 494(3)(f) as not involving a requirement of necessity, and therefore as not limiting each Party's autonomy in choosing the measure that it considers most appropriate in light of all of the relevant circumstances. Two are emphasised here:

349.4.1. Each Party is to have regard to applying proportionate measures "while preserving the regulatory autonomy of the Parties".[666] Consistently with this, Article 493, opening Heading Five on Fisheries, affirms the sovereign rights of coastal States in whose waters the measures are being applied. The preservation of the Parties' regulatory autonomy and sovereign rights is also a principal objective and purpose of the TCA, as explained above. It is consistent with the preservation of regulatory autonomy and sovereign rights that the Parties are <u>not</u> limited in their regulatory choices by a necessity standard.

349.4.2. Article 496(1) read with Article 494(3)(a) requires the Parties to have regard to "applying the precautionary approach to fisheries management", alongside consideration of applying proportionate measures. As noted above in respect of Claim 1, "precautionary approach to fisheries management" is defined in Article 495(1)(b) to mean "an approach according to which the absence of adequate scientific information does not justify postponing or failing to take management measures to conserve target species, associated or dependent species and non-target species and their environment". The precautionary approach thus anticipates acting in circumstances where what is "necessary", or which measure would be least restrictive and still capable of achieving the objective, may not be capable of being determined. It would be inconsistent with that approach for the Parties simultaneously to be required to have regard to applying a form of proportionality aligned to the least restrictive (and often therefore the least protective) measure available.

666 TCA, Article 494(3)(f).

350. In any event, even if the term "proportionate" in Article 494(3)(f) did require consideration of necessity in the form of the least restrictive means available (which is not accepted), it must be the least restrictive means available for achieving the same objective, not a lesser measure for a different or less ambitious objective.

iii. THE FOURTH ELEMENT: THE WEIGHING EXERCISE

351. As to the weighing exercise in the fourth element, there are two relevant questions: (i) what is to be weighed, and (ii) how that weighing exercise is to be carried out by the Parties.

352. On what is to be weighed, the Parties are agreed that regard is to be had to weighing, broadly speaking, the costs and benefits of the measure.[667]

352.1. In considering the benefits, it will be relevant to take account of what the measure is expected to achieve (its objective), the importance of that objective,[668] including the gravity of the situation the measure seeks to address both as a matter of fact and principle,[669] the contribution that the measure is likely to make to achieving the objective, and any additional benefits that the measure may be expected to generate despite not being its specific objective, including considerations relevant to the exercise of regulatory autonomy (such as domestic policy objectives, public support for measures or compliance with other international obligations).

352.2. In considering the costs, or adverse impacts, of a measure, it will be relevant to take account of the adverse effects of the measure on rights or interests of the other Party, and the character of the rights or interests in question. The fact that

667 See EU submission, para. 640.

668 The EU agrees: EU submission, para. 692.

669 On points of principle, see Air Service Agreement of 27 March 1946 between the United States of America and France, (1978) XVIII RIAA 417, **Exhibit RLA-0021**, para. 83 (when considering proportionality of countermeasures: "In the Tribunal's view, it is essential, in a dispute between States, to take into account not only the injuries suffered by the companies concerned but also the importance of the questions of principle arising from the alleged breach. … it will also be necessary to take into account the importance of the positions of principle which were taken when the French authorities prohibited changes of gauge in third countries").

there are numerous considerations to be weighed is suggestive of a broad discretion reserved to the decision-making Party.

353. The character of any rights or interests likely to be adversely affected is an important consideration. The relative weight to be given to the adverse impacts of a measure will vary depending on whether what is being weighed are simply interests that might be affected as compared to unqualified rights existing within a relationship of equality between the Parties. In *Gabçikovo-Nagymaros*, for example, when considering whether Czechoslovakia's unilateral diversion of a shared river was proportionate in the circumstances, the ICJ took into account the "perfect equality of all riparian States in the use[] of the whole course of the river and the exclusion of any preferential privilege of any one riparian State in relation to the others".[670] The Court held that "Czechoslovakia, by unilaterally assuming control of a shared resource, and thereby depriving Hungary of its right to an equitable and reasonable share of the natural resources of the Danube … failed to respect the proportionality which is required by international law".[671] The situation is very different in the present case where the UK, as the coastal State, is the only Party with sovereign rights in respect of living resources in its own waters. Accordingly, appropriately lesser weight may be given to any adverse impacts on the economic and social interests of the EU fishing industry and a qualified right of access for EU vessels which operates within the confines of the UK's consent in the terms of the TCA.[672]

354. As to how a weighing exercise is to be performed, the EU's position is that the costs must not outweigh the benefits for the measure to be proportionate.[673] The UK does not agree that proportionality in this context is amenable to being described so simplistically. Rather, having regard to applying proportionate measures as referred to in Article 494(3) of the TCA should involve the following pertinent factors.

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670 Gabçikovo-Nagymaros Project (Hungary/Slovakia), Judgment, I.C.J. Reports 1997, **Exhibit RLA-0019**, p. 56, para. 85.

671 Gabçikovo-Nagymaros Project (Hungary/Slovakia), Judgment, I.C.J. Reports 1997, **Exhibit RLA-0019**, p. 56, para. 85.

672 On the qualified right of access, see paras. 424ff on the EU's Claim 3 below.

673 EU submission, para. 640.

354.1. Preserving the regulatory autonomy and fully respecting the sovereign rights of coastal States: (i) is a principal objective of the TCA as a whole;[674] (ii) forms part of the specific objectives to which the Parties are to direct fisheries management measures decided upon under Article 496(1);[675] and (iii) is a matter expressly to be had regard to in respect of measures under Article 494(3)(f).[676] From this repeated emphasis at all levels of the TCA on regulatory autonomy and sovereign rights, it is plain that the Parties intended that they be given a wide margin of discretion in deciding on appropriate measures for the conservation of marine living resources and fisheries management.

354.2. This discretion is informed by the precautionary approach to fisheries management endorsed in Heading Five,[677] which the Parties have expressly committed to applying "widely" in the context of conservation of marine living resources and fisheries management.[678] In the absence of full scientific certainty, States will necessarily have to proceed on the basis of imperfect information and exercise judgement about the appropriate measures to be adopted in all the circumstances. That tends against the adoption of a rigid weighing exercise that prioritises absolute positions on whether one factor or categories of factors simply outweigh another. The EU has not explained how such a simplistic approach of seeking to determine if the costs outweigh the benefits would account for competing factors being incommensurable. All of this thus tends against the Tribunal seeking to stand in the shoes of a Party by conducting an assessment of alternative policy choices or weighing costs and benefits of any particular policy choice.

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674 TCA, Preamble, recitals 7 and 20 and Article 1; see also EU submission, paras. 221 and 230-235.

675 TCA, Article 494(1) ("fully respecting the rights and obligations of independent coastal States").

676 TCA, Article 494(3)(f) ("while preserving the regulatory autonomy of the Parties"); see also recital 1 to Annex 38 ("AFFIRMING the sovereign rights and obligations of independent coastal States exercised by the Parties").

677 TCA, Articles 494(3)(a) and 495(1)(b).

678 TCA, Article 404(2)(a), committing to act consistently with, inter alia, the FAO Code of Conduct for Responsible Fisheries, **Exhibit CLA-0033**, Article 7.5.1 of which provides: "States should apply the precautionary approach widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment. The absence of adequate scientific information should not be used as a reason for postponing or failing to take conservation and management measures". See also Article 6(1) of the UNFSA, Exhibit **CLA-0028**.

354.3. In this respect, it is well-recognised that proportionality assessments often cannot be conducted in a precise manner or only in quantitative terms, but rather "can at best be accomplished by approximation".[679] The EU is accordingly wrong to suggest that impacts which are certain to arise from a measure or more easily able to be quantified are to be given any greater weight by virtue of those characteristics than other factors that might be uncertain.[680] Proportionality for the purpose of Article 494(3)(f) involves an evaluative process that takes account of both quantitative and qualitative factors, and accordingly requires a wide measure of discretion to be given to the Party as decision-maker.

354.4. In circumstances where the decision-maker has a wide margin of discretion in conducting a proportionality assessment, courts at both the international and domestic levels have adopted a standard of review whereby they do not stand in the shoes of the original decision-maker and re-make the decision for themselves, but rather ask whether measures are clearly disproportionate.[681] These cases concern the actual application of a principle of proportionality. The position is

679 Air Service Agreement of 27 March 1946 between the United States of America and France, (1978) XVIII RIAA 417, **Exhibit RLA-0021**, para. 83; ILC, Articles on State Responsibility, "Article 51. Proportionality", commentary para. 4 ("Thus, the Court [in *Gabçikovo-Nagymaros*] took into account the quality or character of the rights in question as a matter of principle and (like the tribunal in the *Air Service Agreement* case) did not assess the question of proportionality only in quantitative terms") and see also commentary para. 5 ("In other areas of the law where proportionality is relevant (e.g. self-defence), it is normal to express the requirement in positive terms, even though, in those areas as well, what is proportionate is not a matter which can be determined precisely").

680 EU submission, para. 738.

681 Air Service Agreement of 27 March 1946 between the United States of America and France, (1978) XVIII RIAA 417, **Exhibit RLA-0021**, para. 83 ("the measures taken by the United States do not appear to be clearly disproportionate when compared to those taken by France"); Bank Mellat v HM Treasury (No 2) [2014] AC 700, **Exhibit RLA-0017**, para. 21 (Lord Sumption) ("None of this means that the court is to take over the function of the decision-maker, least of all in a case like this one."), para. 98 (Lord Reed) ("In the present case, it is apparent that any judicial assessment of the rationality of a direction under Schedule 7 must recognise the need to allow the Treasury a wide margin of appreciation, for the reasons explained by Lord Sumption JSC at para 21"), para. 133 (Lord Hope) "In matters of this kind a wide margin of appreciation must be given to the Treasury, and I am satisfied that sufficient grounds were shown for finding that an order directed only against the Bank and its UK subsidiary was rationally connected to the objective of inhibiting the development of nuclear weapons in Iran and that it was proportionate"), Lord Neuberger, para. 165 (I agree with Lord Sumption JSC when he says in para. 21 that the Treasury must be allowed "a large margin of judgment", or, as Lord Reed JSC puts it in para. 94, "a wide margin of appreciation") and para. 200 (Lord Dyson); Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs [2023] CSOH 16; 2023 SLT 369, **Exhibit RLA-0010**, para. 45 ("Even having full regard to its modest nature, its effect on the petitioner is not disproportionate or excessive for the reasons already stated. Lack of compensation for, or equivalent mitigations of, the closure of the fishery is in those circumstances an outcome which is within the wide margin of appreciation afforded in this area to national authorities"), para. 98 per Lord Sandison.

even clearer and even more deferential where, as here, all that is required is that in making a decision a Party has regard to applying proportionate measures.

354.5. If EU law had any relevance, which on the correct approach it does not (see paragraphs 340-343 above), it would be noteworthy that in recognition of the "broad discretion" of the EU legislature in areas which involve complex economic, social and political choices on its part, and the complexity of such assessments,[682] the CJEU applies a standard of review of "manifestly inappropriate"; i.e. "the lawfulness of a measure adopted in that sphere can be affected only if the measure is manifestly inappropriate in terms of the objective which the competent institution is seeking to pursue".[683] This approach has since been affirmed in the intra-EU context in relation to the proportionality of fisheries-related measures.[684]

c. Relevant rules of international law

355. The EU accepts that neither UNCLOS nor international economic law provides a definition of "proportionate".[685] It nonetheless spends many pages setting out provisions and principles from those bodies of law without then explaining how they are to be taken into account to determine the ordinary meaning of the term "proportionate" for the purpose of Article 494(3)(f). The high water-mark of that discussion appears to be that different rules of international law to which the Parties may be subject (in scenarios quite different from the one before the Tribunal) may also involve some kind of weighing exercise to take into account different competing interests.[686] The UK does not accept that this very general observation (or the EU's discussion more generally) makes those

682 C-344/04, R(IATA) v Department for Transport, ECLI:EU:C:2006:10, 10 January 2006, **Exhibit RLA-0022**, para. 80.

683 C-128/15, Kingdom of Spain v Council of the EU, ECLI:EU:C:2017:3, 11 January 2017, **Exhibit RLA-0023**, para. 72.

684 See, e.g., C-611/17, Italian Republic v Council of the EU, ECLI:EU:C:2019:332, 30 April 2019, **Exhibit RLA-0024**, paras. 55-56 (regarding the TAC for Mediterranean swordfish).

685 EU submission, para. 617.

686 See, EU submission, para. 574 ("UNCLOS also contains provisions that imply the need to 'weigh and balance' competing rights and interests") and para. 611 ("the EU relies on the rules under international economic law as an interpretative guide affirming that there needs to be a balancing exercise rather than suggesting that precisely the same legal standard must be applied mutatis mutandis to the TCA").

rules relevant for the purpose of interpreting the term "proportionate" in Article 494(3)(f).

3. Meaning of "non-discriminatory"

a. Non-discrimination in Article 494(3)(f)

356. The term "non-discriminatory" in Article 494(3)(f) is not defined in Heading Five. It therefore falls to be interpreted in accordance with customary rules on treaty interpretation reflected in Article 31 of the VCLT.[687] In this respect, the UK agrees with the EU on three points.

356.1. First, the UK agrees that the term "non-discriminatory" in Article 494(3)(f) relates to discrimination exclusively based upon origin or nationality[688] — i.e. discrimination against EU vessels as opposed to UK vessels, or vice versa. This is consistent with Article 496(2) (addressed in the following subsection), which provides context for the interpretation of Article 494(3)(f) and which concerns discrimination as between vessels of each Party.[689] It is also consistent with the broader context of Heading Five and Annex 38, which regulate access to the waters of each Party by vessels of the other Party to fish based on origin-specific allocations.

356.2. Second, the UK also agrees that the concept of "non-discriminatory measures" in Article 494(3)(f) extends to discrimination in law (*de jure*) and in fact (*de facto*).[690]

356.3. Third, the UK agrees with the EU's general position that whether there is *de facto* discrimination requires consideration of whether the differential impacts stem from a measure that pursues a legitimate regulatory objective.[691] Where they do,

687 TCA, Article 4.

688 EU submission, para. 655.

689 EU submission, para. 655.

690 EU submission, para. 656.

691 EU submission, paras. 761, 763 and see also 681.

the measure will not be *de facto* discriminatory. The following factors support this conclusion.

356.3.1. The EU rightly refers to the words "applying … non-discriminatory measures … while preserving the regulatory autonomy of the Parties"[692] in Article 494(3)(f), which supports the right of each Party to adopt measures that pursue legitimate regulatory objectives even if they have differential effects.

356.3.2. The Parties' commitment to "fully respecting" the rights of coastal States is contained in Article 494(1), at the start of Heading Five, as part of the objective that fisheries management measures must pursue, which provides context for the interpretation of Article 494(3)(f).

356.3.3. The object and purpose of the TCA (discussed a paragraphs 325-326 above) emphasises the preservation of the coastal State's regulatory autonomy and sovereign rights, which is consistent with the Parties preserving their right to adopt measures that pursue legitimate regulatory objectives even if they have differential effects.

356.3.4. It also makes good sense given the allocation of TACs between the Parties in Annexes 35 and 36. In many cases, the percentage allocation of TAC between the Parties results in one Party having a significantly higher percentage of the TAC than the other.[693] Fisheries management measures adopted under Article 496(1) are therefore likely to have differential effects whenever there is an imbalance in the allocation of the TAC.

357. However, the UK differs from the EU in five respects as regards the interpretation of "non-discriminatory".

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692 EU submission, para. 681 and see also para. 760.

693 By way of example, for 2024, the EU held 100% of the TAC for Deep-sea Sharks in all listed ICES areas, the UK held 88.87% of TAC for Anglerfish in the North Sea, the EU held 94.41% of TAC for Greater Silver Smelt in the North Sea, and the UK held 96.26% of TAC for Megrims in the North Sea. In respect of sandeel, in 2024, the EU held 96.89% and the UK held 3.11% of the TAC. See TCA, Annex 35.

357.1. First, while both Parties accept that whether there is *de facto* discrimination for the purpose of Article 494(3)(f) depends on whether the adverse impacts of a measure stem from a legitimate regulatory objective, the EU goes further and argues that if any detrimental impact of a measure does not stem exclusively from the legitimate regulatory objective, then the measure will be discriminatory.[694] That position is based on other rules of international economic law, which are addressed at paragraphs 358-360 below, and which the UK does not accept provide material assistance for the interpretation of the term "non-discriminatory" in Article 494(3)(f) for the reasons given in those paragraphs below.

357.2. Second, the EU wrongly contends that the "object and purpose" of the words "discriminatory measures" in Article 494(3)(f) operates to "to limit or constrain the types of measure that may be applied in accordance with Article 496 TCA".[695] In other words, the measures decided on under Article 496(1) must actually be (on the EU's case) non-discriminatory. This is the same flawed approach adopted by the EU in relation to proportionality, explained in paragraph 347 above, which is wrong for the reasons explained in that paragraph. In short it divorces the words "discriminatory measures" from their proper context; it is only to "have regard to … applying … non-discriminatory measures".[696] Provided that the Party has regard to any potentially discriminatory aspect of a measure, the TCA does not prevent it being imposed, recognising the important role of regulatory autonomy in this area of public policy.

357.3. Third, the EU attempts to read in a principle of equity into the term "non-discriminatory" such that it is to be treated as meaning "equitable or fair" or "even-handed".[697] There is no credible basis for that approach. The EU relies only on recital (18) to the TCA, which refers to the Parties being desirous to "promote … the optimum and equitable utilisation of the marine living resources … including the continued sustainable management of shared stocks" and to

694 EU submission, paras. 681-682.

695 EU submission, para. 649.

696 TCA, Article 494(3) chapeau and (f). See also paras. 321ff in respect of the duty to have "regard to".

697 EU submission, paras. 650-653 and 657.

dictionary and thesaurus entries for "equitable" and "inequitable".[698] However, that general recital does not materially assist with understanding what is meant by "non-discriminatory", which has a specific application and focus.

357.4. Fourth, the fact that the term "non-discriminatory" (and the term "non-discrimination") are used repeatedly in Heading One (Trade) of Part Two of the TCA is of limited relevance. It is unsurprising that, in the context of trade, there would be reference to non-discrimination. It is also unsurprising that the term — in that context — is defined, for example, at Article 300(2) as meaning "most-favoured nation treatment as defined in Articles 130 and 138 and national treatment as defined in Articles 129 and 137, as well as treatment under terms and conditions no less favourable than that accorded to any other like entity in like situations".[699] The lack of an equivalent definition in Heading Five is consistent with an intention of the Parties not to equate the term with its use in the trade context. Any contrary suggestion[700] is unfounded. The question of the relevance of rules of international economic law is addressed below.

357.5. Fifth, the UK does not accept that if a measure is discriminatory, it is "by design" disproportionate.[701] The tests are different. While discrimination may inform in some way a proportionality assessment, it is not possible to take an absolute position applicable in all cases.

b. <u>The relevance of other rules of international law</u>

358. The EU refers to a line of case law from the trade context, in particular relating to the General Agreement on Tariffs and Trade 1994 ("**GATT 1994**") and the Agreement on Technical Barriers to Trade ("**TBT Agreement**"). This caselaw concerns situations where distinctions are drawn between 'like' products. For example, in *US – Clove Cigarettes*, on which the EU relies, a regulatory distinction was drawn between clove cigarettes, which were banned, and methanol cigarettes, which were permitted to be sold. The standard being applied was Article 2.1 of the TBT Agreement, which requires

698 EU submission, para. 650-652.

699 EU submission, para. 643 and footnote 425, and para. 658 and footnote 430.

700 See esp. the EU submission, para. 644 and 658.

701 EU submission, para. 683.

Members to ensure "no less favourable" treatment on the basis of origin.[702] The WTO Appellate Body held, by reference to the TBT's preservation of regulatory autonomy, that a detrimental impact on competitive opportunities may be permitted if it stems exclusively from a legitimate regulatory distinction.[703] In the present case, by deciding on the sandeel fishing prohibitions, no such distinction was drawn by the UK between 'like' things.[704] Rather, the measures apply to all vessels.

359. The UK accepts the basic converse proposition of that stated in the *US – Clove Cigarettes* case, namely that if a measure distinguishes on the basis of an illegitimate distinction, then that is likely to be an indication of discrimination. But that is also not what has occurred here; there is no distinction being drawn on the basis of origin of vessels.

360. The UK also accepts, as explained in paragraph 356.3 above, that a measure that has differential effects will not be *de facto* discriminatory where those effects stem from pursuing a legitimate regulatory objective. That is a broadly similar idea to that discussed in the Article 2.1 TBT case law, including because both treaties preserve regulatory autonomy, but owing to the different treaty language and factual context noted above, the UK does not accept that it is appropriate to import the specific steps set out for compliance with Article 2.1 of the TBT Agreement to understand what is meant by "non-discriminatory measures" in Article 494(3)(f) of the TCA, in particular its strict requirement of exclusivity. Article 494(3)(f) of the TCA merely requires members to have regard to applying non-discriminatory measures.

361. As far as references to "discrimination in form or in fact" in various parts of UNCLOS are concerned, these add nothing of material utility to the analysis.[705] As noted above, the UK accepts that *de jure* and *de facto* discrimination fall within Article 494(3)(f).

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[702] TBT, **Exhibit CLA-0039**, Article 2.1: "Members shall ensure that in respect of technical regulations, products imported from the territory of any Member shall be accorded treatment no less favourable than that accorded to like products of national origin and to like products originating in any other country."

[703] Appellate Body Report, *US – Clove Cigarettes*, **Exhibit CLA-0053**, paras. 174-175. Discussed at EU submission, para. 668.

[704] If any legitimate regulatory distinction has been drawn, it was drawn by the Parties together in agreeing on the TAC allocations as they have in Annex 35 of the TCA, and that was in pursuit of the legitimate objective of cooperating with a view to ensuring environmentally sustainable fish stocks in the North Sea (see e.g. TCA, Article 494(1)).

[705] See EU submission, paras. 674-678.

c. The role of Article 496(2)

362. The UK notes that the EU's request for arbitration refers only to Article 494(3)(f) of the TCA as the legal basis for its non-discrimination claim.[706] Although the request makes a general reference to Articles 496(1) and 496(2) as provisions that the UK purportedly violated, it does not specify those provisions as distinct legal bases for its non-discrimination claim. Article 496(2) is specified as being relevant to Claim 1 on best available science.[707]

363. The second subparagraph of Article 496(2) provides:

> A party shall not apply the measures referred to in paragraph 1 to the vessels of the other Party in its waters unless it also applies the same measures to its own vessels.

364. The EU rightly accepts that the English and Scottish measures apply the prohibition to all vessels such that there is no *de jure* discrimination and thus no breach of Article 496(2).[708] However, the EU appears to allege in its written submission a possible *de facto* breach of Article 496(2)[709] and/or to conflate Article 496(2) and the different obligation arising from Article 494(3)(f) read with Article 496(1).[710]

365. The UK's position on this is as follows:

365.1. The second subparagraph of Article 496(2) refers to the application of measures, rather than the content of the measures.

365.2. There is no basis for contending that either the English or Scottish measure is being applied in a way that contravenes this part of Article 496(2); while different earlier measures were applied only to UK vessels (see paragraphs 132-133 above), the current measures deliberately apply to all vessels.

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706 Request for Arbitration: Letter from Charlina Vitcheva to Tamara Finkelstein CB, 24 October 2024, **Exhibit R-0123**, p. 2.

707 Request for Arbitration: Letter from Charlina Vitcheva to Tamara Finkelstein CB, 24 October 2024, **Exhibit R-0123**, p. 2.

708 EU submission, para. 758.

709 EU submission, paras. 657 and 759.

710 EU submission, para. 657.

365.3. In any event, any alleged breach of the second subparagraph of Article 496(2) is not part of the subject matter of the request for arbitration.

366. The Tribunal should therefore confine its assessment to the alleged breach of Article 496(1) taken together with Article 494(3)(f).

367. Furthermore and in any event, the UK's position is that regard was had to applying non-discriminatory measures and that the UK and Scottish measures are not discriminatory in either a *de jure* or *de facto* sense (as addressed below).

2. Application

1. No breach of the duty to decide "having regard to" "applying proportionate … measures"

368. All that the UK was obliged to do by Article 496(1) read with Article 494(3)(f) was to have regard to applying proportionate measures, in particular the expected benefits and detriments of the measures,[711] while preserving its regulatory autonomy. The evidence makes clear that UK did so in respect of both the English and Scottish measures.

a. The English measure

369. The UK Government had regard to applying proportionate measures in deciding on the English measure. The alleged disproportionality of the proposed prohibition was raised directly by the EU and Denmark in their responses to Defra's consultation and correspondence with the UK Government,[712] which was noted in the Ministerial submission of 14 September 2023.[713] In light of these concerns, the Ministerial submission of 14 September 2023 specifically considered the EU's position "whether a full closure could lead to a large negative impact on industry compared to the possible

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711 See the factors relevant to these broad categories at para. 352 above

712 Letter from Danish Minister for Food, Agriculture and Fisheries to UK Minister of State for Food, Farming and Fisheries, 25 May 2023, **Exhibit R-0124**; Response from the Ministry of Food, Agriculture and Fisheries of Denmark to the Consultation on Spatial Management Measures for Industrial Sandeel Fishing, 26 May 2023, **Exhibit R-0078**; Letter of Directorate-General for Maritime Affairs and Fisheries of the European Commission to Defra in response to the English sandeel consultation, of 30 May 2023, **Exhibit C-0055**. The consultation responses were expressly stated to have been taken into account when the UK Government announced the closure: UK Government response to Defra's consultation on sandeel management in English waters of the North Sea, 31 January 2024, **Exhibit R-0061** ("The UK government has considered … the responses to our consultation about potential measures").

713 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 21.

proposed benefits" and concluded that the prohibition "would be a proportionate measure in terms of the effectiveness of this measure and delivery of Good Environmental Status for Seabirds and Marine food webs."[714] It also stated that despite EU suggestions to the contrary, the measure would not contravene any obligations in the TCA.[715]

370. The UK Government therefore not only had regard to whether the English measure was proportionate but went further than was required by Article 496(1) of the TCA read with Article 494(3)(f) and concluded that it was proportionate. This conclusion was based on consideration of relevant factors, in particular the expected benefits and detriments of the English measure.

371. In respect of expected benefits, the objective of the English measure is set out at paragraph 189 above; in summary the aim of the prohibition is "to offer improved protection to sandeel and the dependent ecosystem"[716] to improve the resilience of dependent marine life including seabirds, other species of fish, as well as marine mammals.[717] The connection between those benefits and the measure was supported by the scientific advice. Related factors concerning the importance of this objective in light of the general situation of the North Sea ecosystem, including in respect of seabirds in particular, as well as regulatory objectives and public support for the measure, were also taken into account, as detailed below.[718] Additional benefits, including the economic benefit of increased populations of commercial fish were also taken into account.[719]

372. In respect of detrimental impacts, the UK Government was aware of and had regard to the anticipated adverse economic and social impacts on UK and non-UK stakeholders flowing from the measures. This included a "worst-case" scenario assessment of the economic impact on non-UK vessels, fishing industry and down-stream effects.[720]

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714 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 24, and see also para. 16.

715 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 27.

716 UK notification of the sandeel fishing prohibition to the EU pursuant to Article 496(3) TCA, 8 February 2024, **Exhibit CLA-0060**.

717 Defra, Consultation outcome, Government response, updated 31 January 2024, **Exhibit R-0087**.

718 See paras. 391-394 below.

719 See para. 395 below.

720 De Minimis Assessment (DMA) For Self-Certified Measures in Defra regarding Consultation on Spatial Management Measures for Industrial Sandeel Fishing, **Exhibit C-0044**, p. 22.

373. To the extent it was necessary to consider alternative measures (which is not accepted), reasonable alternative measures were taken into account. In particular:

373.1. The October 2021 Call for Evidence requested information on "different types of restriction, the geographical scope of restrictions and the timing of restrictions. For example, a ban on sandeel fishing in UK waters, a phased reduction in sandeel fishing in UK waters or additional area closures of the sandeel fisheries".[721]

373.2. The UK Government's summary of responses to the 2021 call for evidence summarised responses that proposed measures falling into the following categories:

> (a) a total closure of the UK exclusive economic zone (EEZ) to sandeel and Norway pout fishing or Total Allowable Catches (TACs) reduced to zero or near zero; (b) taking an ecosystem-based approach to the management of sandeels and Norway pout, incorporating 'set-aside' and reducing catch limits downwards; (c) implementation of, or ideas taken from, the Norwegian model (including in season monitoring and adaptative management and late start of the season) of sandeel stock management while keeping the fisheries open.

Various additional specific measures are mentioned in the more detailed summary, including "spatial closures within 100km of seabird breeding colonies, combined with reducing catch limits to avoid fishing displacement".[722]

373.3. The English Scientific Report published in March 2023 alongside Defra's consultation document explored the effects of different levels of sandeel depletion in the North Sea in two ways:

373.3.1. First, the modelling in the English Scientific Report simulated the effects of different levels of sandeel depletion in the North Sea from fishing in a range of scenarios. Those scenarios included ones in which sandeel fishing was increased and ones in which it was decreased (see Figure 6 of the English Scientific Report (mislabelled as Figure 5)). Decreases in sandeel depletion via reductions in fishing were

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721 Call for Evidence on future management of Sandeels and Norway pout published by the UK Fisheries Administrations on 22 October 2021, **Exhibit CLA-0043**, p. 8.

722 Call for Evidence Outcome, Summary of Responses, updated 18 March 2022, **Exhibit R-0071**.

associated with positive biomass responses for all but two of the predators of sandeel. The summary review of scientific responses to the Defra consultation prepared by Natural England, Cefas and the JNCC on 19 June 2023 (and annexed to the Ministerial submission of 14 September 2023[723]), in responding to a concern that the Defra consultation did not consider partial closures, stated that the English Scientific Report "suggests similar outcomes, with simulated impacts (be it positive or negative biomass responses) generally increasing as sandeel depletion is reduced".[724]

373.3.2. Second, the English Scientific Report addressed the reasons why partial closures may not result in the materialisation of anticipated ecosystem benefits. It advised that partial closures which cause fishing displacement (where vessels simply move from a closed area to an open area to fish) can cause localised depletion (which for distant banks can take years to reverse[725]) and disrupt larval dispersion and thus sandeel availability and abundance, even within closed areas. It was also noted that the fact that ICES stock assessments do not take into account closed areas means that there is a disproportionately large TAC relative to the available area open to the fishery, which increases the risk of localised depletions.[726]

373.4. The DMA published in March 2023 that also accompanied the Defra consultation considered and dismissed technical gear restrictions and temporal measures as unable to achieve the UK's objective of increasing sandeel resilience so as to achieve an increased resilience of the ecosystem dependent on sandeel.[727] It also

723 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 22.

724 Natural England, Cefas and JNCC, Summary review of the evidence presented by respondents to the consultation to prohibit industrial fishing in UK waters, **Exhibit R-0076**, p. 6.

725 This is due to the limited exchange of sandeel between banks and their short life span and their heavy dependency on annual recruitment for stock size: see paras. 91-93 and 120 above.

726 "What are the ecosystem risks and benefits of full prohibition of industrial sandeel fishing in the UK waters of the North Sea (ICES Subarea 4)?" ('Natural England/Cefas/JNCC advice'), March 2023, **Exhibit C-0045**, pp. 21-22.

727 De Minimis Assessment (DMA) For Self-Certified Measures in Defra regarding Consultation on Spatial Management Measures for Industrial Sandeel Fishing, **Exhibit C-0044**, pp. 2 and 9-10. See also Defra,

considered and rejected the likelihood of obtaining a voluntary agreement from the Danish fishing industry as to management measures sufficient to meet the UK's objective.[728] The DMA further considered various forms of closures, including full closure and two partial closures of varying size (one within SA4 and SA3r, and one within SA1r).[729] Economic and social impacts on UK and non-UK stakeholders were assumed to apply to a similar but smaller degree in respect of the partial spatial closures, and thus were taken into account in the consideration of the partial spatial closures.[730]

373.5. The consultation document for the English measure published in March 2023 summarised the findings of the DMA, and also noted that partial closures may result in fishing displacement onto other fish stocks.[731]

373.6. The Ministerial submission of 14 September 2023 concluded: "There are currently no known alternative management interventions that could produce the same potential beneficial effect as closing the sandeel fishery".[732] It also identified additional benefits of a full closure:

> Our evidence suggests that the benefit of the closure would be greater where there is greater predator dependence and overlap. Moreover, a full closure reduces the risk of displacement of sandeel fishing within UK waters. Finally it considers the high interannual variation in

Consultation on Spatial Management Measures for Industrial Sandeel Fishing - Consulting on management measures for industrial sandeel fishing in English waters of the North Sea, March 2023, **Exhibit R-0061**, p. 10.

728 De Minimis Assessment (DMA) For Self-Certified Measures in Defra regarding Consultation on Spatial Management Measures for Industrial Sandeel Fishing, **Exhibit C-0044**, pp. 2 and 10. See also Defra, Consultation on Spatial Management Measures for Industrial Sandeel Fishing - Consulting on management measures for industrial sandeel fishing in English waters of the North Sea, March 2023, **Exhibit R-0061**, p. 10.

729 De Minimis Assessment (DMA) For Self-Certified Measures in Defra regarding Consultation on Spatial Management Measures for Industrial Sandeel Fishing, **Exhibit C-0044**, pp. 2 and 8-9. See also Defra, Consultation on Spatial Management Measures for Industrial Sandeel Fishing - Consulting on management measures for industrial sandeel fishing in English waters of the North Sea, March 2023, **Exhibit R-0061**, pp. 9-10.

730 De Minimis Assessment (DMA) For Self-Certified Measures in Defra regarding Consultation on Spatial Management Measures for Industrial Sandeel Fishing, **Exhibit C-0044**, p. 11 (para. 27).

731 Defra, Consultation on Spatial Management Measures for Industrial Sandeel Fishing - Consulting on management measures for industrial sandeel fishing in English waters of the North Sea, March 2023, **Exhibit R-0061**, pp. 9-10. They were also summarised in the Ministerial submission of 15 February 2023, **Exhibit R-0074**, para. 15.

732 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 16.

> offshore foraging dispersion,[733] and so a more extensive closure would have a higher chance of success when prioritising the need for seabird recovery.[734]

373.7. This position was confirmed on 27 February 2024, when the UK Minister of State for Food, Farming and Fisheries wrote to the Danish Minister for Food, Agriculture and Fisheries, stating that: "In reaching our decision, we considered a range of alternative measures, but they failed to provide sufficient protection to vulnerable seabird populations".[735]

374. Accordingly, the UK Government had "regard to" applying proportionate measures.

375. The EU argues that the fact that adverse impacts "must be taken into account … implies according them due weight in the assessment".[736] In this respect, the EU asserts that some factors have been disregarded or not properly taken into account. These points fall under the EU's broader argument that the UK has "fail[ed] to balance" the costs and benefits of the measure, i.e. it has failed actually to conduct a proportionality assessment properly. These points are accordingly addressed in the section below in responding to the EU's case that the measure must be proportionate, which is a different standard not found in the TCA.

b. The Scottish measure

376. The Scottish Government also plainly had regard to applying proportionate measures. The alleged disproportionality of the proposed prohibition was also raised directly by the EU and Denmark in their responses to the Scottish consultation and correspondence with the Scottish Government.[737] In response to this concern, the Ministerial submission of

733 In this respect, see paras. 297-298 above.

734 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 24.

735 Letter from UK Minister of State for Food, Farming and Fisheries to Danish Minister for Food, Agriculture and Fisheries, 27 February 2024, **Exhibit R-0085**.

736 EU submission, para. 734.

737 European Commission letter of 1 August 2023, **Exhibit C-0057**; Letter from Danish Minister for Food, Agriculture and Fisheries to Scottish Cabinet Secretary for Rural Affairs, Land Reform and Islands, 9 October 2023, **Exhibit R-0097**.

26 January 2024 concluded that the measure was "appropriate and proportionate given the current evidence base and the precautionary principle".[738]

377. The Scottish Government too, therefore, not only had regard to whether the proposed prohibition was proportionate but went further than required by the TCA and found that it was proportionate. As with the UK Government, this conclusion was based on an appreciation of the benefits and adverse impacts of the proposed measure.

378. In respect of benefits, the objective of the Scottish measure is set out at paragraphs 191-192 above; in summary the aim of the prohibition is to bring about "wider environmental and ecosystem benefits, which include potential benefits to sandeel, seabirds, marine mammals, and other fish species".[739] The connection between those benefits and the measure was supported by the scientific evidence. Related factors, including regulatory objectives and public support for the measure were also taken into account, as detailed below.

379. In respect of adverse impacts, the Scottish Government was aware of and had regard to the importance of the sandeel fishery to EU members, in particular Denmark.[740] Consultation responses raising adverse economic consequences for UK and EU fisheries, as well as producers who rely on sandeel for fishmeal and fish oil were considered. As is acknowledged by the EU,[741] the Partial and Final BRIAs set out the adverse impacts on both the UK and EU catching sector.[742]

380. To the extent it was necessary to consider alternative measures (which is not accepted), reasonable alternative measures were addressed in the BRIA[743] and the SEA processes.[744] The assessment followed the detailed statutory requirements in the Environmental Assessment (Scotland) Act 2005 that among other things require the identification and

738 Ministerial submission of 26 January 2024, **Exhibit R-0098**, para. 9.

739 Policy Note: The Sandeel (Prohibition of Fishing) (Scotland) Order, 2024 SSI 2024/36, **Exhibit C-0065**, para. 4.

740 Ministerial submission of 26 January 2024, **Exhibit R-0098**, Annex F (p. 3).

741 EU submission, paras. 727-728.

742 See e.g. The Sandeel (Prohibition Of Fishing) (Scotland) Order 2024: Business and Regulatory Impact Assessment – final, January 2024., **Exhibit C-0066**, pp. 10-11 (section 4.4).

743 Partial Business and Regulatory Impact Assessment, July 2023, **Exhibit C-0051**, pp. 8-14.

744 Strategic Environmental Assessment of proposals to close fishing for sandeel in all Scottish waters, July 2023, **Exhibit C-0052**, section 6.

consideration of "reasonable alternatives".[745] The SEA process involved "a detailed assessment of all the potential additional environmental effects that might arise from the scenarios that have been identified as reasonable alternatives".[746] The five options considered included a lesser extent of geographical closure (option 2) and seasonal closure (option 3). The SEA specifically weighed the benefits of partial closures and a full closure in detail.[747] Full closure (option 1), however, was expected to be able best to deliver the Scottish Government's environmental objectives with regards to sandeel and their associated ecosystem.[748] It was found that the alternatives considered would not achieve the same or greater benefits as a full closure without also risking detrimental effects and other negative impacts.[749]

381. Measures alternative to full closure were also raised in consultation responses and were considered by the Scottish Government prior to adopting the measure, including proposals such as the Norwegian model (including real-time monitoring and adaptative management) of sandeel stock management. The Scottish Government concluded that alternatives "would not be sufficient in moving towards achieving the envisaged ecosystem benefits that a full closure could bring".[750] The final BRIA concluded:

> Following consideration of all representations received, the Scottish Government is of the view that the preferred option to close fishing for sandeel in all Scottish waters, is the most likely approach to achieve our aims, as the potential ecosystem benefits are expected to outweigh the negative impacts identified. In reaching this decision, the Scottish Government has applied the precautionary principle and ensured alignment with national and international commitments, including, but not limited to, the UK-EU TCA,

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745 Environmental Assessment (Scotland) Act 2005, **Exhibit RLA-0026**, sections 14(2)(b) and 18(3)(e). The 2005 Act implements in Scotland Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (the SEA Directive), **Exhibit RLA-0027**, on which see as regards "reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme" Articles 5(1), 9(1)(b) and recital (14).

746 Strategic Environmental Assessment of proposals to close fishing for sandeel in all Scottish waters, July 2023, **Exhibit C-0052**, pp. 86-87.

747 Strategic Environmental Assessment of proposals to close fishing for sandeel in all Scottish waters, July 2023, **Exhibit C-0052**, pp. 93-95.

748 Strategic Environmental Assessment of proposals to close fishing for sandeel in all Scottish waters, July 2023, **Exhibit C-0052**, para. 6.1.4.

749 Strategic Environmental Assessment of proposals to close fishing for sandeel in all Scottish waters, July 2023, Exhibit C-0052, pp. 85-87 and 93-95; Scottish Government, Strategic Environmental Assessment of proposals to close fishing for sandeel in all Scottish waters Post Adoption Statement, 26 April 2024, **Exhibit R-0099**, section 6 (p. 8).

750 Scottish Government response to the consultation analysis report, January 2024, **Exhibit R-0096** , pp. 3-4.

> Scotland's National Marine Plan, Scotland's Fisheries Management Strategy, the UK Joint Fisheries Statement, the Fisheries Act 2020, and the Marine Strategy Regulations 2010.[751]

382. It is therefore clear that the Scottish Government had regard to "applying proportionate … measures".

383. As with the English measure, the EU's contentions regarding a failure properly to balance the relevant factors in respect of the Scottish measure is addressed in the following section.

2. No obligation for the measures to be proportionate, but in any event, they are proportionate

384. Even if, in "having regard to" the principle in Article 494(3)(f), the UK were required to decide on measures that conformed with that principle and therefore were proportionate (which is not accepted), both the English and Scottish measures would meet that test.

385. As noted above, there is a distinction between an obligation for conduct to be proportionate and the standard of review applied by a judicial or arbitral body reviewing such conduct. Thus, even if the Tribunal were to consider whether the measures are "proportionate" (which it should not), the UK submits it would be appropriate for it to apply a deferential standard and ask if the measure is clearly disproportionate,[752] and/or to the extent that the approach in domestic law is relevant (which it is not), if the measure is "manifestly inappropriate".[753] Such an approach is consistent with the terms of Article 494(3)(f), which "preserv[es] the regulatory autonomy of the parties" and the complexity of the different factors involved in assessments concerning fisheries.

386. The measures are not clearly disproportionate, nor manifestly inappropriate applying the test of proportionality explained at paragraph 345 above.

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751 The Sandeel (Prohibition Of Fishing) (Scotland) Order 2024: Business and Regulatory Impact Assessment – final, January 2024, **Exhibit C-0066**, section 4.3 (p. 18).

752 See para. 354.4 above.

753 See para. 354.5 above.

c. The first limb: relationship between means and ends

387. First, on the relationship between means and ends, as the EU accepts,[754] the measures were adopted for the purpose of marine conservation and in particular increasing sandeel biomass so as to benefit sandeel predators within the marine ecosystem. The UK Government's statement following Defra's consultation, which announced the English measure, was consistent with this broad objective. It stated that "[m]easures to increase food availability will […] improve the resilience of marine life for which sandeels are a crucial source of nutrients" and that there was "sufficient evidence supporting an increase of benefits to the marine ecosystem to introduce a spatial closure".[755] Similarly, the objective of the Scottish measure was stated in the final BRIA as being to "seek effective protection of sandeel, as a contribution to the wider marine ecosystem" including for "a range of species in addition to sandeel, including commercial fish species, seabirds and marine mammals".[756]

d. The second limb: apt to contribute to the objective

388. Second, as also accepted by the EU,[757] the closure of UK waters is "apt" to contribute to the conservation of the marine environment and the sustainable exploitation of fisheries resources.[758] The prohibition on fishing for sandeel is, as the scientific evidence in support of both the English and Scottish measures indicates, likely to result in an increase in sandeel which will have beneficial impacts on the resilience of the marine ecosystem.[759]

389. When articulating its position on this second limb of the proportionality test, the EU states that a measure need only be apt or capable of contributing to the objective, in the

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754 See EU submission, paras. 692-694 and 698.

755 UK Government response to Defra's consultation on sandeel management in English waters of the North Sea, 31 January 2024, **Exhibit R-0061**.

756 The Sandeel (Prohibition Of Fishing) (Scotland) Order 2024: Business and Regulatory Impact Assessment – final, January 2024, **Exhibit C-0066**, section 2.1.2 (p. 3). The EU accepts that the additional objective set out in the final BRIA (to complement existing sandeel management measures) is subsidiary or ancillary, and thus does not detract from the satisfaction of the first element of the test of proportionality (EU submission, paras. 695-697).

757 EU submission, para. 694.

758 EU submission, para 699.

759 See paras. 391-392 below.

sense of not being incapable of contributing to that objective.[760] Yet when applying that limb, the EU impermissibly seeks to set a higher standard, drawing a distinction between contributing to the objective (which the EU accepts the measures do) and "achiev[ing] all the environmental effects identified by the UK", for which it says there is insufficient evidence.[761] In respect of this, the UK makes four observations:

389.1. The relevant test for the second limb is whether the measures are not incapable of contributing to the objective. That is clearly met in respect of both the English and Scottish measures. There is no higher standard of achieving the objective, let alone the "full spectrum" of anticipated environmental effects.[762] If it were otherwise, one would struggle to think of a situation in which an environmental protection measure would ever be proportionate.

389.2. The EU is moreover wrong to suggest that there is insufficient evidence that the measures would achieve the objective of improving the resilience of sandeel and their predators.[763] To the extent there is uncertainty, it derives principally not from the state of the evidence or data but from the high degree of variability in the system, compounded by multiple interacting large scale environmental processes such as climate change.[764]

389.3. In any event, the application of the precautionary principle would support the UK taking action even where the link and/or benefit of the measures was uncertain. The precautionary principle necessarily informs the application of the principle of proportionality, especially given that they are both identified as principles in Article 494(3). Both the UK Government in respect of the English measure and the Scottish Government applied the precautionary principle in deciding on the measures.[765]

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760 EU submission, para. 637.

761 EU submission, para. 707. See also para. 712 ("would make a significant contribution to the objectives pursued and would achieve the full spectrum of environmental effects that the UK claims").

762 EU submission, para. 712.

763 Cf. EU submission, paras. 707-711.

764 See, e.g., Ministerial submission of 26 January 2024, **Exhibit R-0098**, Annex F (p. 14).

765 Supplementary note to sandeel submission: Sandeel management in English waters of the North Sea, 4 December 2023, **Exhibit R-0086** ("our strategy for a more precautionary approach to sandeel management

e. The third and final limb: the weighing exercise

390. Third, the measures are not clearly disproportionate when weighing the benefits and impacts of the measure.

391. As regards the benefits, first, the measures were supported by robust scientific evidence, and therefore there was a good understanding of what the measures were expected to achieve.[766] The evidence recognised that although sandeel stocks experience high levels of natural fluctuation due to sensitivity to environmental variation, the closure of sandeel fishing may increase sandeel resilience and thus availability. By increasing the availability of sandeel as food for their predators, a closure of sandeel waters was likely to increase the biomass of those predators, including in particular seabirds, as well as have other ecosystem benefits.[767]

392. Second, the UK was entitled to place significant weight on the importance of its objective, including the gravity of the situation to be addressed, and the extent to which the measures met domestic policy goals. In this respect, the following considerations are relevant.

392.1. Sandeel are integral to the marine ecosystem of the North Sea. They are highly sensitive to environmental variation, including resulting from the effects of climate change which is negatively impacting the North Sea. Consequently, their stock size is subject to high levels of interannual fluctuation, and stock sustainability is thus heavily dependent on successful annual recruitment. This pressure, combined with the continued removal of sandeel through industrial fishing methods, risks further decline of sandeel stock as well as species that are dependent on sandeel for food including fish, marine mammals and seabirds

such as the introduction of spatial closures"); Letter from the Scottish Cabinet Secretary for Rural Affairs, Land Reform and Islands to the Directorate-General for Maritime Affairs and Fisheries of the European Commission, of 2 February 2024, **Exhibit C-0059** ("In reaching this decision, the Scottish Government has applied the precautionary principle").

766 Ministerial submission of 14 September 2023, **Exhibit R-0077**, paras. 15-16; Ministerial submission of 26 January 2024, **Exhibit R-0098**, Annex F.

767 Scottish Scientific Report, **Exhibit C-0050**, p. 13; English Scientific Report, **Exhibit C-0045**, pp. 7 and 10.

(including threatened or endangered seabirds). Even with low levels of fishing, there is a risk of sandeel stock collapse.[768]

392.2. The UK is home nationally and internationally to important seabird populations, but there has been a general decline in their populations. For example, a report by NatureScot published in 2021 reported that the number of breeding seabirds had declined in Scotland by 50% since the 1980s. This was accelerated by the outbreak of avian flu in recent years which has had adverse consequences on their populations.[769] Declines in the abundance of sandeel due to industrial fishing has been shown to impact the breeding success of UK seabirds, most notably in kittiwakes. The best available scientific evidence shows that spatial sandeel fishing closures may build seabird resilience as well as having wider ecosystem benefits.[770]

392.3. What the two preceding sub-paragraphs demonstrate is that: (i) at the time of the adoption of the measures, there was a real and pressing need to take appropriate measures to protect sandeel abundance and resilience, and (ii) the only variable affecting sandeel abundance and resilience that was capable of being directly controlled by the UK and Scottish Governments was fisheries management measures.

392.4. In light of the above, the objective of the closures was therefore very important. The UK notes in this regard that the EU repeatedly acknowledges that it attaches "significant importance" and "considerable importance" to "marine conservation and the sustainable exploitation of fisheries resources".[771] The UK agrees.

392.5. The importance of the objective is also consistent with the UK's domestic policy goals. Since 2010, the UK has had as a regulatory objective the achievement of 'good environmental status' in the marine environment.[772] The 2019 Marine

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768 See Sections IV and V of this submission.

769 See, e.g., Ministerial submission of 27 April 2023, **Exhibit R-0092**, Annex B, p. 17; Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 3.

770 See Section VI and also the discussion of BAS: paras. 226-260.

771 EU submission, paras. 691 and 774. See also para. 389 referring to "very important considerations of marine conservation".

772 Marine Strategy Regulations 2010, available at https://www.legislation.gov.uk/uksi/2010/1627/contents..

Strategy Part One noted that for 11 out of the 15 indicators, the UK was failing to meet GES. The strategy found that "most UK marine bird populations are not achieving GES",[773] and that with regard to fish populations GES in the North Sea was also not achieved.[774] A key objective of the UK since leaving the EU has been to take more robust action in achieving GES.[775] The measures adopted were consistent with the UK and Scottish Government's aim of achieving and maintaining GES.[776]

393. Third, the UK government was entitled to weigh in the balance the potential adverse consequences of not taking action, or of taking less robust action.

394. Fourth, the UK and Scottish Governments were entitled to consider, as relevant to their exercise of regulatory autonomy, the extensive domestic support for the measure. This was evidenced by the fact that over 95% of respondents to the English consultation "support[ed] some form of prohibition on fishing for sandeel in English waters of the North Sea, with a majority favouring the closure of all English waters".[777] Similarly 97% of respondents to the Scottish consultation favoured a full closure of Scottish waters to sandeel fishing.[778]

395. Fifth, additional benefits arising from the closures are relevant. This includes the expected increase in biomass of commercially valuable fish that prey on sandeel, and tourism opportunities.[779]

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773 DEFRA, Marine Strategy Part One: UK updated assessment and Good Environmental Status, October 2019, **Exhibit C-0069**, p. 7.

774 DEFRA, Marine Strategy Part One: UK updated assessment and Good Environmental Status, October 2019, **Exhibit C-0069**, p. 57.

775 See paras. 28ff above. This is supported by the non-allocation of UK sandeel TAC.

776 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 16.

777 Defra, Consultation outcome, Government response, updated 31 January 2024, **Exhibit R-0087**.

778 Scottish Government response to the consultation analysis report, January 2024, **Exhibit R-0096**, section 2.1.

779 See para. 106.2-106.3 and the table in para. 145 above (increase in biomass of predatory fish and improved body composition of predatory fish and harbour porpoise); Call for Evidence Outcome, Summary of Responses, updated 18 March 2022, **Exhibit R-0071** (recreational angling and tourism as regards the bounce back of fish, seabird and marine mammal populations).

396. As regards the adverse impacts of the measure, they do not clearly outweigh the benefits. The adverse impacts include economic and social consequences on UK and EU stakeholders flowing from changed access to UK waters.

396.1. The economic and social impact on non-UK vessels (10-25 vessels from Denmark, Sweden and Germany) of closing the fishery in English waters was estimated by Defra to be around £41.2 million a year.[780] This was a "worst-case scenario" assessment that presumed no displacement of fishing to other areas or species, and which "considerably overestimated" the financial impact to Danish vessels by calculating loss based on values of landed fish rather than operating profit.[781] The Scottish Government similarly "overestimate[ed]" the impact on EU vessels at £3.8 million a year, also based on landed value of fish (revenue) and not operating profit, and also assuming no displacement to other fishing areas.[782] The financial impact on UK vessels was comparatively minimal.[783]

396.2. The indirect costs to UK and non-UK fishmeal and fish oil industries, including job-related economic and social impacts, were also taken into account[784] as recognised by the EU.[785]

396.3. The UK Government also took account of data from the MMO and other sources that showed that EU vessels were not solely reliant on English waters or sandeel for their fishing activity and revenues. The catch of the Swedish vessels, for example, only comprise 35% sandeel landings. It was therefore likely that EU vessels would displace their fishing effort to other stocks in UK waters and would

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780 Defra, Consultation on Spatial Management Measures for Industrial Sandeel Fishing - Consulting on management measures for industrial sandeel fishing in English waters of the North Sea, March 2023, **Exhibit R-0061**, p. 7; Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 25. The EU-provided figures in para. 729 does not disaggregate the England and Scotland measures. In any event, it does not appear to be the EU's position that Defra's economic analysis was inaccurate.

781 De Minimis Assessment (DMA) For Self-Certified Measures in Defra regarding Consultation on Spatial Management Measures for Industrial Sandeel Fishing, **Exhibit C-0044**, Annex 1, p. 22.

782 Partial Business and Regulatory Impact Assessment, July 2023, **Exhibit C-0051**, p. 13; Ministerial submission of 26 January 2024, **Exhibit R-0098**, Annex F, p. 17.

783 See paras. 409 and 414 below.

784 De Minimis Assessment (DMA) For Self-Certified Measures in Defra regarding Consultation on Spatial Management Measures for Industrial Sandeel Fishing, **Exhibit C-0044**, para. 66 and Annex 1, p. 22; The Sandeel (Prohibition Of Fishing) (Scotland) Order 2024: Business and Regulatory Impact Assessment – final, January 2024., **Exhibit C-0066**, section 10 and table 4.

785 EU submission, para. 732.

be able to continue to fish their sandeel quota in EU waters,[786] thereby reducing the already overestimated economic impact to EU vessels and associated industries.

396.4. The impact of the sandeel fishing prohibitions on the conditions for accessing UK waters necessarily went hand in hand with the consideration of the above economic and social impacts which depend on such access. Conditions of access were considered both as regards access to UK waters to fish sandeel (which was to cease) and access to UK waters to continue to fish other agreed stocks, as reflected in the UK Government's consideration of displaced fishing effort onto other species in UK waters.[787]

397. If it is necessary to consider the balance struck by the UK in weighing these adverse impacts against the expected benefits, in addition to the above points, the UK notes two factors which support the Tribunal giving the UK a wide margin of discretion in conducting the weighing exercise and striking the appropriate balance.

397.1. First, there are inherent difficulties comparing quantitative impacts, such as direct economic effects, with impacts that are harder to quantify, such as environmental benefits. In this regard, the UK does not accept that the relative certainty of the economic impacts on EU fishing vessels necessitates more weight being attached to these factors (as the EU suggests at paragraph 738 of its submission). Indeed, the precautionary principle militates against attributing less weight to environmental impacts merely because they are uncertain.

397.2. Second, the adverse economic and social impacts on EU fishing vessels derive from qualified rights of access for EU vessels which are derivative from the TCA.[788] They necessarily are to be given appropriately less weight when balanced against the sovereign right of the UK as the coastal State to exercise its regulatory autonomy in deciding on the most appropriate measures for conservation and management of marine living resources within its own waters, which regulatory

786 Ministerial submission of 14 September 2023, **Exhibit R-0077**, paras. 25-26; Ministerial submission of 26 January 2024, **Exhibit R-0098**, Annex F (p. 17).

787 Ministerial submission of 14 September 2023, **Exhibit R-0077**, paras. 25-26.

788 See paras. 424ff below.

autonomy is explicitly required by Article 494(3)(f) to be "preserv[ed]" when having regard to "applying … proportionate measures".

398. Taking this into account, it was not disproportionate for the UK and Scottish Governments to determine that the environmental benefits of the measures outweigh the adverse economic and social impacts.[789]

f. The EU's incorrect arguments on proportionality

399. The EU appears[790] to make four arguments that the UK measures are not proportionate, namely that: (i) the UK did not adequately consider the economic and social impacts of the measures; (ii) the measures impaired the right of full access to UK waters to fish sandeel; (iii) the UK failed to balance the degree of contribution to its regulatory objectives and the economic and social impact of the measures; (iv) the UK could have decided on alternative proportionate measures.[791] These arguments are unsound for the following reasons.

400. Points (i) and (iii) can be taken together. The EU argues that the UK failed to balance the relevant factors in the weighing exercise by not "adequately" considering or giving "due weight to the economic and social impacts of the sandeel fishing prohibition[s]".[792] The UK makes the following observations:

400.1. The EU does not contest the accuracy of the data or the assessment of the economic and social impacts relied upon in support of the English and the Scottish measures.[793] It also acknowledges that precise quantification is difficult[794] and

789 See paras. 369 and 376 above.

790 It is not clear in respect of some of the arguments (e.g. EU Submission, para. 733 Section VIII.3.6 about access to the UK waters makes no mention of proportionality, but it is assumed to be a proportionality argument by virtue of being in the application section in respect of Claim 2).

791 See EU submission, Sections VIII.3.5, VIII.3.6, VIII.3.7 and VIII.3.8 (together, paras. 719-756).

792 EU submission, paras. 717 and 734.

793 Indeed, the data was principally provided by Denmark in its response to the English and Scottish consultations. See above para. 155 above.

794 EU submission, para. 723.

that the UK and Scottish assessments may overestimate the actual financial impact.[795]

400.2. The new data as to financial impact provided in paragraph 729 of the EU's submission was published by Denmark in July 2024 (after both measures were adopted) and is not disaggregated as between English and Scottish waters. In any event it is not inconsistent with the work done to inform the English and Scottish measures.

400.3. The EU's inexplicable conclusion that the economic and social impacts upon EU operators "were essentially disregarded"[796] is pursued in respect of the English measure by reference to a single expression in the De Minimis Assessment (DMA). The DMA was published alongside the consultation on the English measure and indicated (at paragraph 73) that the cost to UK businesses of closing sandeel fishing in English waters would be "relatively low".[797] That assessment was obviously limited to UK businesses, and is factually correct, especially given the pre-existing non-allocation of sandeel fishing quota to UK vessels. In respect of the Scottish measure the EU places particular reliance on the Policy Note accompanying the 2024 Order.[798] That does not demonstrate a lack of adequate consideration. The Policy Note indicates that the impact of the policy on Scottish business is "minimal", which reflects the domestic nature of the Policy Note. It is not any indication that the Scottish Government considered the impact on EU business to be minimal. That impact was clearly recognised as substantial, as explained above.[799]

400.4. The EU further contends that the UK has not reflected the fact that the degree of environmental benefits is uncertain, whereas the economic and social impacts of the measures are certain. For the reasons explained at paragraph 397 above, it is not correct that the relative certainty of the economic impacts on EU fishing

795 EU submission, para. 729.

796 EU submission, para. 736.

797 EU submission para. 737.

798 EU submission, para. 737.

799 See paras. 396.1-396.2 above.

vessels necessitates more weight being attached to these factors. Moreover, as the EU acknowledges, the degree of economic and social impacts is also uncertain.[800]

400.5. As evident from the summary provided above,[801] a "worst-case" scenario economic and social impact assessment was conducted in respect of both the English and Scottish measures. The EU does not explain how such a "worst-case" assessment fails adequately to consider or to give "due weight" to the economic and social impacts. It does not. The EU's discontent appears to be with the outcome, not the process: it would have preferred the UK and Scottish Governments to regard the economic and social impacts to the EU as outweighing the ecosystem benefits of the measures, but the EU's satisfaction is not the test.

401. As to point (ii), the EU contends that the right of "full access" to UK waters was impaired by the sandeel fishing prohibitions, implying that this itself renders the measure disproportionate.[802] For the reasons set out in relation to the EU's Claim 3 below,[803] there was no impairment of the qualified right of access in Article 2(1)(a) of Annex 38. It follows that this provides no basis for the EU's contention that the measures are disproportionate. Even if there were somehow a breach of the right of access (which is not accepted), that would not automatically render the measures disproportionate. The character of the rights in question is relevant, specifically the UK's sovereign rights to manage the living resources in its own waters as compared to the qualified right of access granted under the TCA to the EU. This is very far from a situation of "perfect equality" of rights to the "exclusion of any preferential privilege of any one … State" in which the total denial of the right (which is in any event not what has occurred here given EU vessels can still access UK water to fish species other than sandeel) has before been held by the ICJ to be disproportionate.[804]

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800 EU submission, para. 723.

801 See para. 396 above.

802 EU submission, para. 733. The EU also argues that the right of access during the adjustment period "should not be lightly impaired given the rationale of the adjustment period". The UK rejects this attempt to set a threshold on the way in this Article 496 limits the right of access, as explained at para. 428.1 below.

803 See paras. 424ff below.

804 See para. 353 above.

402. The EU's point (iv) is essentially its postulated requirement of necessity; that the measures could not be lawfully decided unless they were the least restrictive option. The UK explained above that this is not required as part of the test for proportionality for the purposes of Articles 494(3)(f) and 496(1) of the TCA.[805]

403. In the event, however, that proportionality under Article 494(3)(f) does require a measure to be the least restrictive available (which it does not), the measures would nevertheless be proportionate. The EU submits that the UK could have imposed a spatially limited prohibition on fishing in UK waters that corresponded more closely to the feeding range of chick-rearing seabirds.[806] As to this:

403.1. As identified above, relevant alternative measures ought to be compared against whether they deliver upon the same objective as that pursued by the impugned measure. The objective of the UK measures is not limited to increasing the availability of sandeel for chick-rearing seabirds. The measures were expressly considered to have wider benefits to the marine ecosystem.[807] A more spatially restrictive measure would not deliver the same wider ecosystem benefits to the marine environment and so is not a relevant comparator as recognised in the Defra Consultation document.[808]

403.2. As to foraging practices of predators generally, as illustrated at paragraphs 297-298 above, the foraging range of seabirds differs widely between species and on an interannual basis; it may extend to the entirety of the UK's EEZ; and in any event it would be difficult to define. The "high interannual variation in offshore forage dispersion" was considered by the UK Government as one reason why a full closure provided a higher chance of achieving the anticipated benefits, including building seabird resilience.[809] The feeding range of mobile predators, such as marine mammals and fish, is also difficult to define by virtue of that

805 See para. 349 above.

806 EU submission, para. 746.

807 See paras.189 and 191-192 above.

808 Defra, Consultation on Spatial Management Measures for Industrial Sandeel Fishing - Consulting on management measures for industrial sandeel fishing in English waters of the North Sea, March 2023, **Exhibit R-0061**, pp. 9-10.

809 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 24.

mobility, and some species' distribution has been linked to sandeel abundance.[810] A fuller spatial closure is therefore likely to achieve fuller and greater benefits.

403.3. Other reasons why a partial closure may not result in the materialisation of anticipated ecosystem benefits were also considered, as noted above. These included the risks of fishing displacement within UK waters and consequential local depletions, disrupted larval dispersion affecting stock both in open and closed areas, and the potential for banks straddling or close to the boundaries of closed areas to be drained.[811]

403.4. In addition to partial closures, temporal and technical measures were considered and rejected as unlikely or unable to achieve the same wider ecosystem benefits, as detailed above.[812]

403.5. Further, proposals for zero TAC allowance and management measures based on the Norwegian model (including real-time monitoring and adaptive management) were considered and rejected as not being sufficient in moving towards achieving the ecosystem benefits a full closure would bring.[813]

403.6. A full closure moreover was recognised as providing a greater degree of protection, particularly where there is greater predator dependence and overlap, and thus a comparatively more effective means of achieving the UK's objectives.[814]

403.7. A full and therefore more protective closure is also more consistent with the precautionary approach to fisheries management enshrined in Heading Five generally and Article 494(3) specifically[815] (as well as being consistent with the UK's other international obligations[816]). This is particularly important in respect

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810 See paras. 106-108 above.

811 See paras. 373.3.2 and 380 above.

812 See para. 373.4 above.

813 Scottish Government response to the consultation analysis report, January 2024, **Exhibit R-0096** , pp. 3-4.

814 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 24.

815 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 24.

816 See paras. 58-86 above.

of the compounding effects of (i) the high sensitivity of sandeel to environmental variation, including the effects of climate change that are negatively affecting the North Sea, and thus the high interannual stock fluctuation; (ii) the need to support seabird recovery in light of declining breeding success and the recent impact of the avian flu; and (iii) the fact that the UK has not achieved GES for seabirds or the marine environment more generally.

403.8. Moreover, the UK Government concluded that: "[t]here are currently no known alternative management interventions that could produce the same potential beneficial effect as closing the sandeel fishery".[817] Similarly, the Scottish Government concluded that "the preferred option to close fishing for sandeel in all Scottish waters, is the most likely approach to achieve our aims, as the potential ecosystem benefits are expected to outweigh the negative impacts identified."[818]

404. Accordingly, on any view of the meaning of proportionality in Article 494(3)(f) of the TCA, both the English and the Scottish measures are not disproportionate.

3. No breach of the duty to decide "having regard to" "applying… non-discriminatory measures"

405. The EU pursues its case on the UK measures being non-discriminatory as a "subsidiary argument", claiming that the UK has acted inconsistently with Article 496(1) and Article 496(2), read together with Article 494(3)(f).[819] As explained at paragraph 362 above, a breach of Article 496(2) in respect of discrimination is not within the subject-matter of the dispute submitted to arbitration and thus is not before the Tribunal. The Tribunal should therefore confine itself to the EU's argument as to breach of Article 496(1) read with Article 494(3)(f).[820]

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817 As to the UK: Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 16; see also Letter from UK Minister of State for Food, Farming and Fisheries to Danish Minister for Food, Agriculture and Fisheries, 27 February 2024, **Exhibit R-0085**.

818 The Sandeel (Prohibition Of Fishing) (Scotland) Order 2024: Business and Regulatory Impact Assessment – final, January 2024, **Exhibit C-0066**, section 4.3 (p. 18).

819 EU submission, para. 757.

820 In any event, see para. 423 below.

406. All that the UK was obliged to do by Article 496(1) read with Article 494(3)(f) was to have "regard to" applying non-discriminatory measures, while preserving its regulatory autonomy. The evidence makes clear that the UK did so in respect of both the English and Scottish measures.

a. The English measure

407. The UK Government had regard to applying non-discriminatory measures in deciding on the English measure. The alleged discrimination of the proposed prohibition was raised directly by the EU and the Denmark in their responses to Defra's consultation and correspondence with the UK Government,[821] which was noted in the Ministerial submission of 14 September 2023.[822] In light of these concerns, the Ministerial submission of 14 September 2023 specifically considered the EU position and stated: "We consider that the proposed measures are not discriminatory towards the EU as these measures will apply equally to all vessels operating in English waters of the North Sea nor contravene any access or other obligations in the TCA."[823]

408. The UK Government therefore not only had regard to whether the English measure was *de jure* discriminatory but went further than was required by Article 496(1) of the TCA read with Article 494(3)(f) and concluded that it was not.

409. As to *de facto* discrimination, the UK Government recognised the differential impact of the proposed prohibition on EU and particularly Danish vessels and interests at all stages of decision-making in respect of the English measure, but considered that the measure pursued a legitimate objective. This included the following treatment of differential impact:

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821 Letter from Danish Minister for Food, Agriculture and Fisheries to UK Minister of State for Food, Farming and Fisheries, 25 May 2023, **Exhibit R-0124**; Response from the Ministry of Food, Agriculture and Fisheries of Denmark to the Consultation on Spatial Management Measures for Industrial Sandeel Fishing, 26 May 2023, **Exhibit R-0078**; Letter of Directorate-General for Maritime Affairs and Fisheries of the European Commission to Defra in response to the English sandeel consultation, of 30 May 2023, **Exhibit C-0055**. The consultation responses were expressly stated to have been taken into account when the UK Government announced the closure: Defra, Consultation outcome, Government response, updated 31 January 2024, **Exhibit R-0087** ("The UK government has considered … the responses to our consultation about potential measures").

822 Ministerial submission of 14 September 2023, **Exhibit R-0077**, paras. 21 and 27.

823 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 27.

409.1. the UK Government's summary of responses to the 2021 call for evidence, which summarised responses addressing the "high economic value to some EU nations who rely on access to UK waters to support fishmeal and fishoil industries" and the comparative "little economic value to the UK";[824]

409.2. the 2023 DMA that was published alongside the consultation document, which contained a detailed comparative assessment of the monetary and non-monetary differential impacts on EU and UK vessels and interests, including an annex on the "Non-UK impacts" of a total closure with a "worst-case scenario" economic impact assessment for EU vessels, the Danish fishmeal and fish oil industry and related job losses;[825]

409.3. the 15 February 2023 Ministerial submission on whether to engage in public consultations on the proposed closure, which summarised the differential impact analysed in the DMA;[826]

409.4. the March 2023 consultation document in respect of the proposed English closure, which summarised the comparative impacts on UK and EU business;[827]

409.5. consultation responses from and correspondence with the EU and Denmark, which emphasised and provided data on the monetary and non-monetary impacts of a closure of English waters on EU vessels, industry and interests;[828]

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824 Call for Evidence Outcome, Summary of Responses, updated 18 March 2022, **Exhibit R-0071**.

825 De Minimis Assessment (DMA) For Self-Certified Measures in Defra regarding Consultation on Spatial Management Measures for Industrial Sandeel Fishing, **Exhibit C-0044**, p. 22 and see also pp. 3-4 and 11-17 (the date of the DMA is incorrectly given as "01/02/22", it should be "01/02/23").

826 Ministerial submission of 15 February 2023, **Exhibit R-0074**, paras. 18-19 and 22.

827 Defra, Consultation on Spatial Management Measures for Industrial Sandeel Fishing - Consulting on management measures for industrial sandeel fishing in English waters of the North Sea, March 2023, **Exhibit R-0061**, p. 7.

828 Letter of Directorate-General for Maritime Affairs and Fisheries of the European Commission to DEFRA in response to the English sandeel consultation, of 30 May 2023, **Exhibit C-0055**; Response from the Ministry of Food, Agriculture and Fisheries of Denmark to the Consultation on Spatial Management Measures for Industrial Sandeel Fishing, 26 May 2023, **Exhibit R-0078**; Letter from Danish Minister for Food, Agriculture and Fisheries to UK Minister of State for Food, Farming and Fisheries, 25 May 2023, **Exhibit R-0124**.

409.6. discussions between UK and Danish officials on 19 September 2023 at which Danish economic and social interests were emphasised;[829]

409.7. the 14 September 2023 Ministerial submission on whether to approve the sandeel fishing prohibition, which addressed in detail the differential impacts of the proposed closure on UK and EU vessels (Danish, Swedish and German), related industries and interests,[830] including noting that Danish vessels would be "most affected by a prohibition";[831] and

409.8. the Government response to the consultation, announcing the decision to close sandeel fishing in English waters of the North Sea, which "acknowledge[d] the responses from some stakeholders who will be directly affected by a prohibition and recognise the impact it could have on their businesses".[832]

410. Notwithstanding this differential "large negative impact on industry" of the EU, the UK Government in deciding on the English measure stated that "our view remains that a closure would be a proportional measure in terms of the effectiveness of this measure and delivery of Good Environmental Status for Seabirds and Marine food webs".[833]

411. Regard was therefore clearly had to applying non-discriminatory measures in respect of the English measure.

b. The Scottish measure

412. The Scottish Government similarly had regard to applying non-discriminatory measures. The alleged discrimination of the proposed prohibition was raised directly by the EU and Denmark in their responses to Defra's consultation and correspondence with the UK

829 See para. 157 above; Letter from UK Minister of State for Food, Farming and Fisheries to Danish Minister for Food, Agriculture and Fisheries, 19 October 2023, **Exhibit R-0082**.

830 Ministerial submission of 14 September 2023, **Exhibit R-0077**, pp. 4-6.

831 See e.g. Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 19.

832 Defra, Consultation outcome, Government response, updated 31 January 2024, **Exhibit R-0087**.

833 Ministerial submission of 14 September 2023, **Exhibit R-0077**, para. 24.

Government,[834] which was noted in the Ministerial submission of 26 January 2024.[835] In light of these concerns, the Ministerial submission stated: "our decision to close fishing for sandeel in Scottish waters is not discriminatory as it applies to Scottish, UK and EU vessels alike and therefore is in line with this provision of the TCA".[836]

413. The Scottish Government therefore not only had regard to whether the Scottish measure was *de jure* discriminatory but went further than was required by Article 496(1) of the TCA read with Article 494(3)(f) and concluded that it was not.

414. As to *de facto* discrimination, the Scottish Government recognised the differential impact of the proposed prohibition on EU and particularly Danish vessels and interests at all stages of decision-making in respect of the Scottish measure, but considered that the measure pursued a legitimate objective. This included the following treatment of differential impact:

414.1. the 6 February 2023 Ministerial submission on whether to engage in public consultations in relation to a potential closure of Scottish waters to sandeel fishing, which recognised that "the primary impact of any closure would be on Danish vessels, which hold 96% of the EU sandeel quota";[837]

414.2. the July 2023 consultation document in respect of the proposed Scottish closure, which noted that the "EU catching sector is expected to be most affected by any management measures … with Scottish businesses anticipated to be impacted minimally";[838]

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834 Letter from Danish Minister for Food, Agriculture and Fisheries to UK Minister of State for Food, Farming and Fisheries, 25 May 2023, **Exhibit R-0124**; Response from the Ministry of Food, Agriculture and Fisheries of Denmark to the Consultation on Spatial Management Measures for Industrial Sandeel Fishing, 26 May 2023, **Exhibit R-0078**; Letter of Directorate-General for Maritime Affairs and Fisheries of the European Commission to Defra in response to the English sandeel consultation, of 30 May 2023, **Exhibit C-0055**. The consultation responses were expressly stated to have been taken into account when the UK Government announced the closure: Defra, Consultation outcome, Government response, updated 31 January 2024, **Exhibit R-0087** ("The UK government has considered … the responses to our consultation about potential measures").

835 Ministerial submission of 26 January 2024, **Exhibit R-0098**, Annex F (pp. 15-16).

836 Ministerial submission of 26 January 2024, **Exhibit R-0098**, Annex F (p. 16).

837 Ministerial submission of 6 February 2024, **Exhibit R-0091**, p. 16.

838 Consultation on proposals to close fishing for sandeel in all Scottish waters, July 2023, **Exhibit C-0049**, p. 23.

414.3. the July 2023 Partial BRIA that accompanied the Scottish consultation, which examined in detail the comparative monetary and non-monetary impact of the proposed closure on the EU and UK sandeel fishery and related industry and economic interests;[839]

414.4. consultation responses from and correspondence with the EU and Denmark, which emphasised and provided data on the monetary and non-monetary impacts of a closure of Scottish waters to sandeel fishing on EU vessels, industry and interests;[840]

414.5. the 26 January 2024 Ministerial submission on whether to approve the prohibition of sandeel fishing in all Scottish waters, which addressed in detail the differential impacts of the proposed closure on UK and EU vessels, in particular the "potential for adverse economic consequences, particularly for European and Scottish finfish producers who rely on sandeel for fishmeal and fish oil, and on the Danish fisheries sector, who regularly fish for sandeel in Scottish waters";[841] and

414.6. the final BRIA annexed to the Ministerial submission of 26 January 2024 and published on 31 January 2024, which examined in detail the comparative monetary and non-monetary impact of the proposed closure on EU and UK vessels, industries and interests. It recognised that "EU vessels will face the largest cost of a closure as they catch the vast majority of the sandeel which is caught in Scottish waters. The vessels are primarily Danish, or other EU vessels."[842]

415. Notwithstanding this differential impact on EU vessels and interests, the Scottish Government concluded that the proposed closure "is appropriate and proportionate given the current evidence base and the precautionary principle, which we consider remains

839 Partial Business and Regulatory Impact Assessment, July 2023, **Exhibit C-0051**, pp. 6-7 and 12-14.

840 European Commission letter of 1 August 2023, **Exhibit C-0057**; Letter from Danish Minister for Food, Agriculture and Fisheries to Scottish Cabinet Secretary for Rural Affairs, Land Reform and Islands, 9 October 2023, **Exhibit R-0097**.

841 Ministerial submission of 26 January 2024, **Exhibit R-0098**, Annex E.

842 Final Business and Regulatory Impact Assessment, 31 January 2024, **Exhibit C-0066**, sections 6.1.2, and see generally sections 2.1.2, 2.1.3, 4.4, 5 and 6.

aligned with the TCA".[843] Regard was therefore clearly had to applying non-discriminatory measures in respect of the Scottish measure.

416. There is accordingly no breach of the obligation to have "regard to" applying "non-discriminatory measures" in connection with the adoption of either the English or Scottish measures.

4. No obligation for the measures to be non-discriminatory, but in any event they are non-discriminatory

417. It was explained above that the UK Government and Scottish Government each individually had regard to "applying non-discriminatory measures … while preserving the regulatory autonomy of the Parties", which suffices to discharge the UK's duty under Article 496(1) read in light of Article 494(3)(f) as regards non-discrimination.

418. In any event, neither of the English measure or the Scottish measure are discriminatory. The EU accepts that the measures are not *de jure* discriminatory.[844] It implies,[845] however, that they are *de facto* discriminatory because, although the measures have legitimate regulatory objectives (which the EU accepts[846]), their differential impacts do not stem exclusively from pursuit of those objectives.[847]

419. As set out above, the UK's position is that a measure which produces differential impacts will not be discriminatory for the purpose of Article 494(3)(f) if the measure pursues a legitimate regulatory objective.[848] The English and Scottish measures both pursue a legitimate regulatory objective (which, as noted above, the EU accepts) of increasing sandeel populations and resilience for the benefit of the North Sea ecosystem, in particular various predators of sandeel.[849] The differential effect arises because the TAC

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843 Ministerial submission of 26 January 2024, **Exhibit R-0098** para. 9.

844 EU submission, para. 758.

845 Curiously (and perhaps indicative of its lack of conviction in its own position), the EU poses the question as "whether this differential impact is linked exclusively to its pursuit of the legitimate regulatory objective" and then makes three "observations" thereon, without actually positing that the measures are *de facto* discriminatory for the reasons given in its observations. See EU submission, paras. 761-763.

846 EU submission, paras. 692, 694 and 698-700 and see the reference in para. 763 to "the legitimate regulatory objective of marine conservation and sustainable fisheries exploitation.

847 EU submission, para. 763.

848 See para. 356.3 above.

849 For the English measure, see para.189 above. For the Scottish measure see para. 191-192 above.

for sandeel is allocated almost entirely to EU vessels, not because of anything inherent in the measure, which applies to all vessels. In circumstances where that is an effect of a measure with a legitimate non-discriminatory objective, there is no prohibited discrimination.

420. In this regard, the EU accepts that existing and extended spatial prohibitions on sandeel fishing in the North Sea would be justified by a legitimate regulatory objective, and — presumably — for that reason, would be non-discriminatory, even though *any* such measure would have differential impacts as regards UK and EU vessels of the same ratio as the full prohibition imposed by the UK. The EU has not explained how the same disproportion is non-discriminatory for prohibitions in specific waters but becomes discriminatory when applied to all UK waters in the Noth Sea.

421. For the above reasons, it follows that the measures are not discriminatory.

422. However, even if one were to accept the EU's position that any differential impact must stem exclusively from the legitimate regulatory objective, the EU has not come close to demonstrating that the differential impact was based even in part on something other than a legitimate regulatory objective. It has done no more than impliedly[850] speculate that the UK may have adopted the measures with the intention of differentially affecting EU vessels. In this respect it makes three observations at paragraph 763 of its submission, none of which assists it, for the following reasons.

    422.1. First, the EU notes that other fish are also consumed by seabirds, including Norway pout, sprat and herring. It is not clear where this observation goes. The need for protections for sandeel in particular is clear and well-established and justified in its own right, as explained in paragraphs 108-110 and 392 above. The UK is considering ecosystem-based management approaches for other fisheries also,[851] but that separate possibility is not strictly relevant to the lawfulness of the prohibition on sandeel fishing.

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850 See footnote 845 above.

851 See Report: The importance of sprat to the wider marine ecosystem in the North Sea and English Channel (ICES Subarea 4 and Divisions 7.d–e), 28 March 2024, **Exhibit R-0128**. See also Call for Evidence on future management of Sandeels and Norway pout published by the UK Fisheries Administrations on 22 October 2021, **Exhibit C-0043**, which included a call for evidence on Norway pout and noted that the

422.2. Second, the EU states that the UK provided "no explanation … as to the policy choice to address the legitimate regulatory objective of marine conservation and fisheries management commencing with a fish stock in respect of which the shares in the TCA have been attributed to such a significant proportion to one Party". However, as stated above, protecting sandeel is ecologically justified in its own right.[852] The proportion in which the share of the fishery is divided between the UK and the EU is irrelevant to that justification. In any event, it may be noted that the EU has a significantly higher proportion of the TAC allocation for many of the stocks listed in Annexes 35-36, including each of the three singled out by the EU (Norway pout (North Sea): 77% for the EU and 23% for the UK; sprat (North Sea): 96.18% for the EU and 3.82% for the UK); and herring (North Sea): 68.41% for the EU and 31.59% for the UK, all for 2024).[853] The focus on sandeel does not derive from the significance of the EU's share of the catch and there is no evidence to suggest any such connection. It derives from the particular, and well-evidenced, significance of sandeel in the North Sea ecosystem.

422.3. Third, the EU reiterates in general terms the "relevan[ce]" to this argument of factors relied upon in its argument about proportionality, including the alleged "absence of proper consideration of the economic and social impacts …".[854] However, as is set out above, the UK and Scottish authorities clearly had regard to relevant factors, including economic and social impacts, and the fact that the UK had taken domestic action prior to extending the prohibition to all vessels by not allocating the UK's quota to vessels since 2021.[855]

UK had not allocated UK quota for Norway pout for 2021 (see p. 1). The UK has continued not to allocate Norway pout quota since then, which is evident from the annual apportions and allocation data published by the MMO (available at: https://www.gov.uk/government/statistical-data-sets/fishing-quota-allocations-for-england-and-the-uk).

852 In this regard, the EU supported the closure of Sandeel Area 4 in 2000, and it was initially adopted under EU regulations. See EU submission, para 84 and paragraph 129 above.

853 TCA, Annexes 35-36. There are also herring allocations for "North Sea bycatch" with 98.18% for the EU and 1.82% for the UK, and "Southern North Sea and English Channel" with 87.87% for the EU and 12.13% for the UK, both in 2024.

854 EU submission, para. 763. The EU also refers to "the significant degree of impairment of the rights of full access to waters to fish in the adjustment period established by Annex 38 TCA" but as explained at paragraphs 424-425 below, there is no impairment of the right of access where that right is itself subject to the ability of a Party to adopt measures pursuant to and in accordance with Article 496.

855 See paras. 372 and 396 above.

423. The same conclusion would be reached if an argument were properly before the Tribunal that Article 496(2) were breached by reason of the measures being *de facto* discriminatory (which is not, for the reasons outlined in paragraph 362).

F. THE EU'S CLAIM 3: THE UK HAS NOT BREACHED ARTICLE 2(1)(A) OF ANNEX 38 OF THE TCA

424. The EU's third claim is a wholly derivative one: as the EU puts it, it is "consequential on its claims under Article 496 of the TCA, read together with Article 494 of the TCA."[856] For the reasons given above, there is no breach of Article 496(1) read with Article 494(3)(c) or (f), and no breach of Article 496(2). There is accordingly no breach of Article 2(1)(a) of Annex 38 of the TCA.

425. For completeness, the UK agrees with the EU's framing of its Claim 3 as consequential.

425.1. Annex 38 establishes a temporary regime on access to the waters of the UK and the EU for an "adjustment period" beginning on 1 January 2021 and ending on 30 June 2026.[857] During the adjustment period, the temporary access regime requires the Parties to grant "full access" to each other's vessels to fish the stocks listed in Annex 35, which include sandeel, "at a level that is reasonably commensurate with the Parties' respective shares of the fishing opportunities".[858]

425.2. This is by way of derogation from the general access regime provided for in Article 500(1), (3), (4), (5), (6) and (7).[859]

425.3. Annex 38 does not, however, derogate from Article 500(2), which contemplates agreement on, among other things, conservation measures that restrict access to the waters of the UK or EU.[860] This part of Article 500(2) is itself "without prejudice to Article 496",[861] which permits a Party to decide on "any measures

856 EU submission, para. 772, see also para. 781.

857 TCA, Article 1 of Annex 38.

858 TCA, Article 2(1)(a) of Annex 38.

859 TCA, Article 2(1) of Annex 38, and Article 500(8).

860 TCA, Article 500(2) ("may agree … further specific access conditions relating to … (c) any technical and conservation measures agreed by the Parties, without prejudice to Article 496").

861 TCA, Article 500(2).

applicable to its waters" in pursuit of the objectives set out in Articles 494(1) and (2) and having regard to the principles agreed to in Article 494(3). Thus, during the adjustment period, the Parties may choose to agree on conservation measures that restrict access to their waters, but that is without prejudice to the regulatory freedom that they have to decide on fisheries management measures in accordance with Article 496. The EU agrees that each Party has the right to decide on measures in respect of its own waters that are consistent with Article 496 during the adjustment period.[862]

425.4. The preamble to Annex 38, affirming the "sovereign rights and obligations of independent coastal States exercised by the Parties", supports the position that the obligation to grant access does not restrict the right of the Parties to adopt conservation and management measures in accordance with Articles 496 and 494.

425.5. This position is also consistent with the object and purpose of the TCA which, as explained above at paragraphs 325-326, involves giving expression to each Party's regulatory autonomy, including in respect of measures to protect the environment and conserve the living resources in its waters.

426. The UK notes that, at paragraph 733 of the EU's submission, in its arguments on Claim 2 (not Claim 3), the EU contends that the "the right to decide on fisheries management measures must be reconciled with the commitments of the Parties to grant 'full access to its waters to fish'". It is clear from the EU's framing of its Claim 3 as consequential, and from the above analysis of the relevant TCA provisions, that the manner in which the rights are reconciled is through compliance with Article 496. This ensures that any fisheries management measures adopted by one Party that restrict access to its waters are decided on in pursuit of the objectives in Article 494(1)-(2) and having regard to the principles in Article 494(3). It follows that the subsequent assertion in paragraph 733 of the EU's submission that the right of EU vessels to access UK waters has been impaired because the "rights of access that exist in consequence of the sandeel fishing prohibition are the diametric opposite of the right provided for in Article 2(1)(a) of Annex 38 TCA", is no more than a reference to the EU's position that Article 2(1)(a) of Annex 38 has been breached <u>because</u> there is a breach of Article 496(1) and/or (2) read with Article 494(3).

862 EU submission, paras. 379-381 and 390.

That is wrong for the reasons explained at paragraphs 424-425 above. Moreover, the situation is not the "diametric opposite" of the right to access; EU vessels retain the right to access UK waters to fish, but, like UK vessels, not for sandeel.

427. The UK also notes that, at paragraph 391 of its submission, in a background section on the applicable legal framework, the EU posits that:

> [I]n the context of the application of Annex 38 TCA, any impairment to or restriction on the right of 'full access to waters to fish' should be extraordinary given the rationale for the adjustment period. Hence a particularly high degree of scrutiny over the reliance on such measures is warranted and particular regard should be had to the impairment of the rationale of Annex 38 which was precisely to maintain stability and thereby confer economic and social benefits.

428. The UK has two observations on this.

428.1. First, the UK does not accept that the arrangements in Annex 38 imply any higher threshold or criterion additional to Article 496 that fisheries management measures must meet in order to be TCA compliant. The question before the Tribunal is whether the UK has breached Article 496, read with Article 494(3)(c) and (f). As noted above at paragraph 425, Annex 38 is subject to these Articles. Their requirements are not altered by Annex 38 and Annex 38 does not require the Tribunal to apply "particular scrutiny" in assessing the consistency of any fisheries management measure with Article 496.[863] Annex 38 governs certain questions as to basic rights of access to waters for an initial period, in advance of further negotiations. It does not make "social and economic benefits" an overriding priority, or otherwise operate effectively to prevent the coastal State from taking action to conserve and manage its living resources and protect marine ecosystems (as is permitted under Article 496) for a period of five and a half years[864]. The UK notes again in this regard that the EU repeatedly acknowledges that it attaches "significant importance" and "considerable importance" to

863 EU submission, para. 776. See also EU submission, para. 739 ("should not be lightly impaired given the rationale in the adjustment period").

864 The adjustment period from 1 January 2021 to 30 June 2026 is five and a half years: TCA, Article 1 of Annex 38. See also paragraph 95 above as regards the high sensitivity of sandeels to environmental variability and the consequent high level of fluctuation of stocks from year to year, which militates against the Parties having limited their regulatory freedom to conserve and manage such stocks for such a long period as five and a half years.

"marine conservation and the sustainable exploitation of fisheries resources".[865] The EU rightly does not suggest that there should be a limitation on pursuing measures in support of those goals in the adjustment period, provided they comply with Article 496, read with Article 494.

428.2. Second, the EU makes no argument of breach of Article 2(1)(a) of Annex 38 on the basis that the reasons for the prohibitions on sandeel fishing are not sufficiently "extraordinary". Its Claim 3 is wholly consequential, consistent with the proper interpretation of the TCA as preserving the Parties' regulatory autonomy to decide on fisheries management measures that limit access to their waters so long as they are not in breach of Article 496, read with Article 494.[866]

429. Accordingly, a measure that is not in breach of Article 496 read together with Article 494 will not breach Article 2(1)(a) of Annex 38. The EU's third claim therefore adds nothing to its first and second claims, as its framing rightly recognises.

865 EU submission, paras. 691 and 774. See also para. 389 referring to "very important considerations of marine conservation".

866 See EU submission, para. 390: "The only circumstances in which a Party may derogate from its obligation to grant 'full access to waters to fish' in reliance on the legitimate objectives of marine conservation, fisheries management as defined and expanded upon in Article 494 TCA is where it adopts measures that are consistent with the requirements under Article 496 TCA".

IX. RULING SOUGHT

430. For the reasons given above, the UK respectfully requests the Tribunal to dismiss each of the EU's three claims.

Alex Cooke
Steven Fuller
Agents of the United Kingdom

LIST OF EXHIBITS

Exhibit No.	Description
Exhibit R-0001	A Green Future: Our 25 Year Plan to Improve the Environment (2018)
Exhibit R-0002	Marine Strategy Part One: UK Initial Assessment and Good Environmental Status, December 2012
Exhibit R-0003	Communication from the Commission to the European Parliament and the Council of 21 February 2023: The common fisheries policy today and tomorrow: a Fisheries and Oceans Pact towards sustainable, science-based, innovative and inclusive fisheries management, COM(2023) 103 final
Exhibit R-0004	European Commission, Commission launches consultation on the common fisheries policy, 20 June 2024
Exhibit R-0005	Joint Fisheries Statement (Defra, Welsh Government, Scottish Government, DAERA), November 2022
Exhibit R-0006	Environmental Improvement Plan 2023 First revision of the 25 Year Environment Plan (Defra), 2023
Exhibit R-0007	Defra, Environment Bill 2020 Policy Statement, 30 January 2020
Exhibit R-0008	Marine Scotland Assessment 2020, Case Study: Sandeels in Scottish waters
Exhibit R-0009	Scotland's Fisheries Management Strategy 2020 – 2030
Exhibit R-0010	Régnier et al. (2017) Importance of trophic mismatch in a winter-hatching species: evidence from lesser sandeel. Mar. Ecol. Prog. Ser. 567: 185-19
Exhibit R-0011	Henriksen et al. (2021a) Temperature and body size affect recruitment and survival of sandeel across the North Sea. ICES J. Mar. Sci. 78: 1409-1420
Exhibit R-0012	Wright et al. (2000) The influence of sediment type on the distribution of the Lesser Sandeel, Ammodytes marinus. J. Sea Res. 44: 243-256
Exhibit R-0013	Holland et al. (2005) Identifying sandeel Ammodytes marinus sediment habitat preferences in the marine environment. Mar. Ecol. Prog. Ser. 303: 269-282
Exhibit R-0014	Tien et al. (2017) Burrow distribution of three sandeel species relates to beam trawl fishing, sediment composition and water velocity, in Dutch coastal waters. J. Sea Res. 127: 194-202
Exhibit R-0015	Langton et al. (2021) A verified distribution model for the lesser sandeel Ammodytes marinus. Mar. Ecol. Prog. Ser. 667: 145-159
Exhibit R-0016	[*Intentionally left blank*]

Exhibit R-0017	Gauld. (1990) Movements of lesser sandeels (Ammodytes marinus Raitt) tagged in the northwestern North Sea. Journal du Conseil. 46(3): 229-231
Exhibit R-0018	Wright et al. (2019) Integrating the scale of population processes into fisheries management, as illustrated in the sandeel, Ammodytes marinus. ICES J. Mar. Sci. 76: 1453-1463
Exhibit R-0019	Wright et al. (2017a) Impact of rising temperature on reproductive investment in a capital breeder: The lesser sandeel. J. Exp. Mar. Biol. Ecol. 486: 52-58
Exhibit R-0020	Wright et al. (2017b) Warming delays ovarian development in a capital breeder. Mar. Biol. 164(80): 1-9
Exhibit R-0021	Gibb et al. (2017) Connectivity in the early life history of sandeel inferred from otolith microchemistry. J. Sea Res. 119: 8-16
Exhibit R-0022	Johannessen et al. (2015) Demographically disconnected subpopulations in lesser sandeel (Ammodytes marinus) as basis of a high resolution spatial management system. ICES CM. 2015/E
Exhibit R-0023	Clausen et al. (2018) Shifts in North Sea forage fish productivity and potential fisheries yield. J. App. Ecol. 55: 1092-1101
Exhibit R-0024	van Deurs et al. (2011) Critical threshold size for overwintering sandeel (Ammodytes marinus). Mar. Biol. 158: 2755-2764
Exhibit R-0025	Regnier et al. (2018) Temperature effects on egg development and larval condition in the lesser sandeel, Ammodytes marinus. J. Sea Res. 134: 34-41
Exhibit R-0026	Wright & Bailey. (1996) Time of hatching in Ammodytes marinus from Shetland waters and its significance to early growth and survivorship. Mar. Biol. 126: 143-152
Exhibit R-0027	Poloczanska et al. (2004) Fishing vs. natural recruitment variation in sandeel as a cause of seabird breeding failure at Shetland: a modelling approach. ICES J. Mar. Sci. 61: 788-797
Exhibit R-0028	Mitchell et al. (2004) Seabird Populations of Britain and Ireland (JNCC)
Exhibit R-0029	Dunn. (2021) Revive our Seas: The case for stronger regulation of sandeel fisheries in UK waters (RSPB)
Exhibit R-0030	OSPAR, Status Assessment 2023 – Black-legged Kittiwake
Exhibit R-0031	IUCN Red List, Atlantic Puffin, 2018
Exhibit R-0032	OSPAR, Quality Status Report (2023), Marine Birds Thematic Assessment
Exhibit R-0033	Stanbury et al. (2024) The status of the UK's breeding seabirds: An Addendum to the fifth Birds of Conservation Concern in the United

	Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds. 117: 471-487
Exhibit R-0034	Frederiksen et al. (2004) The role of industrial fisheries and oceanographic change in the decline of North Sea black-legged kittiwakes. J. App. Ecol. 41(6): 1129-1139
Exhibit R-0035	Furness & Tasker. (2000) Seabird-fishery interactions: quantifying the sensitivity of seabirds to reductions in sandeel abundance, and identification of key areas for sensitive seabirds in the North Sea. Mar. Ecol. Prog. Ser. 202: 253-264
Exhibit R-0036	Oro & Furness. (2002) Influences of food availability and predation on survival of kittiwakes. Ecol. 83(9): 2516-2528
Exhibit R-0037	Frederiksen et al. (2008) Differential effects of a local industrial sand lance fishery on seabird breeding performance. J. Ecol. App. 18(3): 701-710
Exhibit R-0038	Daunt et al. (2008) The impact of the sandeel fishery closure on seabird food consumption, distribution, and productivity in the northwestern North Sea. Can. J. Fish. & Aq. Sci. 65(3): 362-381
Exhibit R-0039	Rindorf et al. (2000) Effects of changes in sandeel availability on the reproductive output of seabirds. Mar. Ecol. Prog. Ser. 202: 241-252
Exhibit R-0040	Searle et al. (2023) Effects of a fishery closure and prey abundance on seabird diet and breeding success: Implications for strategic fisheries management and seabird conservation. Biol. Conserv. 281: 1-15
Exhibit R-0041	Natural Environment Research Council Special Committee on Seals, Scientific Advice on Matters Related to the Management of Seal Populations, 2022
Exhibit R-0042	OSPAR, Quality Status Report (2023), Marine Mammals Thematic Assessment
Exhibit R-0043	Hammond et al. (1994) The diet of grey seals around Orkney and other island and mainland sites in north-eastern Scotland. J. App. Ecol. 31(2): 340-350
Exhibit R-0044	Thompson et al. (1996) Comparative distribution, movements and diet of harbour and grey seals from Moray Firth, NE Scotland. J. App. Ecol. 33: 1572-1584
Exhibit R-0045	Wilson & Hammond. (2019) The diet of harbour and grey seals around Britain: Examining the role of prey as a potential cause of harbour seal declines. Aquatic Conserv. Mar. Freshw. Ecosyst. 29(51): 71-85
Exhibit R-0046	Smout et al. (2020) Environment-sensitive mass changes influence breeding frequency in a capital breeding marine top predator. J. App. Ecol. 89(2): 384-396

Exhibit R-0047	Santos & Pierce. (2003) The diet of harbour porpoise (Phocoena phocoena) in the northeast Atlantic. Oceanography Mar. Biol. Ann. Rev. 41. 355-390
Exhibit R-0048	Santos et al. (2004) Variability in the diet of harbor porpoises (Phocoena phocoena) in Scottish waters 1992–2003. Mar. Mam. Sci. 20:1-27
Exhibit R-0049	MacLeod et al. (2007) Linking sandeel consumption and the likelihood of starvation in harbour porpoises in the Scottish North Sea: could climate change mean more starving porpoises? Biology letters 3(2): 185-188
Exhibit R-0050	Pierce et al. (2004) Diet of minke whales Balaenoptera acutorostrata in Scottish (UK) waters with notes on strandings of this species in Scotland 1992–2002. J. Mar. Biol. Assoc. UK. 84(06):1241-1244
Exhibit R-0051	Olsen & Holst. (2001) A note on common minke whale (Balaenoptera acutorostrata) diets in the Norwegian Sea and the North Sea. J. Cetacean Res. Mgmt. 3(2): 179-184
Exhibit R-0052	Windsland et al. (2007) Relative abundance and size composition of prey in the common minke whale diet in selected areas of the northeastern Atlantic during 2000-04. J. Cetacean Res. Mgmt. 9(3): 167-178
Exhibit R-0053	de Boer. (2010) Spring distribution and density of minke whale Balaenoptera acutorostrata along an offshore bank in the central North Sea. Mar. Ecol. Prog. Ser. 408: 265-274
Exhibit R-0054	Engelhard et al. (2013) Body condition of predatory fishes linked to the availability of sandeels. Mar. Biol. 160(2): 299-308
Exhibit R-0055	Trenkel et al. (2005) Spatial and temporal structure of predator–prey relationships in the Celtic Sea fish community. Mar. Ecol. Prog. Ser. 299: 257-268
Exhibit R-0056	Pinnegar et al. (2003) Does diet in Celtic Sea fishes reflect prey availability? J. Fish. Biol. 63: 197-212
Exhibit R-0057	Engelhard et al. (2008) Fishing mortality versus natural predation on diurnally migrating sandeel Ammodytes marinus. Mar. Ecol. Prog. Ser. 369: 213-277
Exhibit R-0058	Mackinson. (2007) Multi-species fisheries management: a comprehensive impact assessment of the sandeel fishery along the English east coast (Cefas report for Defra)
Exhibit R-0059	Rindorf et al. (2008) Growth, temperature, and density relationships of North Sea cod (Gadus morhua). Can. J. Fish. & Aq. Sci. 65(3): 456-470
Exhibit R-0060	van Deurs et al. (2009) Recruitment of lesser sandeel Ammodytes marinus in relation to density dependence and zooplankton composition. Mar. Ecol. Prog. Ser. 381: 249-258

Exhibit R-0061	Defra, Consultation on Spatial Management Measures for Industrial Sandeel Fishing - Consulting on management measures for industrial sandeel fishing in English waters of the North Sea, March 2023
Exhibit R-0062	Seafish, Demersal Trawl – General
Exhibit R-0063	Spence et al. (2023) EcoEnsemble: A general framework for combining ecosystem models in R, R. Methods in Ecology and Evolution. 14: 2011–2018
Exhibit R-0064	Christensen et al. (2008), Sandeel (Ammodytes marinus) larval transport patterns in the North Sea from an individual-based hydrodynamic egg and larval model. Can. J. Fish Aquat. Sci. 65: 1498-1511
Exhibit R-0065	ICES Sandeel Advice for SA1r, 2020
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Exhibit R-0073	UK Fisheries Science Advisory Panel: Advice Output Sheet, 8 November 2022
Exhibit R-0074	Ministerial submission of 15 February 2023
Exhibit R-0075	Defra, Summary of responses to Consultation on Spatial Management Measures for Industrial Sandeel Fishing, updated 31 January 2024
Exhibit R-0076	Natural England, Cefas and JNCC, Summary review of the evidence presented by respondents to the consultation to prohibit industrial fishing in UK waters
Exhibit R-0077	Ministerial submission of 14 September 2023
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Exhibit R-0086	Supplementary note to sandeel submission: Sandeel management in English waters of the North Sea, 4 December 2023
Exhibit R-0087	Defra, Consultation outcome, Government response, updated 31 January 2024
Exhibit R-0088	Email from Defra to the MMO, 2 February 2024
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Exhibit R-0090	Oral Parliamentary Question, Willie Rennie, 9 June 2021, S6O-00016
Exhibit R-0091	Ministerial submission of 6 February 2023
Exhibit R-0092	Ministerial submission of 27 April 2023
Exhibit R-0093	Written Parliamentary Question, Ariane Burgess, 18 May 2023, S6W-18244
Exhibit R-0094	Ministerial submission of 28 June 2023
Exhibit R-0095	SEA Screening and Scoping Report, May 2023
Exhibit R-0096	Scottish Government response to the consultation analysis report, January 2024
Exhibit R-0097	Letter from Danish Minister for Food, Agriculture and Fisheries to Scottish Cabinet Secretary for Rural Affairs, Land Reform and Islands, 9 October 2023
Exhibit R-0098	Ministerial submission of 26 January 2024
Exhibit R-0099	Scottish Government, Strategic Environmental Assessment of proposals to close fishing for sandeel in all Scottish waters Post Adoption Statement, 26 April 2024

Exhibit R-0100	ICES, Advice on fishing opportunities, 23 April 2024
Exhibit R-0101	Gilles et al. 2016, Seasonal habitat-based density models for a marine top predator, the harbor porpoise, in a dynamic environment. Ecosphere 7 (6)
Exhibit R-0102	ICES catch advice for cod in Division 6.b, 30 June 2023
Exhibit R-0103	ICES Framework for Ecosystem-Informed Science and Advice (FEISA), March 2024
Exhibit R-0104	Fishbase, Food items reported for Ammodytes marinus
Exhibit R-0105	Cefas, Framework Document, 25 January 2023
Exhibit R-0106	JNCC, Framework Document, July 2022
Exhibit R-0107	Mackinson & Daskalov. (2007) An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep. No. 142 (Cefas)
Exhibit R-0108	Report of the Working Group on Multispecies Assessment Methods (WGSAM), 9-13 November 2015
Exhibit R-0109	Spence et al. (2018) A general framework for combining ecosystem models. Fish and Fisheries. 19(6): 1031-1042
Exhibit R-0110	Craig & Link. (2023) It is past time to use ecosystem models tactically to support ecosystem-based fisheries management: Case studies using Ecopath with Ecosim in an operational management context. Fish and Fisheries. 24(3): 1-26
Exhibit R-0111	[*Intentionally left blank*]
Exhibit R-0112	Furness. (2007) Responses of seabirds to depletion of food fish stocks. J. Ornith. 148(2): 247-252
Exhibit R-0113	RSPB, UK seabird colony counts in 2023 following the 2021-22 outbreak of Highly Pathogenic Avian Influenza, February 2024
Exhibit R-0114	NatureScot, Guidance Note 3: Guidance to support Offshore Wind Applications: Marine Birds – Identifying theoretical connectivity with breeding site Special Protection Areas using breeding season foraging ranges, 1 January 2023
Exhibit R-0115	Woodward et al. (2019). Desk-based revision of seabird foraging ranges used for HRA screening. BTO Research Report 724
Exhibit R-0116	Thaxter et al. (2013) Modelling the effects of prey size and distribution on prey capture rates of two sympatric marine predators. PLOS ONE. 8(11): 1-10

Exhibit R-0117	Merriam Webster Dictionary, “heed, v.”
Exhibit R-0118	Oxford English Dictionary, “heed, v.”
Exhibit R-0119	UK House of Commons, Parliamentary Briefing Paper No. 8923, The UK-EU future relationship: the March 2020 EU draft treaty and negotiations update, 27 May 2020
Exhibit R-0120	Draft text of the Agreement on the New Partnership with the United Kingdom, 18 March 2020
Exhibit R-0121	Draft Working Text for a Fisheries Framework Agreement Between the United Kingdom of Great Britain and Northern Ireland and the European Union, published 19 May 2020
Exhibit R-0122	Scotland's Fisheries Management Strategy 2020 – 2030, Annex A Rationale and Impact
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Exhibit R-0124	Letter from Danish Minister for Food, Agriculture and Fisheries to UK Minister of State for Food, Farming and Fisheries, 25 May 2023
Exhibit R-0125	Henriksen et al. (2021b) Get up early: Revealing behavioral responses of sandeel to ocean warming using commercial catch data. Ecology and Evolution. 11(23): 16786-16805
Exhibit R-0126	Régnier et al. (2019) Understanding temperature effects on recruitment in the context of trophic mismatch. Sci. Rep. 9: 15179
Exhibit R-0127	ICES Fish stomach contents dataset
Exhibit R-0128	Report: The importance of sprat to the wider marine ecosystem in the North Sea and English Channel (ICES Subarea 4 and Divisions 7.d–e), 28 March 2024
Exhibit R-0129	Fishbase, Lesser Sandeel
Exhibit R-0130	Fishbase, Norway Pout
Exhibit R-0131	van Deurs et al. (2013) Patchy zooplankton grazing and high energy conversion efficiency: Ecological implications of sandeel behavior and strategy. Mar. Ecol. Prog. Ser. 487: 123-133
Exhibit R-0132	Lahoz-Monfort et al. (2011) A capture–recapture model for exploring multi-species synchrony in survival. Methods in Ecology and Evolution, 2: 116-124

Exhibit R-0133	Ransijn et al. (2021) Integrating disparate datasets to model the functional response of a marine predator: A case study of harbour porpoises in the southern North Sea. Ecology and Evolution. 11(23): 17458-17470
Exhibit R-0134	12 February 2024 letter to Danish Minister
Exhibit R-0135	21 February 2024 letter to EU Commissioner
Exhibit R-0136	Nordquist (ed), United Nations Convention on the Law of the Sea 1982: A Commentary
Exhibit R-0137	Request for Advisory Opinion submitted by the Sub-Regional Fisheries Commission, Advisory Opinion, 2 April 2015, ITLOS Reports 2015
Exhibit R-0138	The Concise Oxford English Dictionary (12th edn), “scientific adj.”
Exhibit R-0139	The Concise Oxford English Dictionary (12th edn), “advice”
Exhibits R-0140 – R0293	Scientific papers referenced in the English Scientific Report (Annex I) and the Scottish Scientific Report (Annex II)

LIST OF LEGAL AUTHORITIES

Exhibit No.	Description
Exhibit RLA-0001	Scotland Act 1998
Exhibit RLA-0002	OSPAR Convention
Exhibit RLA-0003	OSPAR Commission, Ecosystem Approach
Exhibit RLA-0004	OSPAR Commission, Precautionary Principle
Exhibit RLA-0005	OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, Meeting of the OSPAR Commission, Bergen (20-24 September 2010), Bergen Statement
Exhibit RLA-0006	Strategy of the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic 2030
Exhibit RLA-0007	Convention on Biological Diversity
Exhibit RLA-0008	Conference of the Parties, Decision V/6 Ecosystem Approach
Exhibit RLA-0009	Kunming-Montreal Global Biodiversity Framework
Exhibit RLA-0010	Sunbeam Fishing Ltd v Secretary of State for Environment, Food and Rural Affairs [2023] CSOH 16; 2023 SLT 369
Exhibit RLA-0011	Appellate Body Report, Australia – Measures Affecting Importation of Salmon, WT/DS18/AB/R, adopted 6 November 1998, DSR 1998:VIII
Exhibit RLA-0012	Whaling in the Antarctic (Australia v. Japan: New Zealand intervening), Judgment, I.C.J. Reports 2014, p. 226
Exhibit RLA-0013	Natural Environment and Rural Communities Act 2006
Exhibit RLA-0014	Kennedy v Information Comr (SC(E)) [2014] UKSC 20 [2015] AC 455
Exhibit RLA-0015	Communication from the Commission on the precautionary principle (COM(2000))
Exhibit RLA-0016	Nuclear Tests (New Zealand v. France), Judgment, I.C.J. Reports 1974, p. 457
Exhibit RLA-0017	Bank Mellat v HM Treasury (No 2) [2014] AC 700
Exhibit RLA-0018	R (Lumsdon) v Legal Services Board [2015] UKSC 41; [2016] AC 697
Exhibit RLA-0019	Gabçikovo-Nagymaros Project (Hungary/Slovakia), Judgment, I.C.J. Reports 1997, p. 7

Exhibit RLA-0020	Oil Platforms (Islamic Republic of Iran v. United States of America), Judgment, I.C.J. Reports 2003, p. 161
Exhibit RLA-0021	Air Service Agreement of 27 March 1946 between the United States of America and France, (1978) XVIII RIAA 417
Exhibit RLA-0022	C-344/04, R(IATA) v Department for Transport, ECLI:EU:C:2006:10, 10 January 2006
Exhibit RLA-0023	C-128/15, Kingdom of Spain v Council of the EU, ECLI:EU:C:2017:3, 11 January 2017
Exhibit RLA-0024	C-611/17, Italian Republic v Council of the EU, ECLI:EU:C:2019:332, 30 April 2019
Exhibit RLA-0025	R (Rotherham MBC) v Business Secretary (SC(E)) [2015] UKSC 6 [2015] PTSR 322
Exhibit RLA-0026	Environmental Assessment (Scotland) Act 2005
Exhibit RLA-0027	Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (the SEA Directive)

ANNEX I: SCIENTIFIC PAPERS REFERENCED IN THE ENGLISH SCIENTIFIC REPORT

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
1	A. and Ruxton, G.D.	2002	Sandeel recruitment in the North Sea: demographic, climatic and trophic effects	Marine Ecology Progress Series	238	199-210	**Exhibit C-0020**
2	Bentley, J.W., Lundy, M.G., Howell, D., Beggs, S.E., Bundy, A., De Castro, F., Fox, C.J., Heymans, J.J., Lynam, C.P., Pedreschi, D., Schuchert, P., Serpetti, N., Woodlock, J., Reid, D.G.	2021	Refining fisheries advice with stock-specific ecosystem information	Frontiers in Marine Science	8	602072	**Exhibit R-0140**
3	Blanchard, J.L., Andersen, K.H., Scott, F., Hintzen, N.T., Piet, G., Jennings, S.	2014	Evaluating targets and trade-offs among fisheries and conservation objectives using a multispecies size spectrum model	Journal of Applied Ecology	51(3)	612-622	**Exhibit R-0141**
4	Boulcott, P., Wright, P.J.	2011	Variation in fecundity in the lesser sandeel: implications for regional management	Journal of the Marine Biological Association of the United Kingdom	91(6)	1273-1280	**Exhibit R-0142**
5	Buckley, L.J., Turner, S.I., Halavik, T.A., Smigielski, A.S., Drew, S.M., Laurence, G.C.	1984	Effects of temperature and food availability on growth, survival, and RNA-DNA ratio of larval sand lance (Ammodytes americanus)	Marine ecology progress series	15(1)	91-97	**Exhibit R-0143**
6	Campanella, F., van der Kooij, J.	2021	Spawning and nursery grounds of forage fish in Welsh and surroundings waters	Cefas Project Report for RSPB		65	**Exhibit R-0144**
7	Carroll, M.J., Bolton, M., Owen, E., Anderson, G.Q., Mackley, E.K., Dunn, E.K., Furness, R.W.	2017	Kittiwake breeding success in the southern North Sea correlates with prior sandeel fishing mortality	Aquatic Conservation: Marine and Freshwater Ecosystems	27(6)	1164-1175	**Exhibit R-0145**
8	Chagaris, D., Drew, K., Schueller, A., Cieri, M., Brito, J., Buchheister, A.	2020	Ecological reference points for Atlantic menhaden established using an ecosystem model of intermediate complexity	Frontiers in Marine Science	7	606417	**Exhibit R-0146**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
9	Christensen, V., Walters, C.J.	2004	Ecopath with Ecosim: methods, capabilities and limitations	Ecological modelling	172(2-4)	109-139	**Exhibit R-0147**
10	Cook, A.S., Dadam, D., Mitchell, I., Ross-Smith, V.H., Robinson, R.A.	2014	Indicators of seabird reproductive performance demonstrate the impact of commercial fisheries on seabird populations in the North Sea	Ecological indicators	38	01.nov	**Exhibit R-0147**
11	Daunt, F., Wanless, S., Greenstreet, S.P., Jensen, H., Hamer, K.C., Harris, M.P.	2008	The impact of the sandeel fishery closure on seabird food consumption, distribution, and productivity in the northwestern North Sea	Canadian journal of fisheries and aquatic sciences	65(3)	362-381	**Exhibit R-0148**
12	Dickey-Collas, M., Engelhard, G.H., Rindorf, A., Raab, K., Smout, S., Aarts, G., van Deurs, M., Brunel, T., Hoff, A., Lauerburg, R.A., Garthe, S.	2014	Ecosystem-based management objectives for the North Sea: riding the forage fish rollercoaster	ICES Journal of Marine Science	71(1)	128-142	**Exhibit R-0149**
13	Dunn, E.	2021	Revive our Seas: The case for stronger regulation of sandeel fisheries in UK waters	RSPB			**Exhibit R-0029**
14	Eddy, T.D., Coll, M., Fulton, E.A., Lotze, H.K.	2015	Trade-offs between invertebrate fisheries catches and ecosystem impacts in coastal New Zealand	ICES Journal of Marine Science	72		**Exhibit R-0150**
15	Eigaard, O.R., van Deurs, M., Behrens, J.W., Bekkevold, D., Brander, K., Plambech, M., Plet-Hansen, K.S. and Mosegaard, H.	2014	Prey or predator—expanding the food web role of sandeel Ammodytes marinus	Marine Ecology Progress Series	516	267-273	**Exhibit R-0151**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
16	Engelhard, G.H., Blanchard, J.L., Pinnegar, J.K., van der Kooij, J., Bell, E.D., Mackinson, S. and Righton, D.A.	2013	Body condition of predatory fishes linked to the availability of sandeels	Marine biology	160(2)	299-308	**Exhibit R-0054**
17	Engelhard, G.H., Peck, M.A., Rindorf, A., C. Smout, S., van Deurs, M., Raab, K., Andersen, K.H., Garthe, S., Lauerburg, R.A., Scott, F. and Brunel, T.	2014	Forage fish, their fisheries, and their predators: who drives whom?	ICES Journal of Marine Science	71(1)	90-104	**Exhibit C-0019**
18	Frederiksen, M. and Wanless, S.	2006	Assessment of the effects of the Firth of Forth sandeel fishery closure on breeding seabirds	PROTECT Work Package 5/Case Study 2			**Exhibit R-0152**
19	Frederiksen, M., Jensen, H., Daunt, F., Mavor, R.A. and Wanless, S.	2008	Differential effects of a local industrial sand lance fishery on seabird breeding performance	Ecological Applications	18(3)	701-710	**Exhibit R-0037**
20	Frederiksen, M., Wanless, S., Harris, M.P., Rothery, P. and Wilson, L.J.	2004	The role of industrial fisheries and oceanographic change in the decline of North Sea black-legged kittiwakes	Journal of Applied Ecology	41(6)	1129-1139	**Exhibit R-0034**
21	Frederiksen, M., Wright, P.J., Harris, M.P., Mavor, R.A., Heubeck, M. and Wanless, S.	2005	Regional patterns of kittiwake Rissa tridactyla breeding success are related to variability in sandeel recruitment	Marine Ecology Progress Series	300	201-211	**Exhibit R-0153**
22	Furness, R.W.	2007	Responses of seabirds to depletion of food fish stocks	Journal of Ornithology	148(2)	247-252	**Exhibit R-0112**
23	Furness, R.W., MacArthur, D., Trinder, M. and MacArthur K.	2013	Evidence review to support the identification of potential conservation measures for selected species of seabirds	MacArthur Green, Glasgow			**Exhibit R-0154**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
24	Greenstreet, S., Fraser, H., Amrstrong, E., Gibb, I.	2010	Monitoring the Consequences of the Northwestern North Sea Sandeel Fishery Closure	Scottish Marine and Freshwater Science (Edinburgh: Scottish Government)	Vol 1 (6)	31	**Exhibit R-0155**
25	Greenstreet, S.P., Armstrong, E., Mosegaard, H., Jensen, H., Gibb, I.M., Fraser, H.M., Scott, B.E., Holland, G.J. and Sharples, J.	2006	Variation in the abundance of sandeels Ammodytes marinus off southeast Scotland	ICES Journal of Marine Science		1530 to 1550	**Exhibit R-0156**
26	Hammond, P.S., Hall, A.J. and Prime, J.H.	1994	The diet of grey seals around Orkney and other island and mainland sites in north-eastern Scotland	Journal of Applied Ecology		340 to 350	**Exhibit R-0157**
27	Wilson, L.J. and Hammond, P.S.	2016	Harbour seal diet composition and diversity	Marine Scotland Science			**Exhibit R-0045**
28	Henriksen, O., Rindorf, A., Brooks, M.E., Lindegren, M. and van Deurs, M.	2021 a	Temperature and body size affect recruitment and survival of sandeel across the North Sea	ICES Journal of Marine Science		1409 to 1420	**Exhibit R-0011**
29	Henriksen, O., Christensen, A., Jónasdóttir, S., MacKenzie, B.R., Nielsen, K.E., Mosegård, H. and van Deurs, M.	2018	Oceanographic flow regime and fish recruitment: reversed circulation in the North Sea coincides with unusually strong sandeel recruitment	Marine Ecology Progress Series		187 to 205	**Exhibit R-0158**
30	Henriksen, O., Rindorf, A., Mosegaard, H., Payne, M.R. and van Deurs, M.	2021 b	Get up early: Revealing behavioral responses of sandeel to ocean warming using commercial catch data	Ecology and Evolution		16786-16805	**Exhibit R-0125**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
31	Howell, D., Schueller, A.M., Bentley, J.W., Buchheister, A., Chagaris, D., Cieri, M., Drew, K., Lundy, M.G., Pedreschi, D., Reid, D.G. and Townsend, H.	2021	Combining ecosystem and single-species modeling to provide ecosystem-based fisheries management advice within current management systems	Frontiers in Marine Science		p.607831	**Exhibit R-0159**
32	ICES	2010	Report of the Benchmark Workshop on Sandeel (WKSAN)			1	**Exhibit R-0160**
33	ICES	2013	Interim Report of the Working Group on Multispecies Assessment Methods (WGSAM)				**Exhibit R-0161**
34	ICES	2017	Sandeel (Ammodytes spage) in divisions 4.a–b, Sandeel Area 4	Report of the ICES Advisory Committee			**Exhibit R-0162**
35	ICES	2018	Sandeel (Ammodytes spage) in divisions 4.a–b, Sandeel Area 4	Report of the ICES Advisory Committee			**Exhibit R-0163**
36	ICES	2022	Sandeel (Ammodytes spage) in divisions 4.b and 4.c, Sandeel Area 1r	Report of the ICES Advisory Committee			**Exhibit R-0164**
37	Jensen, H. and others	2011	Inferring the location and scale of mixing between habitat areas of lesser sandeel through information from the fishery	ICES Journal of Marine Science	Vol 68 (1)	43-51	**Exhibit C-0023**
38	Kennedy, M.C. and O'Hagan, A.	2001	Bayesian calibration of computer models	Journal of the Royal Statistical Society: Series B (Statistical Methodology)	Vol 63(3)	425-464	**Exhibit R-0165**
39	Lauerburg, R.A.M., Temming, A., Pinnegar, J.K., Kotterba, P., Sell, A.F., Kempf, A. and Floeter, J.	2018	Forage fish control population dynamics of North Sea whiting Merlangius merlangus	Marine Ecology Progress Series	594	213-230	**Exhibit R-0166**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
40	Lindegren, M., Van Deurs, M., MacKenzie, B.R., Worsoe Clausen, L., Christensen, A., Rindorf, A.	2018	Productivity and recovery of forage fish under climate change and fishing: North Sea sandeel as a case study	Fisheries Oceanography	27(3)	212 to 221	**Exhibit R-0167**
41	MacDonald, A., Speirs, D.C., Greenstreet, S.P., Boulcott, P., Heath, M.R.	2019	Trends in sandeel growth and abundance off the east coast of Scotland	Frontiers in Marine Science	6	201	**Exhibit C-0026**
42	MacDonald, A., Speirs, D.C., Greenstreet, S.P., Heath, M.R.	2018	Exploring the influence of food and temperature on North Sea Sandeels using a new dynamic energy budget model	Frontiers in Marine Science	5	339	**Exhibit R-0168**
43	Mackinson, S.	2007	Multi-species fisheries management: a comprehensive impact assessment of the sandeel fishery along the English east coast	Cefas report for Defra			**Exhibit R-0058**
44	Mackinson, S., Daskalov, G.	2007	An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation	Sci. Ser. Tech Rep., Cefas Lowestoft	142	196	**Exhibit R-0107**
45	MacLeod, C.D., Santos, M.B., Reid, R.J., Scott, B.E., Pierce, G.J.	2007	Linking sandeel consumption and the likelihood of starvation in harbour porpoises in the Scottish North Sea: could climate change mean more starving porpoises?	Biology letters	3(2)	185 to 188	**Exhibit R-0049**
46	Mahfouz, C., Meziane, T., Henry, F., Abi-Ghanem, C., Spitz, J., Jauniaux, T., Bouveroux, T., Khalaf, G., Amara, R.	2017	Multi-approach analysis to assess diet of harbour porpoises Phocoena phocoena in the southern North Sea	Marine Ecology Progress Series	563	249 to 259	**Exhibit R-0169**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
47	McGregor, R., Trinder, M., Goodship, N.	2022	Assessment of compensatory measures for impacts of offshore windfarms on seabirds	Natural England Commissioned Reports		Report number NECR431	**Exhibit R-0170**
48	Miles, W.T., Mavor, R., Riddiford, N.J., Harvey, P.V., Riddington, R., Shaw, D.N., Parnaby, D., Reid, J.M.	2015	Decline in an Atlantic puffin population: evaluation of magnitude and mechanisms	PLoS One	10(7)	p.e0131527	**Exhibit R-0171**
49	Minto, C. and Worm, B.	2012	Interactions between small pelagic fish and young cod across the North Atlantic	Ecology	93(10)	2139-2154	**Exhibit R-0172**
50	Mitchell, P.I., Newton, S.F., Ratcliffe, N. and Dunn, T.E.	2004	Seabird populations of Britain and Ireland	T. and AD Poyser, London			**Exhibit R-0028**
51	Phillips, R.A., Caldow, R.W.G. and Furness, R.W.	1996	The influence of food availability on the breeding effort and reproductive success of Arctic Skuas Stercorarius parasiticus	Ibis	138(3)	410-419	**Exhibit R-0173**
52	Pinnegar, J.K., Trenkel, V.M., Tidd, A.N., Dawson, W.A. and Du Buit, M.H.	2003	Does diet in Celtic Sea fishes reflect prey availability?	Journal of Fish Biology	63	197-212	**Exhibit R-0056**
53	Pitois, S.G., Lynam, C.P., Jansen, T., Halliday, N. and Edwards, M.	2012	Bottom-up effects of climate on fish populations: data from the Continuous Plankton Recorder	Marine Ecology Progress Series	456	169-186	**Exhibit R-0174**
54	Poloczanska, E.S., Cook, R.M., Ruxton, G.D. and Wright, P.J.	2004	Fishing vs. natural recruitment variation in sandeels as a cause of seabird breeding failure at Shetland: a modelling approach	ICES Journal of Marine Science	61(5)	788-797	**Exhibit R-0027**
55	Ransijn, J.M., Booth, C., and Smout, S.C.	2019	A calorific map of harbour porpoise prey in the North Sea	JNCC Report No. 633. JNCC, Peterborough		ISSN 0963 8091	**Exhibit R-0133**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
56	Régnier, T., Gibb, F.M. and Wright, P.J.	2019	Understanding temperature effects on recruitment in the context of trophic mismatch	Scientific reports	9(1)	janv.13	**Exhibit R-0126**
57	Rindorf, A., Jensen, H. and Schrum, C.	2008	Growth, temperature, and density relationships of North Sea cod (Gadus morhua)	Canadian Journal of Fisheries and Aquatic Sciences	65(3)	456-470	**Exhibit R-0059**
58	Rindorf, A., Wanless, S. and Harris, M.P.	2000	Effects of changes in sandeel availability on the reproductive output of seabirds	Marine Ecology Progress Series	202	241-252	**Exhibit R-0039**
59	Santos, M.B. and Pierce, G.J.	2003	The diet of harbour porpoise (Phocoena phocoena) in the northeast Atlantic: A review	Oceanography and Marine Biology, An Annual Review	Volume 41	363-369	**Exhibit R-0047**
60	Smout, S., King, R. and Pomeroy, P.	2020	Environment-sensitive mass changes influence breeding frequency in a capital breeding marine top predator	Journal of Animal Ecology	89(2)	384 to 396	**Exhibit R-0046**
61	Speirs, D.C., Greenstreet, S.P. and Heath, M.R.	2016	Modelling the effects of fishing on the North Sea fish community size composition	Ecological Modelling	321	35 to 45	**Exhibit R-0175**
62	Thompson, P.M., Mcconnell, B.J., Tollit, D.J., Mackay, A., Hunter, C. and Racey, P.A.	1996	Comparative distribution, movements and diet of harbour and grey seals from Moray Firth, NE Scotland	Journal of Applied Ecology		1572 to 1584	**Exhibit R-0044**
63	Thorpe, R.B., Le Quesne, W.J., Luxford, F., Collie, J.S. and Jennings, S.	2015	Evaluation and management implications of uncertainty in a multispecies size-structured model of population and community responses to fishing	Methods in Ecology and Evolution	6(1)	49 to 58	**Exhibit R-0176**
64	Trenkel, V.M., Pinnegar, J.K., Dawson, W.A., Du Buit, M.H. and Tidd, A.N.	2005	Spatial and temporal structure of predator–prey relationships in the Celtic Sea fish community	Marine Ecology Progress Series	299	257 to 268	**Exhibit R-0055**
65	van Deurs, M., van Hal, R., Tomczak, M.T.,	2009	Recruitment of lesser sandeel Ammodytes marinus in relation to density dependence and zooplankton composition	Marine Ecology Progress Series	381	249 to 258	**Exhibit R-0060**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
	Jónasdóttir, S.H. and Dolmer, P.						
66	Walters, C. and Kitchell, J.F.	2001	Cultivation/depensation effects on juvenile survival and recruitment: implications for the theory of fishing	Canadian Journal of Fisheries and Aquatic Sciences	58 (1)	39 to 50	**Exhibit R-0177**
67	Wanless, S., Harris, M.P., Redman, P. and Speakman, J.R.	2005	Low energy values of fish as a probable cause of a major seabird breeding failure in the North Sea	Marine Ecology Progress Series	294	1 to 8	**Exhibit R-0178**
68	Wilson, L.J. and Hammond, P.S.	2016	Harbour seal diet composition and diversity	Marine Scotland Science			**Exhibit R-0045**
69	Wright P.J., Greenstreet, S.P.R., Tasker, M.L.	1996	Is there a conflict between sandeel fisheries and seabirds? A case history at Shetland	Aquatic Predators and their Prey		154 to 165	**Exhibit R-0026**
70	Wright, P.J., Christensen, A., Régnier, T., Rindorf, A. and van Deurs, M.	2019	Integrating the scale of population processes into fisheries management, as illustrated in the sandeel, Ammodytes marinus	ICES Journal of Marine Science	76(6)	1453 to 1463	**Exhibit R-0018**

ANNEX 2: SCIENTIFIC PAPERS REFERENCED IN THE SCOTTISH SCIENTIFIC REPORT

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
1	Anderson, H. B., Evans, P. G. H., Potts, J. M., Harris, M. & Wanless, S.	2014	The diet of Common Guillemot Uria aalge chicks provides evidence of changing prey communities in the North Sea	Ibis	156	23–34	**Exhibit R-0179**
2	Anker-Nilssen, T., Fayet, A. L., & Aarvak, T.	2023	Top-down control of a marine mesopredator: Increase in native white-tailed eagles accelerates the extinction of an endangered seabird population	Journal of Applied Ecology	0	1–8	**Exhibit R-0180**
3	Arnott, Stephen & Ruxton, Graeme	2002	Sandeel recruitment in the North Sea: Demographic, climatic and trophic effects	Marine Ecology Progress Series	238		**Exhibit C-0020**
4	Barrett, R.T., Camphuysen, K., Anker-Nilssen, T., Chardine, J.W., Furness, R.W., Garthe, S., Huppop, O., Leopold, M.F., Montevecchi, W.A. & Veit, R.R.	2007	Diet studies of seabirds: a review and recommendations	ICES Journal of Marine Science	64(9)		**Exhibit R-0181**
5	Behrens, J.W., Stahl, H.J., Steffensen, J.F., Glud, R.N.	2007	Oxygen dynamics around buried lesser sandeels Ammodytes tobianus(Linnaeus 1785): mode of ventilation and oxygen requirements	J Exp Biol	210 (6)	1006–1014	**Exhibit R-0182**
6	B., Dixon, T., Jones, P.H. & Tasker, M.	1985	Seasonal changes in the feeding ecology of guillemots (Uria aalge) off north and east Scotland	Estuar Coast Shelf Sci	20	559−568	**Exhibit R-0183**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
7	Booth, C. G., Embling, C., Gordon, J., Calderan, S. V., & Hammond, P. S.	2013	Habitat preferences and distribution of the harbour porpoise Phocoena phocoena west of Scotland	Marine Ecology Progress Series	478	273-285	**Exhibit R-0184**
8	Booth, C.G, Guilpin, M., Darias-O'Hara, A.K., Ransijn, J.M, Ryder, M., Rosen, D., Pirotta,E., Smout, S., McHuron, E.A., Nabe-Nielsen, J. & Costa, D.P.	2023	Estimating energetic intake for marine mammal bioenergetic models	Conserv Physiol	11(1)		**Exhibit R-0185**
9	Boulcott, P. & Wright, P.J.	2011	Variation in fecundity in the lesser sandeel: implications for regional management	J. Mar. Biol. Assoc. U.K.	91	1273-1280	**Exhibit R-0186**
10	Boulcott, P., Clarke, J. & Wright, P.J.	2017	Effect of size on spawning time in the lesser sandeel Ammodytes marinus	J. Fish Biol.	91	362-367	**Exhibit R-0187**
11	Brookes, K.L., Bailey, H. & Thompson, P.M.	2013	Predictions from harbor porpoise habitat association models are confirmed by long-term passive acoustic monitoring	Journal of the Acoustical Society of America	134	2523-2533	**Exhibit R-0188**
12	Brown, E. G., Pierce, G. J., Hislop, J. R., & Santos, M. B.	2001	Interannual variation in the summer diets of harbour seals Phoca vitulina at Mousa, Shetland (UK)	Journal of the Marine Biological Association of the United Kingdom	81(2)	325-337	**Exhibit R-0189**
13	Bull, J., Wanless, S., Elston, D., Daunt, F., Lewis, S., & Harris, M.	2004	Local-scale variability in the diet of Black-legged Kittiwakes Rissa tridactyla	Ardea	92(1)	43-52	**Exhibit R-0190**
14	Burthe, S., Daunt, F., Butler, A., Elston, D.A., Frederiksen, M., Johns, D., Newell, M., Thackeray, S.J. & Wanless, S.	2012	Phenological trends and trophic mismatch across multiple levels of a North Sea pelagic food web	Marine Ecology Progress Series	454	119-133	**Exhibit R-0191**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
15	Canning, S. J., Santos, M. B., Reid, R. J., Evans, P. G., Sabin, R. C., Bailey, N., & Pierce, G. J.	2008	Seasonal distribution of white-beaked dolphins (Lagenorhynchus albirostris) in UK waters with new information on diet and habitat use	Journal of the Marine Biological Association of the United Kingdom	88(6)	1159-1166	**Exhibit R-0192**
16	Carroll, M.J., Bolton, M. & Owen, E., et al.	2017	Kittiwake breeding success in the southern North Sea correlates with prior sandeel fishing mortality	Aquatic Conserv: Mar Freshw Ecosyst.	27	1164-1175	**Exhibit R-0193**
17	Carter, M.I.D., Boehme, L., Duck, C.D., Grecian, W.J., Hastie, G.D., McConnell, B.J., Miller, D.L., Morris, C.D., Moss, S.E.W., Thompson, D., Thompson, P.M. & Russell, D.J.F.	2020	Habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles	Sea Mammal Research Unit, University of St Andrews			**Exhibit R-0194**
18	A., Jensen, H., Mosegaard, H., St. John, M. & Schrum, C.	2008	Sandeel (Ammodytes marinus) larval transport patterns in the North Sea from an individual-based hydrodynamic egg and larval model	Can. J. Fish Aquat. Sci.	65	1498-1511	**Exhibit R-0064**
19	Christensen, A., Mosegaard, H. & Jensen, H.	2008	Spatially resolved fish population analysis for designing MPAs: influence on inside and neighbouring habitats	ICES J. Mar. Sci.	66	56–63	**Exhibit R-0195**
20	Clausen, L.W., Rindorf, A., van Deurs, M., Dickey-Collas, M. & Hintzen, N.T	2018	Shifts in North Sea forage fish productivity and potential fisheries yield	J. App. Ecol.	55	1092-1101	**Exhibit R-0023**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
21	Cook et al. Aonghais, S.C.P., Cook, D.D., Mitchell, I., Ross-Smith, V.H. & Robinson, R.A.	2014	Indicators of seabird reproductive performance demonstrate the impact of commercial fisheries on seabird populations in the North Sea	Ecological Indicators	38	01.nov	**Exhibit R-0196**
22	Couturier, C.S., Stecyk, J.A., Rummer, J.L., Munday, P.L. and Nilsson, G.E.	2013	Species-specific effects of near-future CO2 on the respiratory performance of two tropical prey fish and their predator	Comparative Biochemistry and Physiology Part A: Molecular and Integrative Physiology	166	482–489	**Exhibit R-0197**
23	Cunningham, E.J.A, Gamble, A., Hart, T., Humphreys, E.M., Philip, E., Tyler, G. & Wood, M.J.	2022	The incursion of Highly Pathogenic Avian Influenza (HPAI) into North Atlantic seabird populations: an interim report from the 15th International Seabird Group conference	Seabird	34		**Exhibit R-0198**
24	Cunningham, L., Baxter, J. M., Boyd, I. L., Duck, C. D., Lonergan, M., Moss, S. E., & McConnell, B.	2008	Harbour seal movements and haul-out patterns: implications for monitoring and management	Aquatic Conservation: Marine and Freshwater Ecosystems	19(4)	398-407	**Exhibit R-0199**
25	Cury, P.M., Boyd, I.L., Bonhommeau, S., Anker-Nilssen, T., Crawford, R.J.M., Furness, R.W., Mills, J.A., Murphy, E.J., Österblom H., Paleczny, M., Piatt, P.F., Roux, J.-P., Shannon, L. & Sydeman, W.J.	2011	Global seabird response to forage fish depletion – one-third for the birds	Science	334	1703–1706	**Exhibit R-0200**
26	Daunt, F., Reed, T.E., Newell, M., Burthe, S.,	2014	Longitudinal bio-logging reveals interplay between extrinsic and	Ecology	95	2077-2083	**Exhibit R-0201**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
	Phillips, R.A., Lewis, S. & Wanless, S.		intrinsic carry-over effects in a long-lived vertebrate				
27	Daunt, F., Wanless, S., Greenstreet, S. P. R., Jensen, H., Hamer, K. C., & Harris, P. H.	2008	The impact of the sandeel fishery closure on seabird food consumption, distribution and productivity in the northwestern North Sea	Canadian Journal of Fisheries and Aquatic Sciences	65(3)	362-381	**Exhibit R-0038**
28	Davis, S.E., Nager, R.G. & Furness, R.W.	2005	Food availability affects adult survival as well as breeding success of parasitic jaegers	Ecology	86	1047-1056	**Exhibit R-0202**
29	Dunnet, G. M., Furness, R. W., Tasker, M. L. & Becker, P. H.	1990	Seabird ecology in the North Sea	Netherlands Journal of Sea Research	26	387–425	**Exhibit R-0203**
30	Dutkiewicz, S., Morris, J., Follows, M. et al.	2015	Impact of ocean acidification on the structure of future phytoplankton communities	Nature Clim Change	5	1002–1006	**Exhibit R-0204**
31	Eigaard, O., Deurs, M., Behrens, J., Bekkevold, D., Brander, K. & Ryberg, M., Plet-Hansen, K. & Mosegaard, H.	2014	Prey or predator - Expanding the food web role of sandeel Ammodytes marinus	Marine Ecology Progress Series	516	267-273	**Exhibit R-0205**
32	Engelhard, G. H., Peck, M. A., Rindorf, A., Smout, S. C., van Deurs, M., Raab, K., Andersen, K. H., Garthe, S., Lauerburg, R. A. M., Scott, F., Brunel, T., Aarts, G., van Kooten, T., & Dickey-Collas, M.	2014	Forage fish, their fisheries, and their predators: who drives whom?	ICES Journal of Marine Science	71	90–104	**Exhibit C-0019**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
33	Engelhard, G.H., Blanchard, J.L., Pinnegar, J.K., van der Kooij, J., Bell, E.D., Mackinson, S. and Righton, D.A.	2013	Body condition of predatory fishes linked to the availability of sandeels	Marine biology	160	299-308	**Exhibit R-0054**
34	Enzor, L.A., Zippay, M.L. and Place, S.P.	2013	High latitude fish in a high CO2 world: synergistic effects of elevated temperature and carbon dioxide on the metabolic rates of Antarctic notothenioids	Comparative Biochemistry and Physiology Part A: Molecular and Integrative Physiology	164	154–161	**Exhibit R-0206**
35	Frederiksen, M., Anker-Nilssen, T., Beaugrand, G. and Wanless, S.	2013	Climate, copepods and seabirds in the boreal Northeast Atlantic – current state and future outlook	Global Change Biology	19	364–372	**Exhibit R-0154**
36	Frederiksen, M., Edwards, M., Richardson, A. J., Nicholas, C. Halliday, & Wanless, S.	2006	From Plankton to Top Predators: Bottom-up Control of a Marine Food Web across Four Trophic Levels	Journal of Animal Ecology	75(6)	1259–1268	**Exhibit R-0207**
37	Frederiksen, M., Jensen, H., Daunt, F., Mavor, R.A. & Wanless, S.	2008	Differential effects of a local industrial sand lance fishery on seabird breeding performance	Ecological Applications	18	701-710	**Exhibit R-0037**
38	Frederiksen, M., Wanless, S., Harris, M. P., Rothery, P. & Wilson, L. J.	2004	The role of the industrial fishery and climate change in the decline of North Sea Black-legged Kittiwakes	Journal of Applied Ecology	41	1129–1139	**Exhibit R-0034**
39	Frederiksen, M., Wright, P.J., Heubeck M., Harris, M.P., Mavor, R.A. & Wanless, S.	2005	Regional patterns of kittiwake Rissa tridactyla breeding success are related to variability in sandeel recruitment	Marine Ecology Progress Series	300	201–211	**Exhibit R-0153**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
40	Frederiksen, Morten & Furness, Robert & Wanless, Sarah	2007	Regional variation in the role of bottom-up processes in controlling sandeel abundance in the North Sea	Marine Ecology Progress Series	337	279-286	**Exhibit R-0208**
41	Furness, R. W.	2002	Management implications of interactions between fisheries and sandeel-dependent seabirds and seals in the North Sea	ICES Journal of Marine Science	59	261–269	**Exhibit R-0209**
42	Furness, R.W.	2007	Responses of seabirds to depletion of food fish stocks	J Ornithol	148 (Suppl 2)	247–252	**Exhibit R-0112**
43	Furness, R.W. & Tasker, M.L.	2000	Seabird-fishery interactions: quantifying the sensitivity of seabirds to reductions in sandeel abundance, and identification of key areas for sensitive seabirds in the North Sea	Marine Ecology Progress Series	202	253−264	**Exhibit R-0035**
44	Furness, Robert	2003	Impacts of fisheries on seabird communities	Scientia Marina	67 (Suppl .2)	33-45	**Exhibit R-0210**
45	Gauld, J.A & Hutcheon, J.R.	1990	Spawning and fecundity in the lesser sandeel, Ammodytes marinus Raitt, in the north-western North Sea	Journal of Fish Biology	36	611-613	**Exhibit R-0211**
46	Gauld, J.A.	1990	Movements of lesser sandeels (Ammodytes marinus Raitt) tagged in the northwestern North Sea	Journal du Conseil	46(3)	229-231	**Exhibit R-0017**
47	Gibb, F.M., Régnier, T., Donald, K. & Wright, P.J.	2017	Connectivity in the early life history of sandeel inferred from otolith microchemistry	J. Sea Res.	119		**Exhibit R-0021**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
48	Gilles, A., Viquerat, S., Becker, E. A., Forney, K. A., Geelhoed, S. C. V., Haelters, J., Nabe-Nielsen, J., Scheidat, M., Siebert, U., Sveegaard, S., van Beest, F. M., van Bemmelen, R., & Aarts, G.	2016	Seasonal habitat-based density models for a marine top predator, the harbor porpoise, in a dynamic environment	Ecosphere	7 (6)	e01367	**Exhibit R-0101**
49	González-Irusta, J.M & Wright, P.J.	2017	Spawning grounds of whiting (Merlangius merlangus)	Fish. Res.	195	141-151	**Exhibit R-0212**
50	González-Irusta, J.M. & Wright, P.J.	2016a	Spawning grounds of Atlantic cod (Gadus morhua) in the North Sea	ICES J. Mar. Sci.	73	304–315	**Exhibit R-0213**
51	González-Irusta, J.M. & Wright, P.J.	2016b	Spawning grounds of haddock (Melanogrammus aeglefinus) in the North Sea and West of Scotland	Fish. Res.	183	180-191	**Exhibit R-0214**
52	Greenstreet, S. P. R., Armstrong, E., Mosegaard, E., Jensen, H., Gibb, I. M., Fraser, H. M., Scott, B. E., Holland, G. J., & Sharples, J.	2006	Variation in the abundance of sandeel Ammodytes marinus off southeast Scotland: an evaluation of area-closure fisheries management and stock abundance assessment methods	ICES J. Mar. Sci.	63	1530-1550	**Exhibit R-0215**
53	Greenstreet, S.P., Holland, G.J., Guirey, E.J., Armstrong, E., Fraser, H.M. & Gibb, I.M.	2010	Combining hydroacoustic seabed survey and grab sampling techniques to assess “local” sandeel population abundance	ICES J. Mar. Sci	67	971-984	**Exhibit R-0155**
54	Hague, E.L., Sinclair, R.R. & Sparling, C.E.	2020	Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters	Scottish Marine and Freshwater Science	Vol 11, No 12	Appendix 3 SCANS Surveys	**Exhibit R-0216**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
55	Hall, A. J., Watkins, J., & Hammond, P. S.	1998	Seasonal variation in the diet of harbour seals in the south-western North Sea	Marine Ecology Progress Series	170	269-281	**Exhibit R-0217**
56	Hamer, K. C., Furness, R. W., & Caldow, R. W. G.	1991	The effects of changes in food availability on the breeding ecology of great skuas in Shetland	Journal of Zoology	223	1,75E+190	**Exhibit R-0218**
57	Hamer, K. C., Monaghan, P., Uttley, J. D., Walton, P., & Burns, M. D.	1993	The influence of food supply on the breeding ecology of kittiwakes in Shetland	Ibis	135	2,55E+265	**Exhibit R-0219**
58	Hammill, E, Johnson, E, Atwood, TB, et al.	2018	Ocean acidification alters zooplankton communities and increases top-down pressure of a cubozoan predator	Glob Change Biol	24	e128–e138	**Exhibit R-0220**
59	Hammond, P. S. & Grellier, K.	2006	Grey seal diet composition and prey consumption in the North Sea	Final Report under project MF0319, Department for Environment Food and Rural Affairs		54 pp	**Exhibit R-0221**
60	Hammond, P.S., Lacey, C., Gilles, A., Viquerat, S., Börjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M.B., Scheidat, M., Teilmann, J., Vingada, J. & Øien, N.	2021	Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys	SCANS III final report			**Exhibit R-0222**
61	Harris, M. P. & Wanless, S.	1997	Breeding success, diet, and brood neglect in the kittiwake (Rissa tridactyla) over an 11-year period	ICES Journal of Marine Science	54	615–623	**Exhibit R-0223**
62	Harris, M.P., Albon, S., Newell, M.A., Gunn,	2022	Long-term within-season changes in the diet of Common Guillemot Uria	Ibis	164		**Exhibit R-0224**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
	C.M., Daunt, F., & Wanless, S.		aalge chicks at a North Sea colony: implications for dietary monitoring				
63	Heinänen, S., & H. Skov.	2015	The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area	JNCC Report No. 544, JNCC, Peterborough			**Exhibit R-0225**
64	Henriksen, Ole & Rindorf, Anna & Brooks, Mollie & Lindegren, Martin & Deurs, Mikael	2021	Temperature and body size affect recruitment and survival of sandeel across the North Sea	ICES Journal of Marine Science	78		**Exhibit R-0011**
65	Heubeck, M	2009	Common guillemot Uria aalge chick diet and breeding performance at Sumburgh Head, Shetland in 2007-09, compared to 1990-91	Seabird	22	9–18	**Exhibit R-0226**
66	Hislop, J. R. G., Harris, M. P. & Smith, J. G. M.	1991	Variation in the calorific value and total energy content of the lesser sandeel (Ammodytes marinus) and other fish preyed on by seabirds	Journal of Zoology	224(3)	pp. 501–517	**Exhibit R-0227**
67	Holland, G., Greenstreet, S., Gibb, I., Fraser, H. & Robertson, M.	2005	Identifying sandeel Ammodytes marinus sediment habitat preferences in the marine environment	Mar. Ecol. Prog. Ser.	303	269–282	**Exhibit R-0013**
68	Holland, G.J., Greenstreet, S.P., Gibb, I.M., Fraser, H.M. & Robertson, M.R.	2005	Identifying sandeel Ammodytes marinus sediment habitat preferences in the marine environment	Marine Ecology Progress Series	303	269-282	**Exhibit R-0013**
69	Howells, R.J., Burthe, S.J, Green, J.A., Harris, M.P., Newell, M.A., Butler, A., Wanless, S. & Daunt, F.	2018	Pronounced long-term trends in year-round diet composition of the European shag Phalacrocorax aristotelis	Mar Biol	165	188	**Exhibit R-0228**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
70	Howells, R.J., Burthe, S.J., Green, J.A., Harris, M.P., Newell, M.A., Butler, A., Johns, D.G., Carnell, E.J., Wanless, S., & Daunt, F.	2017	From days to decades: short- and long-term variation in environmental conditions affect offspring diet composition of a marine top predator	Mar Ecol Prog Ser	583	227-242	**Exhibit R-0229**
71	ICES	1995	Report of the Working Group on the Assessment of Norway Pout and Sandeel, 31 August–6 September 1994	ICES C.M. 1995/Assess: 5		145pp	**Exhibit R-0230**
72	ICES	1997	Database report of the stomach sampling project, 1991	ICES Cooperative Research Reports (CRR)			**Exhibit R-0231**
73	ICES	2000	Sandeel/Seabird Interactions	ICES Cooperative Research Report 239		277	**Exhibit R-0232**
74	ICES	2007	Report of the Ad-hoc Group on Sandeel, 27–28 February 2007	ICES CM 2007/ACFM:38		36 pp	**Exhibit R-0233**
75	ICES	2010	Report of the Benchmark Workshop on Sandeel (WKSAN), 6–10 September 2010	ICES C.M. 2010/ACOM: 57		201 pp	**Exhibit R-0234**
76	ICES	2017	Report of the Benchmark on Sandeel (WKSand 2016), 31 October - 4 November 2016	ICES CM 2016/ACOM:33		319 pp	**Exhibit R-0235**
77	ICES	2021	Working Group on Multispecies Assessment Methods (WGSAM)	ICES Scientific Reports. 3:115		50 pp	**Exhibit R-0236**
78	ICES	2023	Sandeel (Ammodytes spp.) in divisions 4.a-b, Sandeel Area 4	ICES Advisory Committee	2023		**Exhibit R-0237**
79	ICES	2022a	Herring Assessment Working Group for the area south of 62oN (HAWG)	ICES Scientific Reports	4	16	**Exhibit R-0238**
80	ICES	2022b	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)	ICES Scientific Reports	4	43, 1367 pp	**Exhibit R-0239**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
81	ICES	2022c	Working Group on Widely Distributed Stocks (WGWIDE)	ICES Scientific Reports	4	73, 922 pp	**Exhibit R-0240**
82	IPCC	2007	Climate Change 2007: Synthesis Report	IPCC, Geneva, Switzerland		104 pp	**Exhibit R-0241**
83	Jansen, O., Leopold, M., Meesters, E., & Smeenk, C.	2010	Are white-beaked dolphins Lagenorhynchus albirostris food specialists?	Journal of the Marine Biological Association of the United Kingdom	90(8)	1501-1508	**Exhibit R-0242**
84	Jensen, H., Rindorf, A., Wright, P.J. & Mosegaard, H.	2011	Inferring the location and scale of mixing between habitat areas of lesser sandeel	ICES J. Mar. Sci.	68	43–51	**Exhibit C-0023**
85	JNCC	2021	Seabird Population Trends and Causes of Change: 1986–2019 Report	https://jncc.gov.uk/our-work/smp-report-1986-2019			**Exhibit R-0243**
86	JNCC	2023	Our work: black-legged kittiwake Rissa tridactyla	https://jncc.gov.uk/our-work/smp-reports/			**Exhibit R-0244**
87	Johannessen T., Johnsen E.	2015	Demographically disconnected subpopulations in lesser sandeel	ICES CM	2015/E	12, 20 pp	**Exhibit R-0022**
88	Jones, E.L., McConnell, B.J., Smout, S., Hammond, P.S., Duck, C.D., Morris, C.D., Thompson, D., Russell, D.J., Vincent, C., Cronin, M. & Sharples, R.J.	2015	Patterns of space use in sympatric marine colonial predators reveal scales of spatial partitioning	Marine Ecology Progress Series	534	235-249	**Exhibit R-0245**
89	Lacey, C., Hammond, P.S., Gilles, A., Börjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M.B., Scheidat, M., Teilmann, J.,	2021	Modelled density surfaces of cetaceans in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys				**Exhibit R-0246**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
	Vingada, J., Viquerat, S. & Øien, N.						
90	Lahoz-Monfort J.J, Morgan B.JT., Harris M.P, Daunt, F., Wanless S., & Freeman, S.N	2013	Breeding together: modelling synchrony in productivity in a seabird community	Ecology	94	03.oct	**Exhibit R-0247**
91	Lahoz-Monfort, J.J, Morgan, B.J.T, Harris, M.P, Wanless, S., and & Freeman, S.N	2011	A capture–recapture model for exploring multi-species synchrony in survival	Methods in Ecology and Evolution	2	116-124	**Exhibit R-0132**
92	Lambert, E.	2020	The feeding ecology of the harbour porpoise Phocoena phocoena L. in a changing environment	Doctoral dissertation, MSc. Thesis, Marine and Lacustrine Science and Management, Universiteit Antwerpen, Universiteit Gent, Vrije Universiteit Brussel			**Exhibit R-0248**
93	Langton R., Boulcott P., Wright P.J.	2021	A verified distribution model for the lesser sandeel Ammodytes marinus	Mar. Ecol. Prog. Ser.	667	145-159	**Exhibit R-0015**
94	Leopold, M. F.	2015	Eat and be eaten, Porpoise diet studies	PhD thesis			**Exhibit R-0249**
95	Lewis, S., Sherratt, T.N., Hamer, K.C., Harris, M.P. & Wanless, S.	2003	Contrasting diet quality of Northern Gannets Morus bassanus at two colonies	Ardea	91	167–176	**Exhibit R-0250**
96	Lewis, S., Wanless, S., Wright, P.J., Harris, M.P., Bull, J. & Elston, D.A.	2001	Diet and breeding performance of Black-legged Kittiwakes Rissa tridactyla at a North Sea colony	Mar. Ecol. Prog. Ser.	221	277–284	**Exhibit R-0251**

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97	Lynam, C. P., Llope, M., Möllmann, C., Helaouët, P., Bayliss-Brown, G. A., & Stenseth, N. C.	2017	Interaction between top-down and bottom-up control in marine food webs	Proceedings of the National Academy of Sciences of the United States of America	114(8)	1952–1957	**Exhibit R-0252**
98	MacArthur Green	2021	HRA Derogation Scope B - Review of seabird strategic compensation options	Report to Crown Estate Scotland and SOWEC			**Exhibit R-0253**
99	MacDonald, A., Heath, M., Edwards, M., Furness, R., Pinnegar, J.K., Wanless, S., Speirs, D. & Greenstreet, S.	2015	Climate driven trophic cascades affecting seabirds around the British Isles	Oceanography and Marine Biology – An Annual Review	53	55-79	**Exhibit R-0254**
100	MacLeod, C.D., Santos, M.B., Reid, R.J., Scott, B.E. & Pierce, G.J.	2007	Linking sandeel consumption and the likelihood of starvation in harbour porpoises in the Scottish North Sea: could climate change mean more starving porpoises?	Biology letters	3(2)	185-188	**Exhibit R-0049**
101	Mahfouz, C., Meziane, T., Henry, F., Abi-Ghanem, C., Spitz, J., Jauniaux, T., Bouveroux, T., Khalaf, G. & Amara, R.	2017	Multi-approach analysis to assess diet of harbour porpoises Phocoena phocoena in the southern North Sea	Marine Ecology Progress Series	563	249-259	**Exhibit R-0169**
102	Marubini, F., Gimona, A., Evans, P. G., Wright, P. J., & Pierce, G. J.	2009	Habitat preferences and interannual variability in occurrence of the harbour porpoise Phocoena phocoena off northwest Scotland	Marine Ecology Progress Series	381	297-310	**Exhibit R-0255**
103	Mitchell, P.I., Newton, S.F., Ratcliffe, N. & Dunn, T.E.	2004	Seabird Populations of Britain and Ireland	JNCC, Peterborough		ISBN 0 7136 6901 2	**Exhibit R-0028**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
104	Monaghan, P., Uttley, J. D., Burns, M. D., Thaine, C., & Blackwood, J.	1989	The relationship between food supply, reproductive effort, and breeding success in Arctic terns, Sterna paradisaea	Journal of Animal Ecology	58	261-274	**Exhibit R-0256**
105	Newell, M., Harris, M.P., Burthe, S., Wanless, S. & Daunt, F.	2013	Isle of May seabird studies in 2011	JNCC Report, No. 475g		Isle of May seabird studies in 2011 (jncc.gov.uk)	**Exhibit R-0257**
106	Northridge, S., Kingston, A. & Coram, A.	2020	Preliminary estimates of seabird bycatch by UK vessels in UK and adjacent waters	Defra report ME6024			**Exhibit R-0258**
107	Olin A.B., Banas N.S., Wright P.J., Heath M.R. & Nager R.G	2020	Spatial synchrony of breeding success in the black-legged kittiwake Rissa tridactyla reflects the spatial dynamics of its sandeel prey	Mar Ecol Prog Ser	638	177-190	**Exhibit R-0259**
108	Olsen, E. & Holst, J.C.	2001	A note on common minke whale (Balaenoptera acutorostrata) diets in the Norwegian Sea and the North Sea	Journal of Cetacean Research and Management	3(2)	179-184	**Exhibit R-0051**
109	Oro, D. & Furness, R. W.	2002	Influences of food availability and predation on survival of kittiwakes	Ecology	83(9)	2516-2528	**Exhibit R-0036**
110	Paxton, C.G., Scott-Hayward, L.A.S. & Rexstad, E.A.	2014	Statistical approaches to aid the identification of Marine Protected Areas for minke whale, Risso's dolphin, white-beaked dolphin and basking shark	Scottish Natural Heritage, Policy and Advice Directorate			**Exhibit R-0260**
111	Phillips, R.A., Petersen, M.K., Lilliendahl, K., Solmundsson, J., Hamer,	1999	Diet of the northern fulmar Fulmarus glacialis: reliance on commercial fisheries?	Mar. Biol.	135	159–170	**Exhibit R-0261**

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	K.C., Camphuysen, C.J. & Zonfrillo, B.						
112	Pierce, G. J., & Santos, M. B.	2003	Diet of harbour seals (Phoca vitulina) in Mull and Skye (Inner Hebrides, western Scotland)	Journal of the Marine Biological Association of the United Kingdom	83(3)	647-650	**Exhibit R-0047**
113	Pierce, G., Santos, B., Reid, R.J. & Patterson, I.A.P.	2004	Diet of minke whales Balaenoptera acutorostrata in Scottish (UK) waters with notes on strandings of this species in Scotland 1992–2002	Journal of the Marine Biological Association of the UK	84(06)	1241 – 1244	**Exhibit R-0047**
114	Poloczanska, E.S., Cook, R.M., Ruxton, G.D. & Wright, P.J.	2004	Fishing vs. natural recruitment variation in sandeel as a cause of seabird breeding failure at Shetland: a modelling approach	ICES J. Mar. Sci.	61	788–797	**Exhibit R-0027**
115	Ransijn, J.M., Booth, C. & Smout, S.C.	2019	A calorific map of harbour porpoise prey in the North Sea	JNCC Report No. 633. JNCC, Peterborough		ISSN 0963 8091	**Exhibit R-0133**
116	Ransijn, J.M., Hammond, P.S., Leopold, M.F., Sveegaard, S. & Smout, S.C.	2021	Integrating disparate datasets to model the functional response of a marine predator: A case study of harbour porpoises in the southern North Sea	Ecology and Evolution	11(23)	17458-17470	**Exhibit R-0262**
117	Ratcliffe, N., Catry, P., Hamer, K. & Klomp, N.	2002	The effect of age and year on the survival of breeding adult Great Skuas Catharacta skua in Shetland	Ibis	144(3)	384-392	**Exhibit R-0263**
118	Regnier, T., Gibb, F.M. & Wright, P.J.	2018	Temperature effects on egg development and larval condition in the lesser sandeel, Ammodytes marinus	J. Sea Res.	134	34 - 41	**Exhibit R-0025**
119	Régnier, T., Gibb, F.M. & Wright, P.J.	2017	Importance of trophic mismatch in a winter- hatching species: evidence from lesser sandeel	Mar. Ecol. Prog. Ser.	567	185-197	**Exhibit R-0010**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
120	Régnier, T., Gibb, F.M. & Wright, P.J.	2019	Understanding temperature effects on recruitment in the context of trophic mismatch	Sci. Rep.	9	15179	**Exhibit R-0126**
121	Rindorf, A., Jensen, H., & Schrum, C.	2008	Growth, temperature and density relationships of North Sea cod (Gadus morhua)	Canadian Journal of Fisheries and Aquatic Sciences	65(3)	456-470	**Exhibit R-0059**
122	Rindorf, A., Wanless, S. & Harris, M.P.	2000	Effects of changes in sandeel availability on the reproductive output of seabirds	Mar. Ecol. Prog. Ser.	202	241-252	**Exhibit R-0039**
123	Rindorf, A., Wright, P. J., Jensen, H. & Maar, M.	2016	Spatial differences in growth of lesser sandeel in the North Sea	Journal of Experimental Marine Biology and Ecology	479	sept.19	**Exhibit R-0264**
124	Santos, M. B., Pierce, G. J., Ross, H. M., Reid, R. J., & Wilson, B.	1994	Diets of small cetaceans from the Scottish coast	ICES			**Exhibit R-0265**
125	Santos, M., Pierce, G., Reid, R., Patterson, I., Ross, H., & Mente, E.	2001	Stomach contents of bottlenose dolphins (Tursiops truncatus) in Scottish waters	Journal of the Marine Biological Association of the United Kingdom	81(5)	873-878	**Exhibit R-0266**
126	Santos, M.B. & Pierce, G.J.	2003	The diet of harbour porpoise (Phocoena phocoena) in the northeast Atlantic	Oceanography and Marine Biology: an Annual Review	41	355-390	**Exhibit R-0047**
127	Santos, M.B., Pierce, G.J., Learmonth, J.A., Reid, R.J., Ross, H.M., Patterson, I.A.P., Reid, D.G. & Beare, D.	2004	Variability in the diet of harbor porpoises (Phocoena phocoena) in Scottish waters 1992–2003	Marine Mammal Science	20	janv.27	**Exhibit R-0048**
128	SCOS	2021	Scientific advice on matters related to the management of seal populations: 2021	Natural Environment Research Council (NERC), Special Committee on Seals (SCOS)			**Exhibit R-0267**

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129	Searle, K. R., Regan, C. E., Perrow, M. R., Butler, A., Rindorf, A., Harris, M. P., Newell, M. A., Wanless, S., & Daunt, F.	2023	Effects of a fishery closure and prey abundance on seabird diet and breeding success: Implications for strategic fisheries management and seabird conservation	Biological Conservation	281		**Exhibit R-0040**
130	Sharples, R. J., Arrizabalaga, B., & Hammond, P. S.	2009	Seals, sandeels and salmon: diet of harbour seals in St. Andrews Bay and the Tay Estuary, southeast Scotland	Marine Ecology Progress Series	390	265-276	**Exhibit R-0268**
131	Sharples, R. J., Moss, S. E., Patterson, T. A., & Hammond, P. S.	2012	Spatial variation in foraging behaviour of a marine top predator (Phoca vitulina) determined by a large-scale satellite tagging program	PLoS one	7(5)	e37216	**Exhibit R-0269**
132	Sherman, K., Jones, C., Sullivan, L., Smith, W., Berrien, P., & Ejsymont, L.	1981	Congruent shifts in sandeel abundance in western and eastern North Atlantic ecosystems	Nature	291	486–489	**Exhibit R-0270**
133	Smout, S., Rindorf, A., Wanless, S., Daunt, F., Harris, M.P. & Matthiopoulos, J.	2013	Seabirds maintain offspring provisioning rate despite fluctuations in prey abundance: a multi-species functional response for guillemots in the North Sea	J Appl Ecol	50	1071-1079	**Exhibit R-0271**
134	Sparholt H.	1990	An estimate of the total biomass of fish in the North Sea	ICES J. Mar. Sci.	46	200 - 210	**Exhibit R-0272**
135	STECF	2007	Working Group Report on Evaluation of Closed Area Schemes (SGMOS-07-03)				**Exhibit R-0273**
136	Steel	2018	Isle of May NNR Annual Report 2018. Isle of May National Nature Reserve Annual Report 2017				**Exhibit R-0274**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
137	Swann, R.L, Harris, M.P, & Aiton, D.G	2008	The diet of European shag Phalacrocorax aristotelis, black-legged kittiwake Rissa tridactyla and common guillemot Uria aalge on Canna during the chick-rearing period 1981-2007	Seabird	21	44-54	**Exhibit R-0275**
138	Sydeman, W.J, Thompson, S.A, Anker-Nilssen, T., Mayumi, A., Bennison, A., Bertrand, S., Boersch-Supan, P., Boyd, C., Bransome., Crawford, J.M.R., Daunt, F., Furness, R.W., Gianuca, D., Gladics, A., Koehn, L., Lang, J.W., Logerwell, E., Taryn, M.L., Phillips, E.M., Provencher, J., Punt, A.E., Saraux, C., Shannon, L., Sherley, R.B., Simeone, A., Wanless, R.M., Wanless, S. & Zador, S.	2017	Best practices for assessing forage fish fisheries-seabird resource competition	Fisheries Research	194	209-221	**Exhibit R-0276**
139	Temming, A., Götz, S., Mergardt, N. and Ehrich, S.	2004	Predation of whiting and haddock on sandeel: aggregative response, competition and diel periodicity	Journal of Fish Biology	64	1351-1372	**Exhibit R-0277**
140	Thompson, D., Duck, C.D., Morris, C.D. & Russell, D.J.F.	2019	The status of harbour seals (Phoca vitulina) in the UK	Aquatic Conserv: Mar Freshw Ecosyst.	29 (S1)	40– 60	**Exhibit R-0278**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
141	Thompson, P. M., & Miller, D.	1990	Summer Foraging Activity and Movements of Radio-Tagged Common Seals (Phoca vitulina. L.) in the Moray Firth, Scotland	Journal of Applied Ecology	27(2)	492–501	**Exhibit R-0279**
142	Thompson, P. M., Mcconnell, B. J., Tollit, D. J., Mackay, A., Hunter, C., & Racey, P. A.	1996	Comparative Distribution, Movements and Diet of Harbour and Grey Seals from Moray Firth, N. E. Scotland	Journal of Applied Ecology	33(6)	1572–1584	**Exhibit R-0044**
143	Tien N.S.H., Craeymeersch J., van Damme C., Couperus A.S., Adema J., & Tulp I.	2017	Burrow distribution of three sandeel species relates to beam trawl fishing, sediment composition and water velocity, in Dutch coastal waters	J. Sea Res.	127	194–202	**Exhibit R-0014**
144	Tollit, D. J. & Thompson, P. M.	1996	Seasonal and between-year variations in the diet of harbour seals in the Moray Firth, Scotland	Canadian Journal of Zoology	74	1110-1121	**Exhibit R-0280**
145	Townhill, B.L., van der Molen, J., Metcalfe, J.D., Simpson, S.D., Farcas, A. and Pinnegar, J.K.	2017	Consequences of climate-induced low oxygen conditions for commercially important fish	Marine Ecology Progress Series	580	191–204	**Exhibit R-0281**
146	Trenkel, V.M., Pinnegar, John & Dawson, W.A. and Buit, M.H. & Tidd, Alex	2005	Spatial and temporal predation patterns in the Celtic Sea	Marine Ecology Progress Series	299	257-268	**Exhibit R-0055**
147	van der Kooij, J., Scott, B. & Mackinson, S.	2008	The effects of environmental factors on daytime sandeel distribution and abundance on the Dogger Bank	J. Sea Res.	60	201-209	**Exhibit R-0282**
148	van Deurs M., Hartvig, M. & Steffensen, J.	2011	Critical threshold size for overwintering sandeel (Ammodytes marinus)	Mar. Biol.	158	2755-2764	**Exhibit R-0024**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
149	van Deurs, M., van Hal, R., Tomczak, M.T., Jónasdóttir, S.H. and Dolmer, P.	2009	Recruitment of lesser sandeel Ammodytes marinus in relation to density dependence and zooplankton composition	Marine Ecology Progress Series	381	249-258	**Exhibit R-0060**
150	Votier, S.C., Bearhop, S., Crane, J.E., Manuel Arcos, J. & Furness, R.W.	2007	Seabird predation by great skuas Stercorarius skua– intra-specific competition for food?	Journal of Avian Biology	38	234-246	**Exhibit R-0283**
151	Votier, S.C., Bearhop, S., Ratcliffe, N., Phillips, R.A. & Furness, R.W.	2004	Predation by great skuas at a large Shetland seabird colony	Journal of Applied Ecology	41	1117-1128	**Exhibit R-0284**
152	Waggitt, J.J., Evans, P.G., Andrade, J., Banks, A.N., Boisseau, O., Bolton, M., Bradbury, G., Brereton, T., Camphuysen, C.J., Durinck, J. & Felce, T.	2020	Distribution maps of cetacean and seabird populations in the North-East Atlantic	Journal of Applied Ecology	57(2)	253-269	**Exhibit C-0039**
153	Wanless, S., Harris, M. P., & Greenstreet, S. P. R.	1998	Summer sandeel consumption by seabirds breeding in the Firth of Forth, south-east Scotland	ICES Journal of Marine Science	55	1141–1151	**Exhibit R-0285**
154	Wanless, S., Harris, M. P., Redman, P.& Speakman, J. R.	2005	Low energy values of fish as a probable cause of a major seabird breeding failure in the North Sea	Marine Ecology Progress Series	294	1–8	**Exhibit R-0178**
155	Wanless, S., Harris, M.P., Newell, M.A. and Daunt, F.	2018	A community wide decline in the importance of lesser sandeels Ammodytes marinus in seabird chick diet at a North Sea colony	Marine Ecology Progress Series	600	193–206	**Exhibit R-0286**
156	Wanless, S., Wright, P. J., Harris, M. P. & Elston, D. A.	2004	Evidence for decrease in size of lesser sandeel Ammodytes marinus in a	Marine Ecology Progress Series	279	237–246	**Exhibit R-0287**

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			North Sea aggregation over a 30-yr period				
157	Weir, C. R., Stockin, K. A., & Pierce, G. J.	2007	Spatial and temporal trends in the distribution of harbour porpoises, white-beaked dolphins and minke whales off Aberdeenshire (UK), north-western North Sea	Journal of the Marine Biological Association of the United Kingdom	87(1)	327-338	**Exhibit R-0288**
158	Williamson, L.D., Brookes, K.L., Scott, B.E., Graham, I.M., Bradbury, G., Hammond, P.S. and Thompson, P.M.	2016	Echolocation detections and digital video surveys provide reliable estimates of the relative density of harbour porpoises	Methods in Ecology and Evolution	7(7)	762-769	**Exhibit R-0289**
159	Wilson & Hammond, P.	2019	The diet of harbour and grey seals around Britain: Examining the role of prey as a potential cause of harbour seal declines	Aquatic Conservation, Marine and Freshwater Ecosystems	29(1)	71-85	**Exhibit R-0045**
160	Wilson, L.J., Daunt, F. & Wanless, S.	2004	Self-feeding and chick provisioning diet differ in the Common Guillemot Uria aalge	Ardea	92	197–207	**Exhibit R-0290**
161	Wilson, L.J., Owen, E., Hughes, R., Coledale, T. & Bolton, M.	2021	Geographic variation in black-legged kittiwake diet	Presentation at the 7th World Seabird Twitter Conference			**Exhibit R-0291**
162	Windsland, K., Lindstrom, U., Nilssen, K.T. & Haug, T.	2007	Relative abundance and size composition of prey in the common minke whale diet in selected areas of the northeastern Atlantic during 2000-04	Journal of Cetacean Research and Management	9(3)	167-178	**Exhibit R-0052**
163	Winslade, P.	1974	Behavioural studies on the Lesser Sandeel Ammodytes marinus (Raitt)	J. Fish Biol.	6	565–599	**Exhibit R-0292**

	Authors	Year	Title	Journal	Vol.	Pgs.	Exhibit No.
164	Woodward, I., Thaxter, C.B., Owen, E., Cook, A.S.C.P.	2019	Desk-based revision of seabird foraging ranges used for HRA screening	BTO Research Report	724		**Exhibit R-0293**
165	Wright P.J., Jensen H. & Tuck I.	2000	The influence of sediment type on the distribution of the Lesser Sandeel, Ammodytes marinus	J. Sea Res.	44	243–256	**Exhibit R-0012**
166	Wright, P.J., Christensen, A., Régnier, T., Rindorf, A. & van Deurs, M.	2019	Integrating the scale of population processes into fisheries management, as illustrated in the sandeel, Ammodytes marinus	ICES J. Mar. Sci.	76	1453-1463	**Exhibit R-0018**
167	Wright, P.J., Orpwood, J. & Scott, B	2017a	Impact of rising temperature on reproductive investment in a capital breeder: The lesser sandeel	J. Exp. Mar. Biol. Ecol.	486	52-58	**Exhibit R-0019**
168	Wright, P.J., Orpwood, J.E. & Boulcott, P.	2017b	Warming delays ovarian development in a capital breeder	Mar. Biol.	164	80	**Exhibit R-0020**
169	Wright, P.J., Pinnegar, J.K. and Fox, C.	2020	Impacts of climate change on fish, relevant to the coastal and marine environment around the UK	MCCIP Science Review		354–381	**Exhibit R-0012**
170	Wright, PJ. & Bailey, M.C.	1996	Time of hatching in Ammodytes marinus from Shetland waters and its significance to early growth and survivorship	Mar. Biol.	126	143 - 152	**Exhibit R-0026**