



**Post-consultation scientific advice to Defra
from the Joint Nature Conservation
Committee and Natural England on
candidate Highly Protected Marine Areas
in English waters consulted upon in 2022**

Originally written December 2022, Updated June 2023
Written jointly by the Joint Nature Conservation Committee and Natural England
<https://hub.jncc.gov.uk/assets/13a2a94a-6842-4947-a980-b4c8899a6f86>

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1. Introduction

Natural England and the Joint Nature Conservation Committee (JNCC) were commissioned by Defra to develop and apply a range of ecological criteria¹ to identify Areas of Ecological Interest (AEIs)² for Highly Marine protected Areas (HPMAs). Defra then applied social and economic criteria to select five candidate HPMAs to consult on. Natural England and JNCC provided our pre-consultation scientific advice on these five candidate HPMAs in early 2022³. A public consultation⁴ on these five candidate HPMAs was held between 6th July and 28th September 2022. Approximately 900 responses were received from a range of sectors in response to the public consultation. In addition, Defra led several virtual and in-person workshops during the formal public consultation period to respond to queries from a range of stakeholders and to collect additional socio-economic data. Following the close of the public consultation on 28th September 2022, JNCC and Natural England were commissioned by Defra to provide post-consultation advice considering the data and evidence obtained since our pre-consultation advice and during the public consultation.

This post-consultation advice presents the process JNCC and Natural England followed (Section 2), a summary of changes in our advice (Section 3) and updated scientific advice on the ecological merit of the candidate HPMAs for each of the following five candidate HPMAs that were subject to public consultation (Section 4):

- Allonby Bay;
- Dolphin Head;
- Inner Silver Pit South;
- Lindisfarne; and
- North-east of Farnes Deep.

The location of the five candidate HPMAs subject to public consultation are shown in Figure 1. Please note that for some of the sites there are now different options set out for the site boundaries, at the request of Defra. These are not shown in Figure 1, but are provided with respect to the updated advice on the ecological merit of the candidate HPMAs in Section 4.

Following consultation, Lindisfarne and Inner Silver Pit South were not selected to be designated as HPMAs in June 2023. The rationale behind Lindisfarne and Inner Silver Pit South not being considered any further can be found on the [Defra website](#).

2. Decision Tree Process

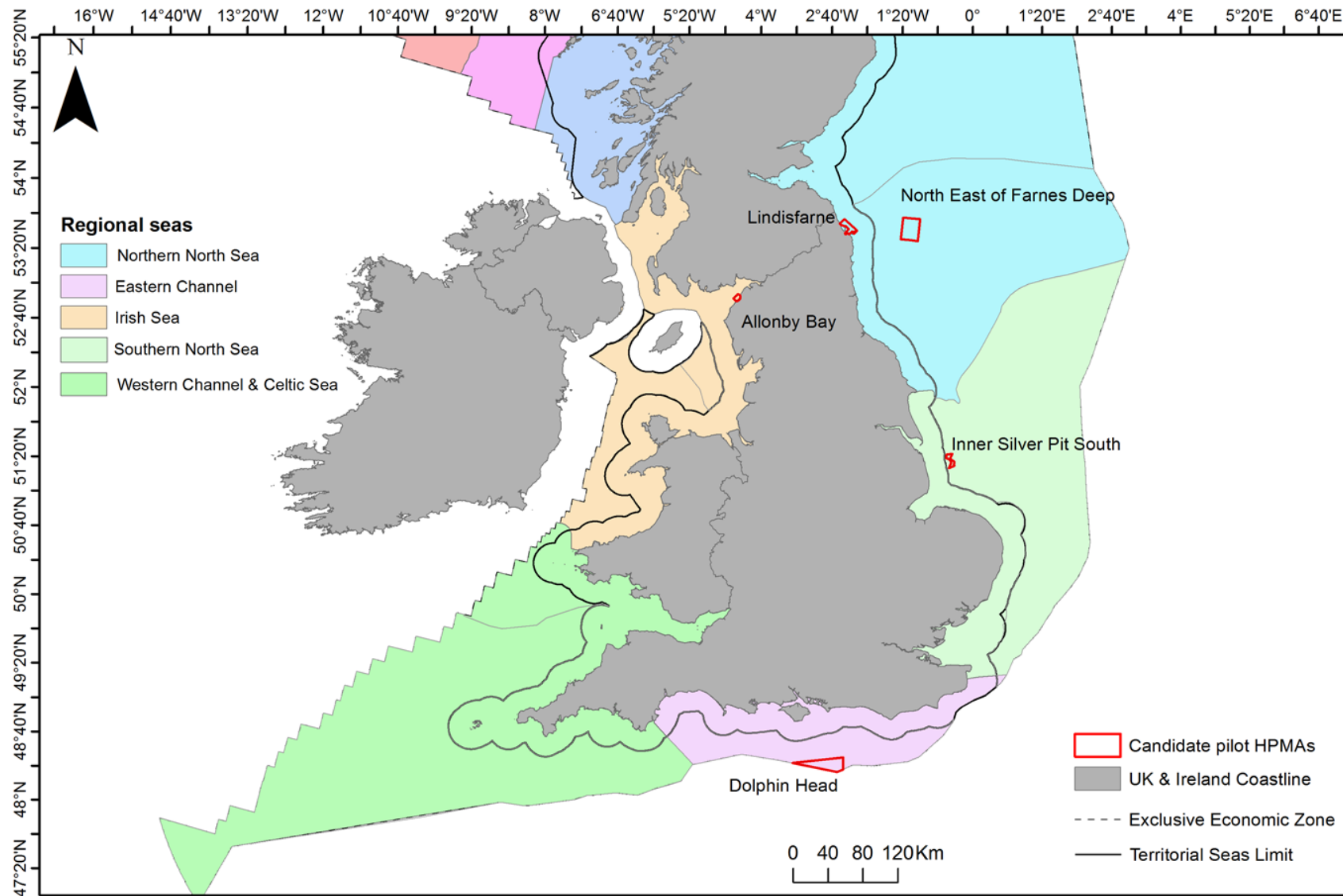
JNCC and Natural England followed a decision tree process to produce our post-consultation scientific advice to Defra on candidate HPMAs (see Annex 1). The decision tree identified where updates and amendments may be required to our pre-consultation advice.

¹ Identifying pilot Highly Protected Marine Areas in English waters: Ecological principles and criteria guidance note. Available at: <https://hub.jncc.gov.uk/assets/47bafb41-05d8-4929-b236-162f4eddd22f>

² Advice to Defra from the Joint Nature Conservation Committee and Natural England on Areas of Ecological Interest for candidate Highly Protected Marine Areas in England 2022. Available at: <https://hub.jncc.gov.uk/assets/cef264d1-b7f1-4eef-b8ca-928494814c62#scientific-advice-on-AEIs-for-candidate-HPMAs-in-England.docx>

³ Scientific advice on the ecological merit of the candidate HPMAs in English Waters. Available at: <https://hub.jncc.gov.uk/assets/cef264d1-b7f1-4eef-b8ca-928494814c62#scientific-advice-on-the-ecological-merit-of-the-candidate-hpmas-in-english-waters.docx>

⁴ Further information available at: <https://consult.defra.gov.uk/hpma/consultation-on-highly-protected-marine-areas/>



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Figure 1. Location of the five candidate HPMA in English waters consulted upon in 2022.

3. Summary of changes in advice

The section below provides a summary of changes in our advice on each of the candidate HPMA since the provision of our pre-consultation advice. Please note that further detail on changes to Allonby Bay and Lindisfarne are contained within Annex 2 of this report, and maps showing all boundary options for each of the five candidate HPMA in the context of overlapping and nearby existing designations are included within Annex 3 of this report.

3.1 Allonby Bay candidate HPMA

Table 1. Summary of changes in advice for Allonby Bay Candidate HPMA.

Candidate HPMA name	Name change required?	Boundary change requested?	Reason(s) underpinning the need for updated advice?	Decision tree outcome
Allonby Bay	No	Yes	New socio-economic information provided during the consultation that required a reassessment of the ecological criteria.	<p>Branch 1 – Outcome A: No new advice required</p> <p>Branch 2 – Outcome E: Revised advice required through a full update to the advice on the ecological merit of the site.</p>
Has there been a change to how the HPMA selection criteria are met?	<p>No change</p> <ul style="list-style-type: none"> Criteria 1a-3b continue to be met Criteria 3c was not met previously and continues to not be met. 		Has there been a change to the evidence standards assessment score?	<p>Yes for Criteria 2a and 2b</p> <ul style="list-style-type: none"> Score has increased from low to medium for Criteria 2a and Criteria 2b Score for all other criteria remains the same
Data				
<p>Ecological data: No new ecological data was received from the consultation.</p> <p>Socio-economic data: Additional information on activities occurring within the site was received from the consultation. This included details of the Maryport Harbour Authority area of jurisdiction, locations dredged by the Port of Silloth, information on use of the site for both shore and boat angling and information on the use of motorised off road vehicles within the site. A Natural England commissioned recreational activity survey of the site, during September and October 2022, provided further detail on the activities occurring within the site.</p>				

Summary of criteria and evidence standards assessment scores									
		Criteria 1a	Criteria 1b	Criteria 1c	Criteria 2a	Criteria 2b	Criteria 3a	Criteria 3b	Criteria 3c
Option A – Consultation boundary	Pre-consultation advice 2021								
	Criteria met	Yes	Yes	Yes	Yes	No	Yes	Yes	No
	Evidence assessment score	High	High	High	Low	Low*	High	Moderate	Low
	Post-consultation advice 2022								
	Criteria met	No change	No change	No change	No change	No change	No change	No change	No change
Evidence assessment score	No change	No change	No change	Moderate	Moderate	No change	No change	No change	
Option B	Criteria met	No change	No change	No change	No change	No change	No change	No change	No change
	Evidence assessment score	No change	No change	No change	Moderate	Moderate	No change	No change	No change
Option C	Criteria met	No change	No change	No change	No change	No change	No change	No change	No change
	Evidence assessment score	No change	No change	No change	Moderate	Moderate	No change	No change	No change

*This is a correction from our pre-consultation advice which scored this as 'Not met' however, it should have stated 'Low' due to the level of evidence that the state of the site was relatively natural and therefore, not likely to be relatively degraded.

Advice on boundary options for Allonby Bay candidate HPMA

Natural England's recommendation: Natural England recommend maintaining as large an area as possible to maximise the protection and recovery of marine ecosystems.

Allonby Bay: Option A – Consultation boundary

Defra requested Natural England provide updated post-consultation advice on the consultation boundary for Allonby Bay.

No new ecological data was received from the consultation.

All the criteria that were previously met continue to be met (1a, 1b, 1c, 2a, 3a, 3b). All the criteria previously not met continue to not be met (2b, 3c).

The only change to our pre-consultation advice is that the evidence standards assessment scores for criteria 2a and 2b have now increased in confidence from low to medium, due to the additional socio-economic information received from the consultation and the data from the Natural England commissioned recreational activity survey of the site during September and October 2022.

Allonby Bay: Option B

Defra requested Natural England provide post-consultation advice on two alternative boundary options to the consultation boundary for this site. Option B is the first of these two alternative boundary options. As requested by Defra, the boundary of Option B excludes the Maryport Harbour Authority area of jurisdiction along the southwestern boundary and areas of maintenance dredging by the Port of Silloth at the northern end of the northwest boundary. The boundary adjustment to exclude the Maryport Harbour Authority area of jurisdiction should have been excluded originally, but the data was not available through the UKHO. In addition, boundaries were straightened in the northeastern and southeastern corners, for compliance and enforcement purposes.

No new ecological data was received from the consultation.

All the criteria that are met by Option A (the consultation boundary) are also met by Option B (1a, 1b, 1c, 2a, 3a, 3b). All the criteria not met by Option A (the consultation boundary) are also not met by Option B (2b, 3c). All the evidence standards assessment scores remain the same as our post-consultation advice for Option A (the consultation boundary). The differences between Option B and Option A are outlined below.

When Option B is compared with Option A (the consultation boundary):

- The total area of the site is reduced by 5.19% (or 2.00 km²).
- The area retains relatively high levels of species diversity when compared to the rest of the region however, there has been a reduction in species diversity of 1.80% as five fewer benthic and demersal species have been recorded within the boundary.
- The area retains the same level of species and habitats of regional, national and global importance for conservation, with 36 species being recorded within the boundary.

- The area retains a high level of importance for key lifecycle stages and behaviours of marine species, with the area retaining a total of 32 key lifecycle stages and behaviours for birds, marine mammals, fish and shellfish, and invertebrates (or suitable conditions for them). The boundary also retains an area that has relatively high potential value as a demersal nursery, when compared to the rest of the region. There is a reduction in the level of importance of the site for key lifecycle stages and behaviours in proportion with the scale of the reduction in the area of the site as a whole. As a result, approximately 5% of areas with suitable conditions for cod, herring, plaice and sole nurseries and sole spawning will be lost. Areas utilised by bass, lobster, edible crab and whelk, feeding areas for marine diving birds such as gannet, red-throated diver, Manx shearwater, common guillemot, razorbill and puffin and feeding areas for waders will be reduced by approximately 5%.
- The area is still considered to be relatively natural, due to overlapping features of Allonby Bay MCZ which are in favourable condition and the relatively low number of activities occurring within the boundary. As a consequence of the boundary amendment, three activities are no longer occurring within the site: maintenance dredging, operation of port and harbours and navigation markers/lights.
- The area retains habitats that are important for the storage of carbon however, the area covered by these habitats is reduced by 5.98% (or 1.06 km²).
- The area retains the same 10 key lifecycle stages and behaviours for commercially important fish and shellfish species (or suitable conditions for them). The boundary retains an area that has relatively high potential value as a demersal nursery, when compared to the rest of the region. There is a reduction in the level of importance of the site for key lifecycle stages and behaviours of commercially important species, in proportion with the scale of the reduction in the area of the site as a whole. As a result, approximately 5% of areas with suitable conditions for cod, herring, plaice and sole nurseries and sole spawning will be lost. Areas utilised by bass, lobster, edible crab and whelk will also be reduced by approximately 5%.
- There is still little evidence that the site contains habitats that are important for the provision of flood or erosion protection.

Allonby Bay: Option C

Defra requested Natural England provide post-consultation advice on two alternative boundary options to the consultation boundary for this site. Option C is the second of these two alternative boundary options. As requested by Defra, the boundary of Option C excludes the Maryport Harbour Authority area of jurisdiction along the southwestern boundary and areas of maintenance dredging by the Port of Silloth at the northern end of the northwest boundary (that are excluded in Option B), as well as an additional area along the northeastern boundary to allow an area for both shore and boat angling. In addition, boundaries were straightened in the northeastern and southeastern corners for compliance and enforcement purposes.

No new ecological data was received from the consultation.

All the criteria that are met by Option A (the consultation boundary) and Option B are also met by Option C (1a, 1b, 1c, 2a, 3a, 3b). All the criteria not met by Option A (the consultation boundary) and Option B are also not met by Option C (2b, 3c). All the evidence standards assessment scores remain the same as our post-consultation advice for Option A (the consultation boundary) and Option B. **Natural England advises that although the same criteria continue to be met by Option C, this is to a lesser degree and in proportion with the scale of the reduction in the area of the site as a whole.** The differences between Option C and Option A, and Option C and Option B, are outlined below.

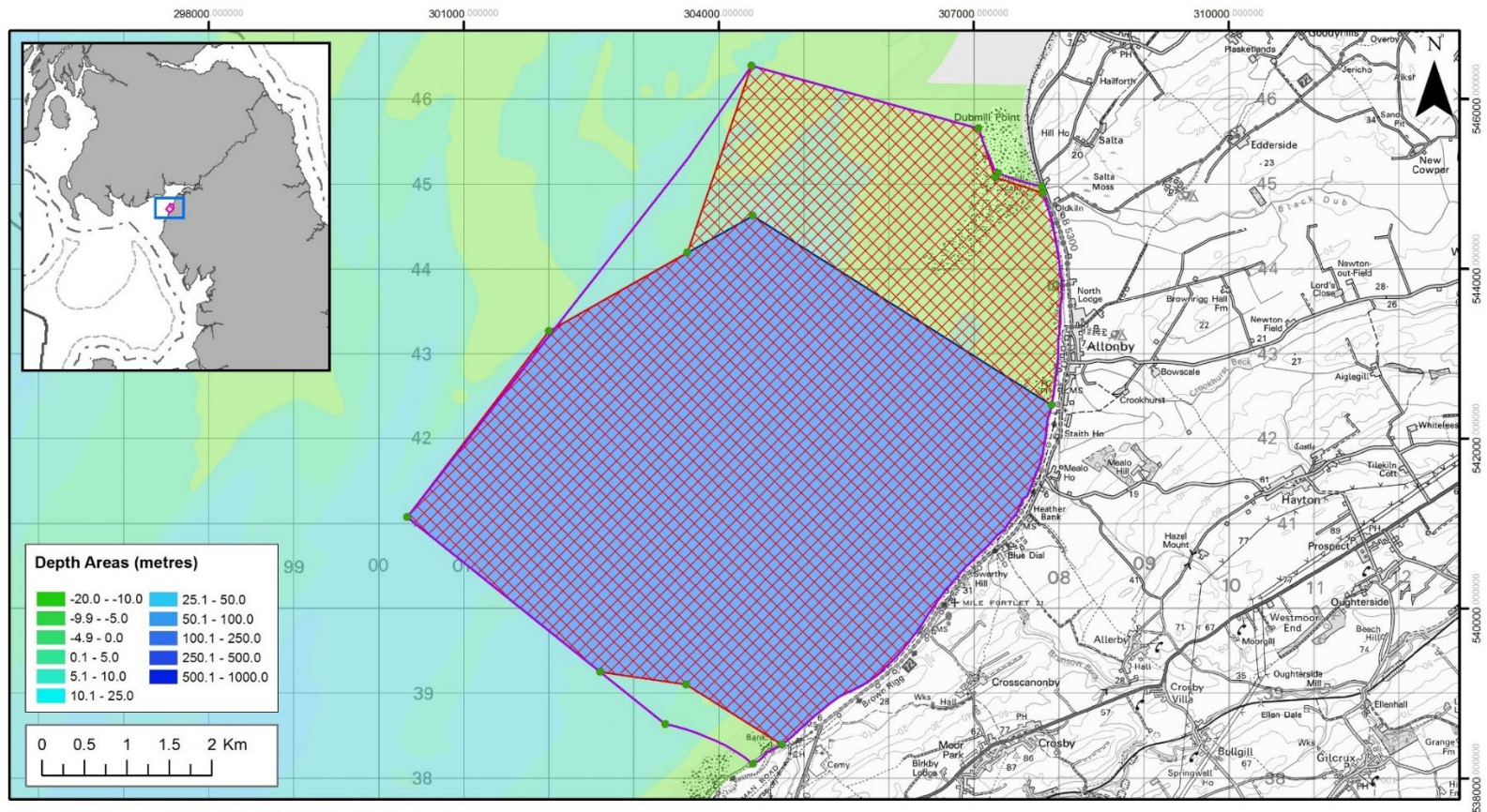
When Option C is compared with Option A (the consultation boundary):

- The total area of the site is reduced by 28.19% (or 10.85 km²).
- The area retains relatively high levels of species diversity, when compared to the rest of the region however, there has been a reduction in diversity of benthic and demersal species of 13.31% (or 37 species) and a reduction in habitat diversity of 20% as three EUNIS Level 3 habitats are no longer recorded within the boundary: A1.1 High energy intertidal rock; A2.4 Intertidal mixed sediments and A4.1 High energy circalittoral rock.
- The area retains the same level of species and habitats of regional, national and global importance for conservation, with 36 species being recorded within the boundary.
- The area retains a high level of importance for key lifecycle stages and behaviours of marine species with a total of 32 key lifecycle stages and behaviours for birds, marine mammals, fish and shellfish, and invertebrates (or suitable conditions for them) still present. The boundary also retains an area that has relatively high potential value as a demersal nursery, when compared to the rest of the region. There is a reduction in the level of importance of the site for key lifecycle stages and behaviours, in proportion with the scale of the reduction in the area of the site as a whole. As a result, approximately 30% of areas with suitable conditions for cod, herring, plaice and sole nurseries and sole spawning will be lost. Areas utilised by bass, lobster, edible crab, whelk, blue mussel beds and feeding and resting areas for 19 species of birds will also be reduced by approximately 30%.
- The area is still considered to be relatively natural due to overlapping features of Allonby Bay MCZ that are in favourable condition and the relatively low number of activities occurring within the boundary. Three activities are no longer occurring within the site: Maintenance dredging, operation of port and harbours and navigation markers/lights.
- The boundary retains habitats that are important for the storage of carbon however, there has been a reduction in their area by 26.61% (or 4.71 km²).
- The area retains the same 10 key lifecycle stages and behaviours for commercially important fish and shellfish species (or suitable conditions for them). The boundary also retains an area that has relatively high potential value as a demersal nursery, when compared to the rest of the region. There is a reduction in the level of importance of the site for key lifecycle stages and behaviours of commercially important species, in proportion with the scale of the reduction in the area of the site as a whole. As a result, approximately 30% of areas with suitable conditions for cod, herring, plaice and sole nurseries and sole spawning will be lost. Areas utilised by bass, lobster, edible crab and whelk will also be reduced by approximately 30%.
- There is still little evidence that the site contains habitats that are important for the provision of flood or erosion protection.

When Option C is compared with Option B (i.e. further changes over and above those with Option B):

- The total area of the site is further reduced by 24.25% (or 8.85 km²).
- The area retains relatively high levels of species diversity, when compared to the rest of the region however, with a reduction in diversity of benthic and demersal species. There is a further reduction of benthic and demersal species of 11.72% (or 32 species) and a further reduction in habitat diversity of 20%, as three EUNIS Level 3 habitats are no longer recorded within the boundary: A1.1 High energy intertidal rock, A2.4 Intertidal mixed sediments and A4.1 High energy circalittoral rock.
- The area retains the same level of species and habitats of regional, national and global importance for conservation, with 36 species being recorded within the boundary.

- The area retains a high level of importance for key lifecycle stages and behaviours of marine species, with a total of 32 key lifecycle stages and behaviours for birds, marine mammals, fish and shellfish, and invertebrates (or suitable conditions for them) still present. The boundary also retains an area that has relatively high potential value as a demersal nursery, when compared to the rest of the region. There is a further reduction in the level of importance of the site for key lifecycle stages and behaviours in proportion with the scale of the reduction in the area of the site as a whole. As a result, there is a further reduction of approximately 25% of areas with suitable conditions for cod, herring, plaice and sole nurseries and sole spawning. Areas utilised by bass, lobster, edible crab, whelk and blue mussel beds, and feeding and resting areas for 19 species of birds will also be further reduced by approximately 25%.
- The area is still considered to be relatively natural, due to overlapping features of Allonby Bay MCZ that are in favourable condition and the relatively low number of activities occurring within the boundary. There are no further changes from Option B.
- The boundary retains habitats that are important for the storage of carbon however, there has been a further reduction in their area by 21.94% (or 3.65 km²).
- The area retains the same 10 key lifecycle stages and behaviours for commercially important fish and shellfish species (or suitable conditions for them). The boundary also retains an area that has relatively high potential value as a demersal nursery, when compared to the rest of the region. There is a further reduction in the level of importance of the site for key lifecycle stages and behaviours of commercially important species, in proportion with the scale of the reduction in the area of the site as a whole. As a result, there is a further reduction of approximately 25% of areas with suitable conditions for cod, herring, plaice and sole nurseries and sole spawning. Areas utilised by bass, lobster, edible crab and whelk will also be further reduced by approximately 25%.
- There is still little evidence that the site contains habitats that are important for the provision of flood or erosion protection. There are no further changes from Option B.



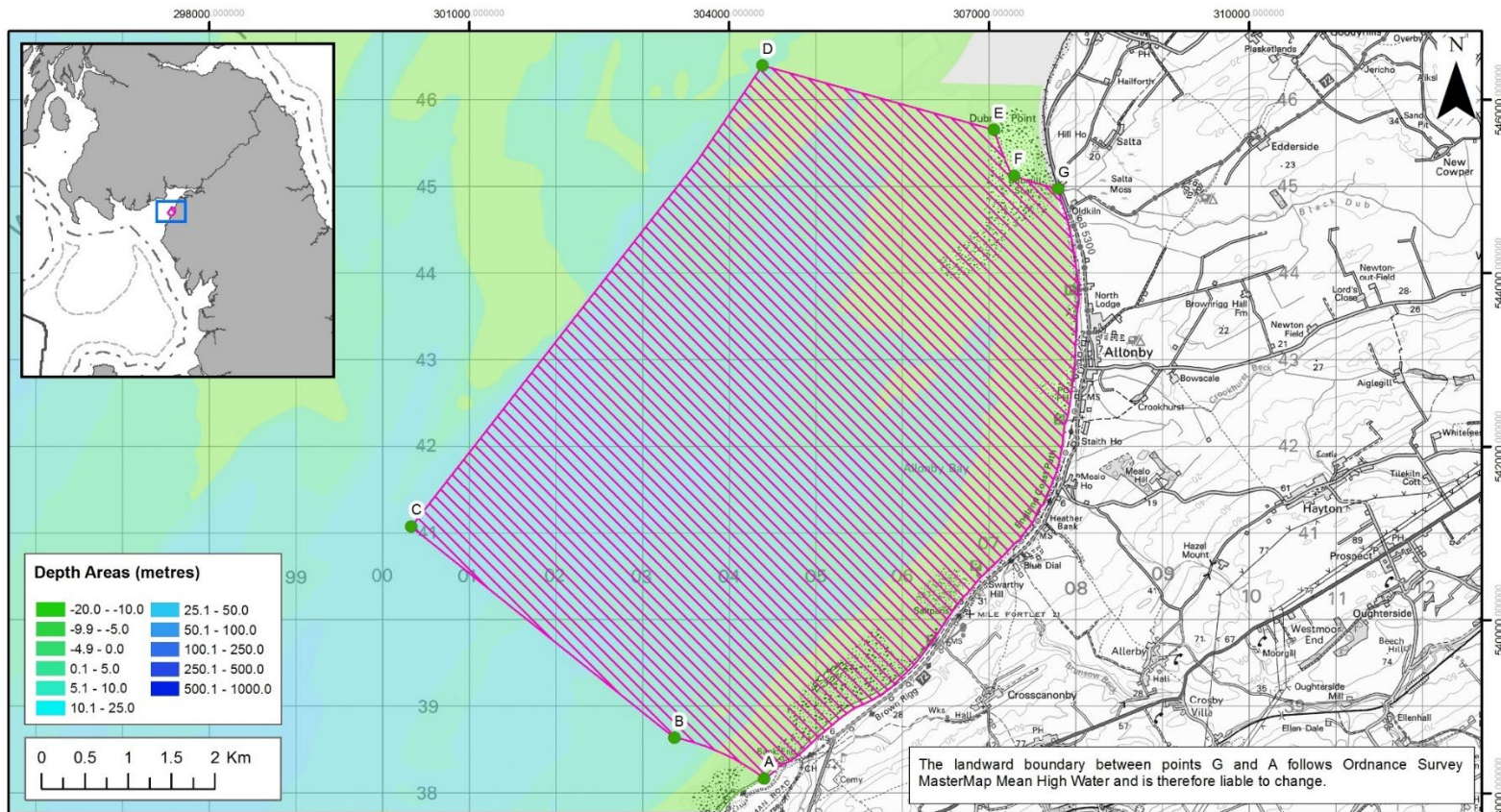
Allonby Bay candidate HPMA: All boundary options

- Allonby Bay candidate HPMA: Option A - Consultation boundary
- Allonby Bay candidate HPMA: Option B
- Allonby Bay candidate HPMA: Option C
- Boundary Coordinates
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial Seas Limit
- Land

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 2. Map showing all proposed site boundary options (A,B and C) for Allonby Bay candidate HPMA.



Allonby Bay candidate HPMA: Option A - Consultation boundary

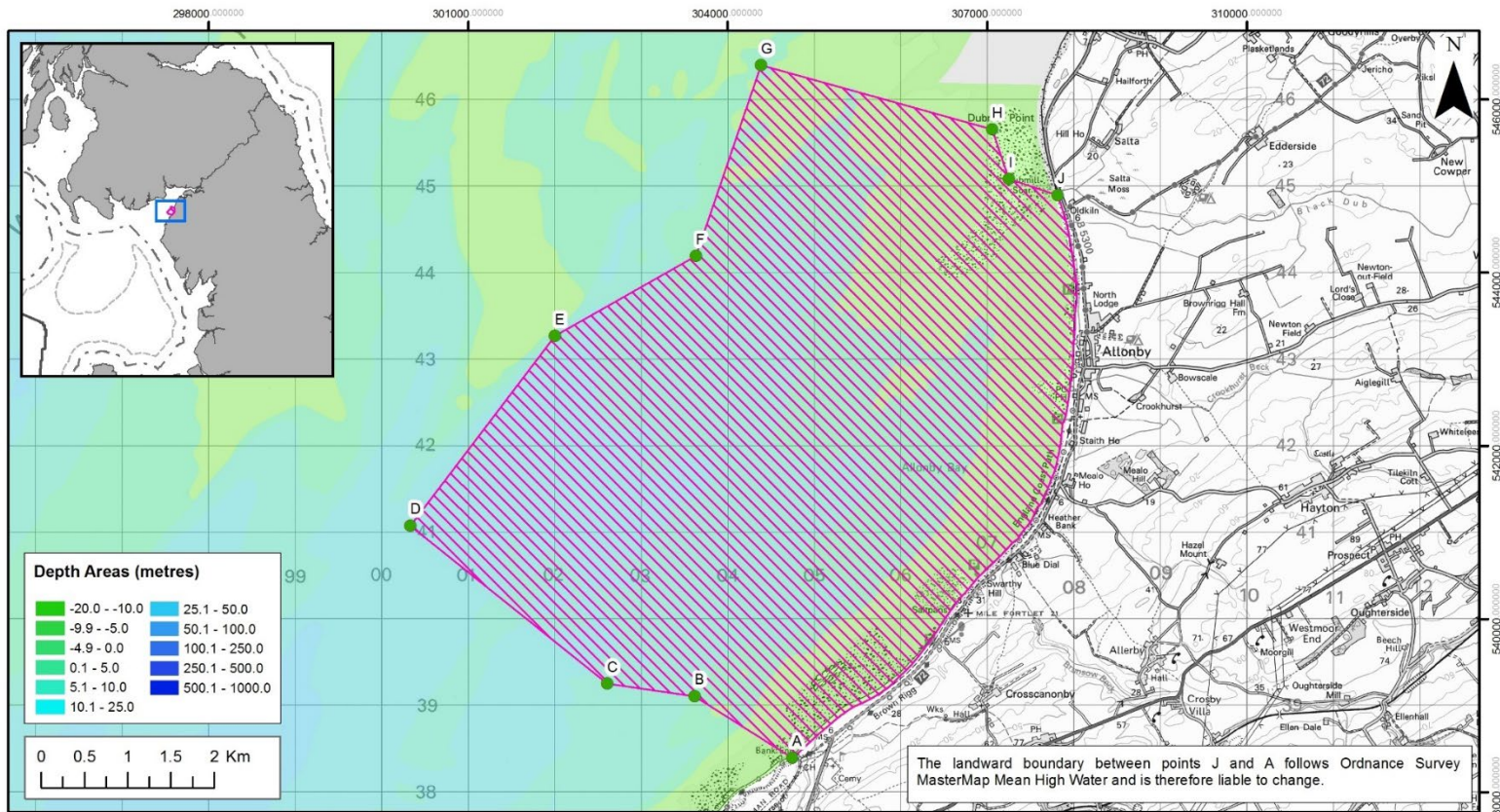
- Candidate HPMA boundary
- Boundary coordinates
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

Point	Latitude	Longitude
A	54° 43' 45.651" N	3° 29' 9.585" W
B	54° 44' 0.166" N	3° 30' 7.910" W
C	54° 45' 16.937" N	3° 33' 0.635" W
D	54° 48' 11.783" N	3° 29' 20.566" W
E	54° 47' 49.631" N	3° 26' 50.084" W
F	54° 47' 32.632" N	3° 26' 36.376" W
G	54° 47' 28.115" N	3° 26' 7.838" W

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 3. Map of Allonby Bay candidate HPMA – Option A boundary.



Allonby Bay candidate HPMA: Option B

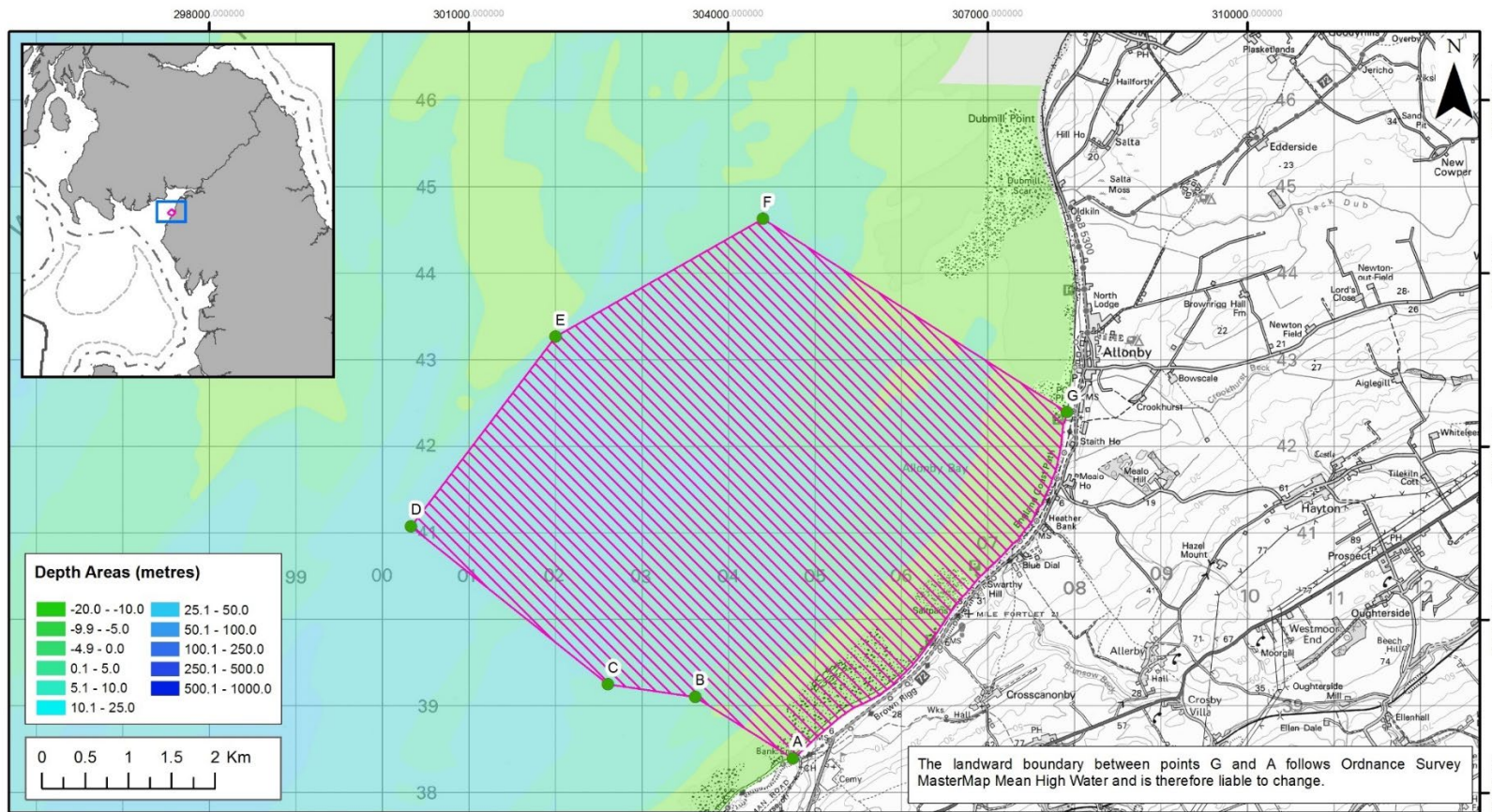
- Candidate HPMA boundary
- Boundary coordinates
- Exclusive economic zone
- 6nm Limit
- 12nm Territorial seas limit
- Land

Point	Latitude	Longitude
A	54° 43' 53.317" N	3° 28' 50.960" W
B	54° 44' 15.532" N	3° 29' 54.682" W
C	54° 44' 19.502" N	3° 30' 51.382" W
D	54° 45' 16.937" N	3° 33' 0.635" W
E	54° 46' 28.937" N	3° 31' 30.093" W
F	54° 47' 0.000" N	3° 30' 0.000" W
G	54° 48' 11.783" N	3° 29' 20.566" W
H	54° 47' 49.631" N	3° 26' 50.084" W
I	54° 47' 31.145" N	3° 26' 38.623" W
J	54° 47' 25.555" N	3° 26' 6.841" W

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 4. Map of Allonby Bay candidate HPMA – Option B boundary.



Allonby Bay candidate HPMA: Option C

- Candidate HPMA boundary
- Boundary coordinates
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

Point	Latitude	Longitude
A	54° 43' 53.317" N	3° 28' 50.960" W
B	54° 44' 15.532" N	3° 29' 54.682" W
C	54° 44' 19.502" N	3° 30' 51.382" W
D	54° 45' 16.937" N	3° 33' 0.635" W
E	54° 46' 28.937" N	3° 31' 30.093" W
F	54° 47' 14.613" N	3° 29' 17.527" W
G	54° 46' 4.737" N	3° 25' 58.230" W

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 5. Map of Allonby Bay candidate HPMA – Option C boundary.

3.2 Dolphin Head candidate HPMA

Table 2. Summary of changes in advice for Dolphin Head Candidate HPMA.

Candidate HPMA name	Name change required?	Boundary change requested?	Reason(s) underpinning the need for updated advice?	Decision tree outcome
Dolphin Head	No	Yes	New ecological and socio-economic data	<p>Branch 1 - Outcome C: Minor update to the advice on the ecological merit of the site.</p> <p>Branch 2 – Outcome E: Revised advice required through a full update to the advice on the ecological merit of the site.</p>
Has there been a change to how the HPMA selection criteria are met?	No change		Has there been a change to the evidence standards assessment score?	No change
Data				
<p>Ecological data⁵: Seabird data not previously considered in our pre-consultation assessment on this candidate HPMA (Bradbury <i>et al.</i>, 2014; Waggitt <i>et al.</i>, 2020) and further discussions with JNCC seabird specialists has resulted in a change to our understanding of seabird presence within the candidate HPMA. Our updated advice is that three species are considered notably present within the candidate HPMA; this includes three seabird species from our pre-consultation advice on this candidate HPMA (common guillemot, lesser-black-backed gull and northern gannet). These three species are considered to be notably present within the candidate HPMA because they occur at higher-than-average densities at different times of the year, by comparison to the wider region and English waters. It should be noted however that there are no available data to support the significance of the candidate HPMA to the life histories of these species. There are now 11 seabird species (Atlantic puffin, Artic tern, black-headed gull, black-legged kittiwake, common tern, great skua, little tern, Mediterranean gull, norther fulmar, razorbill and sandwich tern) not considered to be notably present within the candidate HPMA because these do not occur at higher-than-average densities by comparison to the wider region and English waters.</p>				

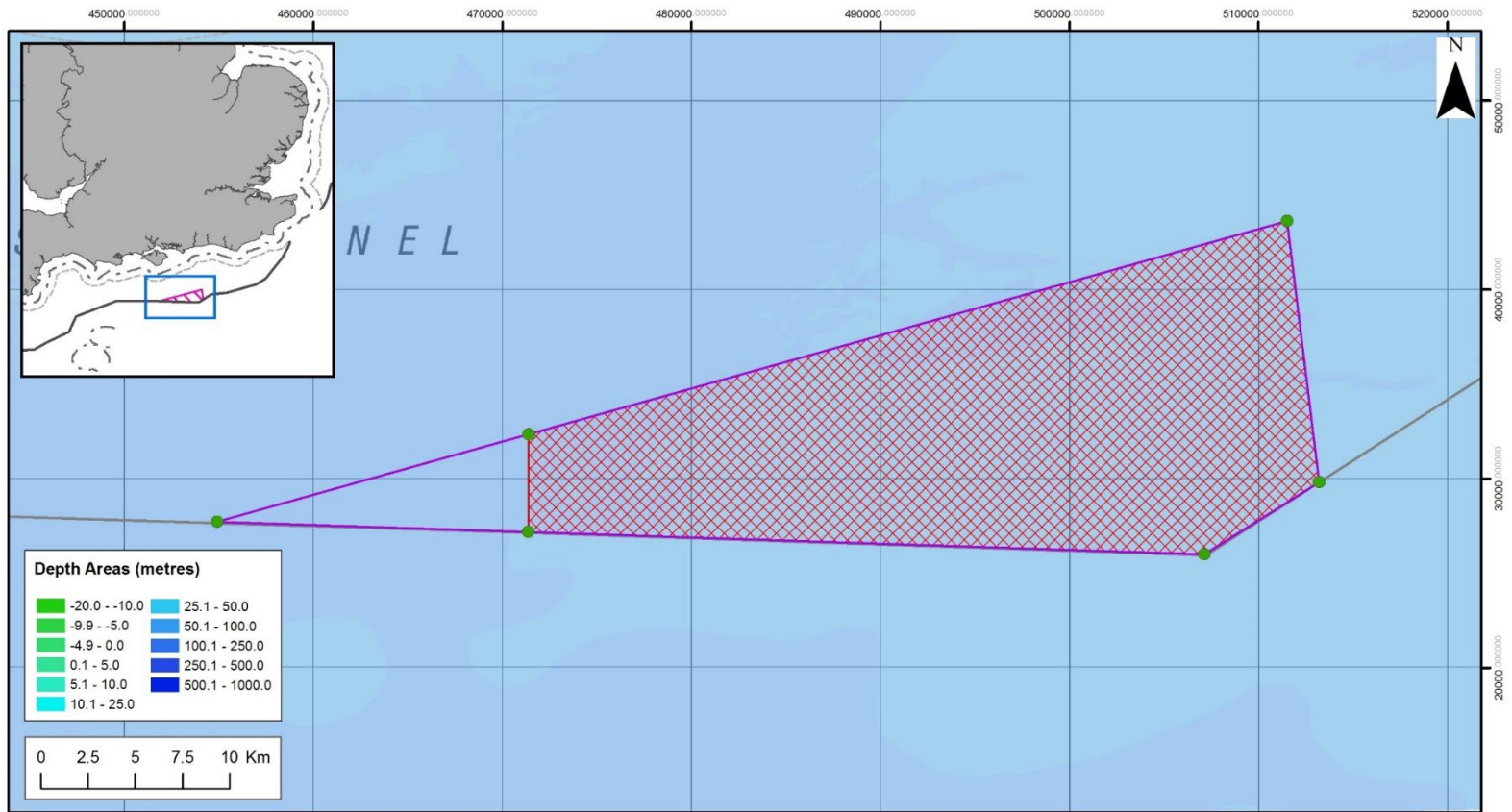
⁵ For full references please see reference list provided in the advice on the ecological merit of the candidate HPMA in Section 4.

Marine mammal data not previously considered in our pre-consultation assessment of this candidate HPMA (Heinänen and Skov, 2015, SCANS III, 2021 and Vincent *et al.* 2017), in combination with further discussions with marine mammal experts at JNCC, has resulted in a change to our understanding of marine mammal presence within the candidate HPMA. Our updated advice is that two species of marine mammals have been recorded within the site; this includes one species from our pre-consultation advice on this candidate HPMA (harbour porpoise) and the addition of one new species (grey seal). Three marine mammal species (Short-beaked common dolphin, Risso's dolphin and Minke whale) are no longer considered to be notably present within the candidate HPMA.

Socio-economic data: Boundary amendments have also been recommended for enforcement and compliance reasons following discussions with the Marine Management Organisation. Their preference was to exclude an area in the south-west corner of the candidate HPMA to avoid an acute angle in any final site boundary.

Following analysis undertaken by JNCC, we conclude that this amendment does not have a significant impact on the ecological merit of the candidate HPMA as loss in area to the candidate HPMA is relatively small and all key interest features remain within the boundary.

Defra requested that JNCC provide, as part of our formal post-consultation advice, two versions of the boundary for this candidate HPMA; one which is the original consulted boundary (Option A) and one which represents the modified version, following consideration of compliance and enforcement as highlighted above (Option B).



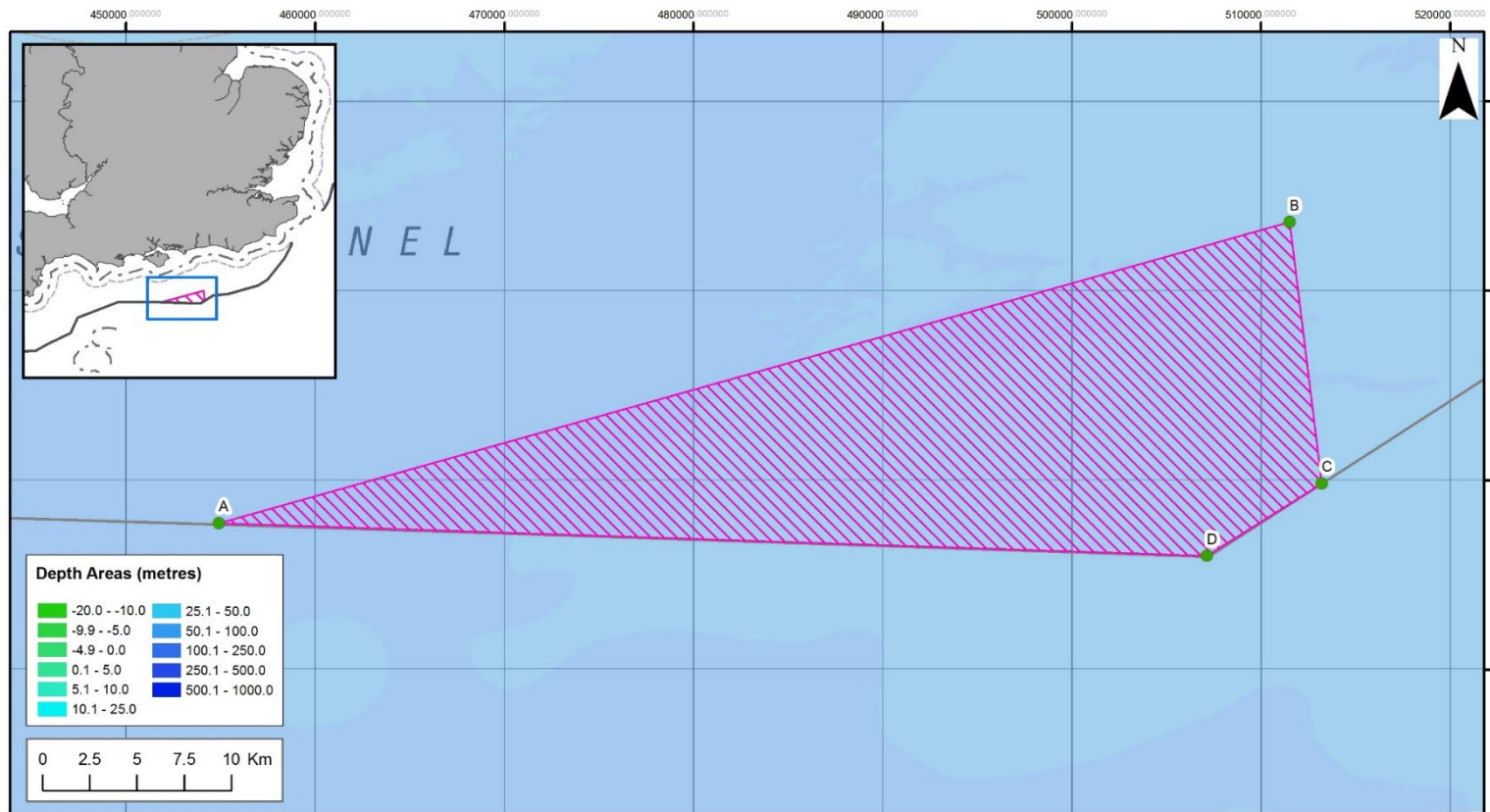
Dolphin Head candidate HPMA: All boundary options

- Dolphin Head - Option A - Consultation boundary
- Dolphin Head - Option B
- Boundary coordinates
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 6. Map showing all proposed site boundary options (A and B) for Dolphin Head Bay candidate HPMA.



Dolphin Head candidate HPMA: Option A - Consultation boundary

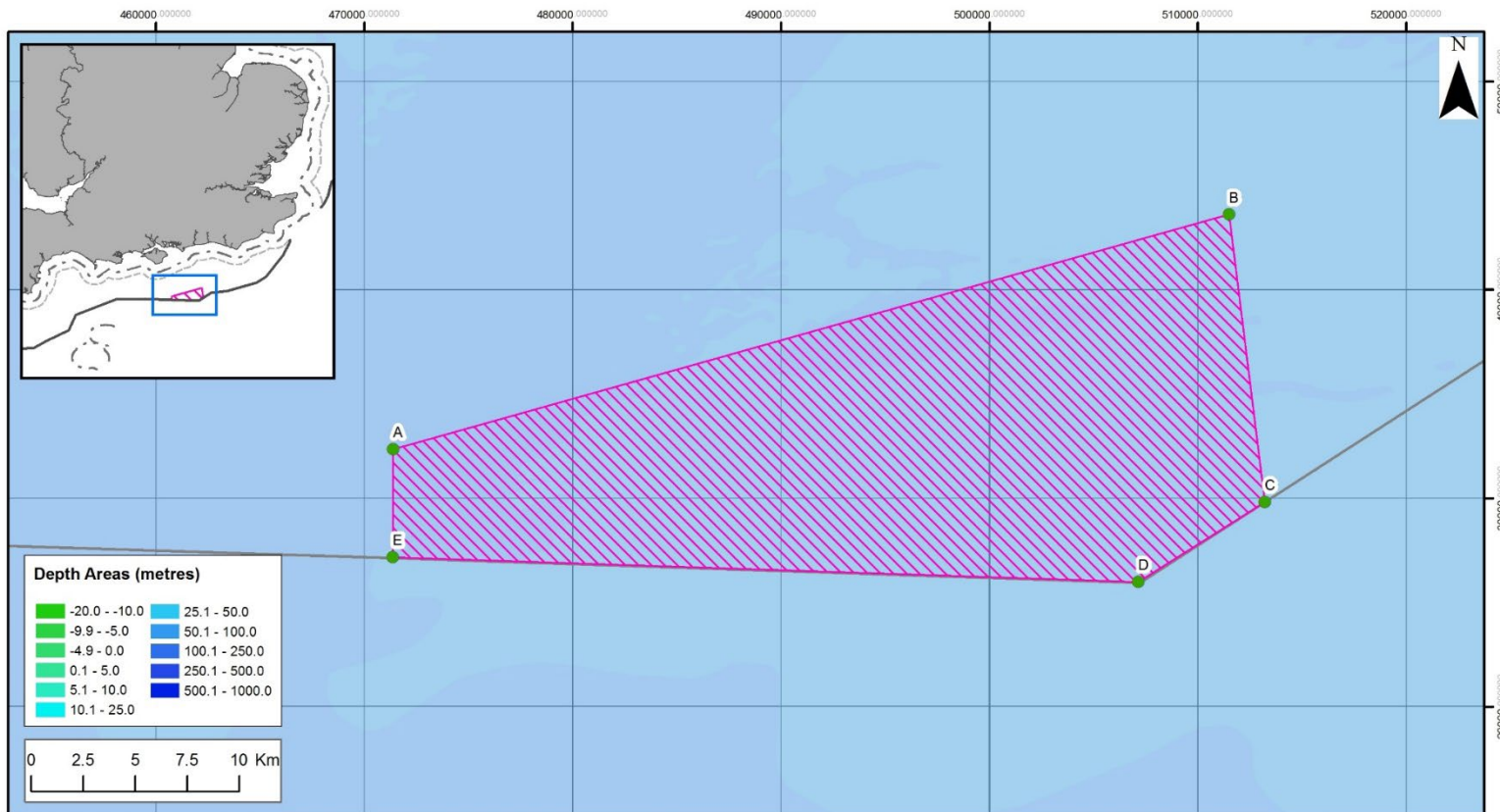
- Candidate HPMA boundary
- Boundary coordinates
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

Point	Latitude	Longitude
A	50° 8' 46.797" N	1° 13' 54.180" W
B	50° 16' 53.075" N	0° 26' 5.592" W
C	50° 9' 24.903" N	0° 24' 54.526" W
D	50° 7' 24.901" N	0° 30' 4.111" W

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 7. Map of Dolphin Head candidate HPMA – Option A boundary.



Dolphin Head candidate HPMA: Option B

- Candidate HPMA boundary
- Boundary coordinates
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial Seas Limit
- Land

Point	Latitude	Longitude
A	50° 11' 10.674" N	0° 59' 59.938" W
B	50° 16' 53.075" N	0° 26' 5.592" W
C	50° 9' 24.903" N	0° 24' 54.526" W
D	50° 7' 24.901" N	0° 30' 4.111" W
E	50° 8' 23.700" N	1° 0' 5.000" W

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 8. Map of Dolphin Head candidate HPMA – Option B boundary.

3.3 Inner Silver Pit South candidate HPMA

Table 3. Summary of changes in advice for Inner Silver Pit South Candidate HPMA.

Candidate HPMA name	Name change required?	Boundary change requested?	Reason(s) underpinning the need for updated advice?	Decision tree outcome
Inner Silver Pit South	No	Yes	New ecological and socio-economic data	<p>Branch 1 - Outcome C: Minor update to the advice on the ecological merit of the site.</p> <p>Branch 2 – Outcome E: Revised advice required through a full update to the advice on the ecological merit of the site.</p>
Has there been a change to how the HPMA selection criteria are met?	No change		Has there been a change to the evidence standards assessment score?	No change
Data				
<p>Ecological data⁶: Seabird data not previously considered in our pre-consultation assessment on this candidate HPMA (Bradbury <i>et al.</i>, 2014; Lawson <i>et al.</i>, 2016; Waggitt <i>et al.</i>, 2020) and further discussions with JNCC seabird specialists has resulted in a change to our understanding of seabird presence within the candidate HPMA. Our updated advice is that seven species are considered to be notably present within the HPMA; this includes four seabird species from our pre-consultation advice on this candidate HPMA (black-legged kittiwake, common guillemot, herring gull and lesser black-backed gull and) and three additional species (red-throated diver, little gull and common tern). These seven species are considered to be notably present within the candidate HPMA because they occur at higher-than-average densities at different times of the year, by comparison to the wider region and English waters. It should be noted however that there are no available data to support the significance of the candidate HPMA to the life histories of these species. Two seabird species (northern fulmar, and razorbill) are not considered to be notably present within the candidate HPMA because they do not occur at higher-than-average densities by comparison to the wider region and English waters.</p>				

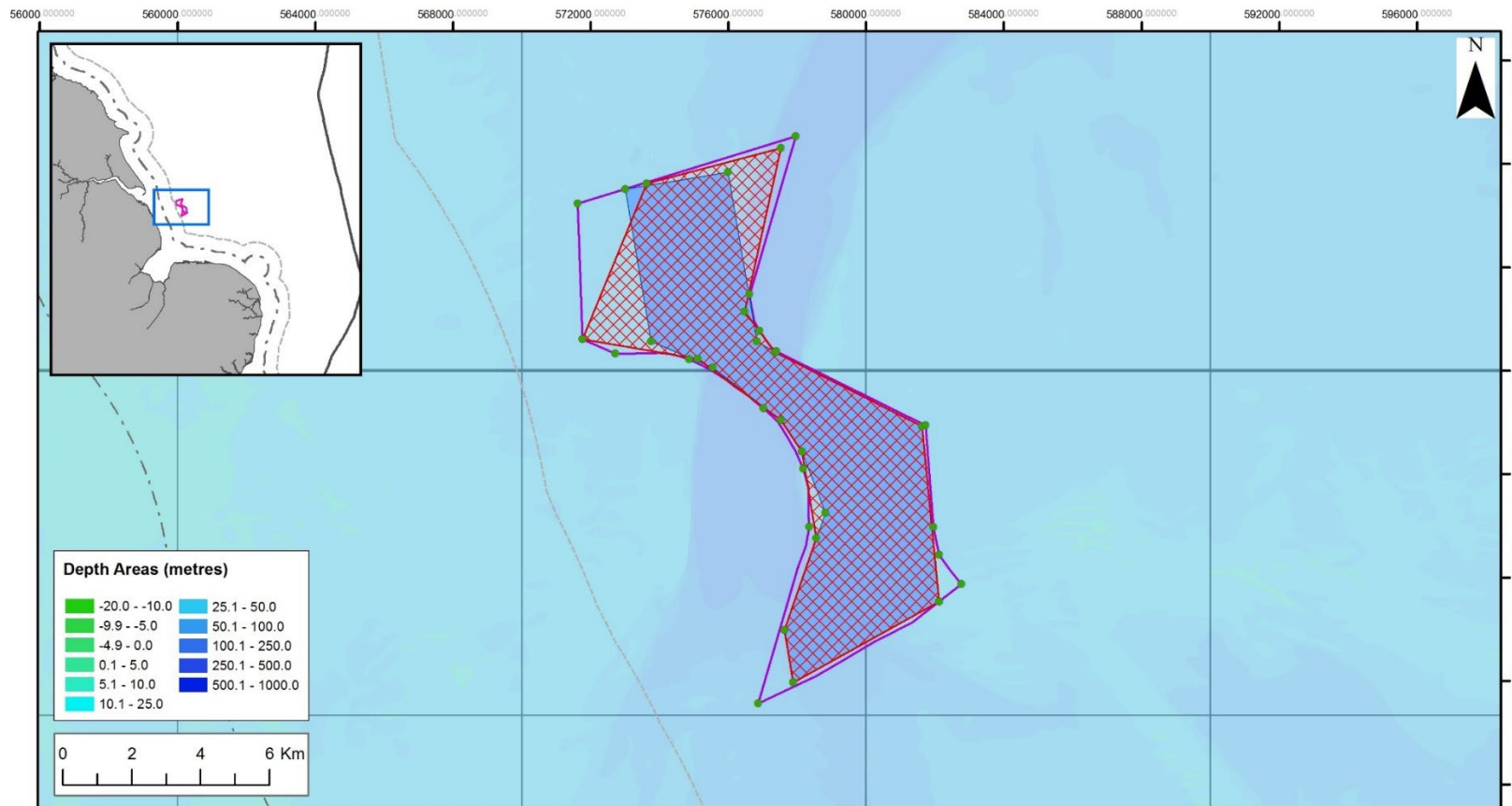
⁶ For full references please see reference list provided in the advice on the ecological merit of the candidate HPMA in Section 4.

Marine mammal data not previously considered in our pre-consultation assessment of this candidate HPMA (Heinänen, and Skov, 2015; Waggitt *et al.*, 2020; SCANS III, 2021; Carter *et al.*, 2022) has confirmed our understanding (detailed in the pre-consultation advice) on the presence of marine mammals within the area and therefore no change is required in our pre-consultation advice.

Socio-economic data: During the public consultation the location of a planned cabling route to the north-west of the candidate HPMA was drawn to our attention and as a result was removed from part of the original consulted boundary; to be consistent with the fact that cabling installation and maintenance is an activity category not considered to be able to adapt to the location of a candidate HPMA.

Boundary amendments for the candidate HPMA have been recommended for enforcement and compliance reasons since public consultation, following discussions with the Marine Management Organisation (MMO). Their preference was to have straight lines and as fewer angles as possible. The revisions have therefore involved straightening the boundary lines where possible to remove any unnecessary angles.

On socio-economic grounds linked to fishing activity, Defra requested that JNCC provide, as part of our formal post-consultation advice, three versions of the boundary for this candidate HPMA; one which mirrors the consulted boundary except for the removal of the cabling route to the north-west (Option A on the accompanying maps), one which represents the modified version for ease of compliance/enforcement purposes as described above (Option B), and one which restricts the extent of the candidate HPMA boundary to the north (Option C). JNCC have done as Defra have requested, which results in the reduction of the extent (but not full removal) of a number of key habitats, species and ecological functions within the candidate HPMA boundary Option B and C. The three boundary options are equivalent in terms of how each meets the HPMA ecological selection criteria. Option C however results in the greatest reduction in the extent of habitats, species and potential areas used for key life cycle stages and/or behaviour of marine species that fall within the boundary of the candidate HPMA. JNCC and the MMO have expressed preference (on ecological grounds and for ease of compliance/enforcement purposes) for Option B - should the Minister be minded to designate this candidate HPMA.



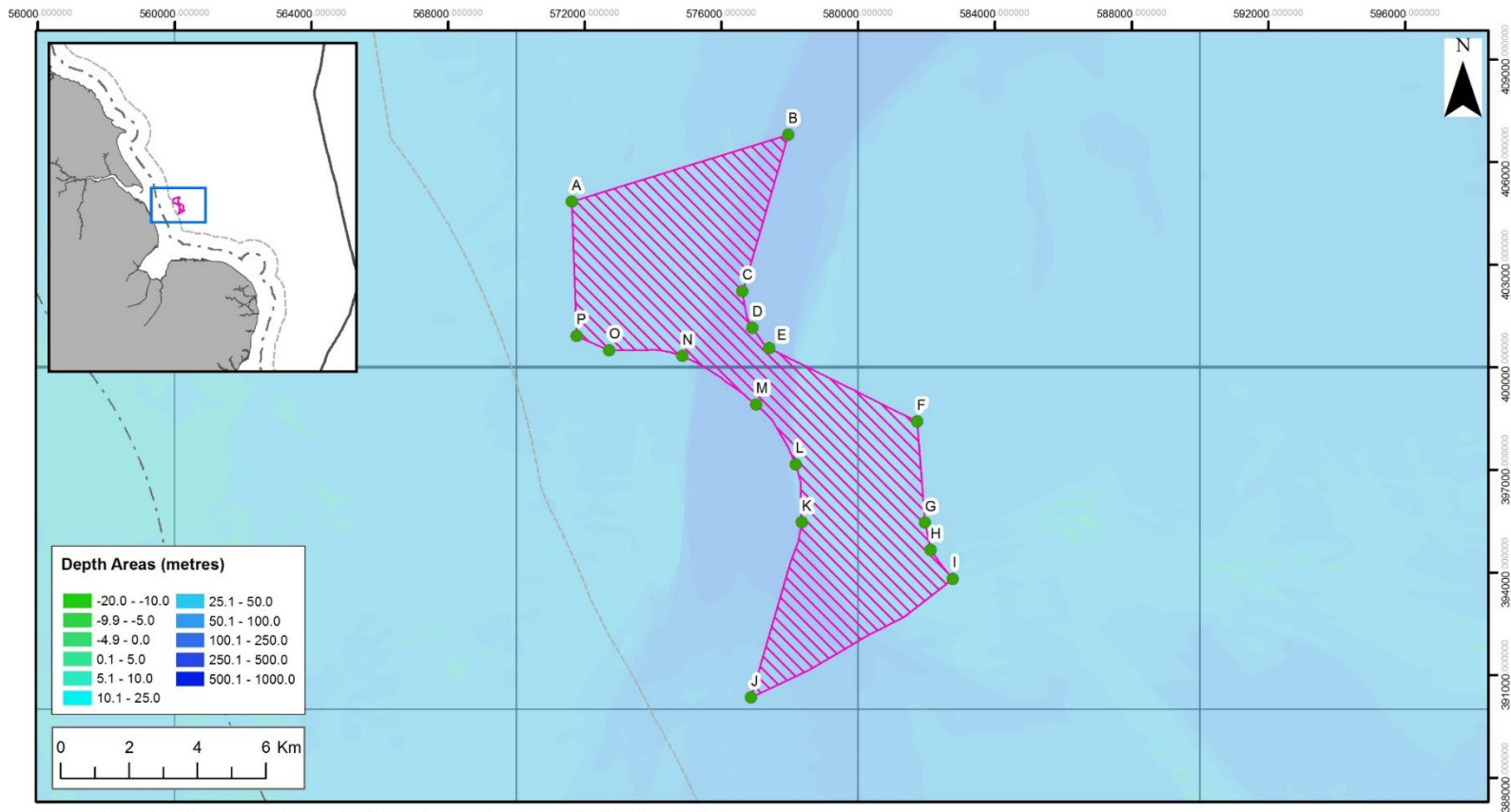
Inner Silver Pit South candidate HPMA: All boundary options

- Inner Silver Pit South - Option A - Consultation boundary
- Inner Silver Pit South - Option B
- Inner Silver Pit South - Option C
- Boundary coordinates
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 9. Map showing all proposed site boundary options (A, B and C) for Inner Silver Pit South candidate HPMA.



Inner Silver Pit South candidate HPMA: Option A - Consultation boundary

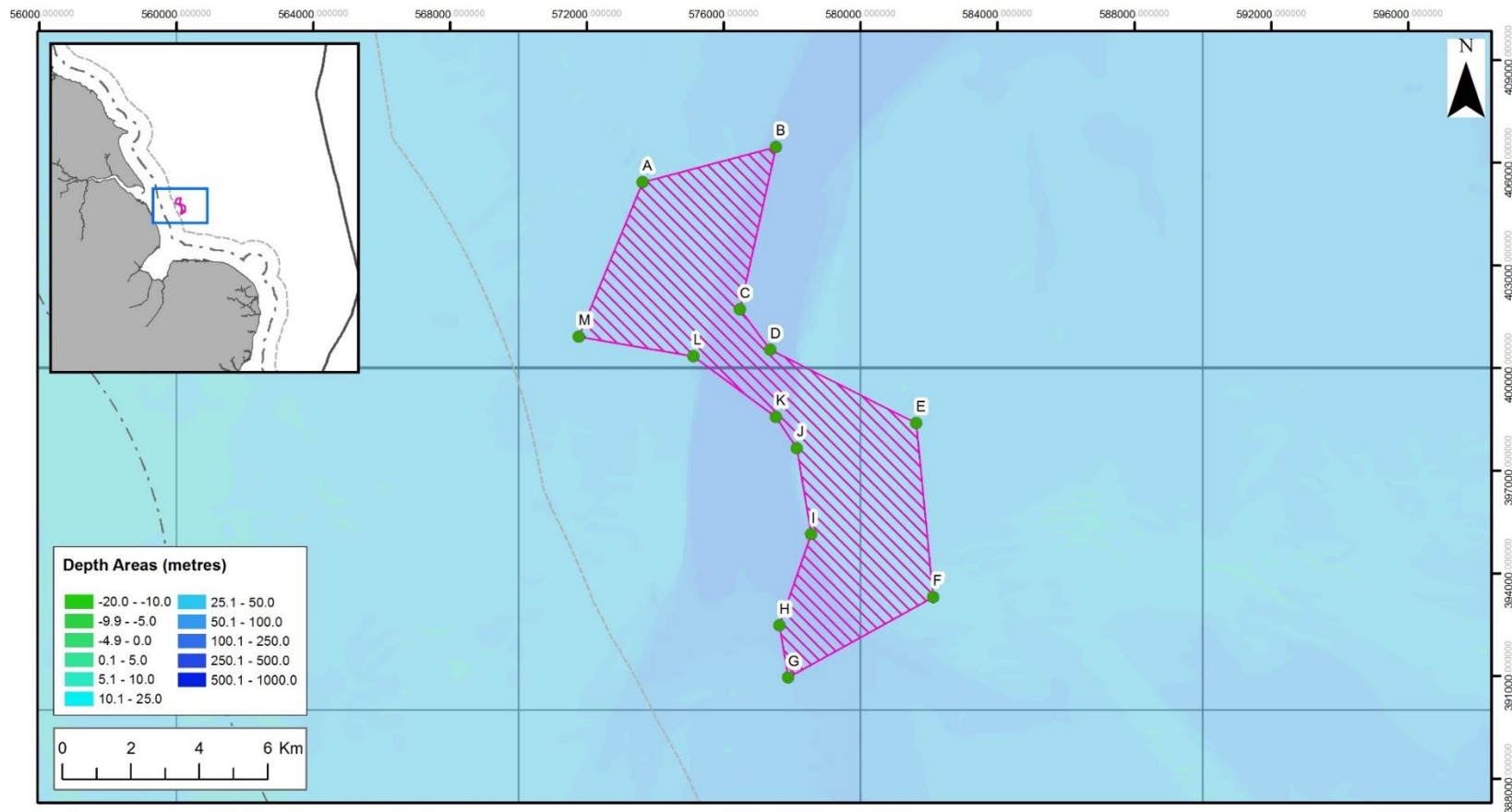
- Candidate HPMA boundary
- Boundary coordinates
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

Point	Latitude	Longitude	Point	Latitude	Longitude
A	53° 30' 44.262" N	0° 35' 11.987" E	I	53° 24' 33.887" N	0° 44' 53.282" E
B	53° 31' 40.004" N	0° 40' 59.347" E	J	53° 22' 49.040" N	0° 39' 27.068" E
C	53° 29' 13.495" N	0° 39' 37.544" E	K	53° 25' 32.916" N	0° 40' 57.842" E
D	53° 28' 38.460" N	0° 39' 50.598" E	L	53° 26' 27.953" N	0° 40' 51.337" E
E	53° 28' 18.678" N	0° 40' 16.266" E	M	53° 27' 25.884" N	0° 39' 52.243" E
F	53° 27' 3.996" N	0° 44' 6.223" E	N	53° 28' 14.412" N	0° 37' 58.393" E
G	53° 25' 28.200" N	0° 44' 12.642" E	O	53° 28' 22.429" N	0° 36' 2.833" E
H	53° 25' 2.003" N	0° 44' 20.126" E	P	53° 28' 37.146" N	0° 35' 11.987" E







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Map Projection: British National Grid
 Boundary Coordinates Projection: WGS84

Figure 10. Map of Inner Silver Pit South candidate HPMA – Option A boundary.



Inner Silver Pit South candidate HPMA: Option B

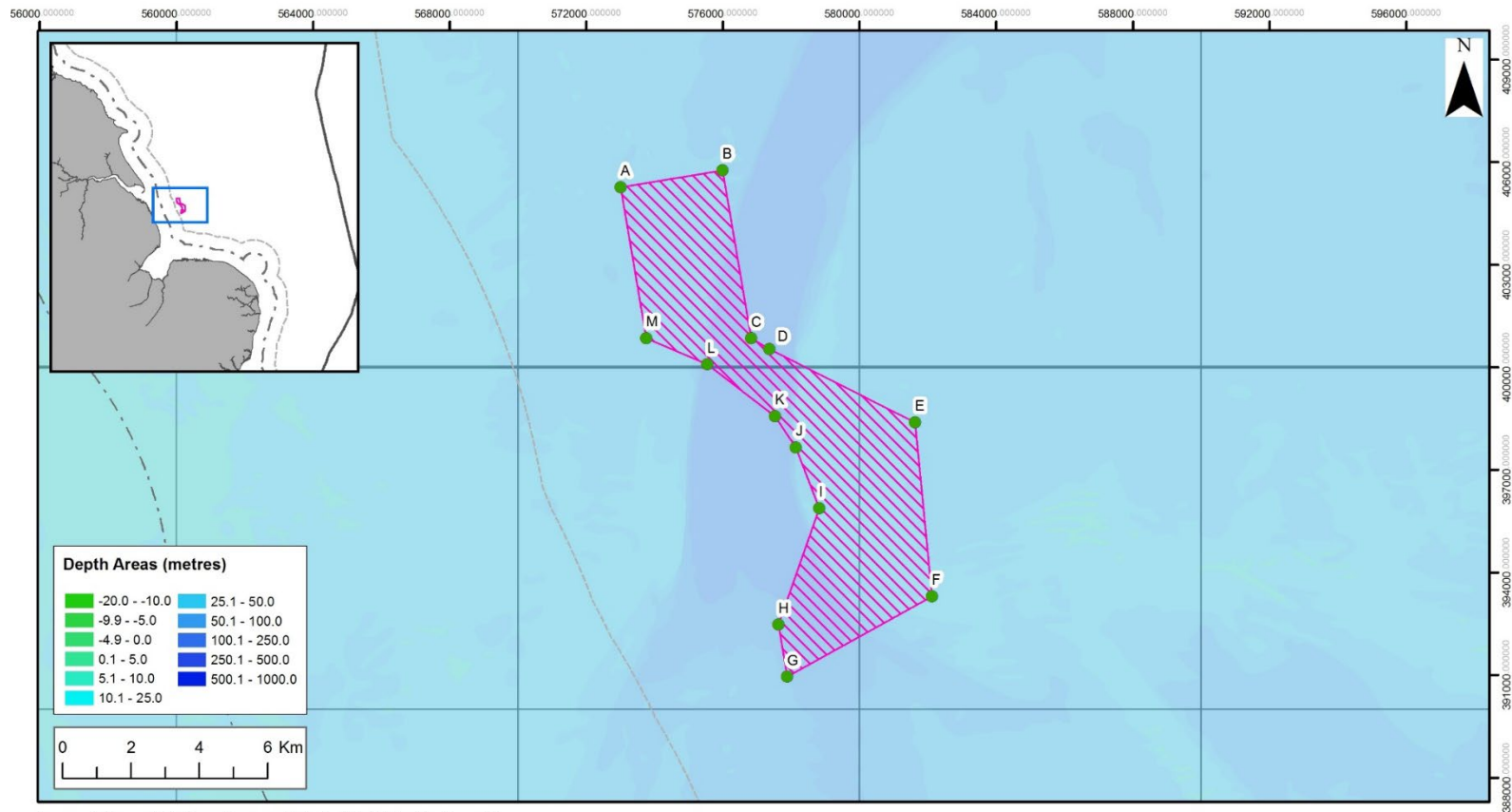
-  Candidate HPMA boundary
-  Boundary coordinates
-  Exclusive economic zone
-  6nM Limit
-  12nM Territorial seas limit
-  Land

Point	Latitude	Longitude	Point	Latitude	Longitude
A	53° 31' 1.010" N	0° 37' 1.891" E	H	53° 23' 57.058" N	0° 40' 12.376" E
B	53° 31' 29.450" N	0° 40' 35.174" E	I	53° 25' 22.093" N	0° 41' 8.345" E
C	53° 28' 57.091" N	0° 39' 28.336" E	J	53° 26' 43.987" N	0° 40' 50.565" E
D	53° 28' 17.796" N	0° 40' 14.346" E	K	53° 27' 14.291" N	0° 40' 19.194" E
E	53° 27' 3.551" N	0° 44' 1.279" E	L	53° 28' 14.723" N	0° 38' 12.552" E
F	53° 24' 18.408" N	0° 44' 17.301" E	M	53° 28' 37.148" N	0° 35' 11.985" E
G	53° 23' 7.380" N	0° 40' 23.263" E			

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 11. Map of Inner Silver Pit South candidate HPMA – Option B boundary.



Inner Silver Pit South candidate HPMA: Option C

- Candidate HPMA boundary
- Boundary coordinates
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

Point	Latitude	Longitude	Point	Latitude	Longitude
A	53° 30' 56.446" N	0° 36' 27.740" E	H	53° 23' 57.058" N	0° 40' 12.376" E
B	53° 31' 8.805" N	0° 39' 10.793" E	I	53° 25' 45.773" N	0° 41' 23.914" E
C	53° 28' 28.726" N	0° 39' 46.049" E	J	53° 26' 43.987" N	0° 40' 50.565" E
D	53° 28' 17.796" N	0° 40' 14.346" E	K	53° 27' 14.291" N	0° 40' 19.194" E
E	53° 27' 3.551" N	0° 44' 1.279" E	L	53° 28' 5.735" N	0° 38' 35.261" E
F	53° 24' 18.408" N	0° 44' 17.301" E	M	53° 28' 32.742" N	0° 36' 59.546" E
G	53° 23' 7.380" N	0° 40' 23.263" E			

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 Boundary Coordinates Projection: WGS84

Figure 12. Map of Inner Silver Pit South candidate HPMA – Option C boundary.

3.4 Lindisfarne candidate HPMA

Table 4. Summary of changes in advice for Lindisfarne Candidate HPMA.

Candidate HPMA name	Name change required?	Boundary change requested?	Reason(s) underpinning the need for updated advice?	Decision tree outcome
Lindisfarne	No	No	None	<p>Branch 1 - Outcome A No new advice required</p> <p>Branch 2 – Outcome D Revised advice likely required through an update to the advice on the ecological merit of the site.</p>
Has there been a change to how the HPMA selection criteria are met?	<p>No change</p> <ul style="list-style-type: none"> • Criteria 1a-3b are met • Criteria 3c is not met 		Has there been a change to the evidence standards assessment score?	No change
Data				
<p>Ecological data: No new ecological data was received from the consultation. It was highlighted throughout the consultation period, during the face-to-face workshops, that Fenham Flats has the best area of seagrass in the Berwickshire and North Northumberland Coast Special Area of Conservation (SAC); and that Fenham Flats is outside the boundary of the candidate HPMA. Natural England have assessed the ecological value of this area however Fenham Flats was removed from the boundary of the candidate HPMA due to the presence of the Holy Island causeway and a Pacific oyster aquaculture operation, as requested by Defra, as these activities were considered incompatible with the definition of HPMA.</p> <p>Socio-economic data: Additional socio-economic information was received from the consultation, however, this did not alter our understanding of the ecological criteria.</p>				

Summary of criteria and evidence standards assessment scores									
		Criteria 1a	Criteria 1b	Criteria 1c	Criteria 2a	Criteria 2b	Criteria 3a	Criteria 3b	Criteria 3c
Option A – Consultation boundary	Pre-consultation advice 2021								
	Criteria met	Yes	Yes	Yes	No	Yes	Yes	Yes	No
	Evidence assessment score	High	High	High	Low	Moderate	High	Moderate	Low
	Post-consultation advice 2022								
	Criteria met	No change	No change	No change	No change	No change	No change	No change	No change
Evidence assessment score	No change	No change	No change	No change	No change	No change	No change	No change	No change

Advice on boundary options for Lindisfarne candidate HPMA

Lindisfarne Option A – Consultation boundary

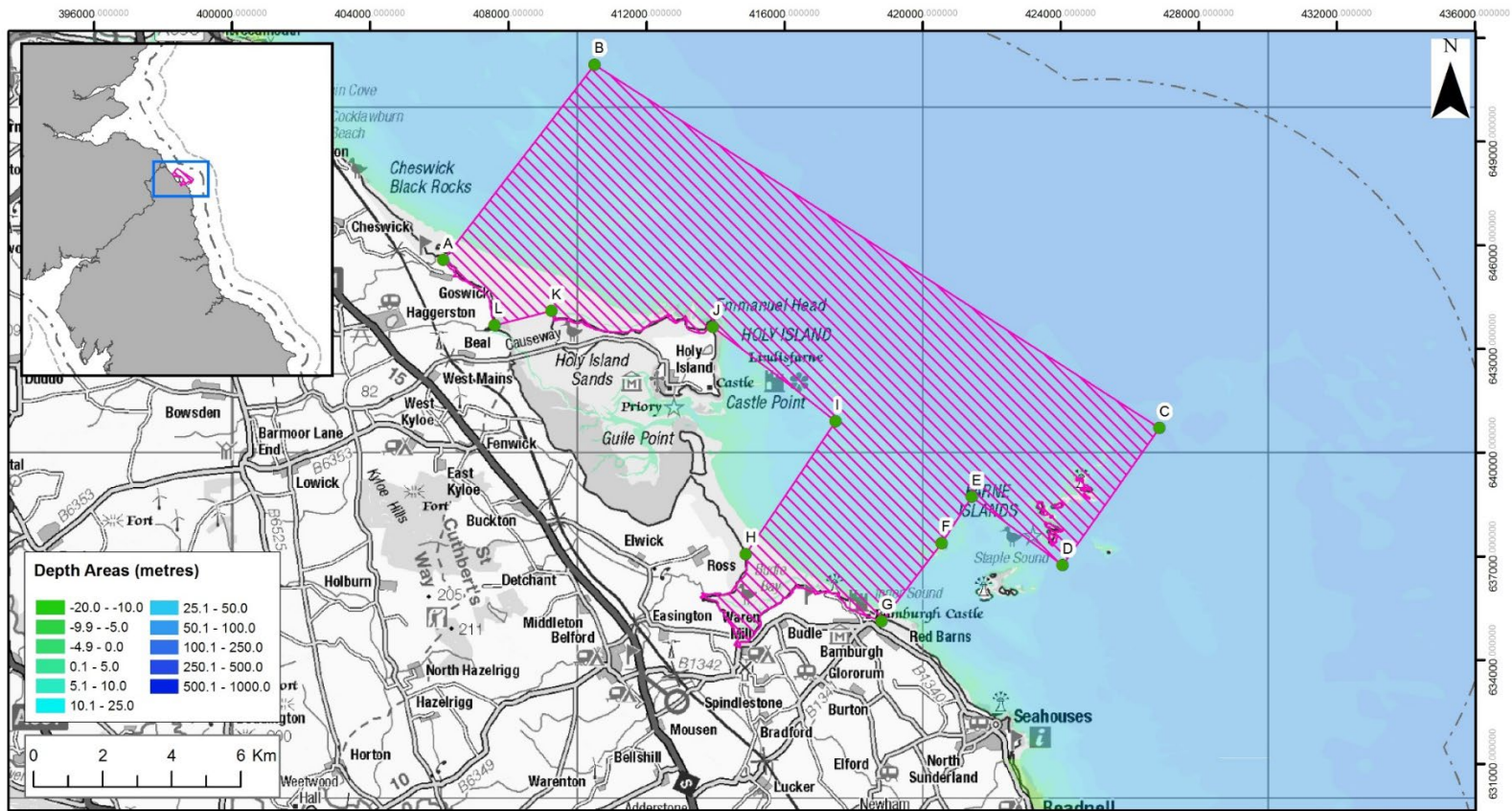
Defra requested Natural England provide updated post-consultation advice on the consultation boundary for Lindisfarne.

No new ecological data was received from the consultation.

Additional socio-economic information was received from the consultation however, this did not change our understanding of the ecological criteria. There has therefore, been no change to our previous advice for this site and no update to the advice on the ecological merit of the site was required.

All the criteria that were previously met continue to be met (1a, 1b, 1c, 2b, 3a, 3b). All the criteria previously not met, continue to be not met (2a, 3c). All the evidence standards assessment scores remain the same.

Defra did not request post-consultation advice for any alternative boundary options for this site.



Lindisfarne candidate HPMA: Option A - Consultation boundary

- Candidate HPMA boundary
- Boundary coordinates
- Exclusive economic zone
- 6Nm Limit
- 12Nm Territorial seas limit
- Land

Point	Latitude	Longitude	Point	Latitude	Longitude
A	55° 42' 12.922" N	1° 54' 15.799" W	G	55° 36' 33.579" N	1° 42' 11.115" W
B	55° 45' 15.659" N	1° 50' 4.025" W	H	55° 37' 37.002" N	1° 45' 55.478" W
C	55° 39' 33.030" N	1° 34' 29.001" W	I	55° 39' 40.779" N	1° 43' 25.831" W
D	55° 37' 25.112" N	1° 37' 10.821" W	J	55° 41' 9.666" N	1° 46' 48.538" W
E	55° 38' 29.607" N	1° 39' 40.213" W	K	55° 41' 25.196" N	1° 51' 16.045" W
F	55° 37' 46.449" N	1° 40' 31.188" W	L	55° 41' 11.807" N	1° 52' 50.963" W

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Figure 13. Map of Lindisfarne candidate HPMA – Option A boundary.

3.5 North East of Farnes Deep candidate HPMA

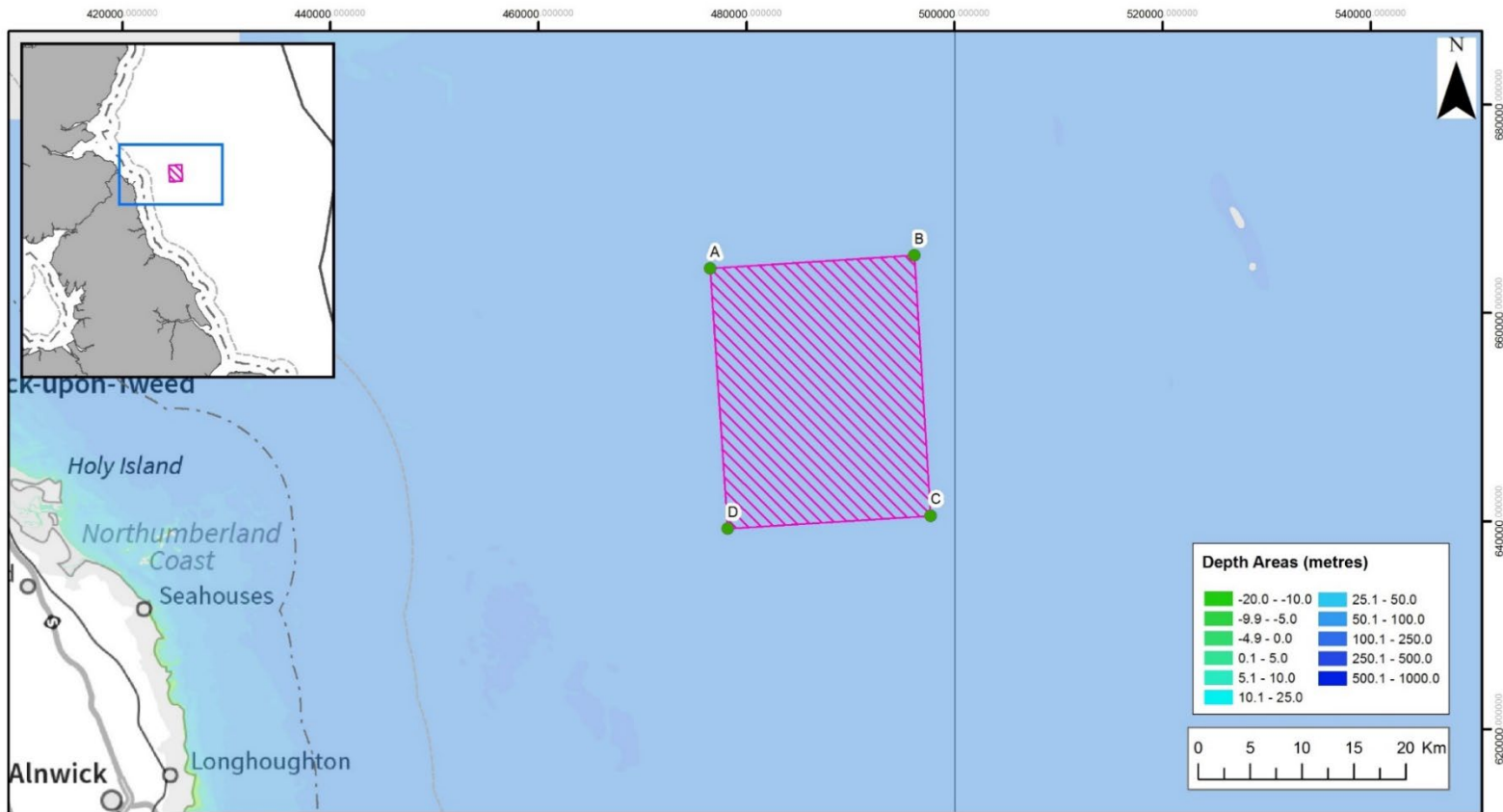
Table 5. Summary of changes in advice for North East of Farnes Deep Candidate HPMA.

Candidate HPMA name	Name change required?	Boundary change requested?	Reason(s) underpinning the need for updated advice?	Decision tree outcome
North East of Farnes Deep	No	No	New ecological and socio-economic data	<p>Branch 1 - Outcome C: Minor update to the advice on the ecological merit of the site.</p> <p>Branch 2 – Outcome G: Minor update to the advice on the ecological merit of the site.</p>
Has there been a change to how the HPMA selection criteria are met?	No change		Has there been a change to the evidence standards assessment score?	No change
Data				
<p>Ecological data⁷: Seabird data not previously considered in our pre-consultation assessment on this candidate HPMA (Bradbury <i>et al.</i>, 2014; Waggitt <i>et al.</i>, 2020) and further discussions with JNCC seabird specialists has resulted in a change to our understanding of seabird presence within the candidate HPMA. Our updated advice is that seven species are considered notably present within the candidate HPMA; this includes seven seabird species from our pre-consultation advice on this candidate HPMA (Atlantic puffin, black-legged kittiwake, common guillemot, great skua, northern fulmar, northern gannet and razorbill). These seven species are considered to be notably present within the HPMA because they occur at higher-than-average densities at different times of the year, by comparison to the wider region and English waters. It should be noted however that there are no available data to support the significance of the candidate HPMA to the life histories of these species. Three seabird species (European storm petrel, herring gull and lesser black-backed gull) are now not considered to be notably present within the candidate HPMA because these do not occur at higher-than-average densities by comparison to the wider region and English waters. Marine mammal data not previously considered in our pre-consultation assessment of this candidate HPMA (Heinänen, and</p>				

⁷ For full references please see reference list provided in the advice on the ecological merit of the candidate HPMA in Section 4.

Skov, 2015; Waggitt *et al.*, 2020; SCANS III, 2021; Carter *et al.*, 2022) has confirmed our understanding (detailed in the pre-consultation advice) on the presence of marine mammals within the area and therefore no change is required in our advice.

Socio-economic data: Defra initially raised some concerns regarding sandeel fisheries within the southern part of the candidate HPMA. On discussion with Defra about whether this should influence the shape of the boundary, it was concluded by Defra that no change was needed, so JNCC have provided our post consultation advice on the candidate HPMA boundary as it was at the point of public consultation.



North East of Farnes Deep candidate HPMA: Option A - Consultation boundary

- Candidate HPMA boundary
- Boundary coordinates
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

Point	Latitude	Longitude
A	55° 51' 56.000" N	0° 46' 45.000" W
B	55° 52' 24.000" N	0° 27' 56.000" W
C	55° 38' 54.000" N	0° 26' 57.000" W
D	55° 38' 26.000" N	0° 45' 35.000" W

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Figure 14. Map of North East of Farnes Deep candidate HPMA – Option A boundary.

4. Scientific advice on the ecological merit of the candidate HPMAs

4.1. Allonby Bay

Table 6. Scientific advice on the ecological merit of Allonby Bay Candidate HPMA.

GENERIC INFORMATION	
Candidate <i>Pilot HPMA</i> name	Allonby Bay
Biogeographic region	Irish Sea (Inshore)
Geographic description	<p>Allonby Bay Option A (the consultation boundary): Allonby Bay candidate HPMA covers 38.5 km² of the southern region at the mouth of the Solway Firth, extending approximately 5.6 km seaward from the shoreline between Maryport and Mawbray. The boundary follows the Mean High Water mark along the length of the enclosed shoreline, out to a maximum depth of 8 m and the area is located within the 12 nm territorial sea limit of the Irish Sea region. It overlaps with Allonby Bay MCZ and the Solway Firth SPA and there is a very small overlap with the Solway Firth SAC and Upper Solway Flats and Marshes SSSI along the northeastern boundary. This Northwest facing bay is relatively sheltered and seawater temperatures range from 6°C in coldest months, to 16.5°C in late summer.</p> <p>Allonby Bay Option B: Allonby Bay candidate HPMA covers 36.5 km² of the southern region at the mouth of the Solway Firth. The boundary follows the Mean High Water line along the shore from the western most building of Bank End Farm, Maryport to where the Black Dub culvert enters the sea north of Allonby and then extends seaward to approximately 5.6 km off the shore at its maximum width. The area is located within the 12 nm territorial sea limit of the Irish Sea region. It overlaps with Allonby Bay MCZ and the Solway Firth SPA and there is a very small overlap with the Solway Firth SAC and Upper Solway Flats and Marshes SSSI along the northeastern boundary. This Northwest facing bay is relatively sheltered and seawater temperatures range from 6°C in coldest months, to 16.5°C in late summer.</p> <p>Allonby Bay Option C: Allonby Bay candidate HPMA covers 27.6 km² of the southern region at the mouth of the Solway Firth. The boundary follows the Mean High Water line along the shore from the western most building of Bank End Farm, Maryport to Christ Church south of Allonby and then extends seaward to</p>

	<p>approximately 5.6 km off the shore at its maximum width. The area is located within the 12 nm territorial sea limit of the Irish Sea region. It overlaps with Allonby Bay MCZ and the Solway Firth SPA. This Northwest facing bay is relatively sheltered and seawater temperatures range from 6°C in coldest months, to 16.5°C in late summer.</p>
<p>Known habitats and species¹</p>	<p>The key habitats and species present in the area are as follows:</p> <p>EUNIS level 3 broad-scale habitats:</p> <p>High energy littoral rock (This habitat is only found in Options A and B and not in Option C) Moderate energy littoral rock Low energy littoral rock Features of littoral rock Littoral coarse sediment Littoral sand and muddy sand Littoral mixed sediments (This habitat is only found in Options A and B and not in Option C) Littoral biogenic reefs Features of littoral sediment Atlantic and Mediterranean high energy infralittoral rock Atlantic and Mediterranean moderate energy infralittoral rock Atlantic and Mediterranean high energy circalittoral rock (This habitat is only found in Options A and B and not in Option C) Atlantic and Mediterranean moderate energy circalittoral rock Sublittoral coarse sediment Sublittoral sand Sublittoral mud Sublittoral mixed sediments Sublittoral biogenic reefs</p> <p>Habitats of conservation importance:</p> <ul style="list-style-type: none"> • Blue mussel (<i>Mytilus edulis</i>) beds (Habitat Feature Of Conservation Importance (FOCI)) • Estuarine rocky habitats (Habitat FOCI) • Honeycomb worm (<i>Sabellaria alveolata</i>) reefs (Habitat FOCI) • Peat and clay exposures (Habitat FOCI) • Tide-swept channels (Habitat FOCI) • Mudflats and sandflats not covered by seawater at low tide (EC Habitats Directive: Annex 1)

- Reefs (EC Habitats Directive: Annex 1)
- Sandbanks which are slightly covered by seawater at low tide (EC Habitats Directive: Annex 1)

Benthic/demersal species of conservation importance:

- Ocean quahog (*Arctica islandica*) (Species FOCI, OSPAR)

Bird species of conservation importance:

Barnacle goose (*Branta leucopsis*) (EC Birds Directive: Annex 1 & 2.2, IUCN (GB): Least Concern – Non-breeding, Bird of Conservation Concern 5 (BoCC5): Amber)

Bar-tailed godwit (*Limosa lapponica*) (EC Birds Directive: Annex 1 & 2.2, IUCN (GB): Least Concern – Non-breeding, BoCC5: Amber)

Curlew (*Numenius arquata*) (EC Birds Directive: Annex 2.2, IUCN (GB): Endangered – Breeding, BoCC5: Red, NERC S.41, BAP 2007)

Gannet (*Morus bassanus*) (IUCN (GB): Least Concern – Breeding, BoCC5: Amber)

Golden plover (*Pluvialis apricaria*) (EC Birds Directive: Annex 1 & 2.2, IUCN (GB): Least Concern – Breeding & Non-breeding)

Knot (*Calidris canutus*) (EC Birds Directive: Annex 2.2, IUCN (GB): Least Concern – Non-breeding, BoCC5: Amber)

Lesser black-backed gull (*Larus fuscus*) (EC Birds Directive: Annex 2.2, IUCN (GB): Data Deficient – Breeding, BoCC5: Amber)

Manx shearwater (*Puffinus puffinus*) (IUCN (GB): Least Concern – Breeding, BoCC5: Amber)

Oystercatcher (*Haematopus ostralegus*) (EC Birds Directive: Annex 2.2, IUCN (GB): Least Concern – Breeding, BoCC5: Amber)

Pink-footed goose (*Anser brachyrhynchus*) (EC Birds Directive: Annex 2.2, IUCN (GB): Least Concern – Non-breeding, BoCC5: Amber)

Pintail (*Anas acuta*) (EC Birds Directive: Annex 2.1, CITES, IUCN (GB): Critically Endangered – Breeding / Endangered – Non-breeding, BoCC5: Amber, WACA: Sch 1 part 2)

Redshank (*Tringa totanus*) (EC Birds Directive: Annex 2.2, IUCN (GB): Vulnerable – Breeding / Near Threatened – Non-breeding, BoCC5: Amber)

Ringed plover (*Charadrius hiaticula*) (IUCN (GB): Near Threatened – Breeding / Vulnerable – Non-breeding, BoCC5: Red)

Scaup (*Aythya marila*) (EC Birds Directive – Annex 2.2, IUCN (GB): Endangered – Non-breeding, BoCC5: Red, NERC S41, BAP 2007, WACA: Sch 1 part 1)

Whooper swan (*Cygnus cygnus*) (EC Birds Directive: Annex 1, IUCN (GB): EN – Breeding / Least Concern – Non-breeding, BoCC5: Amber, WCA Sch 1 part 1)

	<p>Red throated diver (<i>Gavia stellata</i>) (EC Birds Directive: Annex 1, IUCN (GB): Least Concern – Breeding & Non-breeding, WACA: Sch 1 part 1) Common guillemot (<i>Uria aalge</i>) (IUCN (GB): Least Concern – Breeding, BoCC5: Amber) Razorbill (<i>Alca torda</i>) (IUCN (GB): Least Concern – Breeding, BoCC5: Amber) Atlantic puffin (<i>Fratercula arctica</i>) (IUCN (GB): Least Concern – Breeding, BoCC5: Red)</p> <p>Marine mammal species of conservation importance: Harbour porpoise (<i>Phocoena phocoena</i>) (OSPAR, CITES, EC Habitats Directive: Annex 2 & 4, IUCN (Global): Least Concern, WACA: Sch 5 sect 9.4a & 9.5a, NERC S41, BAP 2007, Habitat Regulations: Sch 2)</p> <p>Fish and shellfish species of conservation importance or commercial species: Atlantic herring (<i>Clupea harengus</i>) (IUCN (Global): Least Concern, NERC S.41, BAP 2007 a commercial species) Thornback ray (<i>Raja clavata</i>) (OSPAR, IUCN (Global): Near Threatened, a commercial species) Bass (<i>Dicentrarchus labrax</i>) (IUCN (Global): Least Concern, a commercial species) Sole (<i>Solea solea</i>) (NERC S.41, BAP 2007, a commercial species) Atlantic cod (<i>Gadus morhua</i>) (OSPAR, IUCN (Global): Vulnerable, NERC S.41, BAP 2007, a commercial species) Plaice (<i>Pleuronectes platessa</i>) (IUCN (Global): Least Concern, NERC S.41, BAP 2007, a commercial species) Common whelk (<i>Buccinum undatum</i>) (a commercial species) Edible crab (<i>Cancer pagurus</i>) (a commercial species) Common lobster (<i>Homarus Gammarus</i>) (a commercial species)</p>
<p>Rationale for candidate area</p>	<p>Allonby Bay has relatively high species abundance for the Irish Sea region. 278 species have been recorded in Option A (the consultation boundary), 273 in Option B and 241 in Option C. The site consists of a complex mix of intertidal and subtidal muds, sands and rock, swept by strong currents and big tides. Options A and B include 18 broad scale habitats, such as sublittoral and intertidal sediments and circalittoral, infralittoral and intertidal rock. Option C includes 15 broad scale habitats. High energy littoral rock, littoral mixed sediments and Atlantic and Mediterranean high energy circalittoral rock have not been recorded within the Option C boundary.</p> <p>The shoreline features blue mussel (<i>Mytilus edulis</i>) beds and honeycomb worm (<i>Sabellaria alveolata</i>) reefs, providing habitat for crabs and foraging areas for some bird species, with small outcrops of high energy intertidal rock. This leads down to intertidal sand, dominated by burrowing amphipod shrimps and a range of polychaete worms such as <i>Scolelepis</i> spp. and subtidal muddy sand, also supporting a range of polychaetes and bivalve molluscs. There are large areas of subtidal coarse sediment, supporting keelworms and venerid bivalves. Although less charismatic in nature, these sediment habitats and species provide important food for a wide</p>

	<p>range of bird species; and during high tide, sediment species and the supporting water column above provides a food source for flatfish and juvenile fish such as bass (<i>Dicentrarchus labrax</i>) and herring (<i>Clupea harengus</i>).</p> <p>Areas of subtidal rock and reef include records of <i>Sabellaria alveolata</i>, subtidal biogenic reef comprised of blue mussels (<i>Mytilus edulis</i>) and occasional rocky outcrops which would support crabs and lobsters.</p> <p>The area contains multiple species of national and international importance, recognised in the overlapping MCZ and SPA designations.</p> <p>The area is likely to support harbour porpoise (<i>Phocoena phocoena</i>), as well as several commercial fish species. Allonby Bay is a known spawning area for thornback ray (<i>Raja clavata</i>) and bass (<i>Dicentrarchus labrax</i>) and has suitable conditions for sole to spawn (<i>Solea solea</i>). The bay also has the conditions necessary to make it suitable as a nursery area for cod (<i>Gadus morhua</i>), herring (<i>Clupea harengus</i>), plaice (<i>Pleurionectes platessa</i>), sole (<i>Solea solea</i>) and thornback ray (<i>Raja clavata</i>).</p> <p>The area is important for other commercial species such as common lobster (<i>Homarus Gammarus</i>) and edible crab (<i>Cancer pagurus</i>). Records also show the presence of the ocean quahog (<i>Artica islandica</i>) which lives within subtidal sediments.</p> <p>19 different bird species of conservation importance can be found in the area, including a wide range of seabirds and waders, for example guillemot, red-throated diver, bar-tailed godwit and curlew. The rich sediments and intertidal rock habitats attract important migratory non-breeding bird species and Allonby Bay has some of the largest densities of shore birds in the Solway Firth SPA.</p> <p>Several habitats considered to be 'blue carbon' habitats can be found in the area, including intertidal sand, muddy sand and subtidal sand, which in Option A (the consultation boundary) covers 17.7 km² (46.0% of the site), in Option B 16.6 km² (45.6% of the site) and in Option C 13.0 km² (47% of the site). There are small areas of coastal sand dunes, which provide extremely limited flood mitigation habitat in the proximity of at-risk coastline.</p> <p>This candidate pilot HPMA represents a relatively natural ecosystem, providing an opportunity to safeguard its biodiversity through an HPMA designation.</p>
<p>Identified via SNCBs or 3rd party proposal</p>	<p>This candidate pilot HPMA was identified as a 3rd party proposal and was also independently identified by Natural England as part of a wider area, following the agreed ecological criteria for pilot HPMA selection. It does not fully encompass the third-party proposal, due to the removal of activities in the northeast and southeast</p>

	corners of the site, which were part of the list of activities not considered compatible with the definition of a pilot HPMA.
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Boundary of candidate area	Option A – Consultation boundary		
	Point	Latitude	Longitude
	A	54° 43' 53.317" N	3° 28' 50.960" W
	B	54° 44' 15.532" N	3° 29' 54.682" W
	C	54° 44' 19.502" N	3° 30' 51.382" W
	D	54° 45' 16.937" N	3° 33' 0.635" W
	E	54° 46' 28.937" N	3° 31' 30.093" W
	F	54° 47' 0.000" N	3° 30' 0.000" W
	G	54° 48' 11.783" N	3° 29' 20.566" W
	H	54° 47' 49.631" N	3° 26' 50.084" W
I	54° 47' 31.145" N	3° 26' 38.623" W	
J	54° 47' 25.555" N	3° 26' 6.841" W	
Option B			
Point	Latitude	Longitude	
A	54° 43' 45.651" N	3° 29' 9.585" W	
B	54° 44' 0.166" N	3° 30' 7.910" W	
C	54° 45' 16.937" N	3° 33' 0.635" W	
D	54° 48' 11.783" N	3° 29' 20.566" W	
E	54° 47' 49.631" N	3° 26' 50.084" W	
F	54° 47' 32.632" N	3° 26' 36.376" W	
G	54° 47' 28.115" N	3° 26' 7.838" W	
Option C			
Point	Latitude	Longitude	
A	54° 43' 53.317" N	3° 28' 50.960" W	
B	54° 44' 15.532" N	3° 29' 54.682" W	
C	54° 44' 19.502" N	3° 30' 51.382" W	
D	54° 45' 16.937" N	3° 33' 0.635" W	
E	54° 46' 28.937" N	3° 31' 30.093" W	
F	54° 47' 14.613" N	3° 29' 17.527" W	
G	54° 46' 4.737" N	3° 25' 58.230" W	

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4.2. Dolphin Head

Table 7. Scientific advice on the ecological merit of Dolphin Head Candidate HPMA.

GENERIC INFORMATION	
Candidate HPMA name	Dolphin Head
Biogeographic region	Eastern Channel (Offshore)
Geographic description	<p>The candidate Highly Protected Marine Area (HPMA) Dolphin Head is situated beyond the 12 nm territorial sea limit in the Eastern Channel region. The area is approximately 55 km South of Selsey Bill, West Sussex. This area partially overlaps with the Offshore Brighton Marine Conservation Zone (MCZ).</p> <p>The boundary of the candidate HPMA has been amended since public consultation for enforcement and compliance reasons, following discussions with the Marine Management Organisation (MMO). The MMO's preference was to exclude an area in the south-west corner of the candidate pilot HPMA to avoid an acute angle in any final site boundary. Following analysis undertaken by JNCC, we conclude that this amendment does not have a significant impact on the ecological merit of the candidate HPMA. The loss in area to the candidate HPMA is relatively small, and there are no significant reductions in the extent of the range of habitats and species previously noted as present as a result of the boundary modification.</p> <p>Defra requested that JNCC provide, as part of our formal post-consultation advice to Defra, two versions of the boundary for this candidate HPMA; one which is the original consulted boundary (Option A), and one that represents the modified version, following consideration of compliance and enforcement as highlighted above (Option B). JNCC have provided these boundaries as requested. The boundary developed for Option B results in the reduction of the extent (but not full removal) of a number of habitats, species and ecological functions within the candidate HPMA boundary. This does not impact our pre-consultation assessment of the candidate HPMA against the HPMA ecological guidelines. As a result, the information contained here is applicable to both Option A and Option B.</p>

	<p>The two options are summarised below:</p> <ul style="list-style-type: none"> • Option A: This boundary was originally proposed in JNCC’s pre-consultation advice and has an area of 508 km² and a depth ranging from 45 m to 67 m below sea level. • Option B: This boundary amendment includes the removal of the south-west corner of the candidate HPMA on account of enforcement and compliance reasons. This boundary amendment has an area of 462 km² (9.1% reduction in comparison to the consulted boundary: Option A), and a depth ranging from 45 m to 62 m below sea level.
<p>Habitats and species of Conservation Importance⁸</p>	<p>The habitats and species of conservation importance recorded and considered present in the candidate HPMA are as follows:</p> <p>EUNIS level 3 broad-scale habitats:</p> <ul style="list-style-type: none"> • Atlantic and Mediterranean high energy circalittoral rock • Sublittoral coarse sediment • Sublittoral mixed sediment <p>Habitats:</p> <ul style="list-style-type: none"> • Bedrock Reefs (EC Habitats Directive - Annex I) • <i>Sabellaria spinulosa</i> reefs (EC Habitats Directive - Annex I, UK Priority Habitat, Habitat FOCI, OSPAR T&D Habitat) • Stony Reefs (EC Habitats Directive - Annex I) • Subtidal sands and gravels (UK Priority Habitat, Habitat FOCI) <p>Bird species:</p> <ul style="list-style-type: none"> • Common guillemot (<i>Uria aalge</i>) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC5: Amber) • Lesser black-backed gull (<i>Larus fuscus</i>) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC5: Amber) • Northern gannet (<i>Morus bassanus</i>) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC5: Amber)

⁸ The known habitats and species listed above refer to the key important habitats and species found on national and international lists of conservation importance, including: Priority Marine Habitats and Species, OSPAR (threatened and/or declining), FOCI (Features of Conservation Importance – Habitats and Species), IUCN red list (European assessment for offshore sites), EC Habitats Directive (Habitats and Species), EC Birds Directive (Annex I and II), BoCC5 (Birds of Conservation Concern 5 – Red, Amber and Green lists) and WCA 1981 (Wildlife Countryside Act 1981). There are additional species and habitats also reported as being present, including commercial fish and shellfish species.

	<p>Marine mammal species:</p> <ul style="list-style-type: none"> • Grey seal (<i>Halichoerus grypus</i>) (EC Habitats Directive - Annex II & V, IUCN: Least Concern) • Harbour porpoise (<i>Phocoena phocoena</i>) (CITES - Annex II, EC Habitats Directive - Annex II & IV, IUCN: Vulnerable, UK Priority Species, OSPAR T&D species) <p>Fish species:</p> <ul style="list-style-type: none"> • Atlantic cod (<i>Gadus morhua</i>) (UK Priority Species, OSPAR T&D species, IUCN: Least Concern, a commercial species) • Atlantic herring (<i>Clupea harengus</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • European plaice (<i>Pleuronectes platessa</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • Sole (<i>Solea solea</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • Thornback ray (<i>Raja clavata</i>) (IUCN: Near Threatened, OSPAR T&D species, a commercial species) • Undulate ray (<i>Raja undulata</i>) (UK Priority Species, Species FOCI, IUCN: Near Threatened).
<p>Rationale for candidate area and assessment against the HPMA ecological selection criteria</p>	<p>The area has relatively high levels of biodiversity within the wider Eastern Channel region and has been identified as an important area that attracts seabirds, marine mammals and fish species. This assessment is based upon data acquired and analysed from a variety of ground-truth and modelled data products and additional survey data at a regional level to identify areas that comprise relatively higher levels of biodiversity. These datasets included Annex I habitats dataset, 2021; EUSeaMap 2019; FOCI, 2016; MB0102 Bio-physical Contract, 2010; Natural England Evidence Base 2021; OSPAR Habitats in the North-East Atlantic Ocean, 2020; and UK Combined Map, 2021.</p> <p>The seabed in the area comprises a mix of three broad-scale habitats (BSHs): high energy circalittoral rock, sublittoral coarse sediment and sublittoral mixed sediment. Annex I Reefs are present within this location, which includes bedrock, stony and biogenic Ross-worm (<i>Sabellaria spinulosa</i>) reefs. Ross worm reefs are an OSPAR threatened and/or declining habitat (OSPAR Commission, 2013), which is considered to be an extremely variable habitat type that consists of a diverse community structure (Irving, 2009; European Commission, 2013). The wide-ranging habitat types in the area more broadly support a range of benthic, demersal and mobile species, such as sponges, tube worms, anemones and bivalves.</p> <p>The Ross-worm reef habitats are of significant conservation importance and occur on predominantly sediment or mixed sediment areas, such as the sediment areas found in Dolphin Head candidate HPMA (BRIG, 2011). These reefs are particularly affected by dredging or trawling and in heavily dredged or disturbed areas an impoverished community may be left.</p>

The oceanographic processes occurring within this area drive primary and secondary production within and adjacent to the area (Parker-Humphreys, 2005; Balanced Seas, 2011). Sublittoral coarse sediment and sublittoral mixed sediment are known to be important habitats for attracting seabirds and marine mammals as prey species commonly occur in these sediments (JNCC, 2020). The Eastern Channel is known as a popular area for recreational and commercial fishing. It is reported that the area is of importance for the nursery and spawning behaviour of at least five commercially important species of fish, such as Atlantic cod, and Atlantic herring (Ellis *et al.*, 2012; Katara *et al.*, 2021). Therefore, the designation of Dolphin Head would help to protect the feeding and nursery grounds of many highly important commercial fish species, as well as ecologically important species.

The protection of feeding and nursery grounds through the designation of this candidate HPMA may also help to increase biodiversity at a wider scale across English waters. It has been recorded that populations of commercially important fish species, such as plaice, are connected to wider populations within the Southern North Sea, through migration across the Dover Strait (Arnold and Metcalfe, 1995).

Although there are limited data available to support the relative importance of the area of the Candidate HPMA to the life history of seabirds, at least three species, Common guillemot (*Uria aalge*), Lesser black-backed gull (*Larus fuscus*), and Northern gannet (*Morus bassanus*), are considered to be notably present within the site because they occur within the candidate HPMA at higher than average densities by comparison to the wider region and English waters (Wakefield *et al.*, 2013; Bradbury *et al.*, 2014; Eaton *et al.*, 2015; Pettex *et al.*, 2017; Alderney Wildlife Trust, 2019; Johnston *et al.*, 2020; Waggitt *et al.*, 2020).

Data from Carter *et al.* (2022), Heinänen, and Skov (2015), the Joint Cetacean Protocol (2017) SCANS III (2021), Vincent *et al.* (2017) and Waggitt *et al.* (2020) were used to identify a relatively greater presence of two marine mammal species, Grey seal (*Halichoerus grypus*) and Harbour porpoise (*Phocoena phocoena*), in this area by comparison to the wider region. However, there are limited data available to identify the importance of this area in relation to the key life cycle stages of each marine mammal species. Measures taken to protect this area may enhance ecosystem health and bring added benefits to the conservation status of marine mammal species using the area and surrounding waters.

The area is considered to be a relatively degraded ecosystem with potential to recover subject to pressures being removed. The candidate HPMA partially overlaps with the designated Offshore Brighton MCZ, which has protected features considered to be in an unfavourable condition (BSHs: high energy circalittoral rock, subtidal coarse sediment and subtidal mixed sediment). The expanse of subtidal coarse sediment that dominates this area has potential recovery times that are expected between 2 to 10 years. There are some patches of subtidal mixed sediment and high energy circalittoral rock present. These overlap with the designated features of the Offshore

	<p>Brighton MCZ and are considered to be in unfavourable condition with potential recovery times between 10 to 25 years, due to some species having longer recovery times. Evidence suggests that the seafloor in the area is subject to a range of medium to high disturbance (OSPAR BH3 indicator), meaning that species and habitats are sensitive to some level of fishing pressure (BH3, 2017).</p> <p>A vulnerability assessment of Offshore Brighton MCZ suggests that the MCZ is unlikely to be moving towards its conservation objectives. Therefore, the additional restrictions in the removal of pressures associated with the designation of the candidate HPMA Dolphin Head, may help the MCZ progress towards its conservation objectives (JNCC, 2021).</p>
<p><i>Identified via SNCBs or 3rd party proposal</i></p>	<p>The area was originally identified by JNCC's analysis of available supporting datasets against the ecological criteria. The Sussex Wildlife Trust also recommended an area through the third-party proposal process that partially overlaps with the candidate HPMA. This was based on the non-designated Dolphin Head recommended Marine Conservation Zone, which was originally a proposed Reference Area submitted by the Balanced Seas regional MCZ project for consideration for designation as part of the original MCZ project process. The area does not fully encompass the third-party proposal however due to the location of a cable line, which runs towards the north of the area and is part of the list of activities not considered compatible with the definition of a candidate HPMA.</p>

<p>Boundary of candidate area</p>	<p>Option A</p> <table border="1" data-bbox="517 296 1256 507"> <thead> <tr> <th>Point</th> <th>Lat</th> <th>Long</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>50° 08' 46.79" N</td> <td>1° 13' 54.17" W</td> </tr> <tr> <td>B</td> <td>50° 16' 53.07" N</td> <td>0° 26' 05.59" W</td> </tr> <tr> <td>C</td> <td>50° 09' 24.90" N</td> <td>0° 24' 54.52" W</td> </tr> <tr> <td>D</td> <td>50° 07' 24.90" N</td> <td>0° 30' 04.11" W</td> </tr> </tbody> </table> <p>Option B</p> <table border="1" data-bbox="517 592 1256 847"> <thead> <tr> <th>Point</th> <th>Lat</th> <th>Long</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>50° 11' 10.67" N</td> <td>0° 59' 59.94" W</td> </tr> <tr> <td>B</td> <td>50° 16' 53.07" N</td> <td>0° 26' 05.59" W</td> </tr> <tr> <td>C</td> <td>50° 09' 28.37" N</td> <td>0° 24' 58.20" W</td> </tr> <tr> <td>D</td> <td>50° 09' 24.90" N</td> <td>0° 30' 04.11" W</td> </tr> <tr> <td>E</td> <td>50° 08' 23.70" N</td> <td>1° 0' 05.00" W</td> </tr> </tbody> </table>	Point	Lat	Long	A	50° 08' 46.79" N	1° 13' 54.17" W	B	50° 16' 53.07" N	0° 26' 05.59" W	C	50° 09' 24.90" N	0° 24' 54.52" W	D	50° 07' 24.90" N	0° 30' 04.11" W	Point	Lat	Long	A	50° 11' 10.67" N	0° 59' 59.94" W	B	50° 16' 53.07" N	0° 26' 05.59" W	C	50° 09' 28.37" N	0° 24' 58.20" W	D	50° 09' 24.90" N	0° 30' 04.11" W	E	50° 08' 23.70" N	1° 0' 05.00" W
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<p>Evidence/references</p>	<p>Arnold, G.P. & Metcalfe, J.D. 1996. Seasonal migrations of plaice (<i>Pleuronectes platessa</i>) through the Dover Strait. <i>Marine Biology</i>. 127, 151–160. Available at: https://doi.org/10.1007/BF00993655</p> <p>Balanced Seas. 2011. Balanced Seas Marine Conservation Zone Project Final Recommendations 2011. <i>Balanced Seas Report</i>, 79pp.</p> <p>BRIG. 2011. UK Biodiversity Action Plan – Priority Habitat Descriptions. JNCC, Peterborough.</p> <p>Bradbury, G., Trinder, M., Furness, B., Banks, A.N., Caldow, R.W. & Hume, D. 2014. Mapping seabird sensitivity to offshore wind farms. <i>PloS one</i>, 9 (9), p.e106366. Available at: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0106366</p> <p>Carter, M.I., Boehme, L., Cronin, M.A., Duck, C.D., Grecian, W.J., Hastie, G.D., Jessopp, M., Matthiopoulos, J., McConnell, B.J., Miller, D.L. & Morris, C.D. 2022. Sympatric seals, satellite tracking and protected areas: habitat-</p>																																	

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4.3. Inner Silver Pit South

Table 8. Scientific advice on the ecological merit of Inner Silver Pit South Candidate HPMA.

GENERIC INFORMATION	
<i>Candidate HPMA name</i>	Inner Silver Pit South
<i>Biogeographic region</i>	Southern North Sea (Offshore)
<i>Geographic description</i>	<p>The candidate Highly Protected Marine Area (HPMA) Inner Silver Pit South is situated beyond the 12 nm territorial sea limit in the offshore area of the Southern North Sea region. The area is located approximately 28 km off the coast of Lincolnshire and approximately 35 km south-east of the Humber Estuary. The candidate HPMA overlaps with two MPAs; the Greater Wash Special Protection Area (SPA) and the Inner Dowsing, Race Bank and North Ridge Special Area of Conservation (SAC).</p> <p>During the public consultation knowledge emerged of the location of cable to the north-west of the candidate HPMA. The location of this cable was removed from part of the original consulted boundary; to be consistent with the fact that cabling installation and maintenance is an activity category not considered to be able to adapt to the location of a candidate HPMA. Moreover, boundary amendments for the candidate HPMA have been recommended for enforcement and compliance reasons since public consultation, following discussions with the Marine Management Organisation (MMO). The MMO's preference was for the boundary to have straight lines and as few angles as possible. The revisions have therefore involved straightening the boundary lines, where possible, to remove any unnecessary angles.</p> <p>On socio-economic grounds linked to fishing activity, Defra requested that JNCC provide, as part of our formal post-consultation advice, three versions of the boundary for this candidate HPMA; one that is the original consulted boundary (Option A), one that represents the modified version following consideration of activities data and for ease of compliance/enforcement purposes as highlighted above (Option B), and one that restricts the extent of the</p>

	<p>candidate HPMA boundary to the north in addition to the changes developed for Option B (Option C). JNCC have provided these boundaries as requested. The boundaries developed for Options B and C result in the reduction of the extent (but not full removal) of a number of key habitats, species and ecological functions within the candidate HPMA boundary. However, this does not impact our pre-consultation assessment of the candidate HPMA against the HPMA ecological guidelines. As a result, the information contained here is applicable to all three options. JNCC and the MMO have expressed our preference (on ecological grounds and on ease of compliance/enforcement grounds) for Option B.</p> <p>The three options are summarised below:</p> <ul style="list-style-type: none"> • Option A: This boundary was originally proposed in JNCC’s pre-consultation advice and has an area of 62.5 km², and a depth ranging from approximately 10 m to 94 m below sea level. • Option B: This boundary amendment includes the removal of the north-west corner of the candidate HPMA on account of cabling activity, removal of the south-west corner, and a reduction of angles, resulting in the straightening of boundary lines. This boundary amendment has an area of 53.03 km² (15.5% reduction in comparison to the consulted boundary: Option A), and a depth ranging from approximately 10 m to 92 m below sea level. • Option C: This boundary amendment includes the removal of the north-west corner of the candidate HPMA on account of cabling activity, removal of the south-west corner, and a reduction of angles, resulting in the straightening of boundary lines, and an overall reduction in size of the northern extent of the candidate HPMA. This boundary amendment has an area of 45.40 km² (27.4% reduction in comparison to the consulted boundary: Option A), and a depth ranging from approximately 10 m to 90 m below sea level. <p>The three boundary options are equivalent in terms of how each meets the HPMA ecological selection criteria. Option C, however, results in the greatest reduction in the extent of habitats, species and potential areas used for key life cycle stages and/or behaviour of marine species that fall within the boundary of the candidate HPMA.</p>
<p><i>Habitats and species of</i></p>	<p>The habitats and species of conservation importance recorded and considered present in the candidate HPMA are as follows:</p> <p>EUNIS level 3 broad-scale habitats:</p> <ul style="list-style-type: none"> • Atlantic and Mediterranean moderate energy circalittoral rock • Circalittoral mixed sediment • Sublittoral coarse sediment

<p>conservation Importance⁹</p>	<ul style="list-style-type: none"> • Sublittoral sand • Sublittoral mixed sediment • Sublittoral biogenic reefs <p>Habitats:</p> <ul style="list-style-type: none"> • Blue mussel (<i>Mytilus edulis</i>) beds (EC Habitats Directive - Annex I, UK Priority Habitat, OSPAR T&D species) • <i>Sabellaria spinulosa</i> reefs (EC Habitats Directive - Annex I, UK Priority Habitat, Habitat FOCI, OSPAR T&D Habitat) • Sandbanks which are slightly covered by sea water all the time (EC Habitats Directive - Annex I) • Subtidal sands and gravels (UK Priority Habitat, Habitat FOCI) • Tide-swept channels (Habitat FOCI, UK Priority Habitat) <p>Bird species:</p> <ul style="list-style-type: none"> • Black-legged kittiwake (<i>Rissa tridactyla</i>) (EC Birds Directive - Annex I, OSPAR T&D species, IUCN: Vulnerable, BoCC5: Red) • Common guillemot (<i>Uria aalge</i>) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC5: Amber) • Herring gull (<i>Larus argentatus</i>) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC5: Red, UK Priority Species) • Lesser black-backed gull (<i>Larus fuscus</i>) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC5: Amber) • Common tern (<i>Sterna hirundo</i>) (EC Birds Directive – Annex I, IUCN: Least Concern, BoCC5: Amber) • Red-throated diver (<i>Gavia stellata</i>) (EC Birds Directive – Annex I, IUCN: Least Concern, BoCC5: Green, WCA 1981) • Little gull (<i>Hydrocoloeus minutus</i>) (EC Birds Directive – Annex I, IUCN: Least Concern, BoCC5: Green, WCA 1981) <p>Marine mammal species:</p> <ul style="list-style-type: none"> • Harbour porpoise (<i>Phocoena phocoena</i>) (CITES - Annex II, EC Habitats Directive - Annex II & IV, IUCN: Vulnerable, UK Priority Species, OSPAR T&D species)
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⁹ The known habitats and species listed above refer to the key important habitats and species found on national and international lists of conservation importance, including: Priority Marine Habitat and Species, OSPAR (threatened and/or declining), FOCI (Features of Conservation Importance – Habitats and Species), IUCN red list (European assessment for offshore sites), EC Habitats Directive (Habitats and Species), EC Birds Directive (Annex I and II), BoCC5 (Birds of Conservation Concern 5 – Red, Amber, and Green lists) and WCA 1981 (Wildlife Countryside Act 1981). There are additional species and habitats also reported as being present, including commercial fish and shellfish species.

	<ul style="list-style-type: none"> • Minke whale (<i>Balaenoptera acutorostrata</i>) (CITES - Annex I, EC Habitats Directive - Annex IV, IUCN: Least Concern, UK Priority Species) • Grey seal (<i>Halichoerus grypus</i>) (EC Habitats Directive - Annex II & V, IUCN: Least Concern) • Harbour seal (<i>Phoca vitulina</i>) (EC Habitats Directive - Annex II & V, IUCN: Least Concern, UK Priority Species) <p>Fish species:</p> <ul style="list-style-type: none"> • Atlantic cod (<i>Gadus morhua</i>) (UK Priority Species, IUCN: Least Concern, OSPAR T&D species, a commercial species) • Atlantic mackerel (<i>Scomber scombrus</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • Atlantic herring (<i>Clupea harengus</i>) (UK Priority Species: IUCN: Least Concern, a commercial species) • Horse mackerel (<i>Trachurus trachurus</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • European plaice (<i>Pleuronectes platessa</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • European smelt (<i>Osmerus eperlanus</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • Sole (<i>Solea solea</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • Thornback ray (<i>Raja clavata</i>) (IUCN: Near Threatened, OSPAR T&D species, a commercial species) • Whiting (<i>Merlangius merlangus</i>) (UK Priority Species, IUCN: Least Concern, a commercial species)
<p>Rationale for candidate area and assessment against the HPMA ecological selection criteria</p>	<p>The area has relatively high levels of biodiversity within the wider Southern North Sea region. This assessment is based upon data acquired and analysed from a variety of ground-truth and modelled data and additional data products at a regional level to identify areas that comprise relatively higher levels of biodiversity. These datasets included Annex I habitats datasets 2021; EUSeaMap, 2019; FOCI, 2016; MB0102 Bio-physical Contract, 2010; Natural England Evidence Base, 2021; OSPAR Habitats in the North-East Atlantic Ocean, 2020; Survey GB200016, 2004; Survey GB000240, 2015; and UK Combined Map 2021).</p> <p>The seabed in the area comprises five broad-scale habitats (BSHs): moderate energy circalittoral rock, circalittoral mixed sediment, sublittoral coarse sediment, sublittoral sand, sublittoral mixed sediment and sublittoral biogenic reef. Ross-worm (<i>Sabellaria spinulosa</i>) reefs and blue mussel (<i>Mytilus edulis</i>) beds are also recorded as being present. The JNCC assessments have found evidence of some blue mussel beds within the area, but the Humber Regional Environmental Characterisation report (Tappin <i>et al.</i>, 2011) suggests that these may be present at several locations within the wider Inner Silver Pit region. In the same report (Tappin <i>et al.</i>, 2011) it is suggested that there may be a cyclical succession occurring between <i>Sabellaria spinulosa</i> and <i>Mytilus edulis</i> and that this may be driven by recruitment success and minor changes in environmental conditions. Both of these habitat types are OSPAR threatened and/or declining habitats, they are representative of extremely variable habitat types, and they consist of</p>

diverse community structures (Irving, 2009; European Commission, 2013; Tillin *et al.*, 2020). Moreover, blue mussel beds and the sandbank features present within the area may enhance levels of primary and secondary productivity through the provision of feeding and nursery grounds for a range of ecologically important and commercial fish species, and, furthermore, foraging areas for seals, cetaceans and seabirds (Camphuysen *et al.*, 2007; Scott *et al.*, 2010).

The area supports key prey species for the foraging of several species of fish, seabirds and marine mammals. Data from Katara *et al.* (2021) reveals that the area is of importance for the nursery and spawning behaviour of at least 23 fish and shellfish species. Examples include the Horse mackerel (*Trachurus trachurus*), Cuttlefish (*Sepia* spp.), Edible crab (*Cancer pagurus*), and Black seabream (*SpondylIOSoma cantharus*). At least six of these are commercially important species of fish: Atlantic cod (*Gadus morhua*), Atlantic mackerel (*Scomber scombrus*), Atlantic herring (*Clupea harengus*), European plaice (*Pleuronectes platessa*), Sole (*Solea solea*) and Whiting (*Merlangius merlangus*).

Although there are limited data available to support the relative importance of the area of the candidate HPMA to the life history of seabirds, at least seven species are considered to be notably present within the site because they occur within the candidate HPMA at higher than average densities by comparison to the wider region and English waters (Bradbury *et al.*, 2014; Lawson *et al.*, 2016; Johnston *et al.*, 2020; Waggitt *et al.*, 2020). Furthermore, the boundary of the candidate HPMA overlaps with the Greater Wash SPA that delineates areas of particular importance to red-throated diver and little gull in their non-breeding seasons (Lawson *et al.*, 2016).

Data from Carter *et al.* (2022), Heinänen, and Skov (2015), the Joint Cetacean Protocol (2017) SCANS III (2021), and Waggitt *et al.* (2020) were used to identify a relatively greater presence of four marine mammal species in this area by comparison to the wider region (see list above). However, there are limited data available to identify the importance of this area in relation to the key life cycle stages of each marine mammal species. Measures taken to protect this area may enhance ecosystem health and bring added benefits to the conservation status of marine mammal species using the area and surrounding waters.

The area is considered to represent a relatively degraded ecosystem. The area overlaps with Inner Dowsing, Race Bank and North Ridge SAC, of which the site's protected features, Annex I Sandbanks which are slightly covered by sea water all the time and Annex I Reef, are considered to be in unfavourable condition. Moreover, evidence suggests that the seafloor in the area is subject to a range of low to high disturbance (OSPAR BH3 indicator) meaning that species and habitats are sensitive to some level of fishing pressure (BH3, 2017). Annex I Sandbanks and Annex I Reefs are found in the area, including records of the Ross worm (*Sabellaria spinulosa*) (potential

	recovery times of 2 to 10 years). The BSHs within the area have a range of recovery times from <10 years to >10 years, subject to pressures being removed.																																																																																																						
Identified via SNCBs or 3rd party proposal	The area was identified by JNCC's analysis of available supporting datasets against the ecological criteria to identify candidate HPMA in English waters. Part of the area overlaps with third-party proposals put forward by the Blue Marine Foundation and The Wildlife Trusts: Silver Pit and Inner Silver Pit, respectively. The area does not fully encompass the third-party proposals however, due to the locations of activities not considered compatible with the definition of a candidate HPMA.																																																																																																						
Boundary of candidate area	<p>Option A:</p> <table border="1" data-bbox="526 566 1951 946"> <thead> <tr> <th>Point</th> <th>Lat</th> <th>Long</th> <th>Point</th> <th>Lat</th> <th>Long</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>53° 30' 44.26" N</td> <td>0° 35' 11.99" E</td> <td>I</td> <td>53° 24' 33.89" N</td> <td>0° 44' 53.28" E</td> </tr> <tr> <td>B</td> <td>53° 31' 40.004" N</td> <td>0° 40' 59.35" E</td> <td>J</td> <td>53° 22' 49.04" N</td> <td>0° 39' 27.07" E</td> </tr> <tr> <td>C</td> <td>53° 29' 13.495" N</td> <td>0° 39' 37.54" E</td> <td>K</td> <td>53° 25' 32.92" N</td> <td>0° 40' 57.84" E</td> </tr> <tr> <td>D</td> <td>53° 28' 38.46" N</td> <td>0° 39' 50.60" E</td> <td>L</td> <td>53° 26' 27.95" N</td> <td>0° 40' 51.34" E</td> </tr> <tr> <td>E</td> <td>53° 28' 18.68" N</td> <td>0° 40' 16.27" E</td> <td>M</td> <td>53° 27' 25.88" N</td> <td>0° 39' 52.24" E</td> </tr> <tr> <td>F</td> <td>53° 27' 3.99" N</td> <td>0° 44' 6.22" E</td> <td>N</td> <td>53° 28' 14.41" N</td> <td>0° 37' 58.39" E</td> </tr> <tr> <td>G</td> <td>53° 25' 28.20" N</td> <td>0° 44' 12.64" E</td> <td>O</td> <td>53° 28' 22.43" N</td> <td>0° 36' 2.83" E</td> </tr> <tr> <td>H</td> <td>53° 25' 2.00" N</td> <td>0° 44' 20.13" E</td> <td>P</td> <td>53° 28' 37.15" N</td> <td>0° 35' 11.99" E</td> </tr> </tbody> </table> <p>Option B:</p> <table border="1" data-bbox="526 1016 1951 1351"> <thead> <tr> <th>Point</th> <th>Lat</th> <th>Long</th> <th>Point</th> <th>Lat</th> <th>Long</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>53° 31' 1.01" N</td> <td>0° 37' 1.89" E</td> <td>H</td> <td>53° 23' 57.06" N</td> <td>0° 40' 12.37" E</td> </tr> <tr> <td>B</td> <td>53° 31' 29.45" N</td> <td>0° 40' 35.17" E</td> <td>I</td> <td>53° 25' 22.09" N</td> <td>0° 41' 8.34" E</td> </tr> <tr> <td>C</td> <td>53° 28' 57.09" N</td> <td>0° 39' 28.34" E</td> <td>J</td> <td>53° 26' 43.99" N</td> <td>0° 40' 50.57" E</td> </tr> <tr> <td>D</td> <td>53° 28' 17.80" N</td> <td>0° 40' 14.35" E</td> <td>K</td> <td>53° 27' 14.29" N</td> <td>0° 40' 19.19" E</td> </tr> <tr> <td>E</td> <td>53° 27' 3.55" N</td> <td>0° 44' 1.28" E</td> <td>L</td> <td>53° 28' 14.72" N</td> <td>0° 38' 12.55" E</td> </tr> <tr> <td>F</td> <td>53° 24' 18.41" N</td> <td>0° 44' 17.30" E</td> <td>M</td> <td>53° 28' 37.15" N</td> <td>0° 35' 11.99" E</td> </tr> <tr> <td>G</td> <td>53° 23' 7.38" N</td> <td>0° 40' 23.26" E</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Point	Lat	Long	Point	Lat	Long	A	53° 30' 44.26" N	0° 35' 11.99" E	I	53° 24' 33.89" N	0° 44' 53.28" E	B	53° 31' 40.004" N	0° 40' 59.35" E	J	53° 22' 49.04" N	0° 39' 27.07" E	C	53° 29' 13.495" N	0° 39' 37.54" E	K	53° 25' 32.92" N	0° 40' 57.84" E	D	53° 28' 38.46" N	0° 39' 50.60" E	L	53° 26' 27.95" N	0° 40' 51.34" E	E	53° 28' 18.68" N	0° 40' 16.27" E	M	53° 27' 25.88" N	0° 39' 52.24" E	F	53° 27' 3.99" N	0° 44' 6.22" E	N	53° 28' 14.41" N	0° 37' 58.39" E	G	53° 25' 28.20" N	0° 44' 12.64" E	O	53° 28' 22.43" N	0° 36' 2.83" E	H	53° 25' 2.00" N	0° 44' 20.13" E	P	53° 28' 37.15" N	0° 35' 11.99" E	Point	Lat	Long	Point	Lat	Long	A	53° 31' 1.01" N	0° 37' 1.89" E	H	53° 23' 57.06" N	0° 40' 12.37" E	B	53° 31' 29.45" N	0° 40' 35.17" E	I	53° 25' 22.09" N	0° 41' 8.34" E	C	53° 28' 57.09" N	0° 39' 28.34" E	J	53° 26' 43.99" N	0° 40' 50.57" E	D	53° 28' 17.80" N	0° 40' 14.35" E	K	53° 27' 14.29" N	0° 40' 19.19" E	E	53° 27' 3.55" N	0° 44' 1.28" E	L	53° 28' 14.72" N	0° 38' 12.55" E	F	53° 24' 18.41" N	0° 44' 17.30" E	M	53° 28' 37.15" N	0° 35' 11.99" E	G	53° 23' 7.38" N	0° 40' 23.26" E			
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B	53° 31 ' 8.80" N	0° 39 ' 10.79" E	I	53° 25 ' 45.77" N	0° 41 ' 23.91" E	
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UK Combined Map. 2021. Full-coverage EUNIS Level 3 Layer Integrating Maps from Surveys and Broad-scale Models. 2019. © JNCC. Contains restricted spatial data layers. For specific copyright information and use constraints please contact JNCC in the first instance.

4.4. Lindisfarne

Table 9. Scientific advice on the ecological merit of Lindisfarne Candidate HPMA.

GENERIC INFORMATION	
Candidate Pilot HPMA name	Lindisfarne
Biogeographic region	Northern North Sea (Inshore)
Geographic description	<p>Lindisfarne Option A (the consultation boundary):</p> <p>Lindisfarne candidate pilot HPMA covers 129 km² of the Northumberland coast and is located within the 12 nm territorial sea limit of the Northern North Sea region. It covers a wide range of intertidal and subtidal habitats, extending from the intertidal zone north of Goswick, north eastward out to sea, before heading southeast and returning inland south of Budle Bay at Bamburgh. The area includes the north shore of Holy Island, Budle Bay, and encompasses the outer group of the Farne Islands, excluding Inner Farne.</p> <p>This moderately exposed northeast-facing area includes some of the most diverse habitats in the North Sea, both in a UK and European context. In recognition of this, this part of the Northumberland coast is already heavily designated; the area overlaps with several other areas of conservation significance, including Berwickshire and North Northumberland Coast SAC, Northumbria Coast SPA, Farne Islands SPA, Northumberland Marine SPA, Lindisfarne SPA, Berwick to St. Mary's MCZ, Northumberland Shore SSSI, Farne Islands SSSI, Lindisfarne SSSI, Bamburgh Coast and Hills SSSI and an extremely small area of Bamburgh Dunes SSSI and North Northumberland Dunes SAC.</p> <p>Sea temperatures in this north-east area range from 5°C in colder months, to 16°C in warmer months during the year.</p>

Known habitats and species⁷

The key habitats and species present in the proposed area are as follows:

EUNIS level 3 broad-scale habitats:

- High energy littoral rock
- Moderate energy littoral rock
- Low energy littoral rock
- Features of littoral rock
- Littoral coarse sediment
- Littoral sand and muddy sand
- Littoral mud
- Littoral mixed sediments
- Coastal saltmarshes and saline reedbeds
- Littoral sediments dominated by aquatic angiosperms
- Littoral biogenic reefs
- Features of littoral sediment
- High energy infralittoral rock
- Moderate energy infralittoral rock
- Features of infralittoral rock
- High energy circalittoral rock
- Moderate energy circalittoral rock
- Low energy circalittoral rock
- Features of circalittoral rock
- Sublittoral coarse sediment
- Sublittoral sand
- Sublittoral mixed sediments
- Sublittoral macrophyte-dominated sediment

Habitats of conservation importance:

- Seagrass beds (Habitat FOCI)
- Sheltered muddy gravels (Habitat FOCI)
- Blue mussel (*Mytilus edulis*) beds (Habitat FOCI)
- Tide-swept channels (Habitat FOCI)

- Fragile sponge and anthozoan communities on subtidal rocky habitats (Habitat FOCI)
- Intertidal under boulder communities (Habitat FOCI)
- Littoral chalk communities (Habitat FOCI)
- Mudflats and sandflats not covered by seawater at low tide (EC Habitats Directive: Annex 1)
- Reefs (EC Habitats Directive: Annex 1)
- Sandbanks which are slightly covered by seawater at low tide (EC Habitats Directive: Annex 1)

Benthic/demersal species of conservation importance:

- Ocean quahog (*Arctica islandica*) (Species FOCI, OSPAR)
- Stalked jellyfish (*Haliclystus* species) (Species FOCI, NERC S.41, BAP 2007)
- Spiny Lobster (*Palinurus elephas*) (Species FOCI, NERC S.41, BAP 2007)
- Native oyster (*Ostrea edulis*) (Species FOCI, OSPAR, NERC S.41, BAP 2007)

Marine mammals of conservation importance

- Grey seal (*Halichoerus grypus*) (EC Habitats Directive: Annex 2 & 5, IUCN (Global): Least Concern, Habitat Regulations: Sched 4)

Bird species of conservation importance:

- Arctic tern (*Sterna paradisaea*) (EC Birds Directive: Annex 1, IUCN (GB): Vulnerable - Breeding, BoCC5: Amber)
- Bar-tailed godwit (*Limosa lapponica*) (EC Birds Directive: Annex 1 & 2.2, IUCN (GB): Least Concern - Non-breeding, BoCC5: Amber)
- Black-headed gull (*Chroicocephalus ridibundus*) (EC Birds Directive: Annex 2.2, IUCN (GB): Least Concern – Breeding / Vulnerable – Non-breeding, BoCC5: Amber)
- Common guillemot (*Uria aalge*) (IUCN (GB): Least Concern – Breeding, BoCC5: Amber)
- Common scoter (*Melanitta nigra*) (EC Birds Directive: Annex 2.2, IUCN (GB): Critically Endangered – Breeding / Least Concern – Non-breeding, BoCC5: Red, WACA: Sch 1 part 1, NERC S.41, BAP 2007)
- Common tern (*Sterna hirundo*) (EC Birds Directive: Annex 1, IUCN (GB): Near Threatened – Breeding, BoCC5: Amber)
- Dunlin (*Calidris alpina*) (IUCN (GB): Vulnerable – Breeding / Endangered – Non-breeding, BoCC5: Red)
- Eider duck (*Somateria mollissima*) (EC Birds Directive: Annex 2.2, IUCN (GB): Vulnerable – Non-breeding, BoCC5: Amber)
- Gannet (*Morus bassanus*) (IUCN (GB): Least Concern – Breeding, BoCC5: Amber)

- Golden plover (*Pluvialis apricaria*) (EC Birds Directive: Annex 1 & 2.2, IUCN (GB): Least Concern – Breeding & Non-breeding)
- Grey plover (*Pluvialis squatarola*) (EC Birds Directive: Annex 2.2, IUCN (GB): Vulnerable – Non-breeding, BoCC5: Amber)
- Greylag goose (*Anser anser*) (EC Birds Directive: Annex 2.1, IUCN (GB): Least Concern – Breeding & Non-breeding, BoCC5: Amber, WACA: Sch I part 2)
- Herring gull (*Larus argentatus*) (EC Birds Directive: Annex 2.2, IUCN (GB): Data Deficient – Breeding / Endangered – Non-breeding, BoCC5: Red)
- Light-bellied Brent goose (*Branta bernicla hrota*) (IUCN (GB): Least Concern – Non-breeding)
- Little tern (*Sternula albifrons*) (EC Birds Directive: Annex 1, IUCN (GB): Vulnerable – Breeding, BoCC5: Amber, WACA: Sch 1 part 1)
- Long-tailed duck (*Clangula hyemalis*) (EC Birds Directive: Annex 2.2, IUCN (GB) : Near Threatened – Non-breeding, BoCC5: Red, WACA: Sch 1 part 1)
- Puffin (*Fratercula arctica*) (IUCN (GB): Least Concern – Breeding, BoCC5: Red)
- Purple sandpiper (*Calidris maritima*) (IUCN (GB): Critically Endangered – Breeding / Endangered – Non-breeding, BoCC5: Red, WACA: Sch 1 part 1)
- Red-breasted merganser (*Mergus serrator*) (EC Birds Directive: Annex 2.2, IUCN (GB): Vulnerable – Non-breeding, BoCC5: Amber)
- Redshank (*Tringa totanus*) (EC Birds Directive: Annex 2.2, IUCN (GB): Vulnerable – Breeding / Near Threatened – Non-breeding, BoCC5: Amber)
- Ringed plover (*Charadrius hiaticula*) (IUCN (GB): Near Threatened – Breeding / Vulnerable – Non-breeding, BoCC5: Red)
- Roseate tern (*Sterna dougallii*) (EC Birds Directive: Annex 1, OSPAR, IUCN (GB): Endangered – Breeding, BoCC5: Red, WACA: Sch 1 part 1, NERC S.41, BAP 2007)
- Sanderling (*Calidris alba*) (IUCN (GB): Least Concern – Non-breeding, BoCC5: Amber)
- Sandwich tern (*Thalasseus sandvicensis*) (EC Birds Directive: Annex 1, IUCN (GB): Least Concern – Breeding, BoCC5: Amber)
- Shelduck (*Tadorna tadorna*) (IUCN (GB): Endangered – Breeding & Non-breeding, BoCC5: Amber)
- Turnstone (*Arenaria interpres*) (IUCN (GB): Vulnerable – Non-breeding, BoCC5: Amber)
- Barnacle goose (*Branta leucopsis*) (EC Birds Directive: Annex 1, IUCN (GB): Least Concern – Non-breeding, BoCC5: Amber)
- Curlew (*Numenius arquata*) (EC Birds Directive: Annex 2.2; IUCN (GB): Endangered – Breeding, BoCC5: Red, NERC S.41, BAP 2007)

- Whooper Swan (*Cygnus cygnus*) (EC Birds Directive: Annex 1, IUCN (GB): EN – Breeding / Least Concern – Non-breeding, BoCC5: Amber, WCA Sch 1 part 1)
- Wigeon (*Mareca penelope*) (EC Birds Directive: Annex 2.1, CITES, IUCN (GB): Near Threatened – Breeding / Least Concern – Non-breeding, BOCC5: Amber)
- Cormorant (*Phalacrocorax carbo*) (IUCN (GB): Near Threatened – Breeding / Least Concern – Non-breeding)
- Shag (*Phalacrocorax aristotelis*) (IUCN (GB): Endangered – Breeding, BOCC5: Red,
- Kittiwake (*Rissa tridactyla*) (OSPAR, IUCN (GB): Critically Endangered – Breeding, BOCC5: Red)
- Razorbill (*Alca torda*) (IUCN (GB): Least Concern – Breeding, BoCC5: Amber)

Fish and shellfish species of conservation importance or commercial species:

- Thornback ray (*Raja clavata*) (OSPAR, IUCN (Global): Near Threatened, a commercial species)
- Atlantic cod (*Gadus morhua*) (OSPAR, IUCN (Global): Vulnerable, NERC S.41, BAP 2007, a commercial species)
- Dab (*Limanda limanda*) (a commercial species)
- Edible crab (*Cancer pagurus*) (a commercial species)
- Atlantic herring (*Clupea harengus*) (IUCN (Global): Least Concern, NERC S.41, BAP 2007, a commercial species)
- Lemon sole (*Microstomus kitt*) (a commercial species)
- Mackerel (*Scomber scombrus*) (NERC S.41, BAP 2007, a commercial species)
- Plaice (*Pleuronectes platessa*) (IUCN (Global): Least Concern, NERC S.41, BAP 2007, a commercial species)
- Sole (*Solea solea*) (NERC S.41, BAP 2007, commercial species)
- Great/King scallop (*Pecten maximus*) (a commercial species)
- Queen scallop (*Aequipecten opercularis*) (a commercial species)
- Native oyster (*Ostrea edulis*) (OSPAR, NERC S.41, BAP 2007)
- Blue mussel (*Mytilus edulis*) (a commercial species)
- European lobster (*Homarus gammarus*) (a commercial species)
- Common whelk (*Buccinum undatum*) (a commercial species)
- Common cockle (*Cerastoderma edule*) (a commercial species)
- Spiny Lobster (*Palinurus elephas*) (NERC S.41, BAP 2007, a commercial species)

Rationale for candidate area

Lindisfarne is an area of relatively high abundance for the inshore Northern North Sea region, with 792 species being recorded. In total the area is home to 39 benthic, mammal and bird species of conservation importance; and the area overlaps with designations such as SAC, SPA, RAMSAR Site, MCZ and SSSI.

This area is located along one of the most varied coastlines in the UK, containing a complex mix of marine habitats and associated species, which are unusually diverse for the North Sea. It includes important intertidal and subtidal biotopes and assemblages, from tide-swept kelp forests to sheltered seagrass and rich, muddy sediments. The intertidal area contains saltmarsh, and intertidal seagrass beds comprised of *Zostera noltii* and *Zostera marina*. The muddy sands on the shore contain lugworms and bivalve molluscs, other areas of mud support ragworms and bivalves. Areas of fine sand support a wide range of polychaete bristle worms and mobile intertidal sand is dominated by sand shrimp (*Bathyporeia pilosa*). These sediment habitats provide key food sources for many bird species. Mussel (*Mytilus edulis*) beds provide a varied habitat for a different range of bird and crab species and during high tide provide a source of food for flatfish.

Intertidal rock areas feature mussels, limpets and sea snails, with kelp and mixed seaweeds. Below the tideline the area supports kelp forest and red seaweeds; under this canopy of kelp the habitat supports edible crabs (*Cancer pagurus*) and common lobster (*Palinurus elephas*). Deeper subtidal infralittoral rock is animal dominated and found to be covered in a diverse and colourful mix of encrusting bryozoans, hydroids, sponges and echinoderms. This animal dominated rocky habitat supports species of crabs and lobsters.

Deeper subtidal coarse and mixed sediments may appear more barren, but the water column above can provide habitat and a food source for commercial fish species such as herring (*Clupea harengus*) and cod (*Gadus morhua*).

This area is important for many mobile species, primarily migrating birds, and grey seals (*Halichoerus grypus*). The area provides important foraging and haul out areas for grey seals and the Northumberland colony provides 3% of the British annual pup production. Lindisfarne is an important area for the behaviours and key life cycles stages of 54 species in total: 34 bird species, 17 fish and shellfish species, 1 mammal species and 2 other invertebrate species. The area is the only regular British wintering site for light-bellied brent geese (*Branta bernicla hrota*), during their winter migration from the Arctic and supports thousands of other waders and geese. The area is an important foraging and breeding location for thousands of seabirds which utilise the Farne Islands as their breeding colony, species include puffins (*Fratercula arctica*), common guillemot (*Uria aalge*), eider duck (*Somateria mollissima*), and several tern species such as Arctic tern (*Sterna paradisaea*).

	<p>Commercial marine species that may have nursery or spawning areas within the site include lemon sole (<i>Microstomus kitt</i>), herring (<i>Clupea harengus</i>), cod (<i>Gadus morhua</i>), sole (<i>Solea solea</i>), plaice (<i>Pleuronectes platessa</i>), mackerel (<i>Scomber scombrus</i>), dab (<i>Limanda limanda</i>), and thornback ray (<i>Raja clavata</i>). The area also supports the key life cycle stages of shellfish including edible crab (<i>Cancer pagurus</i>), scallops, lobsters, whelks and cockles.</p> <p>Several habitats considered to be 'blue carbon' habitats can be found in the area, including intertidal mud, kelp on rock substrate, intertidal sand & muddy sand, saltmarsh, seagrass and subtidal sand. There are small areas of habitats that are important for the provision of flooding and coastal erosion protection, including: coastal sand dunes, kelp on rock substrate, saltmarsh, seagrass but these offer only extremely limited flood mitigation in proximity to an at-risk coastline.</p> <p>The area is subject to relatively high intensities of activities, which the habitats in the area are moderately or highly sensitive to, therefore, the area is considered to be a degraded ecosystem and no natural habitats were found. The candidate pilot HPMA contains habitats which have been assessed as having a potential recovery from pressures within 2-10 years, making this a suitable area for assessment of HPMA recovery. This site is in a mixed conservation condition; some of the designated species and habitats are in favourable conservation status, while others are in unfavourable condition.</p> <p>This candidate pilot HPMA offers a range of benefits in terms of both habitat recovery and conservation.</p>																					
<p>Identified via SNCBs or 3rd party proposal</p>	<p>This candidate pilot HPMA was identified by Natural England, following the agreed ecological criteria for pilot HPMA selection.</p>																					
<p>Boundary of candidate area</p>	<p>Option A – Consultation boundary</p> <table border="1" data-bbox="526 1141 2024 1394"> <thead> <tr> <th>Point</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>55° 42' 12.922" N</td> <td>1° 54' 15.799" W</td> </tr> <tr> <td>B</td> <td>55° 45' 15.659" N</td> <td>1° 50' 4.025" W</td> </tr> <tr> <td>C</td> <td>55° 39' 33.030" N</td> <td>1° 34' 29.001" W</td> </tr> <tr> <td>D</td> <td>55° 37' 25.112" N</td> <td>1° 37' 10.821" W</td> </tr> <tr> <td>E</td> <td>55° 38' 29.607" N</td> <td>1° 39' 40.213" W</td> </tr> <tr> <td>F</td> <td>55° 37' 46.449" N</td> <td>1° 40' 31.188" W</td> </tr> </tbody> </table>	Point	Latitude	Longitude	A	55° 42' 12.922" N	1° 54' 15.799" W	B	55° 45' 15.659" N	1° 50' 4.025" W	C	55° 39' 33.030" N	1° 34' 29.001" W	D	55° 37' 25.112" N	1° 37' 10.821" W	E	55° 38' 29.607" N	1° 39' 40.213" W	F	55° 37' 46.449" N	1° 40' 31.188" W
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	G	55° 36' 33.579" N	1° 42' 11.115" W
	H	55° 37' 37.002" N	1° 45' 55.478" W
	I	55° 39' 40.779" N	1° 43' 25.831" W
	J	55° 41' 9.666" N	1° 46' 48.538" W
	K	55° 41' 25.196" N	1° 51' 16.045" W
	L	55° 41' 11.807" N	1° 52' 50.963" W
Evidence/references	<p>Bradbury, G. et al. (2014). Mapping Seabird Sensitivity to Offshore Wind Farms. PLOS One 9, 1-17. Available from: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0106366</p> <p>Brereton, T., Davies, R., Babey, L., Kitching, M. and Walker, R., 2020. Temporal and spatial analysis of Marinelife and Orca white-beaked dolphin data from Northumberland and adjacent sea areas. Natural England Commissioned Report NECR 289.</p> <p>Brereton, T., Kitching, M., Davies, R., McNie, F., and Walker, R., 2016. Photo-identification of white-beaked dolphins off Southwest and Northeast England 2007 - 2014. Natural England.</p> <p>Carter, M. I. D., Boehme, L., Duck, C.D., Grecian, W.J., Hastie, B.J., McConnell, B.J., Miller, D.L., Morris C.D., Moss, S.E.W., Thompson, P.M., AND 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, Report to BEIS, OESEA-16-76/OESEA-17-78.</p> <p>Corr, S., 2020. Using citizen science data to assess the vulnerability of bottlenose dolphins (<i>Tursiops truncatus</i>) along England's south coast. Unpublished MRes. thesis. University of Plymouth.</p> <p>Environment Agency, 2021. Ecology & Fish Data Explorer [online]. Available from: https://environment.data.gov.uk/ecology/explorer/</p> <p>Environment Agency, 2020. WFD Transitional and Coastal Waterbodies Cycle 2 [online]. Available from: https://data.gov.uk/dataset/3a75ec5f-a361-475c-80e3-52d93bbc5dbe/wfd-transitional-and-coastal-waterbodies-cycle-2.</p> <p>Environment Agency, 2020. National Coastal Erosion Risk Mapping (NCERM) [online]. Available from: https://data.gov.uk/dataset/7564fcf7-2dd2-4878-bfb9-11c5cf971cf9/national-coastal-erosion-risk-mapping-ncerm-national-2018-2021.</p>		

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4.5. North East of Farnes Deep

Table 10. Scientific advice on the ecological merit of North East of Farnes Deep Candidate HPMA.

GENERIC INFORMATION	
Candidate HPMA name	North East of Farnes Deep
Biogeographic region	Northern North Sea (Offshore)
Geographic description	<p>The candidate HPMA North East of Farnes Deep is situated beyond the 12 nm territorial sea limit in the western offshore area of the Northern North Sea region. The area is approximately 55 km offshore from the Northumberland coast. This area overlaps entirely with the North East of Farnes Deep Marine Conservation Zone (MCZ), designated in November 2013, and has an area of 491.8 km². The depth of the area ranges from approximately 59 m to 93 m below sea level.</p> <p>Following the public consultation, there have been no modifications to the original consulted candidate HPMA boundary.</p>
Habitats and species of conservation Importance ¹⁰	<p>The habitats and species of conservation importance recorded and considered present in the candidate HPMA are as follows:</p> <p>EUNIS level 3 broad-scale habitats:</p> <ul style="list-style-type: none"> • Sublittoral coarse sediment • Sublittoral sand

¹⁰ The known habitats and species listed above refer to the key important habitats and species found on national and international lists of conservation importance, including: Priority Marine Habitats and Species, OSPAR (threatened and/or declining), FOCI (Features of Conservation Importance – Habitats and Species), IUCN red list (European

	<ul style="list-style-type: none"> • Sublittoral mud • Sublittoral mixed sediment <p>Habitats:</p> <ul style="list-style-type: none"> • Seapens and burrowing megafauna (Habitat FOCI, OSPAR T&D habitats) • Subtidal sands and gravels (UK Priority Habitat, Habitat FOCI) • Mud habitats in deep water (Habitat FOCI, UK Priority Habitat) <p>Demersal/benthic species:</p> <ul style="list-style-type: none"> • Ocean quahog (<i>Arctica islandica</i>) (OSPAR T&D species, Species FOCI) • Norway lobster (<i>Nephrops norvegicus</i>) (IUCN: Least Concern, a commercial species) <p>Bird species:</p> <ul style="list-style-type: none"> • Black-legged kittiwake (<i>Rissa tridactyla</i>) (EC Birds Directive - Annex I, OSPAR T&D species, IUCN: Vulnerable, BoCC5:Red) • Common guillemot (<i>Uria aalge</i>) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC5: Amber) • Northern fulmar (<i>Fulmarus glacialis</i>) (EC Birds Directive - Annex I, BoCC5: Amber, IUCN: Vulnerable) • Northern gannet (<i>Morus bassanus</i>) (EC Birds Directive - Annex I, BoCC5: Amber, IUCN: Least Concern) • Razorbill (<i>Alca torda</i>) (EC Birds Directive - Annex I, BoCC5: Amber, IUCN: Least Concern) • Atlantic puffin (<i>Fratercula arctica</i>) (EC Birds Directive - Annex I, BoCC5: Red, IUCN: Endangered) • Great skua (<i>Stercorarius skua</i>) (EC Birds Directive - Annex I, BoCC5: Amber, IUCN: Least Concern) <p>Marine mammal species:</p> <ul style="list-style-type: none"> • Harbour porpoise (<i>Phocoena phocoena</i>) (CITES - Annex II, EC Habitats Directive - Annex II & IV, IUCN: Vulnerable, UK Priority Species, OSPAR T&D species) • Minke whale (<i>Balaenoptera acutorostrata</i>) (CITES - Annex I, EC Habitats Directive - Annex IV, IUCN: Least Concern, UK Priority Species) • White-beaked dolphin (<i>Lagenorhynchus albirostris</i>) (CITES - Annex II, EC Habitats Directive – Annex IV, IUCN: Least Concern, UK Priority Species)
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assessment for offshore sites, excluding Norway lobster, which only has a global assessment available), EC Habitats Directive (Habitats and Species), EC Birds Directive (Annex I and II), BoCC5 (Birds of Conservation Concern 5 – Red, Amber and Green lists) and WCA 1981 (Wildlife Countryside Act 1981). There are additional species and habitats also reported as being present, including commercial fish and shellfish species.

	<ul style="list-style-type: none"> • Grey seal (<i>Halichoerus grypus</i>) (EC Habitats Directive - Annex II & V, IUCN: Least Concern) • Harbour seal (<i>Phoca vitulina</i>) (EC Habitats Directive - Annex II & V, IUCN: Least Concern, UK Priority Species) <p>Fish species:</p> <ul style="list-style-type: none"> • Haddock (<i>Melanogrammus aeglefinus</i>) (IUCN: Least Concern, a commercial species) • European pilchard (<i>Sardina pilchardus</i>) (IUCN: Near Threatened, a commercial species) • Whiting (<i>Merlangius merlangus</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • European smelt (<i>Osmerus eperlanus</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • European sprat (<i>Sprattus sprattus</i>) (IUCN: Least Concern, a commercial species) • Lemon sole (<i>Microstomus kitt</i>) (IUCN: Least Concern, a commercial species)
<p>Rationale for candidate area and assessment against the HPMA ecological selection criteria</p>	<p>The area has relatively high levels of biodiversity within the wider Northern North Sea region. This assessment is based upon data acquired and analysed from a variety of ground-truth and modelled data and additional data products at a regional level to identify areas that comprise relatively higher levels of biodiversity. These datasets included Annex I habitats datasets 2021, EUSeaMap, 2019; FOCI, 2016; MB0102 Bio-physical Contract, 2010; Natural England Evidence Base, 2021; OSPAR Habitats in the North-East Atlantic Ocean, 2020; Survey GB001126, 2014; and UK Combined Map 2021).</p> <p>The seabed in the area comprises four broad-scale habitats (BSHs); sublittoral sand, sublittoral coarse sediment, and sublittoral mixed sediment. They are interspersed relatively evenly within the area, with sublittoral mixed sediment occupying over one third of the area (Survey GB001126, 2014; Hawes et al. 2020). Sublittoral mud covers 27.63 km² of the area (5.6 % by area) and is thought to be an important habitat in the absorption of atmospheric carbon (JNCC, 2021). Sublittoral mud has been identified to have a large stock of residing carbon (23.9 million tonnes in English waters), which highlights its importance as a carbon reservoir and its role in carbon sequestration (Parker <i>et al.</i>, 2020). Sublittoral sand, which occurs within the area, also has the potential to store organic carbon from the water column for decades to centuries (Gregg <i>et al.</i>, 2021).</p> <p>The wide-ranging habitat types in the area are relatively stable and support a diverse range of benthic, demersal and mobile species including sponges, hydroids, anemones, worms, molluscs, crustaceans, echinoderms, fish, marine mammals and seabirds. Survey data indicates high biodiversity of benthic and demersal species, which include the phosphorescent sea pen (<i>Pennatula phosphorea</i>), common dragonet (<i>Callionymus lyra</i>), and Atlantic</p>

hagfish (*Myxine glutinosa*). Barnacles (*Verruca stroemia*), amphipods (*Atylidae* and *Paraphoxus sp.*) and squat lobsters (*Galathea intermedia*) occur in relatively large numbers across the extent of the area. Species of conservation importance are also present, such as the Ocean quahog (*Arctica islandica*) (OSPAR Commission, 2008; Tyler-Walters and Sabatini, 2017; Hawes et al. 2020), and rare/regionally distinctive mobile species such as the European smelt (*Osmerus eperlanus*), which is an important prey source for larger fish, seabirds and marine mammals. Data for important demersal/benthic species have been derived from the datasets mentioned above.

The area is exposed to relatively uniform and weak tidal currents running north or south depending on the state of the tide. Mean current velocities range from 0.19 ms⁻¹ to 0.23 ms⁻¹ with currents tending to be stronger in the west of the area (Hawes et al., 2020). The overall hydrodynamic regime indicates a low energy environment in the area. Geological/geomorphological features are present in the area and are depositional glacial features and topographic features of the North-East Bank seabed mound or pinnacle.

The area supports prey items for the foraging of several species of fish, seabirds and marine mammals. Data from Katara et al. (2021) reveals that the area is of importance for the nursery and spawning behaviour of at least ten commercially important marine species of fish. Examples include Surmullet (*Mullus surmuletus*), Whiting (*Merlangius merlangus*), as well as Haddock (*Melanogrammus aeglefinus*).

Although there are limited data available to support the relative importance of the area of the candidate HPMA to the life history of seabirds, at least seven species are considered to be notably present within the site because they occur within the candidate HPMA at higher than average densities by comparison to the wider region and English waters (Bradbury et al., 2014; Johnston et al., 2020; Waggitt et al., 2020). These species include the Atlantic puffin (*Fratercula arctica*) and Black-legged kittiwake (*Rissa tridactyla*) (both of which are classified as 'Endangered' and 'Vulnerable' on the IUCN Red List respectively).

Data from Carter et al. (2022), Heinänen, and Skov (2015), the Joint Cetacean Protocol (2017) SCANS III (2021), and Waggitt et al. (2020) were used to identify a relatively greater presence of five marine mammal species in this area by comparison to the wider region (see list above). However, there are limited data available to identify the importance of this area in relation to the key life cycle stages of each marine mammal species. Measures taken to protect this area may enhance ecosystem health, and bring added benefits to the conservation status of marine mammal species using the area and surrounding waters.

The candidate HPMA fully overlaps with the North East of Farnes Deep MCZ. An MCZ verification survey was conducted in March 2012, in which data were analysed to identify benthic communities, including Seapens and burrowing megafauna in fine deep circalittoral sand. The site was also surveyed in May 2016, providing an initial

	<p>dataset for a monitoring time series, as well as between April and May 2018 in an effort to investigate existing and future management measures for the site.</p> <p>The area is considered to represent a relatively natural location. It overlaps entirely with the designated North East of Farnes Deep MCZ, which presents the only example of a candidate HPMA in the English offshore area where all designated features are considered to be in favourable condition (JNCC, 2020). These species and habitats are the Ocean quahog and four BSHs: subtidal coarse sediment, subtidal sand, subtidal mixed sediment and subtidal mud. Evidence suggests that the seafloor in the area is subject to a range of low to relatively medium disturbance (OSPAR BH3 indicator), meaning that species and habitats are sensitive to some level of fishing pressure (BH3, 2017). The habitats within the area have a range of recovery times from <10 years to >10 years, subject to pressures being removed.</p> <p>This area meets all ecological criteria used to identify candidate HPMA's, including relatively high levels of biodiversity and the representation of important blue carbon habitats. It is the only candidate HPMA in offshore English waters that represents a relatively natural ecosystem. As the area has previously been surveyed, initial datasets will be available to monitor the site across a time series and evaluate the impact of HPMA designation in a relatively shorter timeframe.</p>															
<p><i>Identified via SNCBs or 3rd party proposal</i></p>	<p>The area was not identified, either in full or in part, by any third-party proposals. It was identified based on JNCC's analysis of available supporting evidence against the ecological criteria for selecting candidate HPMA's.</p>															
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Evidence/references

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Annex 1: Post-consultation: Decision Tree Process

Overview

JNCC and Natural England have followed a decision tree process to produce our post-consultation scientific advice to Defra on candidate Highly Protected Marine Areas (HPMAs) (see Figure 15). This decision tree helped identify where updates and amendments may be required to our pre-consultation advice. The scope of the amendments to the advice we provided in our pre-consultation scientific advice depend on whether any new data or information (either ecological or socio-economic) became available, since submitting that advice and the end of the public consultation, that could potentially change our previously submitted scientific advice for a site. This includes any potential boundary changes resulting from this new data or information.

For each candidate HPMA, both branches of the decision tree were followed to ensure that scientific advice is provided where required, from both an ecological and socio-economic perspective. There were eight potential outcomes from the decision tree, which are explained in more detail under Figure 15.

The decision tree requires expert judgement to be applied to any new information. Any use of expert judgement made through this decision tree should be reviewed in line with the JNCC Evidence Quality Assurance Policy¹¹ and Natural England Analysis of Evidence Standard¹².

¹¹ Available at: <https://data.jncc.gov.uk/data/5f7aa652-69b5-48ab-8239-dbccc5333d09/jncc-evidence-quality-assurance-2019-A.pdf>

¹² Available at: <http://publications.naturalengland.org.uk/file/5639624661663744>

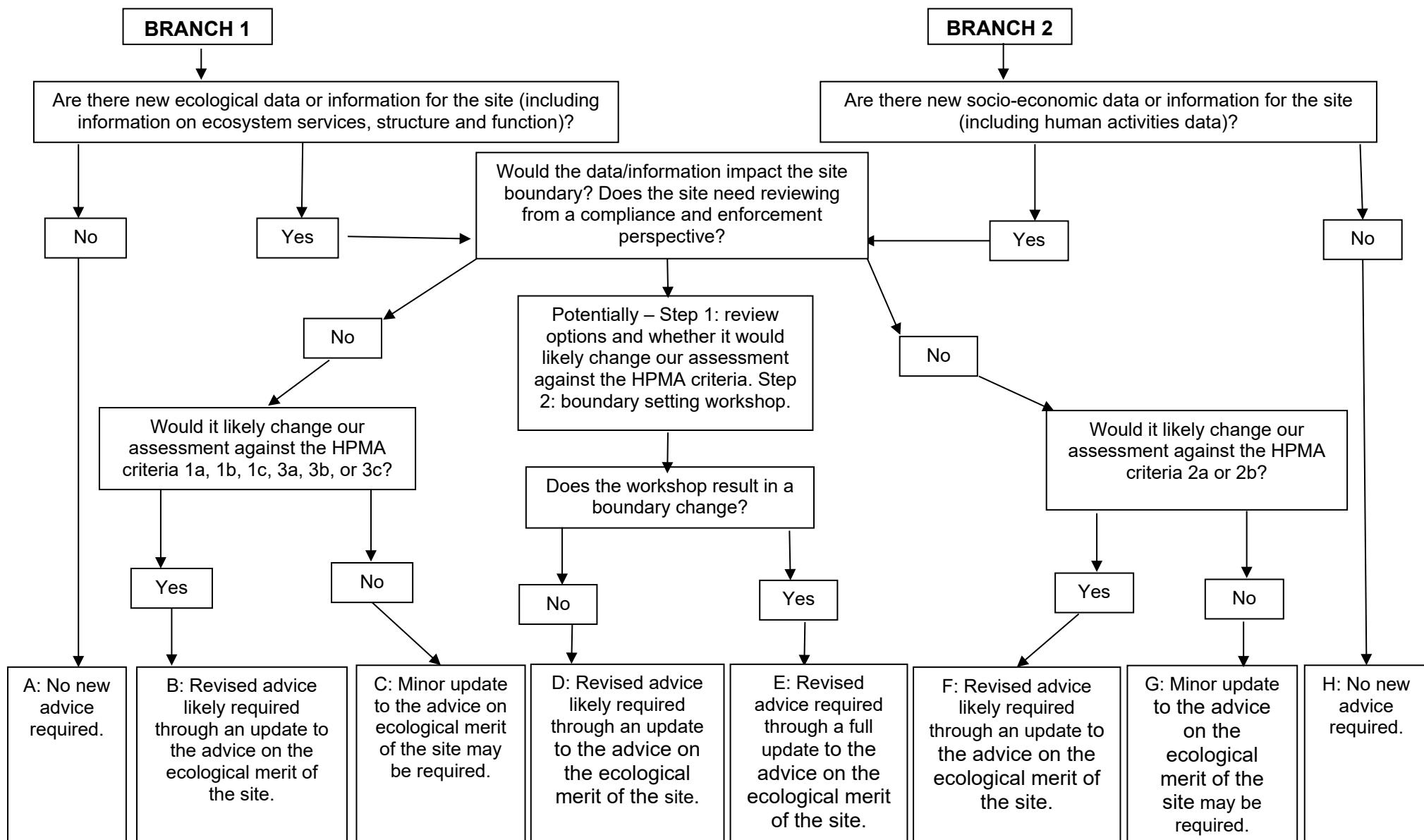


Figure 15: Candidate HPMA post-consultation advice decision tree

Explanation of HPMA Advice decision tree outcomes

The following paragraphs explain the different outcomes from the decision tree and give examples of how new information may lead to each outcome.

Outcome A and H

No new advice is required for a site, as there are no new ecological or socio-economic data or information and all known available data will have been considered in JNCC and Natural England's pre-consultation advice.

Outcome B

New ecological data or information exists that may change previous advice on sites against the HPMA selection criteria. Revised advice may be required depending on the nature of the new data/information. For example, new data may come to light that change our understanding on the important spawning and nursery grounds within the area which may require a change to the advice on the ecological merit of the site..

Outcome C

New ecological data or information exists, but this data/information are judged not to change previous advice on sites against the HPMA selection criteria. An update to our advice is possible, but in the form of a minor update to the advice on the ecological merit of the site. For example, data may reinforce what we already know about the presence of an important species within a site but not significantly change what we know.

Outcome D

New ecological or socio-economic data exist that could result in a boundary change, but a decision is made not to amend the boundary as a result. An update to our advice is likely in cases where there is new ecological data, but in the form of a minor update to the advice on the ecological merit of the site. For example, data may reinforce what we already know about the presence of an important species within a site but not significantly change what we know.

Outcome E

New ecological or socio-economic data or information exists that change a sites boundary. Where a new boundary is taken forward, revised advice will be required. For example, new data may come to light that change our understanding on the important spawning and nursery grounds within the area which require a revision to the site boundary; or data for a previously unknown activity such as an existing cable, which will require the site boundary to be amended and advice provided on the new boundary and any implications for the HPMA criteria.

Outcome F

New socio-economic data or information exists that may change previous advice on sites against the HPMA selection criteria. Revised advice may be required depending on the nature of the new data/information. For example, new data may come to light that change our understanding of whether a site is considered natural or degraded, which may require a change to the advice on the ecological merit of the site.

Outcome G

New socio-economic data or information exists, but this data/ information are judged not to change previous advice on sites against the HPMA selection criteria. An update to our advice is possible, but in the form of a minor update to the advice on the ecological merit of the site. For example, data may reinforce what we already know about the presence of an activity within a site but not significantly change what we know.

Annex 2: Natural England amendments to pre-consultation advice

Since the submission of our pre-consultation scientific advice, Natural England have reviewed the evidence and noted some amendments within our advice. This annex is intended to highlight and address the most critical of these amendments. None of the amendments have changed the outcome of the ecological criteria assessments contained in our pre-consultation advice. One amendment corrects the Natural England evidence standards assessment score for criteria 2b for Allonby Bay candidate HPMA.

Please note the scientific advice on the ecological merit of the candidate HPMA within this advice document have been updated to include further details for each site option, along with any additional references used for our post-consultation advice. As these form part of our post-consultation advice, these changes are not included below.

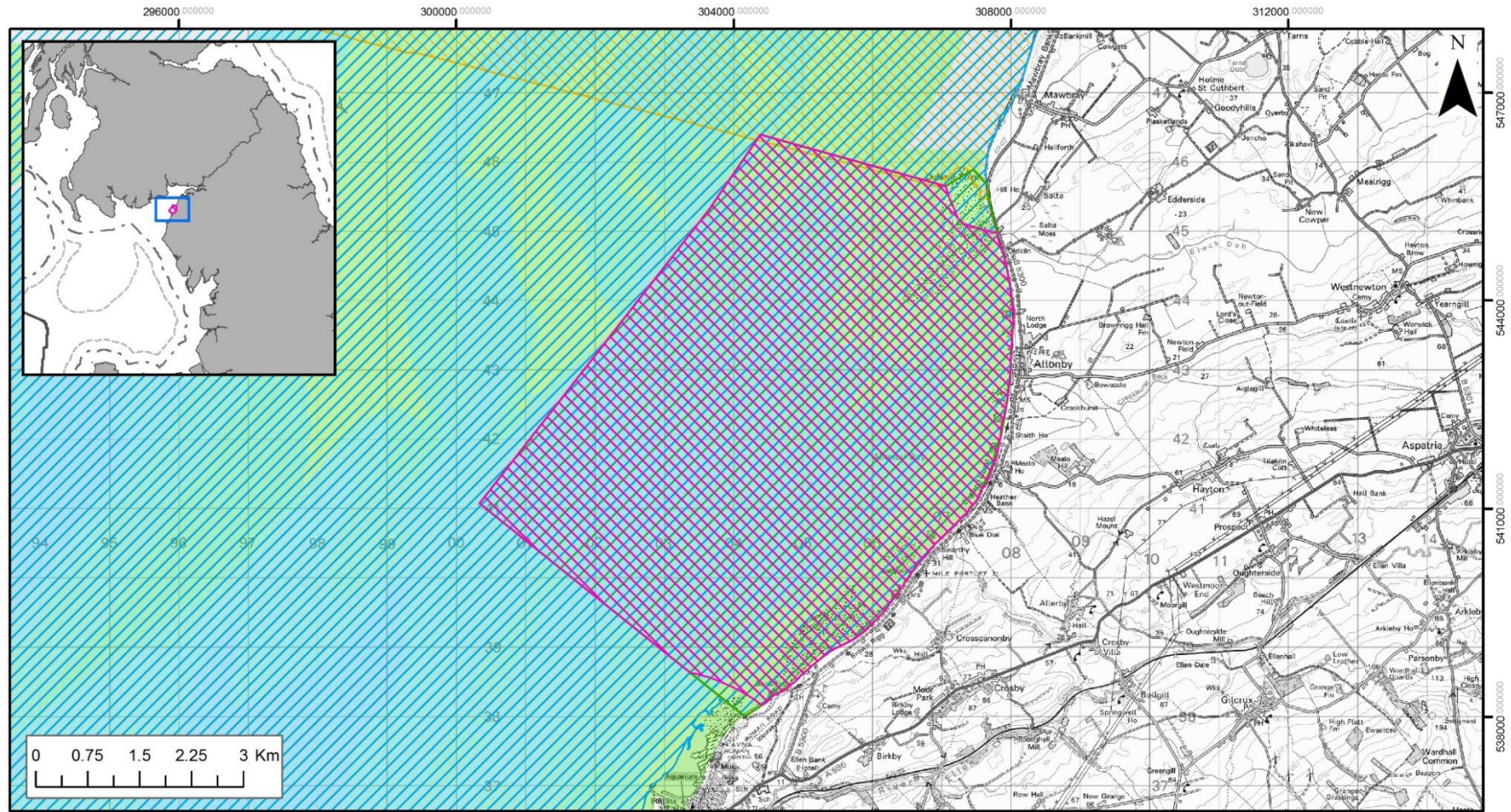
Table 11. Natural England amendments to pre-consultation advice.

	Section	Issue and amendment
Allonby Bay pre-consultation advice evidence assessment score		
1	Criteria 2b	Corrected previous score which was 'Not met' to 'Low' due to the level of evidence that the assessment of the site was 'relatively natural' and therefore, not likely to be 'relatively degraded'.
Allonby Bay pre-consultation advice on the ecological merit of the site		
2	Geographic description	Corrected distance of seaward boundary from shore from 8 km to 5.6 km
3		Added overlap of Solway Firth SAC and Upper Solway Flats and Marshes SSSI
4	Known habitats and species	Added littoral coarse sediment, as the Natural England Marine Evidence Database identified this was present within the boundary
5		Removed sea pens and burrowing megafauna, as there is no evidence this is present within the site
6		Added tide-swept channels, as the Natural England Marine Evidence Database identified this was present within the boundary
7		Added Atlantic puffin (<i>Fratercula arctica</i>), as this was identified in the third-party proposal submission, and added scaup (<i>Aythya marila</i>) and whooper swan (<i>Cygnus cygnus</i>) which are features of the overlapping Solway Firth SPA
8		Removed European eel (<i>Anguilla anguilla</i>), as the Environment Agency water body tagged with this species does not overlap with the site boundary (although it is adjacent, so potentially could be present)
9		Updated the conservation designations for all species listed, as there was an update to the JNCC Conservation Designations for UK taxa spreadsheet in January 2022 which included the updated Birds of Conservation Concern list (BoCC5)
10		Rationale for candidate area and assessment against the HPMA
11		Corrected number of bird species of conservation importance from 16 to 19, as three bird species present in the site were missing. Atlantic puffin (<i>Fratercula arctica</i>) was identified in the third-party

	ecological selection criteria	proposal submission, and scaup (<i>Aythya marila</i>) and whooper swan (<i>Cygnus cygnus</i>) are features of the overlapping Solway Firth SPA.
12		Updated paragraph 7 to clarify the site is also used by other seabirds as well as waders
13		Corrected area of blue carbon habitats from 17.5 Km ² to 17.7 Km ²
14		Corrected percentage of site that is blue carbon habitats from 45% to 46%
15	References	Updated reference for JNCC Conservation Designations for UK taxa spreadsheet in January 2022 with latest version date of 2022
Lindisfarne pre-consultation advice on the ecological merit of the site		
16	Geographic description	Added overlap of Bamburgh Coast and Hills SSSI and an extremely small area of Bamburgh Dunes SSSI and North Northumberland Dunes SAC which was missing.
17	Known habitats and species	Added features of circalittoral rock as the Natural England Marine Evidence Database identified this was present within the boundary
18		Added low energy circalittoral rock as the Natural England Marine Evidence Database identified this was present within the boundary
19		Added tide-swept channels as the Natural England Marine Evidence Database identified this was present within the boundary
20		Added littoral chalk communities as the Natural England Marine Evidence Database identified this was present within the boundary
21		Removed spider crab (<i>Maja brachydactyla</i>) (a commercial species) as there is no evidence this is present within the site.
22		Added thornback ray (<i>Raja clavata</i>) as evidence shows that there are suitable conditions for nursery areas from Katara et al. 2021.
23		Added cockle (<i>Cerastoderma edule</i>) as the Natural England Marine Evidence Database identified this was present within the boundary
24		Added whooper swan (<i>Cygnus cygnus</i>), this was a typing mistake
25		Added wigeon (<i>Mareca penelope</i>), this was a typing mistake
26		Removed barnacled goose (<i>Branta leucopsis</i>), this was a typing mistake
27		Removed black-headed gull (<i>Chroicocephalus ridibundus</i>) as does not appear to overlap with maps in Johnston et al. 2020 though it is difficult to tell due to the scale of the maps.
28		Removed herring gull (<i>Larus argentatus</i>) as does not appear to overlap with maps in Johnston et al. 2020 though it is difficult to tell due to the scale of the maps.
29		Added cormorant (<i>Phalacrocorax carbo</i>) which is a feature of the overlapping Farne Islands SSSI
30		Added shag (<i>Phalacrocorax aristotelis</i>) which is a feature of the overlapping Farne Islands SSSI and the site is also identified within its breeding foraging range in Johnston et al. 2020
31	Added kittiwake (<i>Rissa tridactyla</i>) which is a feature of the overlapping Farne Islands SSSI and the site is also identified within its breeding foraging range in Johnston et al. 2020	

32		Added Razorbill (<i>Alca torda</i>) as it the site is identified within its breeding foraging range in Johnston et al. 2020
33		Updated the conservation designations for all species listed, as there was an update to the JNCC Conservation Designations for UK taxa spreadsheet in January 2022 which included the updated Birds of Conservation Concern list (BoCC5)
34	Rationale	Corrected number of species recorded within site from 873 to 792 as this figure was not previously recalculated following resizing of the AEI to meet the maximum size requirement policy and remove areas with additional socio-economic activities not compatible with the definition of HPMA's prior to the consultation.
35		Corrected number of species and habitats important for conservation from '40 threatened or important benthic, mammal and bird species' to '39 benthic, mammal and birds species of conservation importance' based on the updated list of known habitats and species (and not included species listed only as commercial species)
36		Removed spider crab (<i>Maja brachydactyla</i>) as an example from the text in paragraph 3 and 6 as there is no evidence this is present within the site (however there is the potential it is still present)
37		Corrected total number of behaviours and/or key life cycles stages in paragraph 5 from 44 to 54 species based on the updated list of known habitats and species
38		Corrected number lifecycle stages/behaviours of fish from 14 fish to 17 fish and shellfish species based on the updated list of known habitats and species
39		Corrected number of lifecycle stages/behaviours of birds from 29 to 34 based on the update list of known bird species
40		Added thornback ray (<i>Raja clavata</i>) that may have nursery or spawning areas within the site to paragraph 6 as evidence shows that there are suitable conditions for nursery areas from Katara et al. 2021.
41	References	Updated reference for JNCC Conservation Designations for UK taxa spreadsheet in January 2022 with latest version date of 2022

Annex 3: Maps of HPMA post-consultation boundary options also illustrating existing MPA boundaries



Allonby Bay candidate HPMA: Option A - Consultation boundary with existing MPAs

- Candidate HPMA boundary
- Marine Conservation Zones
- Special Protection Areas
- Special Areas of Conservation

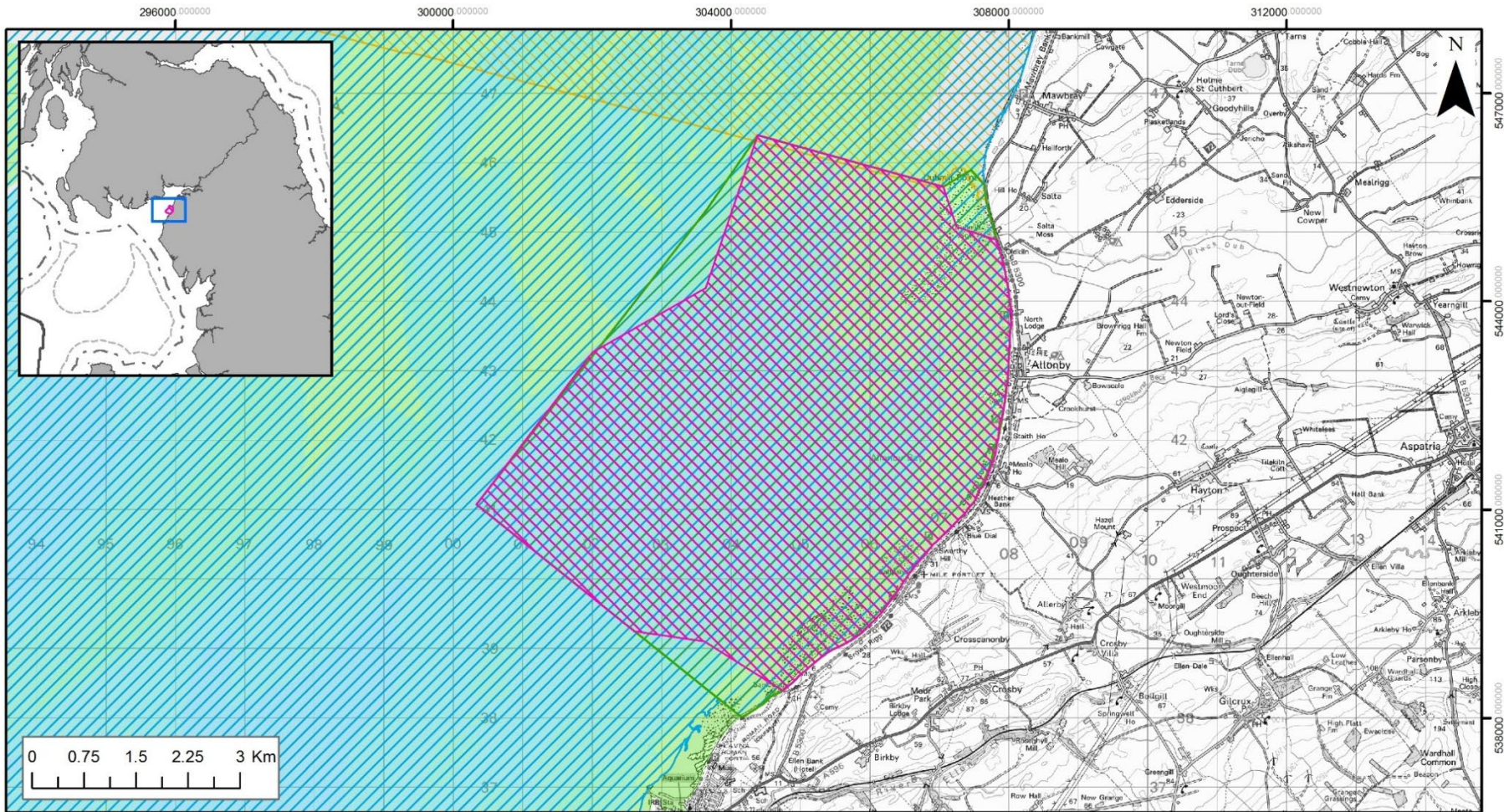
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

Depth Areas (metres)	
-20.0 - -10.0	25.1 - 50.0
-9.9 - -5.0	50.1 - 100.0
-4.9 - 0.0	100.1 - 250.0
0.1 - 5.0	250.1 - 500.0
5.1 - 10.0	500.1 - 1000.0
10.1 - 25.0	

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 16. Map of Allonby Bay candidate HPMA – Option A with existing MPAs.



Allonby Bay candidate HPMA: Option B with existing MPAs

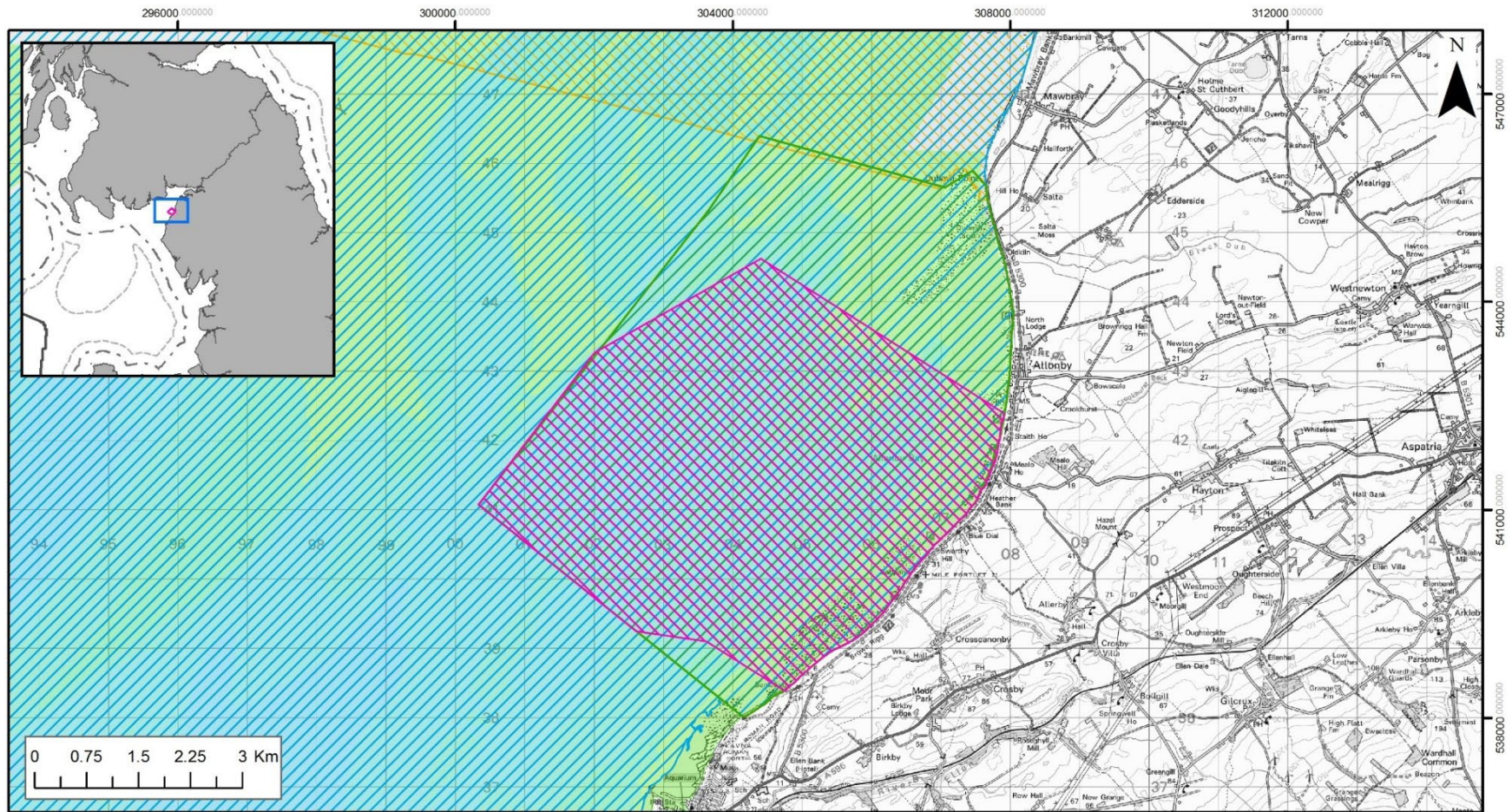
- Candidate HPMA boundary
- Marine Conservation Zones
- Special Protection Areas
- Special Areas of Conservation
- Exclusive economic zone
- 6N Limit
- 12N Territorial seas limit
- Land

Depth Areas (metres)	
	-20.0 - -10.0
	-9.9 - -5.0
	-4.9 - 0.0
	0.1 - 5.0
	5.1 - 10.0
	10.1 - 25.0
	25.1 - 50.0
	50.1 - 100.0
	100.1 - 250.0
	250.1 - 500.0
	500.1 - 1000.0

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 17. Map of Allonby Bay candidate HPMA – Option B with existing MPAs.



Allonby Bay candidate HPMA: Option C with existing MPAs

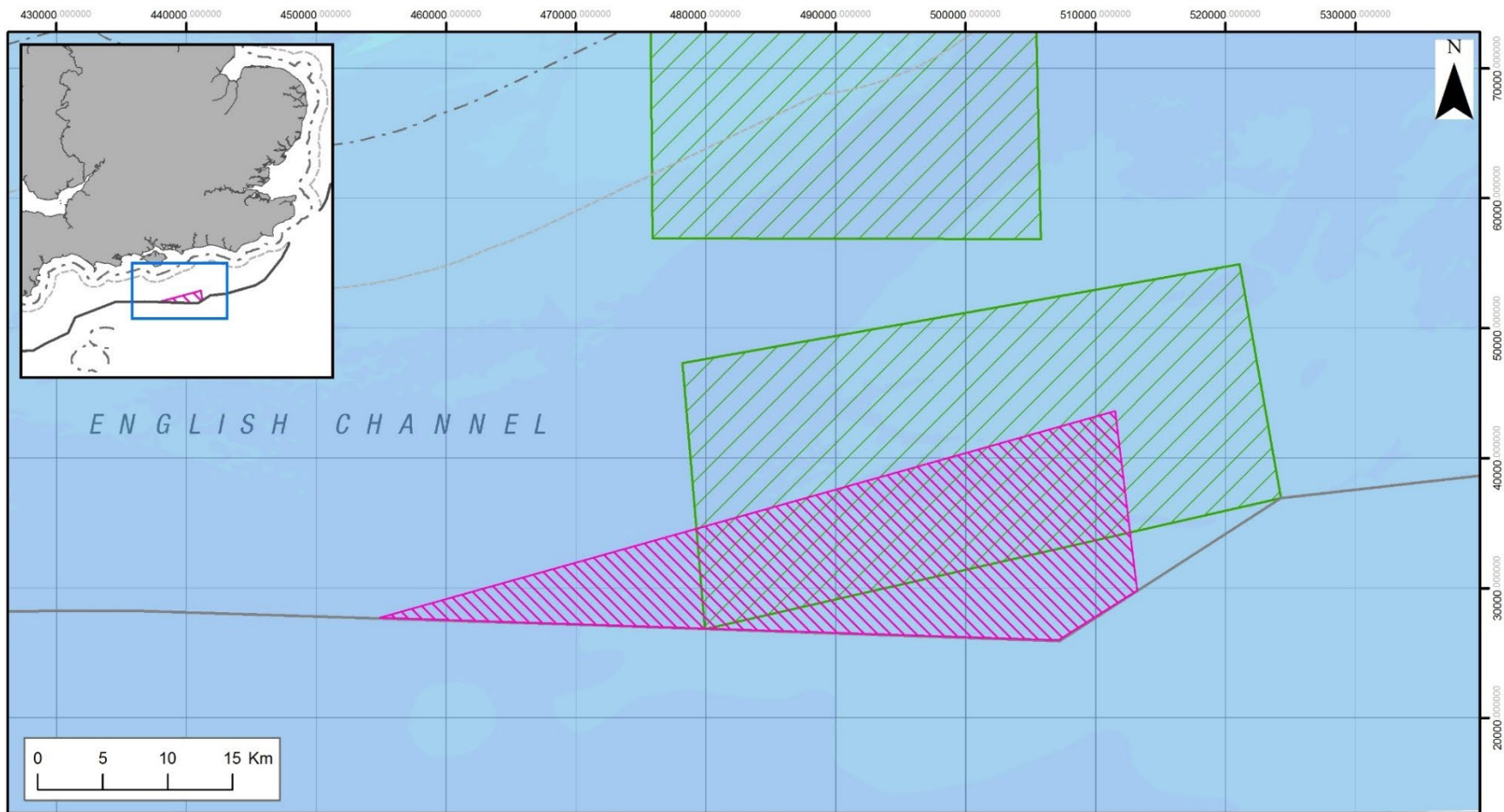
- Candidate HPMA boundary
- Marine Conservation Zones
- Special Protection Areas
- Special Areas of Conservation
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

Depth Areas (metres)	
-20.0 - -10.0	25.1 - 50.0
-9.9 - -5.0	50.1 - 100.0
-4.9 - 0.0	100.1 - 250.0
0.1 - 5.0	250.1 - 500.0
5.1 - 10.0	500.1 - 1000.0
10.1 - 25.0	







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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 18. Map of Allonby Bay candidate HPMA – Option C with existing MPAs.



Dolphin Head candidate HPMA: Option A - Consultation boundary with existing MPAs

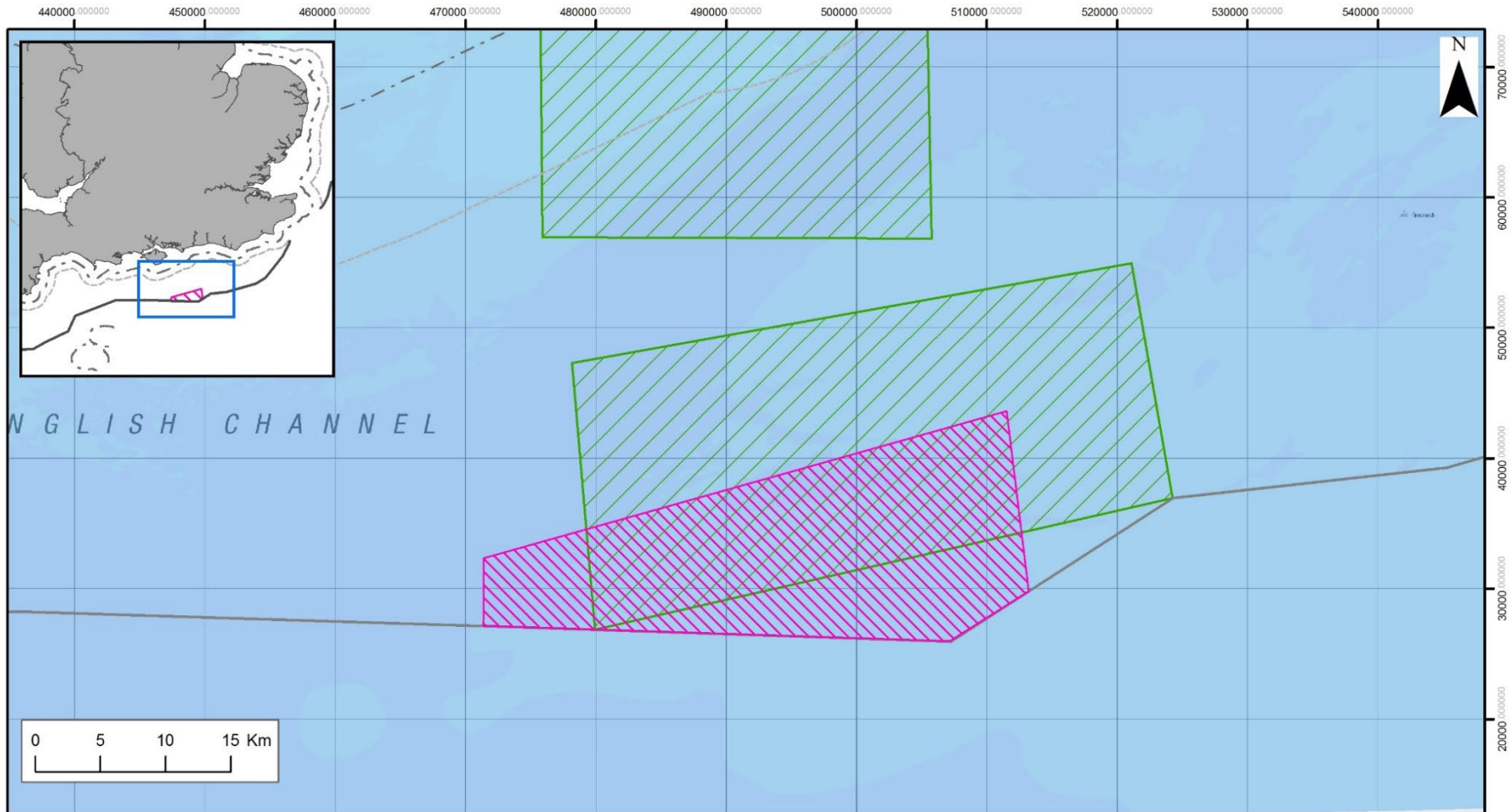
-  Candidate HPMA boundary
-  Marine Conservation Zones
-  Exclusive economic zone
-  6nM Limit
-  12nM Territorial seas limit
-  Land

Depth Areas (metres)	
 -20.0 - -10.0	 25.1 - 50.0
 -9.9 - -5.0	 50.1 - 100.0
 -4.9 - 0.0	 100.1 - 250.0
 0.1 - 5.0	 250.1 - 500.0
 5.1 - 10.0	 500.1 - 1000.0
 10.1 - 25.0	







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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 19. Map of Dolphin Head candidate HPMA – Option A with existing MPAs.



Dolphin Head candidate HPMA: Option B with existing MPAs

-  Candidate HPMA boundary
-  Marine Conservation Zones
-  Exclusive economic zone
-  6nM Limit
-  12nM Territorial seas limit
-  Land

Depth Areas (metres)	
 -20.0 - -10.0	 25.1 - 50.0
 -9.9 - -5.0	 50.1 - 100.0
 -4.9 - 0.0	 100.1 - 250.0
 0.1 - 5.0	 250.1 - 500.0
 5.1 - 10.0	 500.1 - 1000.0
 10.1 - 25.0	

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 20. Map of Dolphin Head candidate HPMA – Option B with existing MPAs.

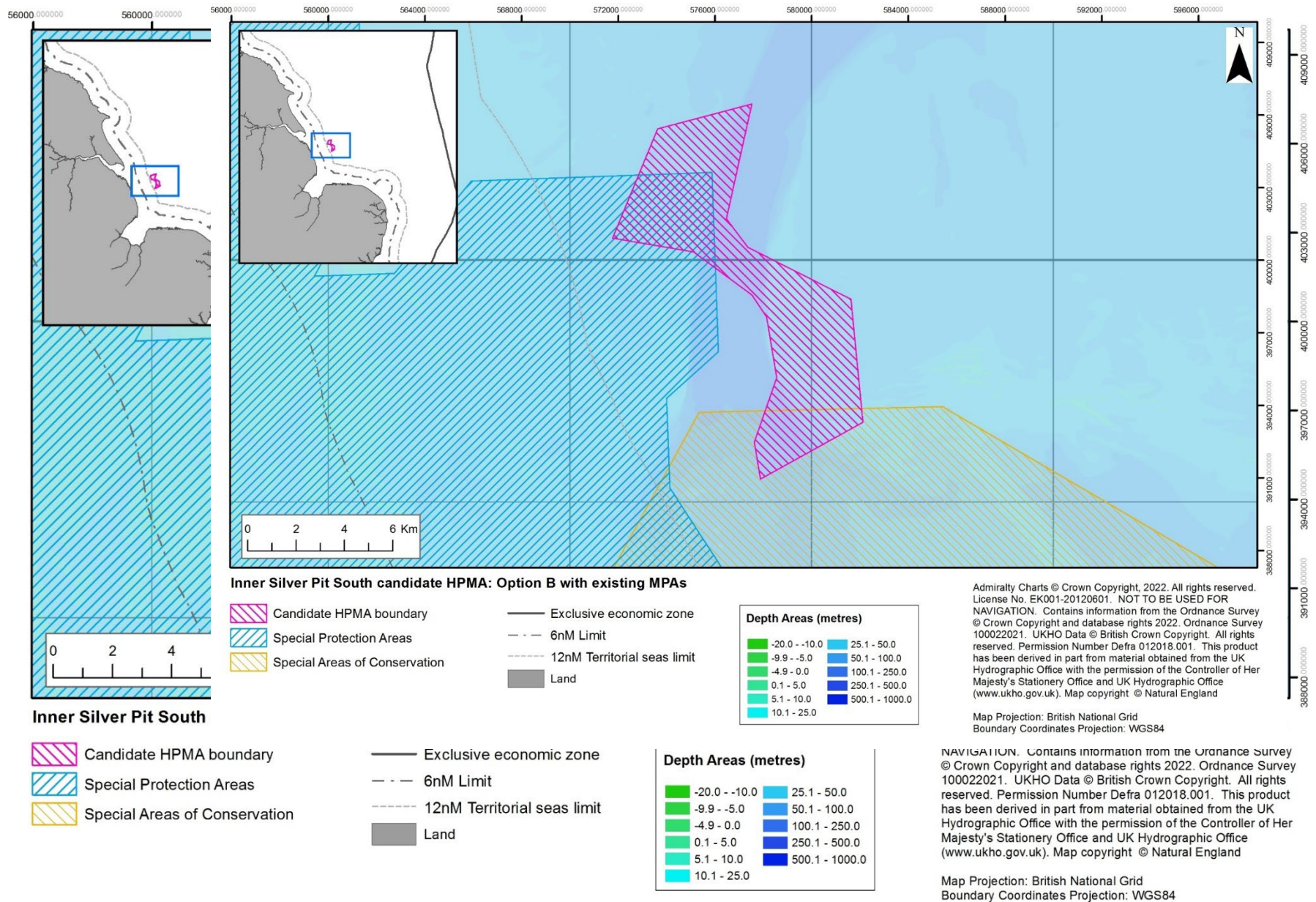
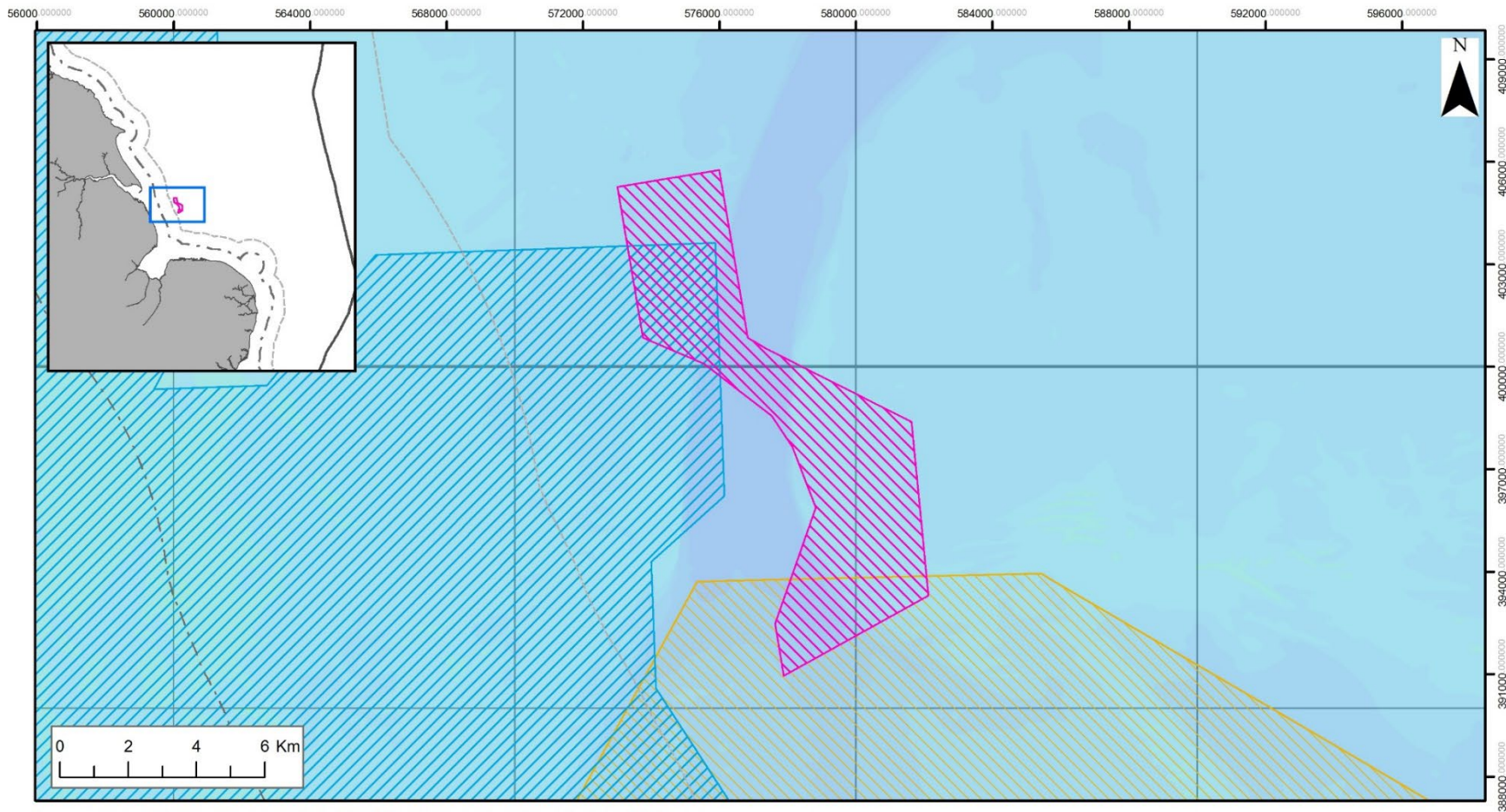


Figure 21. Map of Inner Silver Pit South candidate HPMA – Option B with existing MPAs.



Inner Silver Pit South candidate HPMA: Option C with existing MPAs

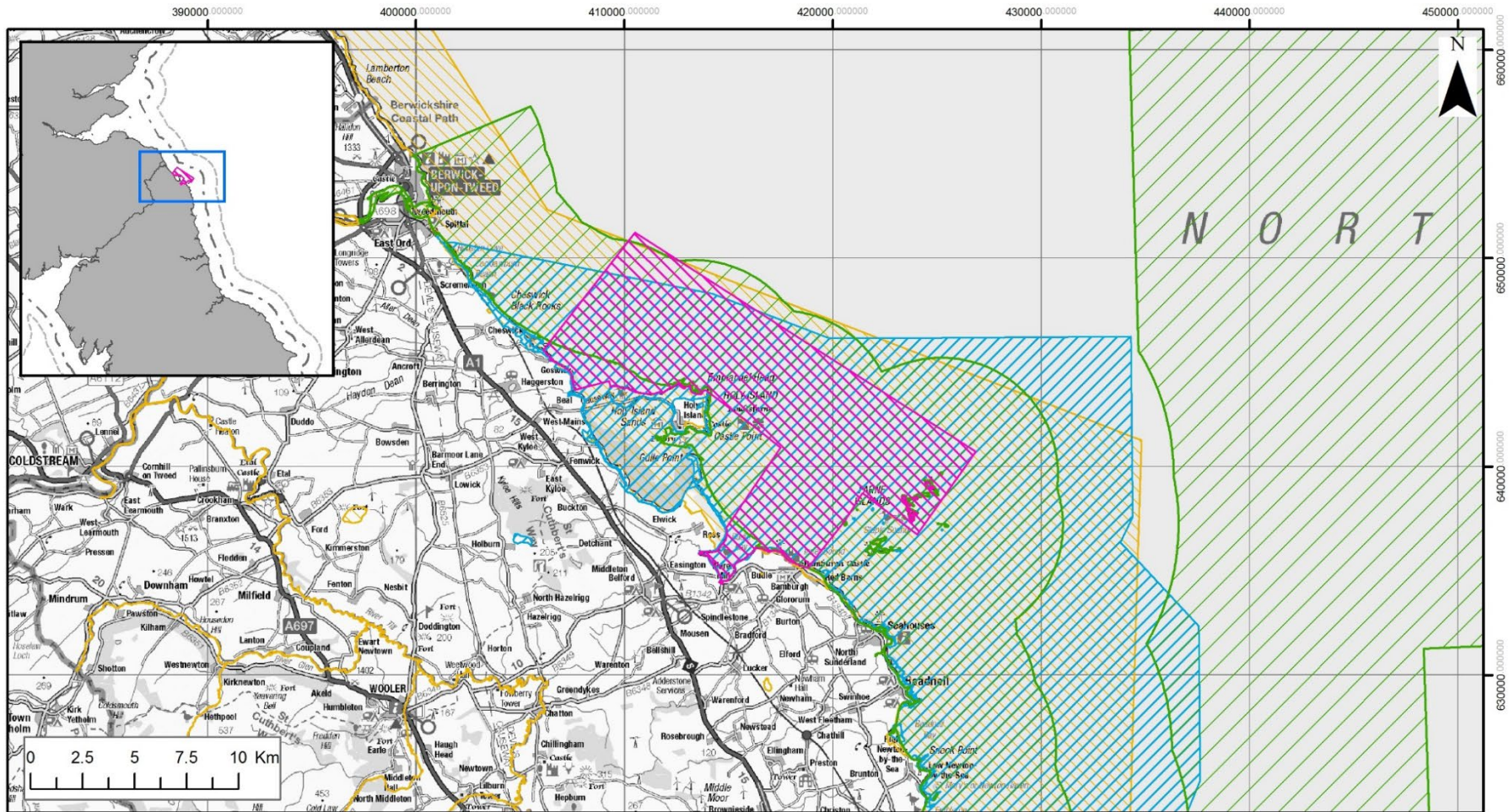
- Candidate HPMA boundary
- Special Protection Areas
- Special Areas of Conservation
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

Depth Areas (metres)	
-20.0 - -10.0	25.1 - 50.0
-9.9 - -5.0	50.1 - 100.0
-4.9 - 0.0	100.1 - 250.0
0.1 - 5.0	250.1 - 500.0
5.1 - 10.0	500.1 - 1000.0
10.1 - 25.0	

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 22. Map of Inner Silver Pit South candidate HPMA – Option C with existing MPAs.



Lindisfarne candidate HPMA: Option A - Consultation boundary with existing MPAs

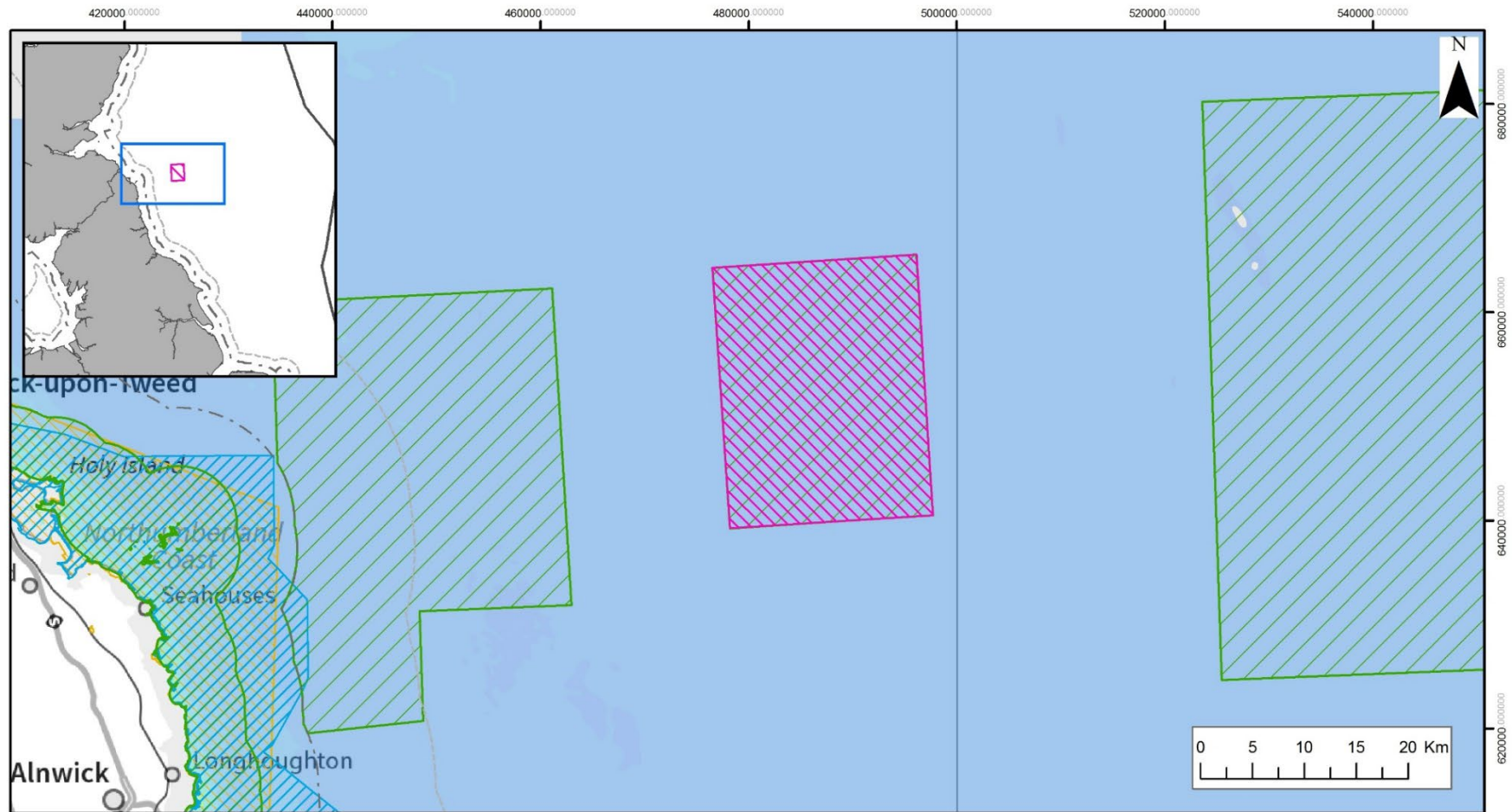
- Candidate HPMA boundary
- Marine Conservation Zones
- Special Protection Areas
- Special Areas of Conservation
- Exclusive economic zone
- 6N Limit
- 12N Territorial Seas Limit
- Land

Depth Areas (metres)	
-20.0 - -10.0	25.1 - 50.0
-9.9 - -5.0	50.1 - 100.0
-4.9 - 0.0	100.1 - 250.0
0.1 - 5.0	250.1 - 500.0
5.1 - 10.0	500.1 - 1000.0
10.1 - 25.0	

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 23. Map of Lindisfarne candidate HPMA – Option A with existing MPAs.



North East of Farnes Deep candidate HPMA: Option A - Consultation boundary with existing MPAs

- Candidate HPMA boundary
- Marine Conservation Zones
- Special Protection Areas
- Special Areas of Conservation
- Exclusive economic zone
- 6nM Limit
- 12nM Territorial seas limit
- Land

Depth Areas (metres)	
-20.0 - -10.0	25.1 - 50.0
-9.9 - -5.0	50.1 - 100.0
-4.9 - 0.0	100.1 - 250.0
0.1 - 5.0	250.1 - 500.0
5.1 - 10.0	500.1 - 1000.0
10.1 - 25.0	

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Map Projection: British National Grid
Boundary Coordinates Projection: WGS84

Figure 24. Map of North East of Farnes Deep candidate HPMA – Option A with existing MPAs