Morecambe Offshore Windfarm: Generation Assets

Examination Documents

Volume 9

Offshore Ornithology Technical Note 3 (Red-Throated Diver at Liverpool Bay SPA Update Assessment)

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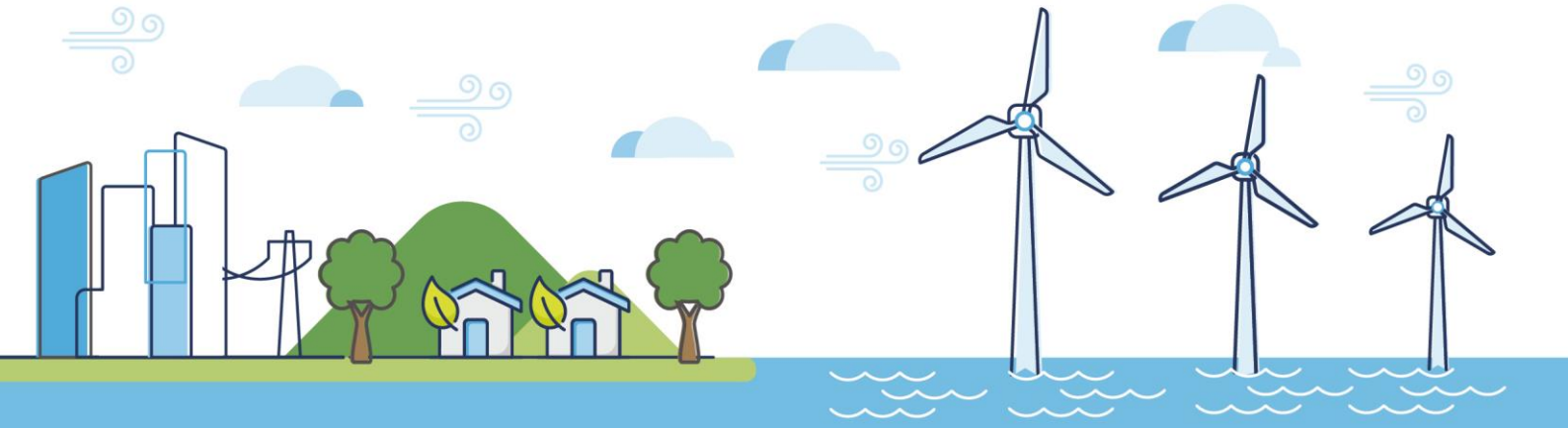
Rev 01



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Glossary of Acronyms

AEoI	Adverse effect on integrity
AfL	Agreement for Lease
DCO	Development Consent Order
ExA	Examining Authority
HRA	Habitats Regulations Assessment
JNCC	Joint Nature Conservation Committee
NRW	Natural Resources Wales
OSP(s)	Offshore substation platform(s)
OWF	Offshore Windfarm
PINS	Planning Inspectorate
RIAA	Report to Inform the Appropriate Assessment
RRs	Relevant Representations
RTD	Red-throated diver
SEP&DEP	Sheringham and Dudgeon Extension Projects
SNCBs	Statutory Nature Conservation Bodies
SoCG	Statement of Common Ground
SoS	Secretary of State
SPA	Special Protection Area
WTG(s)	Wind turbine generator(s)

Glossary of Units

km	kilometre
km^2	square kilometre

Glossary of Terminology

Agreement for Lease (AfL)	Agreements under which seabed rights are awarded following the completion of The Crown Estate tender process.
Applicant	Morecambe Offshore Windfarm Ltd
Application	This refers to the Applicant's application for a Development Consent Order (DCO). An application consists of a series of documents and plans which are published on the Planning Inspectorate's (PINS) website.
Generation Assets (the Project)	Generation assets associated with the Morecambe Offshore Windfarm. This is infrastructure in connection with electricity production, namely the fixed foundation wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect OSP(s).
Inter-array cables	Cables which link the WTGs to each other and the OSP(s).
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects
Windfarm site	The area within which the WTGs, inter-array cables, OSP(s) and platform link cables would be present.

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1 Introduction

1. This document presents an update to the Report to Inform the Appropriate Assessment (RIAA) (APP-027) submitted as part of the assessment of the Morecambe Offshore Windfarm Generation Assets (the Project) on the red-throated diver feature of Liverpool Bay Special Protection Area (SPA).

2. It is the position of the Applicant (Morecambe Offshore Windfarm Ltd) that there would be no adverse effect on integrity (AEoI) on Liverpool Bay SPA as a result of the Project, either alone or in-combination with other plans or projects. Evidence to support this conclusion is set out in Section 8.4.2 of the RIAA (APP-027). However, in its Relevant Representations (RRs) to the Planning Inspectorate (the Examining Authority (ExA)) (RR-061), Natural England (NE) has stated that it does not agree with the Applicant's conclusions, and that it is NE's view that AEoI cannot be ruled out when considering the effects on red-throated diver within Liverpool Bay SPA. NE's comments relevant to this position are set out in **Table 1.1**.

Table 1.1 NE RRs addressed in this document

NE reference (RR-061)	Applicant Reference	NE comment
B2	RR-061-64	Natural England advise that an adverse effect on integrity cannot be ruled out for the red-throated diver feature at the Liverpool Bay SPA. Natural England agree with the Applicant that impacts on the original SPA boundary (delineated according to areas of high red-throated diver density) are of most relevance. We note that 41.5% of the 'original' SPA area is already impacted. Morecambe Offshore Windfarm (OWF) will further impact >1% of the SPA most suitable for red-throated diver. New displacement impacts over 18km^2 of habitat will arise, which is of considerable concern given the restore objective for feature distribution. We highlight that the Applicant has not submitted a without-prejudice compensation case for RTD. Natural England advise that every effort is made to avoid the impact on red-throated diver distribution within the 'original' SPA area. This would most effectively be delivered by committing to a red-line boundary change or structures exclusion zone to ensure no turbines are located within 10km of this area. Natural England consider the design and delivery of derogations for red-throated diver to be extremely challenging, especially when considering the nature of the impacts (i.e. distribution, not mortality). As compensation for impacts may not be realistic, efforts to mitigate will be essential.
B25	RR-061-87	Natural England note that the Applicant continues to advocate for a method that effectively reduces the total area over which displacement impacts to red-throated divers are felt at the SPA by considering the diminishing displacement effect with distance from the array. Natural England highlight that the relevant conservation objective of most concern is to "Restore the distribution of the feature; preventing further deterioration, and where possible, reduce any existing anthropogenic influences impacting feature distribution." (https://publications.naturalengland.org.uk/publication/3236717) Whilst we recognise the desire to factor in the diminishing displacement effect to the assessment somehow, we remain of the opinion that the calculation of an 'effective displacement area' for red-throated diver is fundamentally flawed. There is no logical way to proportionally reduce the area of habitat loss by the expected level of displacement. Some level of displacement is occurring over the full extent of the area. Ultimately, calculating a (reduced) area of effect in this way underestimates the simple % of the SPA that is subject to displacement effects.

NE reference (RR-061)	Applicant Reference	NE comment
		Natural England welcome the presentation of the total area impacted, alongside the area reduced according to the proportion of red-throated divers assumed to be displaced. We confirm that we will base our advice on the total area impacted (project alone impacts calculated by the Applicant at 9.07% of the SPA and 1.24% of the pre-2017 boundary). Natural England consider this the only appropriate metric with respect to proper assessment against the conservation objectives relating to the distribution of qualifying features.
B32	RR-061-94	The Applicant concludes no AEoI from the project alone on red-throated diver at the Liverpool Bay SPA. Natural England does not agree with this conclusion. Natural England conclude that the project alone will impact red-throated diver distribution over 9.07% of the total SPA, and in particular 1.24% of the original SPA area, where red-throated diver densities were sufficiently high for these areas to qualify for inclusion within the SPA. As a result, we cannot rule out AEoI from the project alone. We note that the projects impact is slightly reduced when considered in-combination as some areas of impact are closer to other OWFs. We advise that it is appropriate that displacement impact is assigned to the OWF in closest proximity.
B33	RR-061-95	Natural England note that 53.29% of the SPA boundary is impacted by (in-combination) OWF displacement effects on red-throated divers, with 42.55% of the original SPA being impacted. The Applicant calculates that the project contributes 8.75% and 1.06% to those in-combination totals respectively. This is slightly smaller than the project-alone impact as parts of the impacted buffer area are closer to other OWFs. We agree with the Applicants position that the most concerning effect is that upon the original SPA boundary area. Natural England advise that the Applicant considers any opportunity to mitigate the impact on red-throated diver displacement within the original SPA boundary area, by increasing the distance between this part of the original SPA and potential turbine locations.
B34	RR-061-96	The Applicant highlights that in the HRA of the Awel y Môr OWF project (DESNZ, 2023a), the Secretary of State (SoS) concluded that an adverse effect on the integrity on the red-throated diver feature of the SPA from the Awel y Môr project in-combination with other projects could be excluded, and concludes that it is unlikely that the SoS would reach a materially different conclusion in this regard.

NE reference (RR-061)	Applicant Reference	NE comment
		Natural England have advised that AEoI cannot be ruled out in-combination for red-throated diver at Liverpool Bay SPA since the Burbo Bank Extension OWF examination. Further, we understand from Natural Resources Wales (NRW) and Joint Nature Conservation Committee (JNCC) that the advice given to the Awel y Môr OWF related to specific factors in that area, namely the low numbers of divers encountered in the area and the findings of the post-construction monitoring of the Gwynt y Môr windfarm. As a result, the SNCBs concluded that Awel y Môr would not significantly affect the distribution of Red-throated diver (RTD) in this particular area. It should be borne in mind that Morecambe OWF is impacting the northern part of the SPA, which to date, has been less impacted than the south. Given the 'restore' conservation objective for feature distribution, Natural England advise that efforts are made to mitigate the impacts of the project with respect to displacement of red-throated divers. We consider this especially critical with respect to the original SPA boundary area.

3. It is noted that NE's position on AEoI is in relation to the 'distribution' conservation objective; i.e. the extent of the SPA area available to red-throated diver. NE has stated in its RRs that this is its primary area of concern, and has not commented on the other conservation objectives, including 'population'. The Applicant assumes that the respective conclusions for other conservation objectives set out in the RIAA (APP-027) are accepted by NE; i.e. that as the predicted in-combination mortality for red-throated diver would be less than 1% increase in background mortality, this would not be detectable against background variation. Accordingly, mortality effects are not discussed further within this note.

4. For context, the current conservation objectives for the Liverpool Bay SPA red-throated diver feature are set out in **Table 1.2**.

Table 1.2 Conservation Objectives for red-throated diver feature of Liverpool Bay SPA (Natural England, Natural Resources Wales and the Joint Nature Conservation Committee, 2022)

Attribute	Target
Non-breeding population: abundance	Maintain the size of the non-breeding population at a level which is at or above 1800 individuals (mean peak, 2015, 2018, 2019 & 2020).
Non-breeding population: distribution	Restore the distribution of the feature; preventing further deterioration, and where possible, reduce any existing anthropogenic influences impacting feature distribution.
Disturbance caused by human activity	Minimise the frequency, duration and/or intensity of disturbance affecting the feature so that the population, its distribution within the site, or its use of the habitat is not significantly affected
Supporting habitat: Food availability and quality of prey	Maintain the distribution, abundance and availability of key food and prey items (e.g. fish) to maintain the population.
Supporting habitat: extent, distribution and quality of supporting habitat for the non-breeding season	Restore the extent, distribution and availability of suitable habitat which supports the feature; preventing further deterioration, and where possible, reduce any existing anthropogenic influences impacting the extent and quality (including water quality)

2 Red-throated diver assessment update

5. Within this assessment update, the Applicant presents additional information to support that presented in the RIAA (APP-027). While some of the information presented in the RIAA is summarised in this note, reference should also be made to the original assessment.

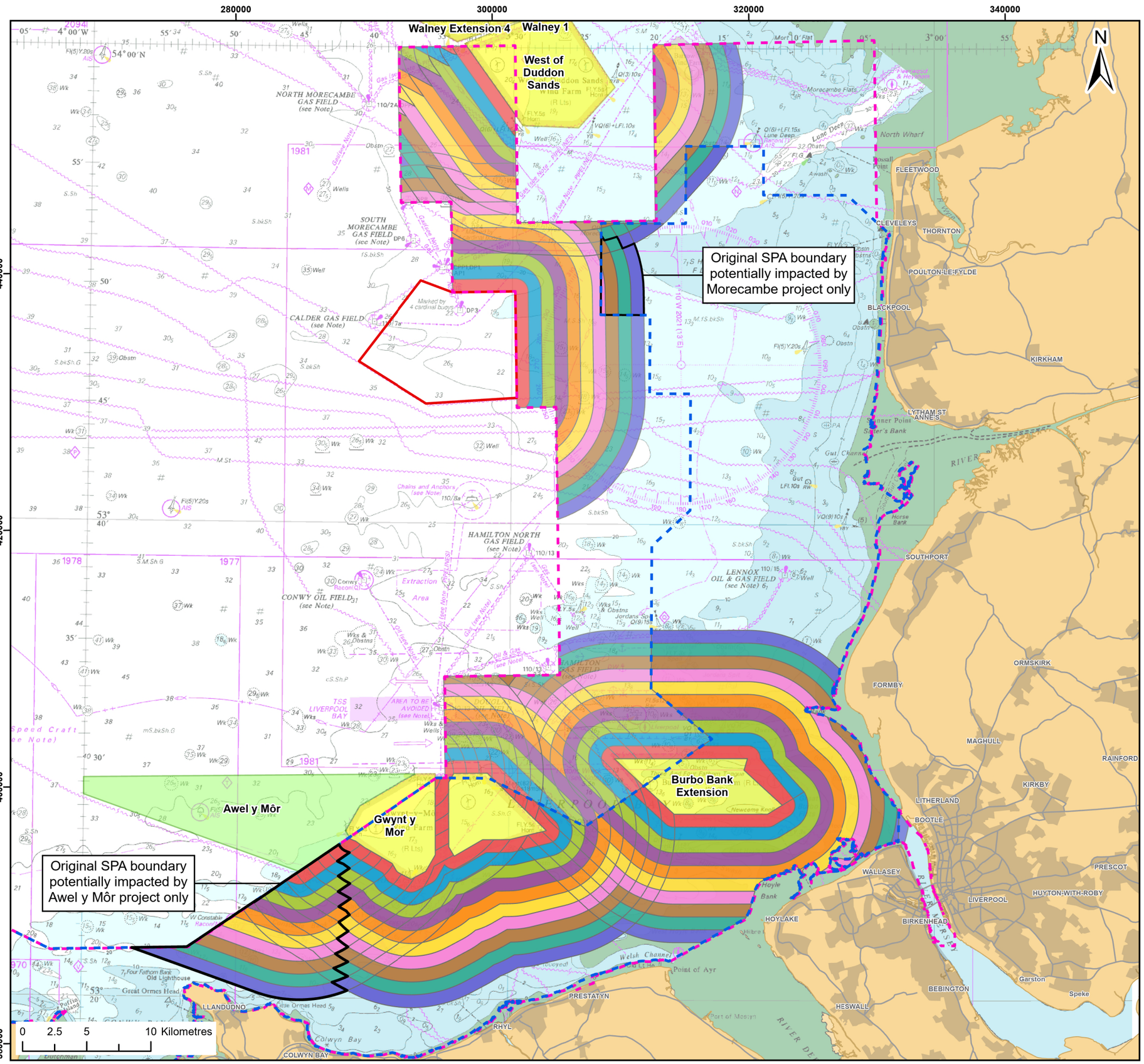
6. The information presented in the following sections addresses the concerns raised by NE in its RRs (**Table 1.1**). The Applicant does not agree with NE that AEoI cannot be ruled out in respect of red-throated diver from Liverpool Bay SPA. This is for a number of reasons, which, in addition to the information presented in Section 8.4.2 of the RIAA (APP-027), are set out by the Applicant in the following sections of this document. In summary, these reasons are:

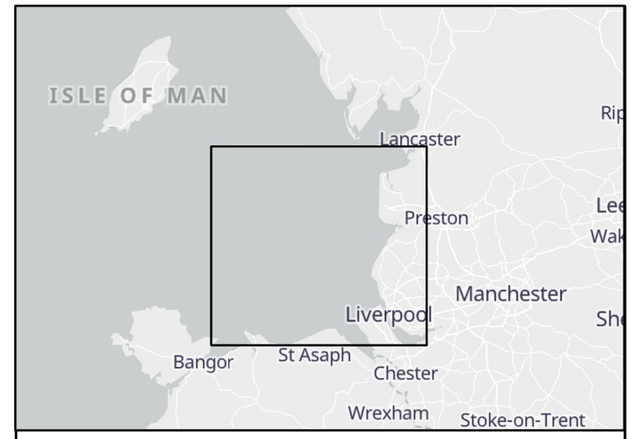
   - That the area 'uniquely' impacted by the Project is so small as to be inconsequential to the existing in-combination effect on the red-throated diver SPA distribution (**Section 2.1**)
   - That the Project would make no material change to the distribution of red-throated divers within Liverpool Bay SPA, as evidence indicates that the area that would be 'uniquely' impacted by the Project currently supports very low densities of red-throated diver and (as set out in B34 of **Table 1.1**). It was agreed by the Secretary of State that AEoI could be ruled out for the Awel Môr offshore windfarm (OWF) due to the low numbers of birds present, and densities of birds at the Project site are substantially lower than at Awel y Môr OWF (**Section 2.2**).
   - That the area that would be 'uniquely' impacted by the Project is, in fact, already subject to significant disturbance by ship and helicopter traffic, and therefore it is very unlikely that the Project would result in significant increase in disturbance effects (**Section 2.3**).
   - That it is reasonable and proportionate to take into account the diminishing effect on red-throated diver as distance from a windfarm increases when considering the potential effect on the distribution of the species, and although NE state that they do not agree with the approach used by the Project, they offer no appropriate alternative approach but, instead, advocate an approach which fails to account for this well established effect (**Section 2.4**).
   - That, taking into account the above, the precedent from the Awel y Môr OWF decision by the Secretary of State (i.e. that AEoI can be ruled out) confirms that there would be no justification in reaching a different conclusion in respect of the Project (**Section 2.5**).

2.1 Area 'uniquely' impacted by the Project

7. Within the RIAA (APP-027), the Applicant has presented information to identify the area within Liverpool Bay SPA where an impact arising from the Project could potentially occur. This is shown as the area outlined in black on Figure

8.2 of the RIAA (APP-027) and reproduced in below, updated to also show the equivalent area of potential effect resulting from the Awel y Môr OWF.





Legend:

- Morecambe Offshore Windfarm Site
- Liverpool Bay Special Protection Area (SPA) boundary at original designation
- Liverpool Bay Special Protection Area (SPA)
- Area within original Special Protection Area (SPA) boundary potentially impacted

Wind farm status

- Fully commissioned
- Consented

Red Throated Diver Distance Buffer

- 0-1km
- 1-2km
- 2-3km
- 3-4km
- 4-5km
- 5-6km
- 6-7km
- 7-8km
- 8-9km
- 9-10km

Report:
Morecambe Offshore Windfarm: Generation Assets

Title:
Red-throated diver - buffer areas used in the in-combination assessment

Figure: 2.1 | Drawing No: PC1165-RHD-EX-OF-DG-Z-0160

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	30/09/2024	JH	SB	A3	1:300,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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8. This area comprises the overlap between a 10km buffer drawn around the Project boundary and the original SPA designated boundary, but also taking into account a similar buffer around existing windfarms (in the case of the Project, West of Duddon Sands). NE has agreed in its RRs (RR-061-95; **Table 1.1**) that the original (rather than current) SPA boundary is most relevant to the assessment, as this comprises the area designated for red-throated diver, while the more recent SPA extension was designated specifically for little gull, common tern and little tern (Natural England *et al.*, 2016). In other words, there would be no effect on the 'distribution' conservation objective within the SPA extension area, as few or no red-throated divers occur within this part of the SPA. NE has also agreed that potential displacement effects should be assigned to the windfarm in closest proximity to the SPA (RR-061-94; **Table 1.1**), i.e. that it is appropriate to exclude the effects of the Project for areas that are already subject to a greater level of potential effect from existing windfarms (because they are closer to the SPA than the Project).

9. On this basis, it is agreed between NE and the Applicant that the area that could be 'uniquely' impacted by the Project in terms of the potential effects associated with the presence of OWF arrays is as shown outlined in black, hereafter referred to as 'the potentially impacted area'. As set out in the RIAA (APP-027), this is an area of 17.99km^2, equivalent to 1.06% of the original SPA boundary (1,702.93km^2), or 0.37% if the 'displacement gradient' is applied (see **Section 2.4** below). However, it is also important to note that this potentially impacted area is subject to significant disturbance from other anthropogenic activities, with the evidence for this presented by the Applicant in **Section 2.3**.

10. It is the Applicant's position, as set out in the RIAA (APP-027), that even excluding the additional evidence presented below, the potentially affected area is so small as to be inconsequential to the existing in-combination effect on the SPA (i.e. as determined with the Project excluded). The existing in-combination effect comprises a total area of 706.64km^2, equivalent to 41.50% of the original SPA boundary, or 23.13% if the 'displacement gradient' is applied.

2.2 Occurrence of red-throated diver within the potentially impacted area

11. It is the Applicant's position that the potentially impacted area regularly supports few, if any, red-throated divers during the winter period. The evidence to support this is as follows:

    - Figure 10 of JNCC Report *'An assessment of the numbers and distributions of inshore aggregations of waterbirds using Liverpool Bay during the non-breeding season in support of possible SPA identification'* (Webb *et al.*, 2006a) and Figure 3 of 'Recommendations for the selection

of, and boundary options for, an SPA in Liverpool Bay' (Webb et al., 2006b) (these two reports utilise the same data).

- Figure 6 of JNCC Report *'An assessment of the numbers and distributions of wintering waterbirds and seabirds in Liverpool Bay/Bae Lerpwl area of search'* (Lawson *et al.*, 2016).
- Figure 8 and 9 of NE Report *'Densities of qualifying species within Liverpool Bay/ Bae Lerpwl SPA: 2015 to 2020'* (HiDef, 2023).

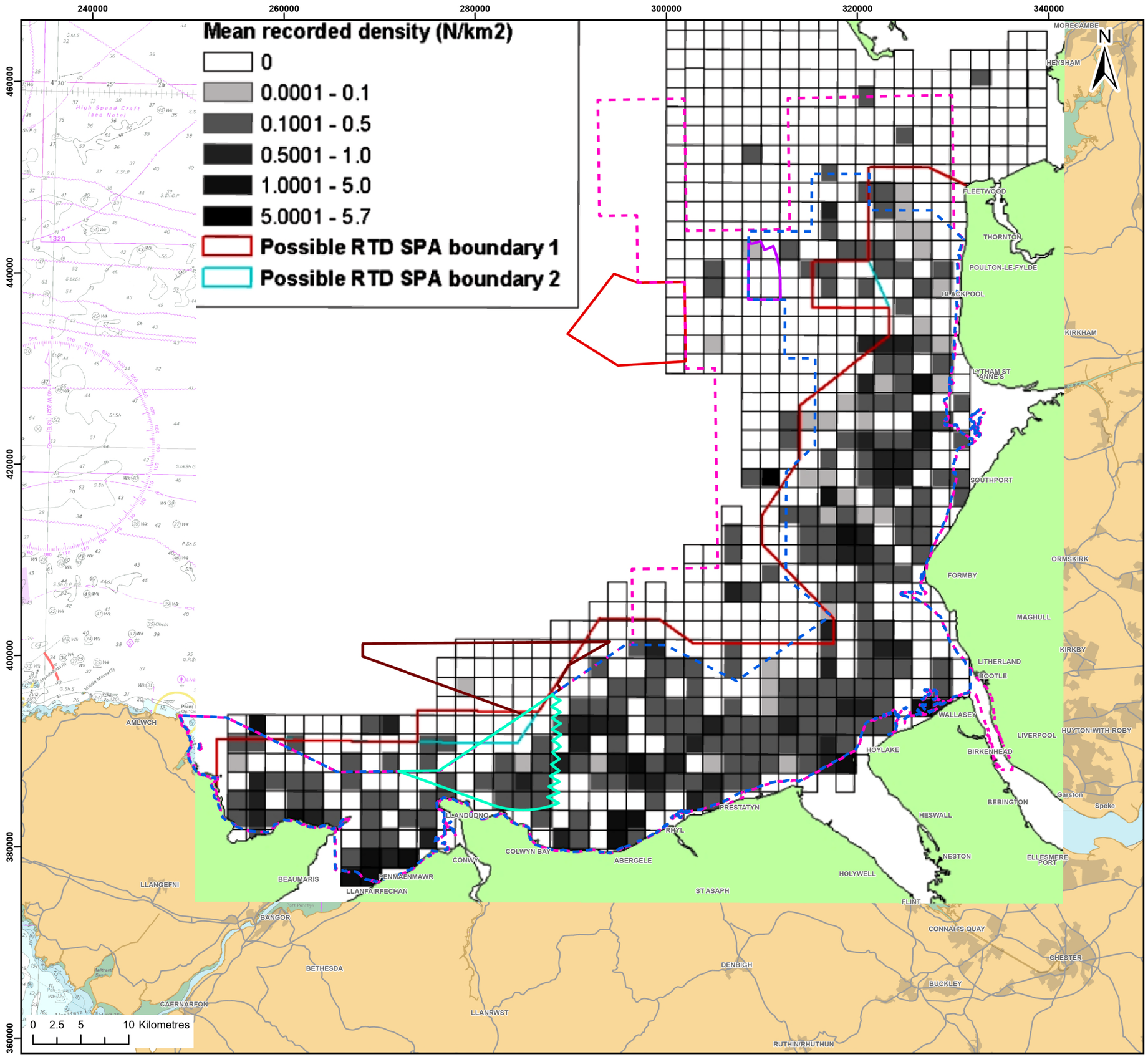
12. These documents provide estimates of red-throated diver distribution and density covering the period from 2001 to 2020, and consistently show that red-throated divers occur within the potentially impacted area sporadically and in low numbers. The relevant figures from these reports, overlaid with the location of the potentially impacted area, are reproduced in **Figure 2.2** to **Figure 2.11**. Also shown is the area that is uniquely impacted by the Awel y Môr OWF, which is further discussed in **Section 2.5** below.

13. In summary, this information shows:

- For the period 2001-2003 the mean recorded density for red-throated diver within the potentially impacted area was between 0.0 and 0.1 birds/km^2 (mapped at a resolution of 2km squares), with the majority of squares recording 0.0 birds/km^2 (Webb *et al*., 2006a, 2006b); refer to **Figure 2.2**. The highest densities of birds recorded within the wider Liverpool Bay area was up to 5.7 birds/km^2; i.e. more than 50 times higher. It is noted that Webb *et al*. (2006b) originally identified proposed boundaries for the SPA, and that the potentially impacted area was located outside that boundary, which supports the Applicant's position that this area is of low importance to red-throated diver.
- For the period 2005 to 2011, mean densities for the potentially impacted area were estimated at up to 0.09 birds/km^2, the lowest recorded within the SPA (Lawson *et al.*, 2016) (refer to **Figure 2.3**). Peak densities within the wider SPA were estimated at up to 1.74 birds/km^2, i.e. approximately 20 times higher.
- For the period 2015-2020, values were presented by month for the eight surveys undertaken, in January and February (2015, 2018 and 2019) and January and March 2020 (**Figure 2.4** to **Figure 2.11**). Densities within the potentially impacted area were zero for one month, 0.01-0.1 for three months, and up to 0.5 birds/km^2 (within small parts of the potentially impacted area) for the remaining four months (HiDef, 2023). Peak densities within the wider SPA were up to 20 birds/km^2, i.e. up to 40 times higher than peak densities within the potentially impacted area.

14. This demonstrates that over a period of approximately 20 years the potentially impacted area has supported red-throated diver only sporadically, and when present they have occurred at consistently low densities which are

comparable to areas outside the pre-2017 SPA boundary. This area is therefore considered of low importance for this species when compared to the wider SPA. It is the Applicant's position, therefore, that even if this area was affected by the Project, this would have no meaningful effect on the distribution of red-throated divers within the SPA.



Legend:

- Morecambe Offshore Windfarm Site
- Awel y Môr Offshore Windfarm Site
- Liverpool Bay Special Protection Area (SPA) boundary at original designation
- Liverpool Bay Special Protection Area (SPA)
- Area within original Special Protection Area (SPA) boundary potentially impacted by Morecambe Project only
- Area within original Special Protection Area (SPA) boundary potentially impacted by Awel y Môr Project only

Report:
Morecambe Offshore Windfarm: Generation Assets

Title:
Distribution of red-throated divers in Liverpool Bay SPA 2001-2003, taken from Webb *et al.* (2006b)

Figure: 2.2 | Drawing No: PC1165-RHD-EX-OF-DG-Z-0161

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	07/10/2024	JH	SB	A3	1:400,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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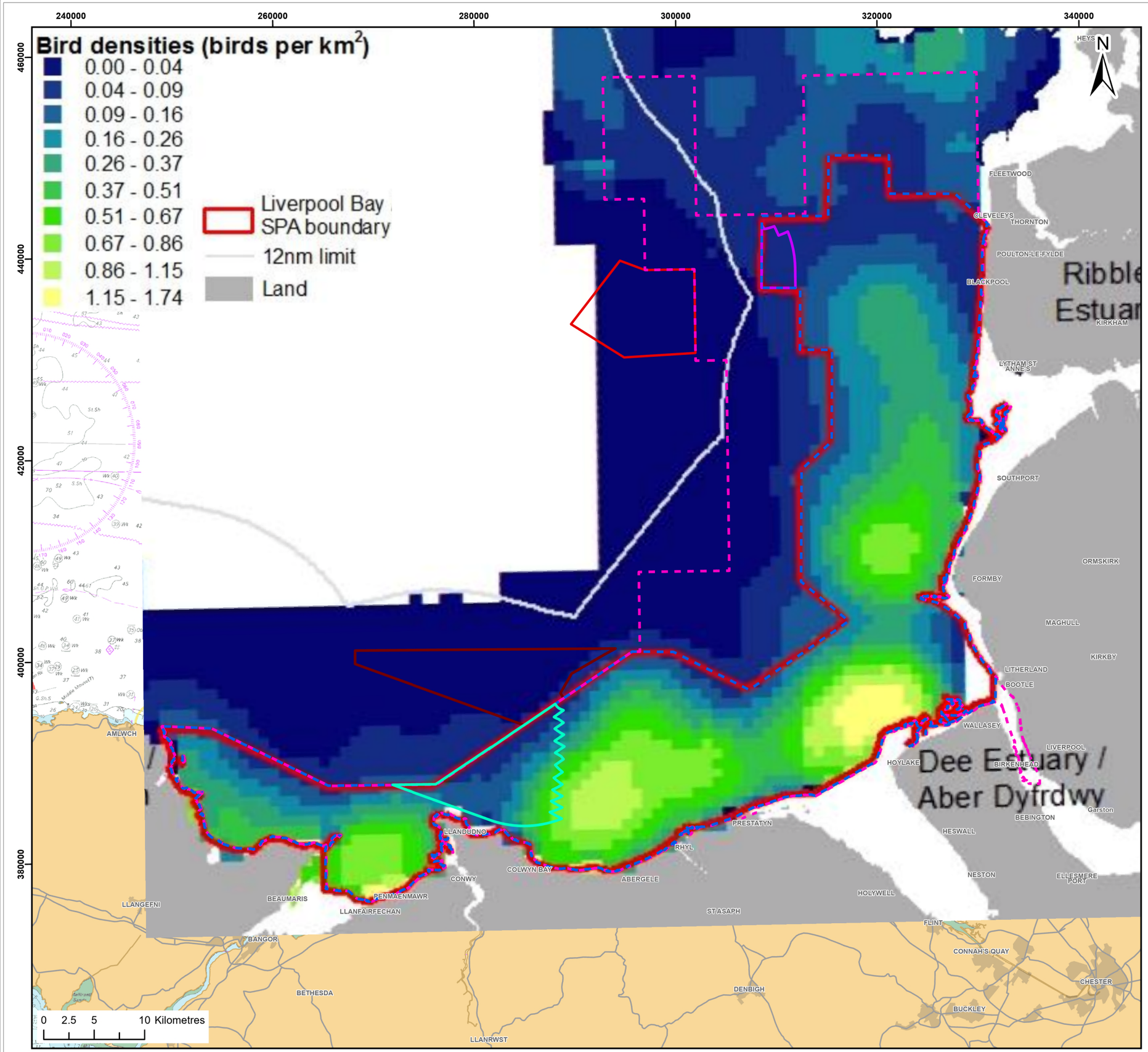

Legend:

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Report:
Morecambe Offshore Windfarm: Generation Assets

Title:
Distribution of red-throated divers in Liverpool Bay SPA 2005-2011, taken from Lawson *et al.* (2016)

Figure: 2.3 | Drawing No: PC1165-RHD-EX-OF-DG-Z-0163

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P01	07/10/2024	JH	SB	A3	1:375,000

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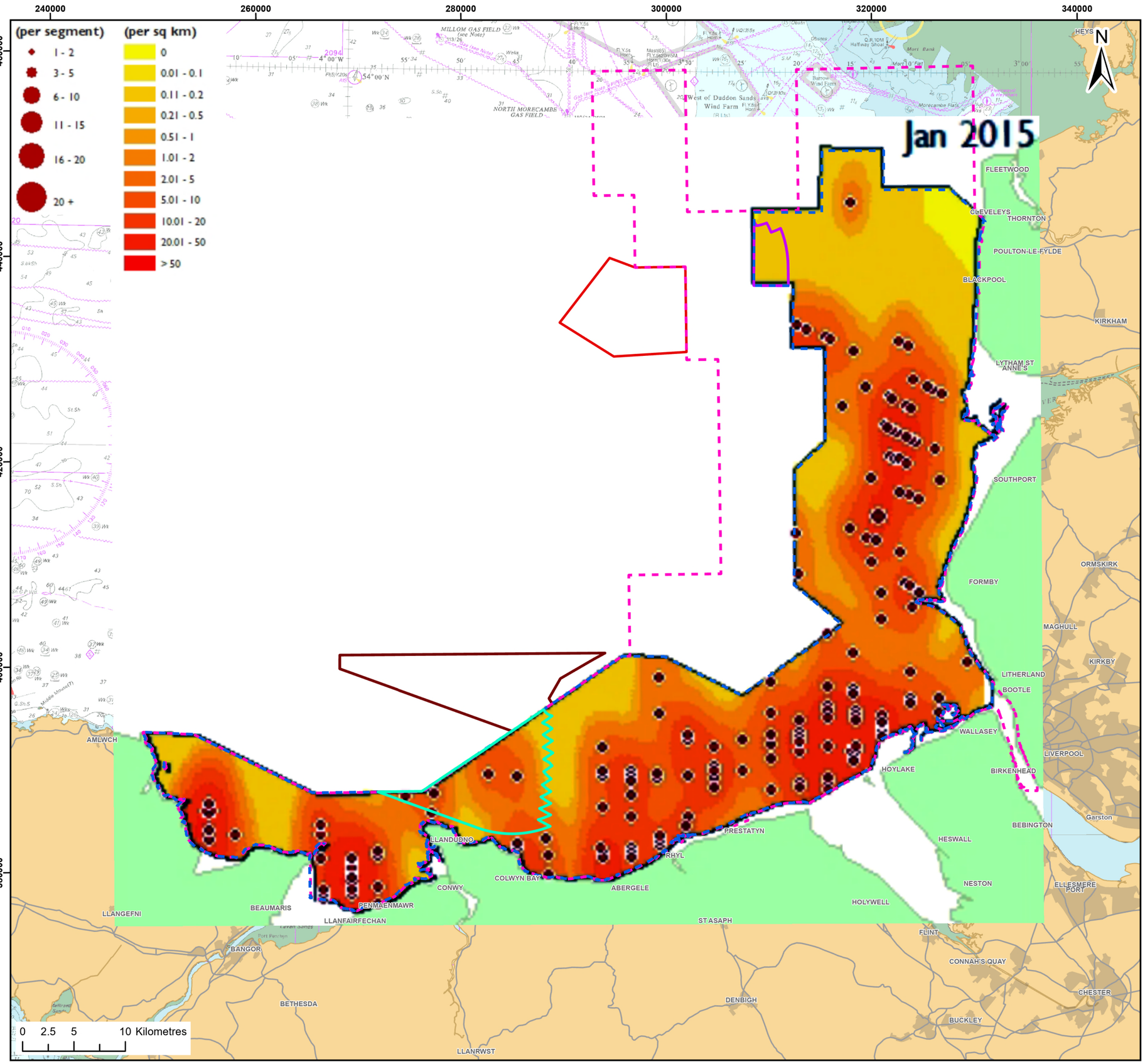

Legend:

- Morecambe Offshore Windfarm Site
- Awel y Môr Offshore Windfarm Site
- Liverpool Bay Special Protection Area (SPA) boundary at original designation
- Liverpool Bay Special Protection Area (SPA)
- Area within original Special Protection Area (SPA) boundary potentially impacted by Morecambe Project only
- Area within original Special Protection Area (SPA) boundary potentially impacted by Awel y Môr Project only

Report:
Morecambe Offshore Windfarm: Generation Assets

Title:
Distribution of red-throated divers in Liverpool Bay SPA 2015-2020 (January 2015) , taken from HiDef (2023)

Figure: 2.4 | Drawing No: PC1165-RHD-EX-OF-DG-Z-0164

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	07/10/2024	JH	SB	A3	1:375,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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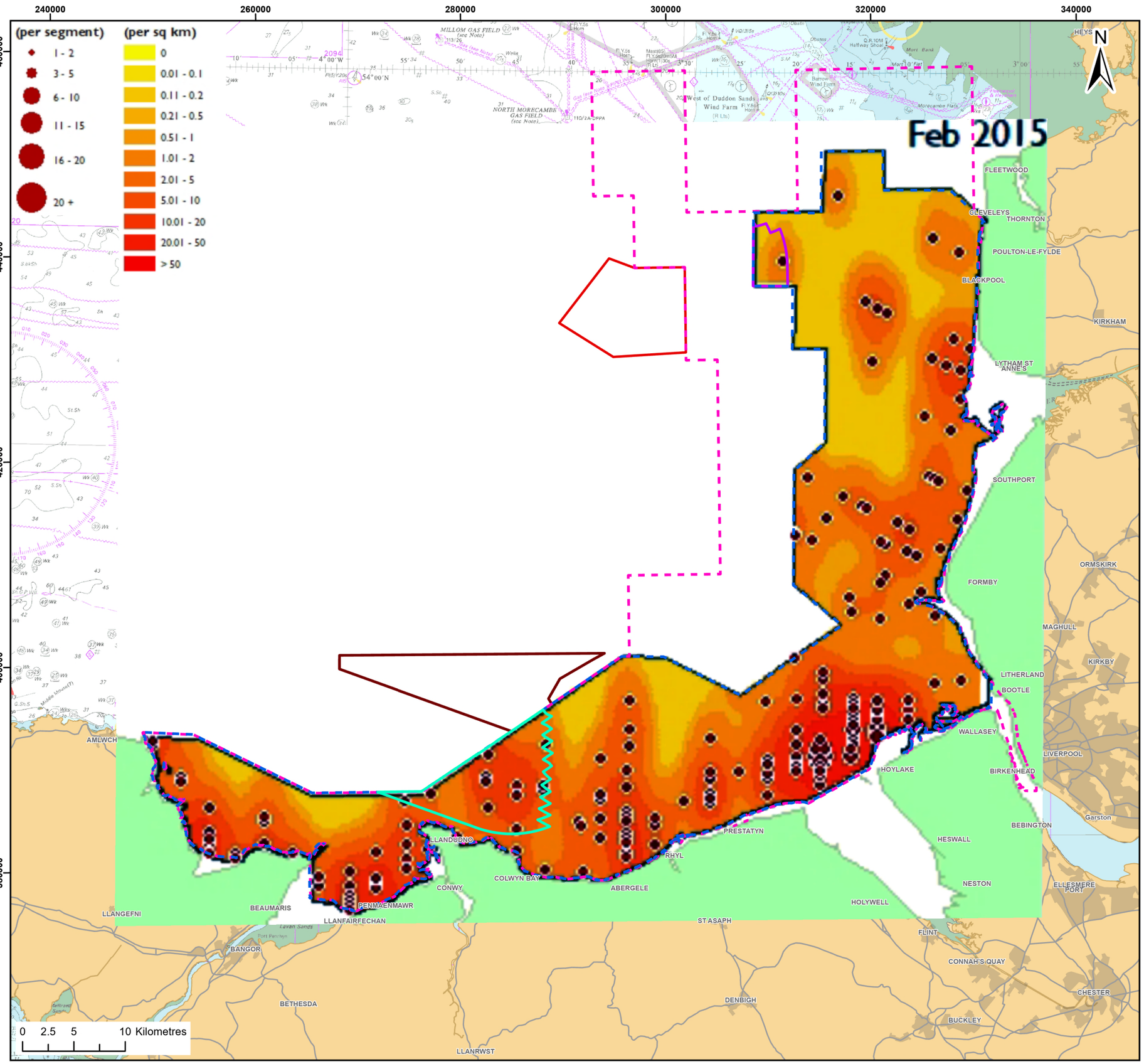

Legend:

- Morecambe Offshore Windfarm Site
- Awel y Môr Offshore Windfarm Site
- Liverpool Bay Special Protection Area (SPA) boundary at original designation
- Liverpool Bay Special Protection Area (SPA)
- Area within original Special Protection Area (SPA) boundary potentially impacted by Morecambe Project only
- Area within original Special Protection Area (SPA) boundary potentially impacted by Awel y Môr Project only

Report:
Morecambe Offshore Windfarm: Generation Assets

Title:
Distribution of red-throated divers in Liverpool Bay SPA 2015-2020 (February 2015) , taken from HiDef (2023)

Figure: 2.5 | Drawing No: PC1165-RHD-EX-OF-DG-Z-0165

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	07/10/2024	JH	SB	A3	1:375,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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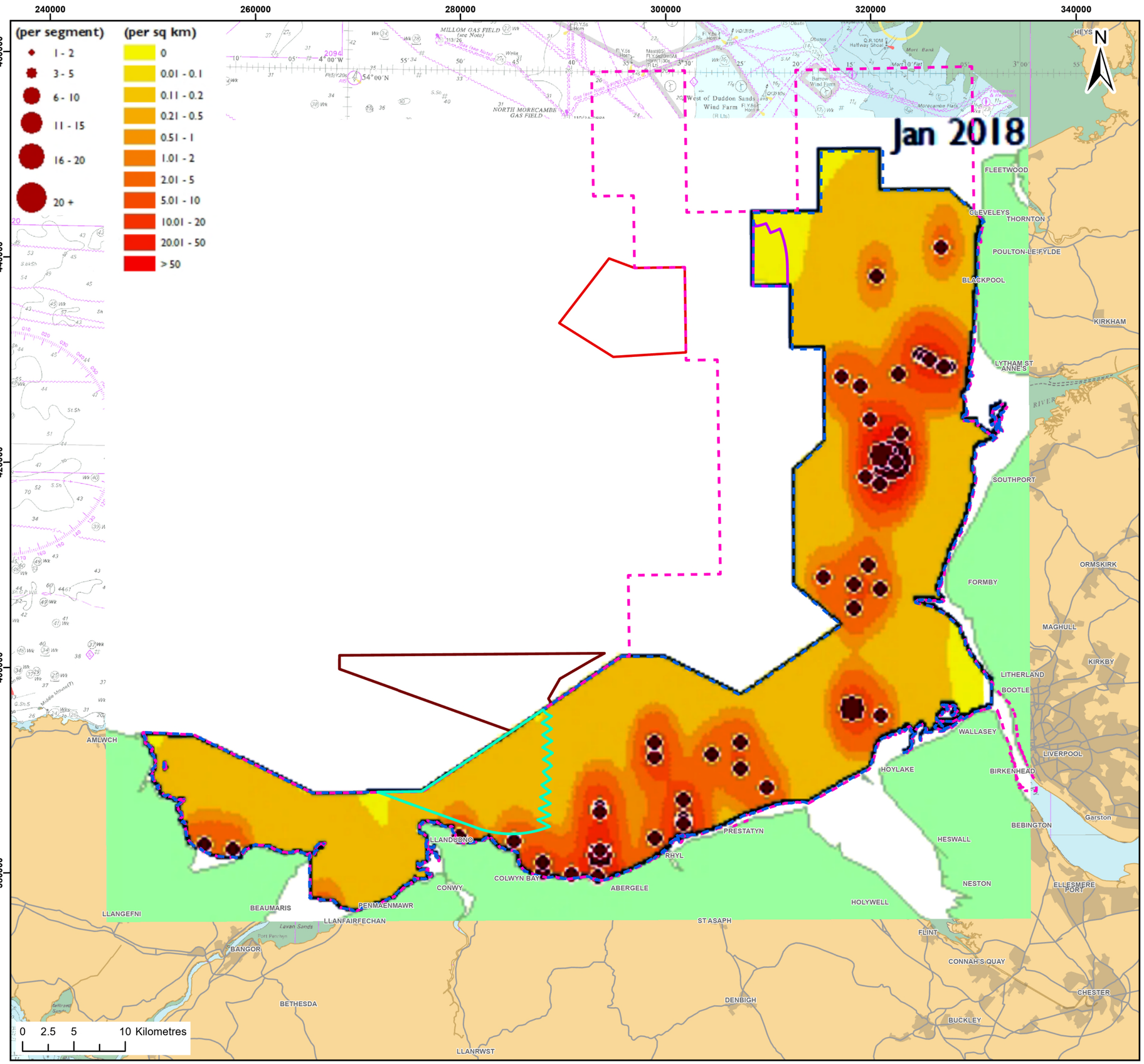

Legend:

- Morecambe Offshore Windfarm Site
- Awel y Môr Offshore Windfarm Site
- Liverpool Bay Special Protection Area (SPA) boundary at original designation
- Liverpool Bay Special Protection Area (SPA)
- Area within original Special Protection Area (SPA) boundary potentially impacted by Morecambe Project only
- Area within original Special Protection Area (SPA) boundary potentially impacted by Awel y Môr Project only

Report:
Morecambe Offshore Windfarm: Generation Assets

Title:
Distribution of red-throated divers in Liverpool Bay SPA 2015-2020 (January 2018) , taken from HiDef (2023)

Figure: 2.6 | Drawing No: PC1165-RHD-EX-OF-DG-Z-0166

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	07/10/2024	JH	SB	A3	1:375,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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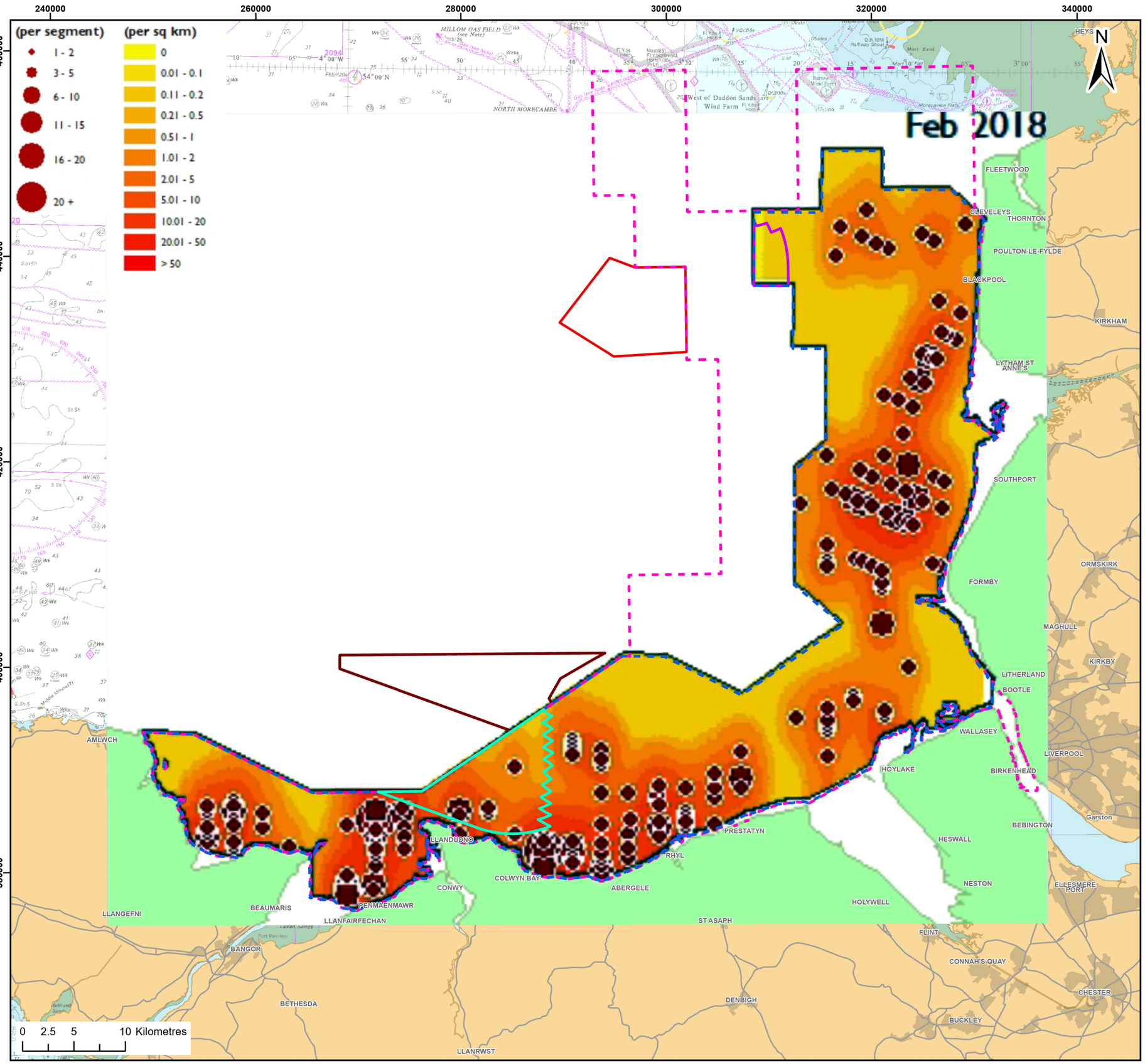

Legend:

- Morecambe Offshore Windfarm Site
- Awel y Môr Offshore Windfarm Site
- Liverpool Bay Special Protection Area (SPA) boundary at original designation
- Liverpool Bay Special Protection Area (SPA)
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Report:
Morecambe Offshore Windfarm: Generation Assets

Title:
Distribution of red-throated divers in Liverpool Bay SPA 2015-2020 (February 2018) , taken from HiDef (2023)

Figure: 2.7 | Drawing No: PC1165-RHD-EX-OF-DG-Z-0167

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	07/10/2024	JH	SB	A3	1:375,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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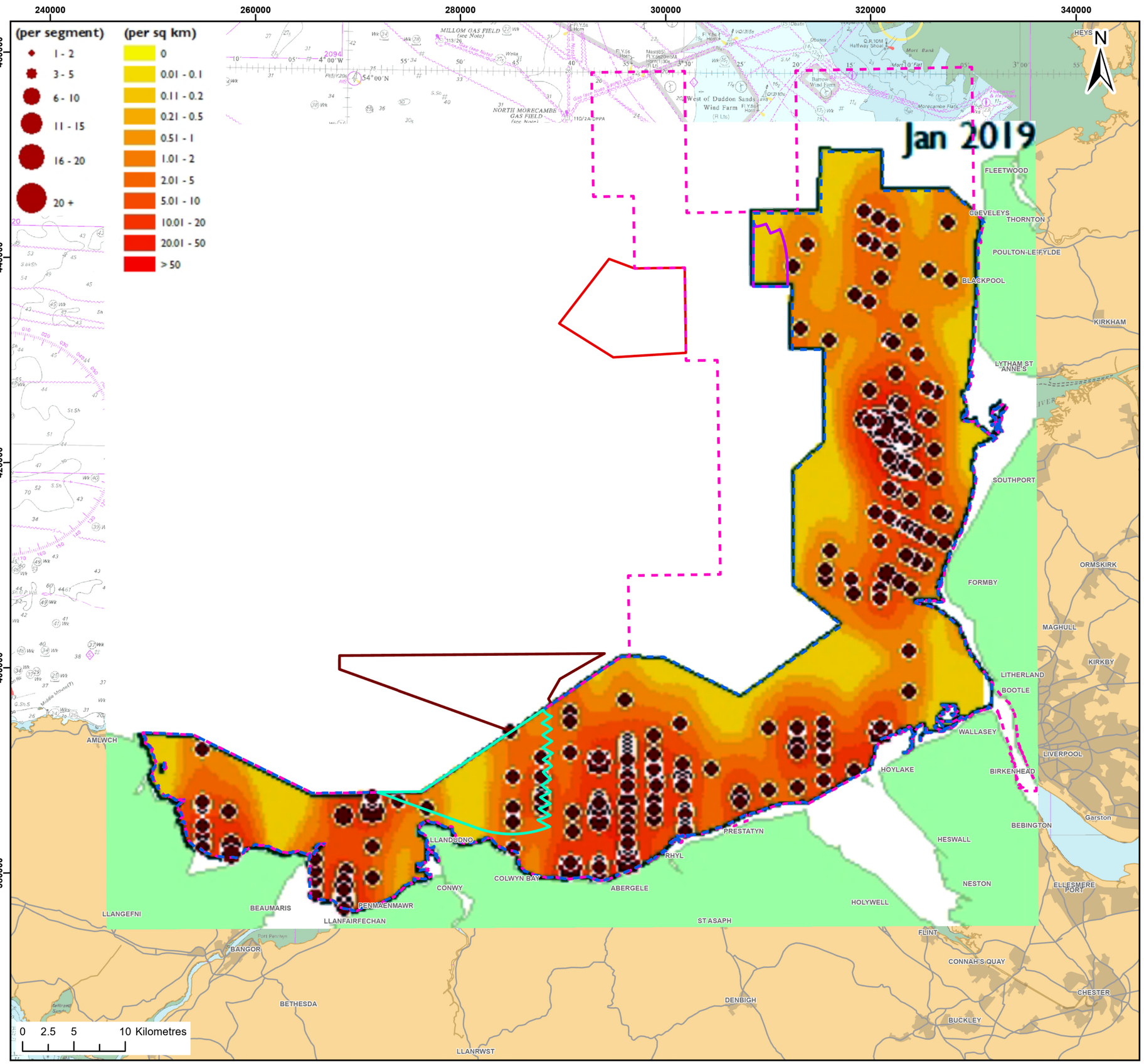

Legend:

- Morecambe Offshore Windfarm Site
- Awel y Môr Offshore Windfarm Site
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- Liverpool Bay Special Protection Area (SPA)
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Report:
Morecambe Offshore Windfarm: Generation Assets

Title:
Distribution of red-throated divers in Liverpool Bay SPA 2015-2020 (January 2019) , taken from HiDef (2023)

Figure: 2.8

Drawing No: PC1165-RHD-EX-OF-DG-Z-0168

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	07/10/2024	JH	SB	A3	1:375,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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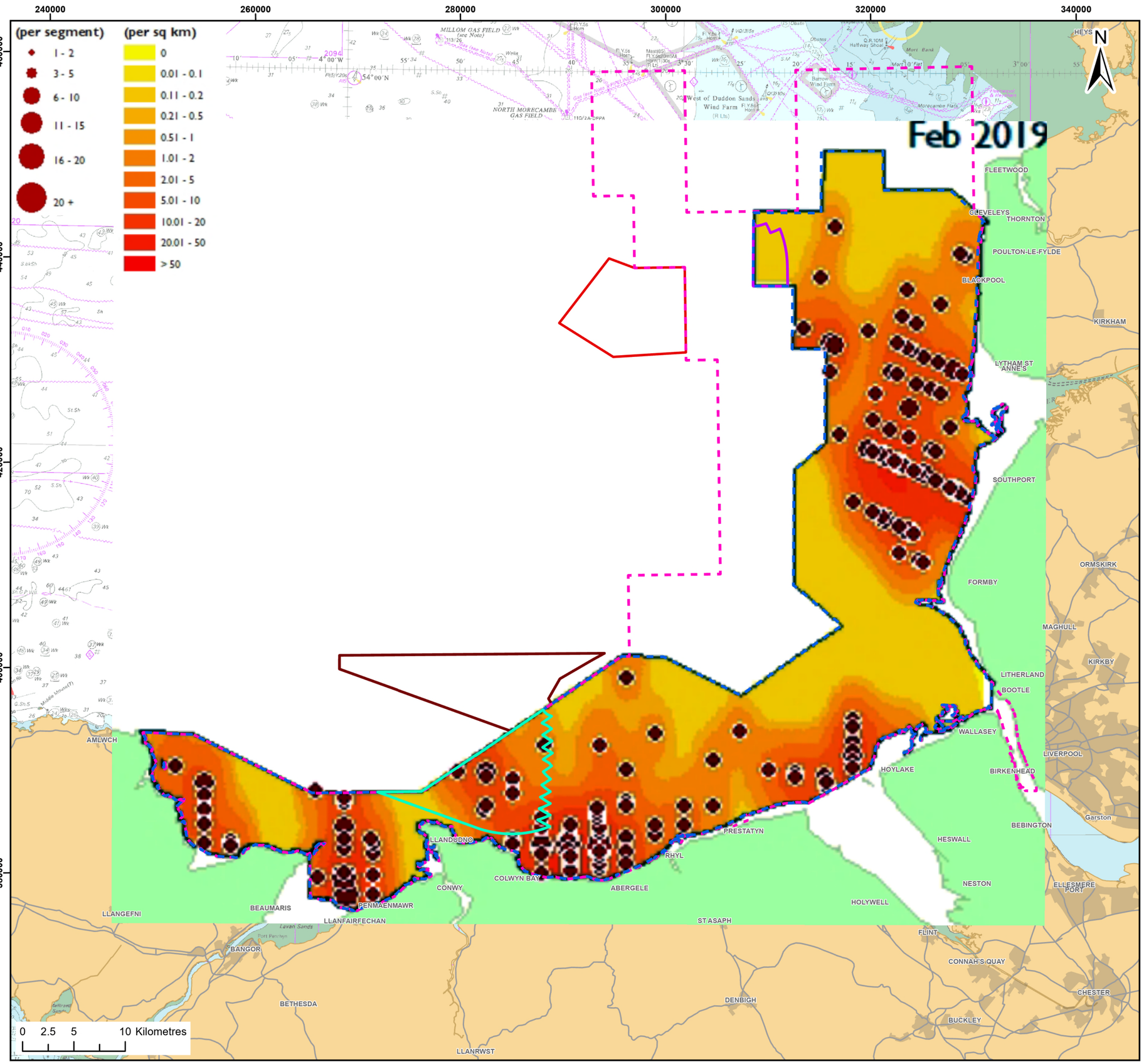

Legend:

- Morecambe Offshore Windfarm Site
- Awel y Môr Offshore Windfarm Site
- Liverpool Bay Special Protection Area (SPA) boundary at original designation
- Liverpool Bay Special Protection Area (SPA)
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- Area within original Special Protection Area (SPA) boundary potentially impacted by Awel y Môr Project only

Report:
Morecambe Offshore Windfarm: Generation Assets

Title:
Distribution of red-throated divers in Liverpool Bay SPA 2015-2020 (February 2019) , taken from HiDef (2023)

Figure: 2.9 | Drawing No: PC1165-RHD-EX-OF-DG-Z-0169

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	07/10/2024	JH	SB	A3	1:375,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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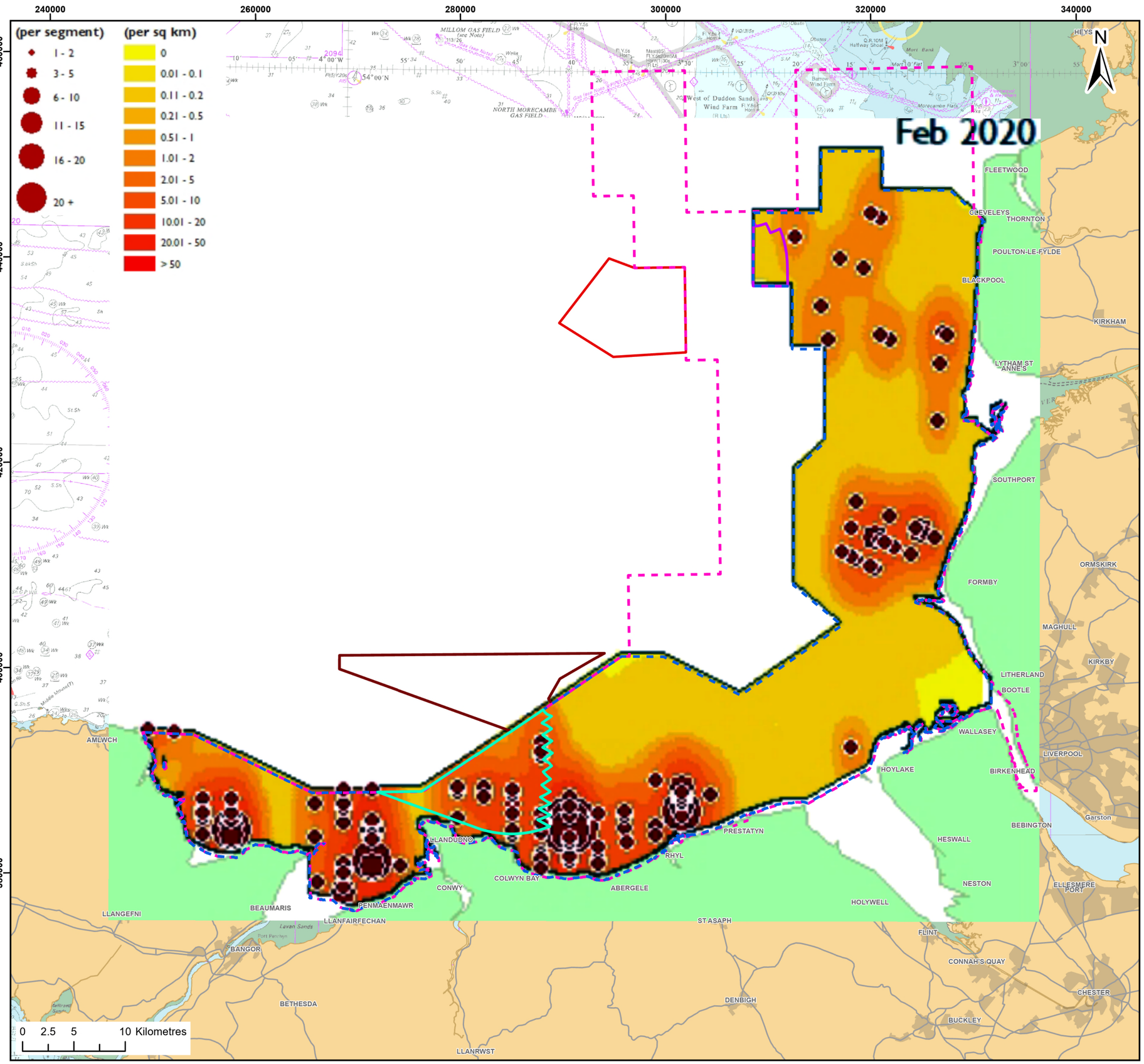

Legend:

- Morecambe Offshore Windfarm Site
- Awel y Môr Offshore Windfarm Site
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- Area within original Special Protection Area (SPA) boundary potentially impacted by Awel y Môr Project only

Report:
Morecambe Offshore Windfarm: Generation Assets

Title:
Distribution of red-throated divers in Liverpool Bay SPA 2015-2020 (February 2020) , taken from HiDef (2023)

Figure: 2.10 | Drawing No: PC1165-RHD-EX-OF-DG-Z-0170

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	07/10/2024	JH	SB	A3	1:375,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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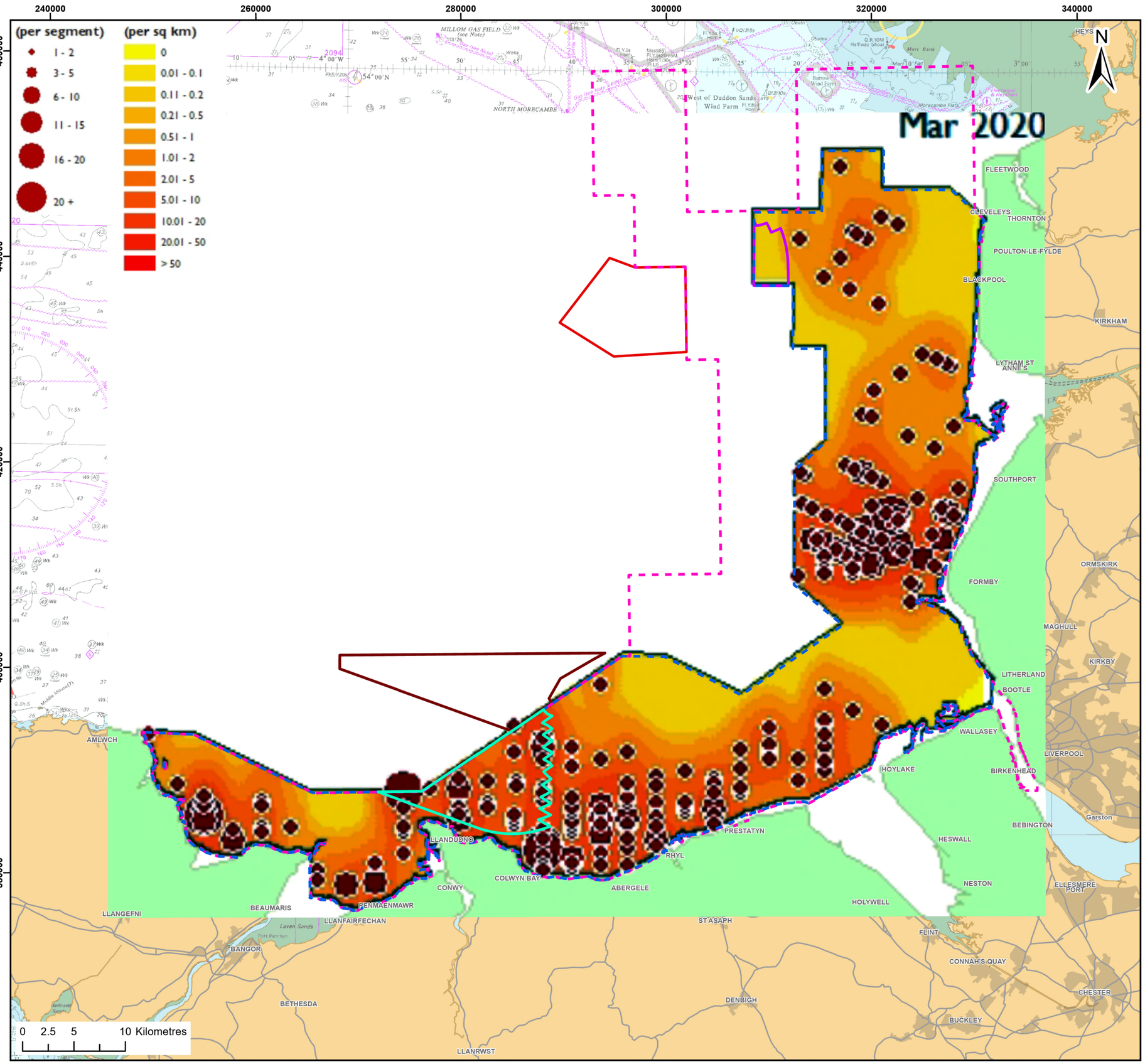

Legend:

- Morecambe Offshore Windfarm Site
- Awel y Môr Offshore Windfarm Site
- Liverpool Bay Special Protection Area (SPA) boundary at original designation
- Liverpool Bay Special Protection Area (SPA)
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Report:
Morecambe Offshore Windfarm: Generation Assets

Title:
Distribution of red-throated divers in Liverpool Bay SPA 2015-2020 (March 2020) , taken from HiDef (2023)

Figure: 2.11 | Drawing No: PC1165-RHD-EX-OF-DG-Z-0171

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	07/10/2024	JH	SB	A3	1:375,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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2.3 Existing disturbance within the potentially impacted area

15. It is NE's implied position in relation to red-throated diver that the effect of the Project is on an area that is not otherwise subject to significant disturbance effect (e.g. B34 in **Table 1.1**). While it is agreed by the Applicant that the potentially impacted area is not affected by existing OWFs, it does not agree that this area is not otherwise subject to significant existing disturbance. Appendices 1 and 2 present the results of a review of existing helicopter and shipping traffic within the potentially impacted area. This provides confirmation that this area is subject to significant disturbance effects, particularly from helicopter traffic from the nearby gas platforms, and it is recognised that both ship and helicopter activity can have a significant disturbance/displacement effect on red-throated divers (Garth and Hüppop (2004), Furness and Wade (2012), Bradbury *et al*. (2014), Dierschke *et al*. (2016); refer to Paragraph 17 below). A summary of this review is provided below.

2.3.1 Helicopter traffic

16. The review of existing helicopter traffic is presented in **Appendix 1 – Review of existing helicopter activity within the potentially impacted area**. In summary, this shows that:

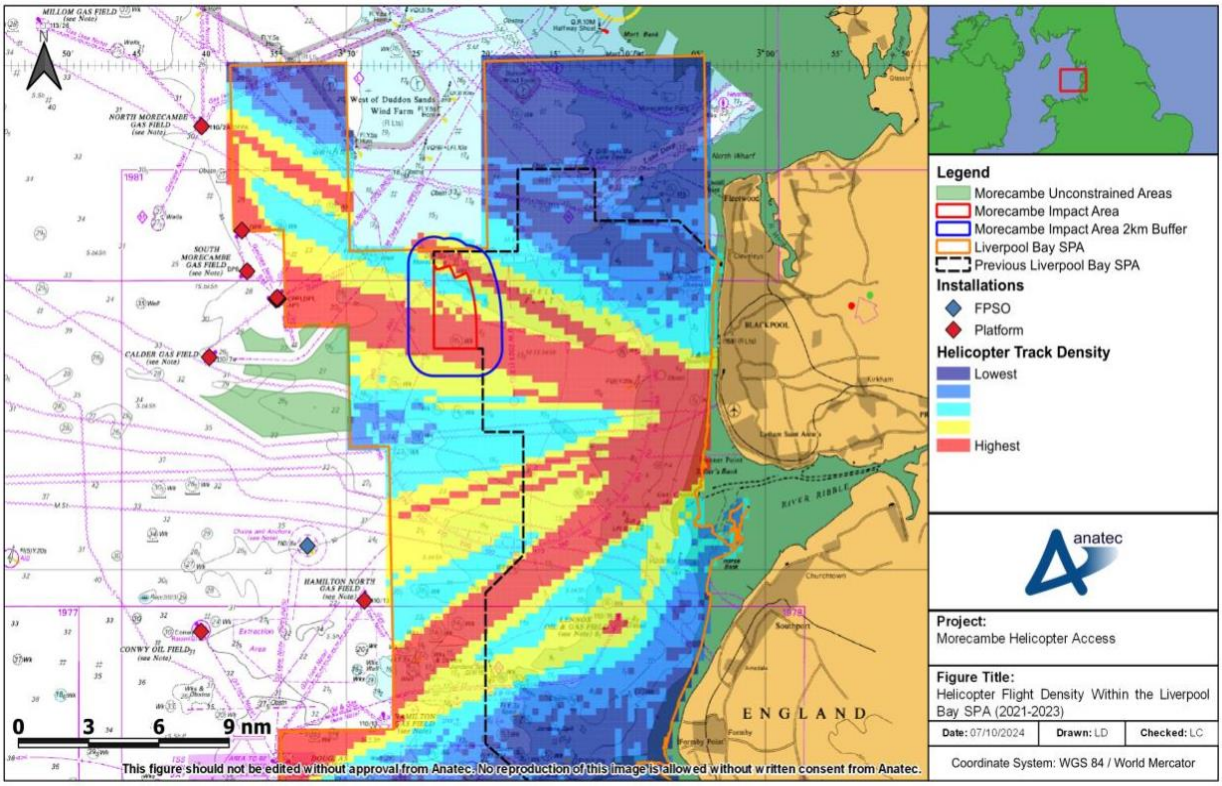
- The potentially impacted area is located within one of the areas of highest helicopter activity within Liverpool Bay SPA, as a result of traffic servicing the gas platforms to the northeast (refer to **Figure 2.12**; reproduced from **Appendix 1**). Two areas of high helicopter activity affect the potentially impacted area, one to the south, and one to the north.
- Over the period 2021-2023, five to six flights per day occurred on average within the potentially impacted area plus a precautionary 2km buffer (noting that the affected area may be significantly larger than this[1]). Peak activity occurred in September 2023 (over nine flights per day on average), but overall, there was no clear pattern of seasonal difference across the three years.
- 10% of flights occurred below 500ft (c.150m); 48% of flights occurred at an altitude of 500 to 1,000ft (c.150-300m); and 32% were between 1,000 and 1,500ft (c.300m to 460m). Overall, 80% of flights were at an altitude of less than 1,500ft (c.460m).

[1] SNCBs (2022) state: *'For most species, the SNCBs recommend a standard 'displacement buffer' of 2km from the edge of the footprint. The recommendation does not apply to divers and sea ducks which are sensitive to offshore development and associated boat and helicopter traffic and avoid a larger area.'*

17. Although there is limited published data on the effect of helicopter disturbance on red-throated diver, it is generally accepted that this species is very sensitive to such disturbance. Garth and Hüppop (2004) scored the species as '4' (out of a possible 5) for vulnerability to ship and helicopter disturbance, with only two species (common and velvet scoters) scoring 5. Furness and Wade (2012) and Bradbury *et al.* (2014) both scored red-throated diver as '5' using the same scale. Dierschke *et al*. (2016) stated that '*Some seabird species, especially divers and seaducks, are known to escape from moving ships and/or helicopters and therefore areas with much traffic are avoided partly or completely.*'

18. It is also widely accepted that the disturbance effects of aircraft will increase as altitude decreases. A height of 460-500m is considered to be the threshold above which significant disturbance to birds is unlikely to occur (Thaxter *et al.*, 2015). As set out above, at least 80% of helicopter flights across the potentially impacted area were below this altitude, with 58% below 300m and 10% below 150m. It can be concluded, therefore, that the small number of red-throated divers (as discussed in **Section 2.2**) using the potentially impacted area will be subject to significant existing disturbance and displacement effects as a result of helicopter traffic.

Figure 2.12 Helicopter flight density within Liverpool Bay SPA (2021-2023)

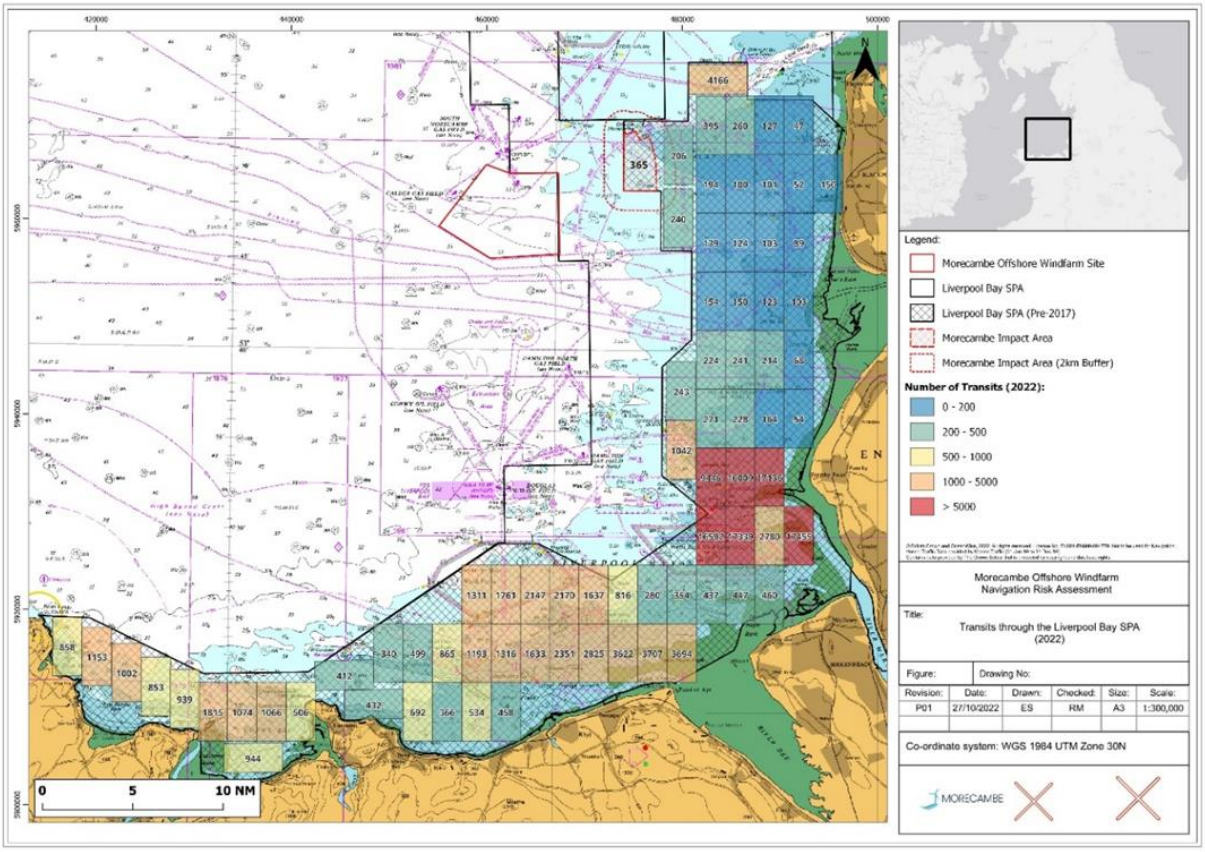


2.3.2 Boat traffic

19. A review of existing boat traffic is presented in **Appendix 2 – Review of existing vessel activity within the potentially impacted area**. In summary, this shows that:

- During 2022, available data indicates that there were 365 vessel transits through the potentially impacted area, i.e. approximately one per day on average. Within the potentially impacted area and a precautionary 2km buffer, there were 788 vessel transits during the same period. As set out in Paragraph 17 above, it is widely accepted that red-throated diver are very sensitive to disturbance by vessels.
- Traffic is higher than areas to the east and southeast of the potentially impacted area (i.e. within the original SPA to the west of an area between Blackpool and Formby), where transit numbers were typically between 50 and 200 per annum (refer to **Figure 2.13**, reproduced from **Appendix 2**). As would be expected, transits were highest around the mouth of the Mersey (up to c. 17,000 transits per annum) and River Dee (up to c. 3,700 transits per annum). There was also a peak of activity in the most northerly section of the SPA which corresponds with the Lune Deep channel at the entrance to Morecambe Bay, of c.4,200 transits per annum.
- The majority of vessels were tug and service vessels with a length overall (LOA) of between 50m and 100m. Smaller numbers of fishing, tanker, cargo, recreational and passenger vessels were also recorded.
- The majority of vessels were travelling at speeds between 5 and 15 knots.
- It is noted that if the Project is consented, it will be necessary to divert one of the routes currently used by the Liverpool to Belfast Ferry (as highlighted in the Navigation Risk Assessment (APP-073)). This would reduce the transit distance through the original SPA by approximately 3.6km, resulting in a reduction in disturbance effects within that part of the SPA (refer to Figure 15 in **Appendix 2**).

Figure 2.13 Vessel transits through Liverpool Bay SPA (2022)



2.3.3 Conclusion to effects of existing disturbance

20. The evidence presented above confirms that the potentially impacted area is currently subject to significant disturbance from helicopter and vessel traffic. Combined, it is estimated that these two sources contribute, on average, between five and seven disturbance events per day (assuming 80% of helicopter flights were at an altitude of less than 1,500ft). Assuming a precautionary distance of 2km around the disturbance source, and that the helicopter or vessel transits from east to west across the potentially impacted area (a distance of approximately 3km), up to 12km^2 of the potentially impacted area could be affected by each disturbance event. This is equivalent to approximately 67% of the potentially impacted area (17.99km^2). Given that slightly different routes are likely to be taken, it is likely that most, if not all of the potentially impacted area would therefore be subject to disturbance each day.

21. There is limited information on the repopulation of areas by red-throated diver following displacement by vessels. However, Burger *et al.* (2019) suggested that birds may return to areas a vessel has passed through after around seven hours, though the displacement effect may be greater where faster vessels are concerned. Assuming that there was a minimum of six disturbance events

spread evenly through the day, it is therefore unlikely that any disturbed birds would return to the affected area.

22. It is considered likely that the extent of existing disturbance is a major causal factor in the low densities of red-throated diver known to occur within the potentially impacted area, as set out in **Section 2.2** above. NE, in its RRs has advised that *'it is appropriate that displacement impact is assigned to the OWF in closest proximity'* (refer to **Table 1.1** above). The Applicant considers, therefore, that the existing effects from helicopter and vessel traffic should similarly be taken into account when considering the effects arising from the Project. Given the high level of existing disturbance, and the distance of the Project site from the boundary of the SPA (c. 7km), it is very unlikely that the Project would result in any additional effect.

2.4 Diminishing effect as distance from the windfarm increases

23. NE has maintained throughout its engagement with the Applicant that it is not appropriate to consider the diminishing effect as distance from the windfarm increases when assessing the 'distribution' conservation objective for red-throated diver. It is noted by the Applicant that NE has adopted a similar stance on previous projects on the east coast of England, such as the Sheringham and Dudgeon Extension Projects (SEP&DEP).

24. In its RRs for the Project (RR-061-087; **Table 1.1**), NE has stated *'There is no logical way to proportionally reduce the area of habitat loss by the expected level of displacement. Some level of displacement is occurring over the full extent of the area. Ultimately, calculating a (reduced) area of effect in this way underestimates the simple % of the SPA that is subject to displacement effects.*'

25. The Applicant does not agree with the logic of this argument. Firstly, NE has conflated 'habitat loss' with the affected area of displacement. The Project would have no effect on habitats within the SPA likely to support red-throated divers, and consequently there would be no 'habitat loss' in the sense that NE implies. Secondly, it is agreed between the Applicant and NE that any displacement effect on red-throated divers will diminish as distance from the windfarm array increases (refer to paragraph 453 and Table 8.5 of the RIAA (APP-027)). However, NE's argument appears to be that as *some* (but not all) birds could be affected, that would automatically trigger an AEoI for the distribution conservation objective. This is not logical for a number of reasons:

    - It is accepted by NE that there must be a threshold below which no meaningful effect would occur. This is demonstrated by the fact that it has been accepted by NE that the potential effect on red-throated divers need not be considered beyond 10km from a windfarm, as set out in the

Joint SNCB advice for red-throated diver (2022). It is clear that if any such effect occurs, there would not be a hard cut-off between an effect at, say, 9.9km, but no effect at 10.1km. However, it is accepted that beyond 10km the effect is considered sufficiently small to be disregarded. By that logic, it can be concluded that the effect on distribution does diminish as distance from the windfarm increases, and that there is a threshold by which no meaningful effect on the 'distribution' conservation objective would occur.

- This would mean that some level of redistribution of red-throated divers within the SPA must be acceptable and could occur without AEoI being concluded. Almost *any* activity within or adjacent to the SPA would have some effect on the distribution of red-throated divers, and if there was no minimum threshold this would mean that no activity within, or within a certain distance of, the SPA could be consented. This is supported by the Secretary of State's conclusion in respect of the Awel y Môr OWF, as acknowledged by NE in B34 of **Table 1.1**, where the 'low numbers' of red-throated diver meant that no AEoI in respect of all conservation objectives (including distribution) was concluded (refer also to **Section 2.5** for further consideration of the precedent set by Awel y Môr OWF). It is clear, therefore, that in the case of Awel y Môr OWF Natural Resources Wales (NRW) and the Secretary of State reached a different conclusion to that proposed by NE.
- However, it is NE's assertion that the potential for a redistribution effect extends in full to 10km from the windfarm array, despite the fact that it accepts that not all birds would be affected. In the case of the Project, which would affect areas within the SPA between 7km and 10km from the windfarm, NE's displacement gradient (refer to Paragraph 453 of the RIAA (APP-027)) indicates that between 40% and 29% of birds present at this distance from the array could be affected, i.e. that between 60% and 71% would not.
- The Applicant argues, therefore, that contrary to NE's statement above, it would not be logical to conclude that there would be a '100%' effect on the distribution of red-throated divers within the potentially impacted area when, in reality, the majority of birds present would not be affected.
- Taking into account the very small number of birds present within the potentially impacted area, and the fact that the majority of these would *not* be 'redistributed' by the Project (i.e. affecting approximately two birds annually from an SPA population of 1,800; based on mean annual 'Total birds displaced' in Table 8.8 of the RIAA (APP-027)), it is not reasonable to conclude that the 'distribution' conservation objective would not be met. This is because the number of affected birds, and hence extent of any potential distributional shift, is so small as to be irrelevant to the SPA objective. It would also be difficult to conclude that the distribution would

be significantly affected when the available evidence demonstrates that the use of the potentially impacted area by red-throated diver is sporadic (**Section 2.2** above) and that it cannot be considered core to the distribution of the species across the wider SPA. As set out in Paragraph 3, it is assumed to be agreed between the Applicant and NE that the Project would not affect the 'population' (i.e. abundance) conservation objective for red-throated diver.

- Based on the above, it could be argued that where a large proportion of birds are *not* 'redistributed', there would be no (i.e. zero) effect on the 'distribution' conservation objective. The Applicant does not advocate this position, but has instead presented a more conservative assessment, based on NE's recommended displacement gradient, that accounts for the fact that a proportion of birds would be redistributed, and some would not. The Applicant acknowledges that this is not intended to suggest that some parts of the potentially impacted area are affected, while others are not. Rather, it is intended as a proxy to demonstrate that there would be some effect on that area, but that effect would be less than if it was located closer to the windfarm array.

26. In the assessment presented within the RIAA (APP-027), the Applicant has concluded that 0.37% of the SPA would be affected, when the NE gradient is applied. When the low numbers of red-throated diver using this area are taken into account (i.e. affecting approximately two birds annually from an SPA population of 1,800; refer to Table 8.8 of the RIAA (APP-027)), the Applicant maintains that no AEoI can be logically concluded for the 'distribution' conservation objective for this feature.

2.5 Precedent from Awel y Môr Windfarm

27. The Awel y Môr OWF was consented by the Secretary of State in September 2023. This project is located immediately adjacent to the Liverpool Bay SPA boundary (both pre-2017 and current) in the southern part of the SPA. The boundary of Awel y Môr OWF immediately adjoins the Gwynt y Môr OWF to the east, which was operational from 2015.

28. In the Habitats Regulations Assessment (HRA) for the Awel y Môr OWF, the Secretary of State concluded that AEoI for the red-throated diver feature of Liverpool Bay SPA could be excluded, both for the project alone and in-combination (DESNZ, 2023). This conclusion was reached on the basis of information provided by the applicant and the advice provided by NRW. NE did not provide comments on the application, but instead stated that it deferred its advice to NRW for SPAs within Welsh waters or crossing both English and Welsh Waters (Natural England, 2023). It would be reasonable to assume, therefore, that the advice provided by NRW would be aligned with NE advice, given the SPA extends into both jurisdictions.

29. In its RRs to that application (NRW, 2022), and subsequent Statement of Common Ground (SoCG; RWE, 2023), NRW stated:

'As noted in NRWs RR, from the evidence provided by the Applicant, it does appear that the extent of the supporting habitat for Red-Throated Diver within Liverpool Bay SPA will be maintained if the project is constructed and therefore there will be no adverse effect on the Red-Throated Diver feature of Liverpool Bay SPA from loss of habitat. However, NRW notes that the lack of displacement of Red-Throated Diver in this part of Liverpool Bay SPA is not consistent with what has been observed in other areas of Liverpool Bay SPA, as well as in other areas of the UK and Europe. Given this anomaly in observation, we advised that comprehensive validation monitoring before, during, and after construction is needed to confirm the modelled conclusion of no loss of supporting habitat (as identified in the sites conservation objectives). We welcome the Applicant's commitment, as noted in the Deadline 2 submissions (REP2-002 and associated documentation), to validation monitoring as necessary. NRW agrees with the need for a Vessel Traffic Management Plan to be developed and agreed and appropriately secured.'

30. It is noted that the NRW response is focussed on the 'extent of habitat' within Liverpool Bay SPA, i.e. the *'Supporting habitat: extent, distribution and quality of supporting habitat for the non-breeding season'* conservation objective (**Table 1.2**). No reference is made to the 'distribution' conservation objective, which is the focus of NE's response to the Morecambe Project. It can be concluded that, as both NRW's response and the Secretary of State's conclusion to the HRA confirm no AEoI, this would apply to all conservation objectives presented in **Table 1.2**. In other words, there was no indication that NRW, or by proxy NE, had concerns that the Awel y Môr OWF would prevent the 'distribution' conservation objective for Liverpool Bay SPA being met, noting that the Conservation Objectives are unchanged from those at the time of the Awel y Môr OWF consent.

31. In NE's RRs for the Project (RR-061) it has stated '*we understand from NRW and JNCC that the advice given to the Awel y Môr OWF related to specific factors in that area, namely the low numbers of divers encountered in the area and the findings of the post-construction monitoring of the Gwynt y Môr windfarm*.' This provides further confirmation that the 'distribution' conservation objective was not the key consideration in the Awel y Môr OWF decision, as this would otherwise conflict with NE's implied position (**Table 1.1**) that the number of birds within the impacted area is not of relevance to the 'distribution' conservation objective.

32. The Secretary of State, in considering their position on the Project consent, will need to establish whether the Project would generate an effect that would result in a different conclusion to the Awel y Môr OWF. It is noted that in its RRs (RR-061) NE has stated that it considers that AEoI cannot be ruled out

for the *Project alone*. If this is the case, then the same criteria would have been applied to the *project alone* effects for Awel y Môr OWF. The Applicant has, therefore, reviewed the effects of the Awel y Môr OWF, using the same approach as documented in the Project RIAA (APP-027). The results of this analysis are presented below.

2.5.1 Project alone assessment

33. As set out above, the position of NE (RR-061) is that AEoI cannot be ruled out for the Project in respect of the 'distribution' conservation objective for red-throated diver. In the responses from NRW and the conclusions of the Awel y Môr OWF HRA (DESNZ, 2023), key points of discussion were in respect of the 'extent of habitat' conservation objective. As the Morecambe Project is distant (i.e. approximately 7km) from the potentially impacted area, no effects on the extent of supporting habitats are predicted. As set out in Paragraph 25, while NE has partly conflated the habitat and distribution effects in its RRs (RR-061-64; **Table 1.1**), it is clear that its position is in relation to the 'distribution' conservation objective. The Applicant therefore considers it agreed with NE that there would be no risk of AEoI in respect of the 'extent of habitat' conservation objective.

34. **Table 2.1** below sets out an estimation of the area of the SPA that would be subject to displacement effect by the Awel y Môr OWF, and compared to the Project, using the same approach documented in the RIAA. This includes the total area of effect, and also net area once the 'displacement gradient' has been applied (noting that NE do not agree with the latter approach, as discussed in **Section 2.4**).

35. The area affected by the Project would be substantially less than Awel y Môr OWF. For the total area (and not taking into account existing projects), Awel y Môr OWF would impact approximately 296km^2, compared to 21km^2 for the Project. This is equivalent to 17.41% of the original SPA boundary, compared to 1.24%; i.e. the total affected area is approximately 14 times greater for Awel y Môr OWF than it would be for the Project.

36. If the displacement gradient is taken into account, Awel y Môr OWF would impact approximately 140km^2, compared to 7km^2 for the Project. This is equivalent to 8.20% of the original SPA boundary, compared to 0.43%; i.e. the total affected area is approximately 19 times greater for Awel y Môr OWF than it would be for the Project. It is noted that for both projects, the area of effect is reduced when existing projects are taken into account (see **Section 2.5.2** below); but that the effect of Awel y Môr OWF remains substantially larger than for the Project.

Table 2.1 Estimate of total and effective area of Liverpool Bay SPA which would be subject to displacement, comparing Morecambe Generation Assets and Awel y Môr OWF projects (Project alone)

		Morecambe Generation Project		Awel y Môr OWF	
Buffer (km)	**Effect Gradient**	**Total Area (km^2)**	**Effective Area (km^2)**	**Total Area (km^2)**	**Effective Area (km^2)**
0-1	80%	0.00	0.00	6.37	5.09
1-2	74%	0.00	0.00	13.63	10.08
2-3	68%	0.00	0.00	19.58	13.31
3-4	63%	0.00	0.00	24.43	15.39
4-5	57%	0.00	0.00	28.70	16.36
5-6	51%	0.00	0.00	32.93	16.80
6-7	46%	1.09	0.50	37.15	17.09
7-8	40%	5.30	2.12	41.36	16.54
8-9	34%	7.26	2.47	44.30	15.06
9-10	29%	7.47	2.17	48.04	13.93
Total	**-**	**21.12**	**7.25**	**296.48**	**139.66**
Percentage of SPA (boundary at designation)[1]	-	1.24%	0.43%	17.41%	8.20%
Percentage of SPA (current boundary)[2]	-	0.84%	0.29%	11.73%	5.53%

[1] Assumes SPA area of 1702.93km^2
[2] Assumes SPA area of 2527.58km^2

37. On the basis that the effect of the Project alone is substantially less than is the case for the Awel y Môr OWF, the Applicant considers that that the same conclusion for the Project should be applied, i.e. that there would be no risk of an AEoI for the Project alone.

38. In its RRs (RR-061), NE has stated that the SNCB position for Awel y Môr OWF relates to '*the low numbers of divers encountered in the area and the findings of the post-construction monitoring of the Gwynt y Môr windfarm*'. This further supports the Applicant's position that the Project-alone effect would be substantially less than Awel y Môr OWF:

    - In terms of the 'low numbers' of birds present, **Figure 2.2** to **Figure 2.11** demonstrate clearly that the densities of red-throated diver in the area potentially impacted by the Project have been consistently and substantially lower than those that would be affected by the Awel y Môr

OWF. As an approximation, the mean of the peak densities for the two projects across each of the estimates in **Figure 2.2** to **Figure 2.11** would be 0.15 birds/km^2 for the Project and 1.15 birds/km^2 for the Awel y Môr OWF. Assuming an area of 17.99km^2 for the Project and 93.62km^2 for Awel y Môr OWF (in-combination areas; see below), this would be the equivalent of less than three birds present in the area potentially impacted by the Project, compared to 107 birds for Awel y Môr OWF.

- This is supported by the results of site-specific surveys for the two projects, which confirm that for all seasons (except the breeding season, which is not the period for which the red-throated diver feature is designated), the total population of red-throated divers potentially affected would be larger for Awel y Môr OWF than for the Project (noting that Awel y Môr OWF population estimates included a buffer of 8km around the array area, and are therefore likely to further underestimate population when compared to the 10km buffer used for the Project). Note that the numbers of birds in **Table 2.2** are those for the whole survey area for each project, and would be reduced when the effects of existing projects are taken into account (to approximately five birds in the case of the Project).
- Furthermore, the Project would affect a substantially smaller area of the SPA; a total area of 21.12km^2 compared to 296.48km^2 for Awel y Môr OWF (project alone; **Table 2.1**); or 17.99km^2 compared to 93.62km^2 (in-combination, taking into account the effects of existing projects; **Table 2.3**).
- A review of the post-construction monitoring of the Gwynt y Môr OWF was undertaken as part of the Awel y Môr OWF submission (RWE, 2022a). This compared densities of red-throated diver around the Gwynt y Môr windfarm during the pre-construction, construction and operational phases of the project. The review presented evidence that there was no decrease in red-throated diver numbers within and adjoining the windfarm during the post-construction period, and also that the nearby Rhyl Flats windfarm (which is located within the SPA) did not exert a 100% displacement effect on the species. This differs from much of the existing evidence from elsewhere which suggests that windfarms typically exert a significant displacement effect on this species. The review speculated that this may be due to site-specific physical or ecological differences at different windfarm locations.
- The Awel y Môr OWF submission argued that the proximity of the Gwynt y Môr windfarm would indicate that a similarly reduced displacement response would be expected at Awel y Môr OWF. In its response to the application, NRW appeared to broadly accept this argument (Paragraph 29), but identified the need for validation monitoring. The Applicant considers that the evidence from Gwynt y Môr OWF confirms that there

is significant variability in the response of red-throated diver to OWFs, and also that, as the potential impacts of the Project would impact the same population of birds as Gwynt y Môr OWF, the same argument (i.e. a low predicted displacement response) should be applied for the current assessment. The Applicant can confirm that it would be willing to undertake validation monitoring for red-throated diver.

Table 2.2 Comparison of red-throated diver population estimates (seasonal mean peaks) used in the displacement assessments for Morecambe Generation Assets and Awel y Môr OWF projects

Project	Autumn	Spring	Winter	Breeding	Year-round
Morecambe Generation Assets[1]	10	41	8	8	**67**
Awel y Môr OWF[2]	62	87	48	5	**202**

[1] Taken from RIAA (APP-027) Table 8.8. Note that this is the population for the Project site plus 10km buffer where this overlaps the SPA (current boundary); the population within the potentially impacted area would be much less than this; approximately **five birds** year-round.

[2] Taken from Awel y Môr Environmental Statement Volume 4 Annex 4.2: Offshore Ornithology Displacement (RWE, 2022b), Tables 33-47; abundances for each displacement band (array area, 0-5km, 5-8km) combined.

39. In its RRs (RR-061), NE also commented on the relative effects of the Project and Awel y Môr OWF in respect of their different locations within the SPA: '*It should be borne in mind that Morecambe OWF is impacting the northern part of the SPA, which to date, has been less impacted than the south*.' The implication of this comment is that NE consider that the effects of the Project would be more significant because it is located in an area (that NE consider) less affected by existing anthropogenic pressures than areas in the south of the SPA. The Applicant disagrees with this characterisation of the relative effects of the two projects for the following reasons:

- It is not clear that the area potentially impacted by the Project is currently less disturbed than that affected by Awel y Môr OWF. In addition to potential effects from the West of Duddon Sands project, **Section 2.3** sets out the further anthropogenic disturbance that is affecting this area.
- However, if it is assumed that the southern part of the SPA is currently subject to greater impacts than the northern parts, then it would seem valid to argue that any additional effect would be more likely to have a significant effect on remaining unaffected areas within the south of the SPA than a relatively small effect on less disturbed areas by the Project in the north. This would seem to be (strongly) supported by the fact that, on the basis of the data presented above, Awel y Môr OWF would be

predicted to displace a substantially greater proportion of the SPA population than would the Project (and, hence, be more likely to affect distribution).

- In particular, the Applicant would highlight that the Project is at a distance from the original SPA boundary (i.e. c. 7km), whereas Awel y Môr OWF directly adjoins the original boundary of the SPA, and, on the basis that it is agreed between the Applicant and NE that the potential displacement effect diminishes with distance from the array, any effect will therefore be much greater for the latter. It is also the case that the in-combination assessment approach (as presented in the RIAA (APP-027) and replicated for the Awel y Môr OWF in this document) specifically considers effects from existing projects, and even when this is taken into account the area of effect for Awel y Môr OWF is significantly larger than for the Project (Paragraph 43 and **Table 2.3**).

40. In summary, therefore, the Applicant considers that it has been demonstrated beyond all reasonable scientific doubt that **the effects of the Project alone on the red-throated diver feature of Liverpool Bay SPA would be substantially less than those of the Awel y Môr OWF,** and would affect substantially fewer birds. As the Secretary of State was able to conclude that there would be no AEoI for this feature in respect of the Awel y Môr OWF (both alone and in-combination), there can be no justification for a different conclusion in respect of the Project alone.

2.5.2 In-combination

41. The Applicant's position in respect of the in-combination effects is unchanged from that presented in the RIAA (APP-027). The Applicant considers that the Project would make no discernible contribution to potential in-combination effects, and **therefore the Secretary of State can conclude that there would be no risk of AEoI, either alone or in-combination**.

42. Without prejudice to this conclusion, the Applicant has presented information on in-combination effects within the RIAA (APP-027) to provide context to the Project-alone assessment. Additional information to support this is provided below.

43. **Table 2.3** presents the estimates of total and effective area of effect for both the Project and Awel y Môr OWF, when taking into account the effects of existing projects. For both projects, the affected area is reduced when compared to the project-alone assessment, as some areas are impacted by existing projects, and NE has agreed that displacement effects should be assigned to the project closest to the SPA (RR-061-94; **Table 1.1**). When comparing the total affected area (without application of the displacement gradient) the area affected by Awel y Môr OWF is 93.62km^2, compared to 17.99km^2 for the Project; i.e. an area approximately five times greater. Taking

into account the displacement gradient, Awel y Môr OWF would impact 45.64km^2, compared to 6.29km^2; an area approximately seven times greater.

Table 2.3 Estimate of total and effective area of Liverpool Bay SPA which would be subject to displacement, comparing Morecambe Generation Assets and Awel y Môr OWF projects (in-combination)

Buffer (km)	Effect Gradient	Morecambe Generation Project (km^2)		Awel y Môr OWF (km^2)	
		Total Area	Effective Area	Total Area	Effective Area
0-1	80%	0.00	0.00	4.68	3.74
1-2	74%	0.00	0.00	5.69	4.21
2-3	68%	0.00	0.00	6.71	4.57
3-4	63%	0.00	0.00	7.75	4.89
4-5	57%	0.00	0.00	8.78	5.00
5-6	51%	0.00	0.00	9.66	4.93
6-7	46%	1.09	0.50	10.57	4.86
7-8	40%	5.30	2.12	11.54	4.61
8-9	34%	6.13	2.08	12.78	4.34
9-10	29%	5.47	1.59	15.46	4.48
Total	**-**	**17.99**	**6.29**	**93.62**	**45.64**
Percentage of SPA (boundary at designation)[1]	-	1.06%	0.37%	5.50%	2.68%
[1] Assumes SPA area of 1702.93km^2					

44. **Table 2.4** presents a comparison of the relative increase in affected area that Awel y Môr OWF and the Project would have, taking into account the area that would be impacted prior to accounting for each of these projects. This demonstrates that the percentage increase would be substantially higher for Awel y Môr OWF than for the Project (i.e. 15.27% vs. 2.55% for the total area, or 13.11% vs. 1.60% if the displacement gradient is taken into account).

Table 2.4 Comparison of relative increase to in-combination area effects for Morecambe Generation Assets and Awel y Môr OWF projects

	Pre-Awel y Môr OWF	Awel y Môr OWF	In-combination	% increase	Pre-Morecambe Generation Project	Morecambe Generation Project	In-combination	% increase
Total area of displacement effect (km^2)	613.02	93.62	706.64	**15.27%**	706.64	17.99	724.64	**2.55%**
Effective Area (km^2)	348.24	45.64	393.88	**13.11%**	393.88	6.29	400.18	**1.60%**

45. It is acknowledged by the Applicant that the small relative contribution of the Project is not strictly relevant when considering the total in-combination effect. However, it is the case that there must be a threshold of effect that is considered by NE to generate an AEoI, and below which AEoI can be ruled out. In this case, therefore, it appears that NRW (and by proxy NE) considered that the effect up to and including Awel y Môr OWF was below such a threshold, while NE considers that the threshold would be exceeded with the addition of the Project (though noting that NE has only considered Project-alone effects in its RRs, as set out in Paragraph 32 and **Table 1.1**). The Applicant considers that the logic applied by NE is flawed and that there is no justification for the threshold that has been applied to the Project:

- The total affected area is estimated to increase from 41.50% of the original SPA boundary in the absence of the Project, or 42.55% with the addition of the Project; an addition of 1.06% (refer to Table 8.16 of the RIAA (APP-027)). Taking into account the displacement gradient, 23.13% of the original SPA boundary would be affected in the absence of the Project, or 23.50% with the addition of the Project; an addition of 0.37%. As set out in **Table 2.4**, the relative increase in effect of the Project is substantially less than would have been the case for Awel y Môr OWF at the time of its submission and determination.
- It is noted by the Applicant, as set out in Paragraph 29 above, that NRW (and by proxy NE) made no comment on the 'distribution' conservation objective in its response to the Awel y Môr OWF application. It can be inferred from this response that it was not considered that the threshold for AEoI would be reached (or was close to being reached) for this conservation objective.
- Given the very small contribution of the Project to the in-combination effect (as evidenced in the preceding sections above), the Applicant can see no evidence or justification as to why the AEoI threshold would be exceeded for the Project (in-combination) in respect of the 'distribution' conservation objective, when such a threshold was not met for the Awel y Môr OWF. Using NE's preferred estimate of total affected area (i.e. not taking into account the displacement gradient) an increase from 41.50% of the original SPA boundary (where it is agreed that there would be no AEoI) to 42.55% (at which point NE states that AEoI cannot be ruled out) appears to be arbitrary and without scientific justification.
- Taking into account the evidence that has been presented in this note to demonstrate the relative low importance of the potentially impacted area to red-throated diver, particularly when compared to that impacted by the Awel y Môr OWF (Paragraph 38 and to **Figure 2.11**), this further supports the Applicant's position that there is no justification for the Secretary of State to reach a different conclusion for the Project to that agreed for Awel y Môr OWF.

46. As set out in Paragraph 41, it is the Applicant's position that the Project would make no discernible contribution to in-combination effects, and therefore a conclusion of no AEoI can be reached by the Secretary of State. However, if the Secretary of State does not agree with the Applicant's position (i.e. they consider that the in-combination effect should be assessed), they will need to consider whether the contribution of the Project would make any discernible difference to the conclusion for the Awel y Môr OWF, i.e. that AEoI can be ruled out. The Applicant considers that the difference in effect is so small and affecting an area shown to be of low importance to red-throated divers (particularly when compared to that affected by Awel y Môr OWF), that there is no meaningful difference between the in-combination effect at the point that the Awel y Môr OWF was consented, and that which would occur if the Project were consented. The Applicant has seen no evidence that there is a threshold that would be exceeded for the in-combination effect when considering the Project, when no such threshold was applied to the Awel y Môr OWF. The Applicant considers, therefore, that even if consideration of in-combination effects is required, the Secretary of State can conclude there would be no risk of AEoI for the red-throated diver feature of Liverpool Bay SPA.

3 Conclusion

47. This note presents additional evidence to support the Applicant's position, as set out in the RIAA (APP-027), that there would be no AEoI for the red-throated diver feature of Liverpool Bay SPA. This is for both for the Project alone and in-combination with other plans or projects. The Applicant considers that the information presented demonstrates beyond reasonable scientific doubt that there would be no effect on the ability to meet the conservation objectives for the red-throated diver feature, including the 'distribution' conservation objective identified by NE. It is agreed with NE that there would be no effect on the other conservation objectives.

48. The Applicant considers that the Secretary of State can conclude no AEoI because:

- The Project would affect only a very small part of the SPA (c.1%), and the affected area is distant (c.7km at its closest point) from the Project boundary, and therefore the level of effect is also likely to be very small.
- Very few red-throated divers use the potentially impacted area, with consistent evidence over a 20-year period that the species occurs only sporadically and in low numbers. The Applicant considers that this area supports the lowest densities of red-throated diver anywhere within the original SPA boundary (refer to Figures in **Section 2.2**).
- The small size of the potentially affected area, combined with its distance to the Project array and its low densities of red-throated diver mean that approximately two birds are predicted to be displaced (refer to Table 8.8

of the RIAA (APP-027)), representing only 0.12% of the SPA population (1,800 birds).

- The potentially impacted area is subject to significant existing disturbance from boat and helicopter traffic, and it is reasonable and appropriate to take this existing disturbance into account when considering any additional effect from the Project. It is considered very unlikely that the Project would result in a measurable increase in disturbance effect.
- The Applicant maintains that it is scientifically valid to account for the diminishing effect of a windfarm with increasing distance from the SPA when considering the potential effect on red-throated diver distribution. This is consistent with documented effects of windfarms on the species (as reflected in NE's advised displacement gradient) and is particularly the case when the potentially impacted area supports such low numbers of red-throated divers. This would further reduce any assessed effect of the Project.
- The Applicant has demonstrated that the effect of the Project alone would be substantially less than was the case for the consented Awel y Môr OWF, and therefore the same conclusion for both (in respect of project alone) should be reached. The Applicant considers that the effect of the Project is so small that it would not contribute to in-combination effects. However, even when in-combination effects are considered, there would be no measurable increase in disturbance to that assessed for the consented Awel y Môr OWF.
- The Applicant is willing to commit to post-construction validation monitoring to confirm the assessment conclusions.

49. The Applicant therefore considers that the Secretary of State can conclude that there would be no risk that the conservation objectives for the red-throated diver feature of Liverpool Bay SPA would not be met as a result of the Project, alone or in-combination with other plans or projects. Accordingly, **it can be concluded that there would be no adverse effect on the integrity of Liverpool Bay SPA**.

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Appendix 1 – Review of existing helicopter activity within the potentially impacted area

1 Introduction

This technical note details helicopter flights within the Liverpool Bay Special Protection Area (SPA), with a particular focus on the area uniquely impacted by the Morecambe Offshore Wind Farm project. The note is based on analysis of flight data from January 2021 to December 2023. The data is not guaranteed to be fully comprehensive of all flights, but is expected to cover the vast majority of flights. Therefore, the data is considered representative of flight activity within Liverpool Bay.

2 Liverpool Bay SPA Helicopter Flight Analysis

2.1 Helicopter Track Density within Liverpool Bay SPA

Figure 2.1 presents the density of helicopter tracks within the Liverpool Bay SPA, based on tracks intersecting a grid of 500m x 500m cells.

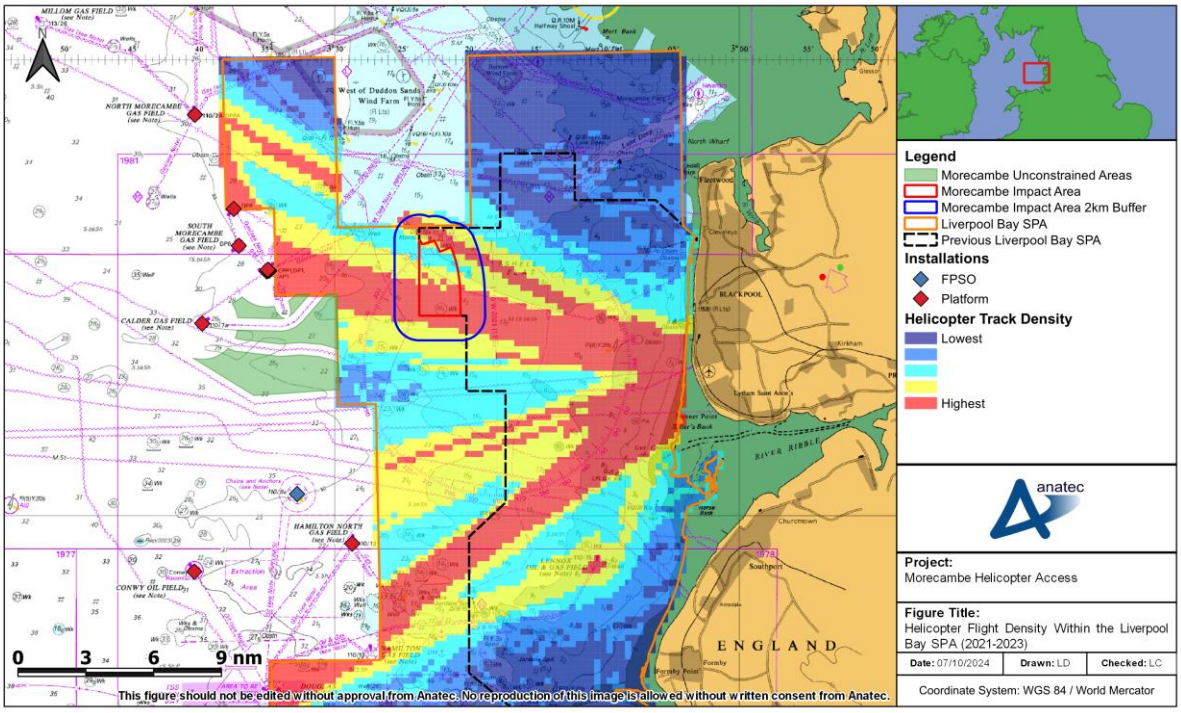

Figure 2.1 Helicopter Flight Density within the Liverpool Bay SPA (2021-2023)

The density heatmap highlights areas within the Liverpool Bay SPA where helicopter routes to and from Blackpool are busiest. The Morecambe Impact Area is crossed by two bands of high density, with the southern extent covered by the route to the South Morecambe field, and the northern extent crossed by the North Morecambe route. Other regions of high density within Liverpool Bay include routes to the Douglas field and the Offshore Storage Installation (OSI), to the southwest of the Morecambe Impact Area. The area of the Liverpool

Bay SPA along the north Welsh coast, which is not shown in Figure 2.1, is all low density, with very few flights recorded south of the Douglas field.

2.2 Helicopter Flight Frequency

Figure 2.2 presents the tracks of helicopter flights in proximity to the Morecambe Impact Area in July 2023.

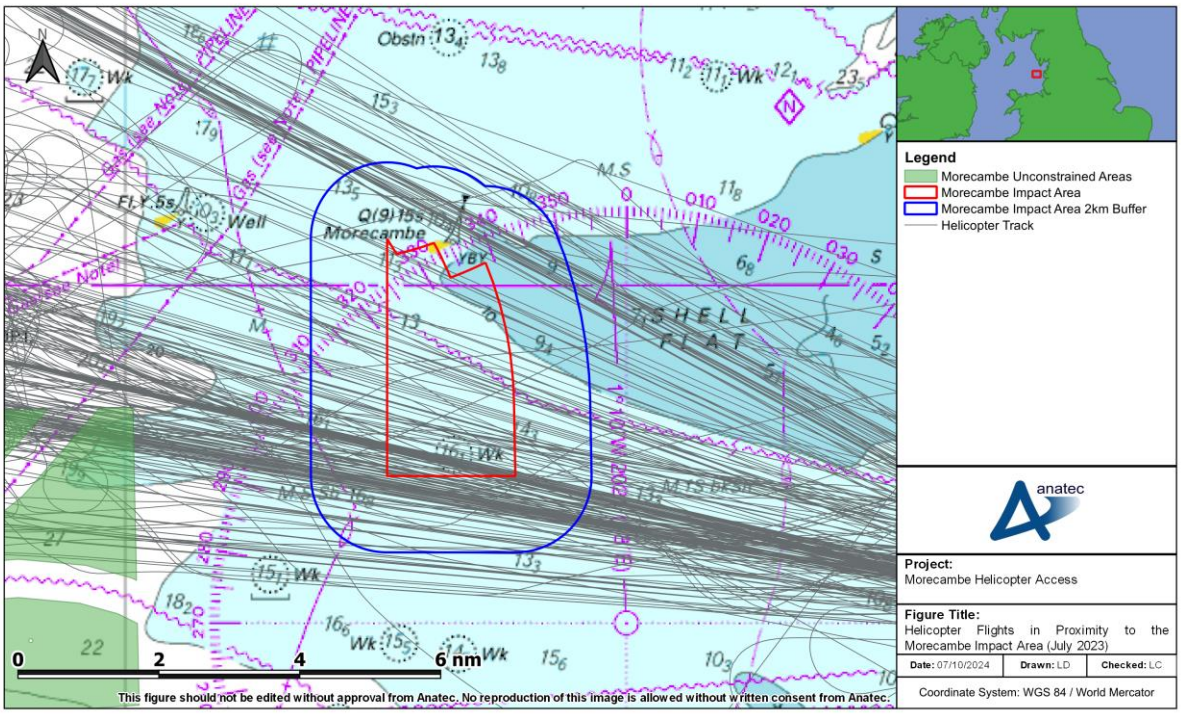

Figure 2.2 Helicopter Flights within the Liverpool Bay SPA (July 2023)

It can be seen that the Morecambe Impact Area lies on routes used by helicopters from Blackpool to the North and South Morecambe fields, the Calder platform and the Millom field.

Figure 2.3 presents the number of flights per day within 2km of the Morecambe Impact Area, each month from 2021 to 2023.

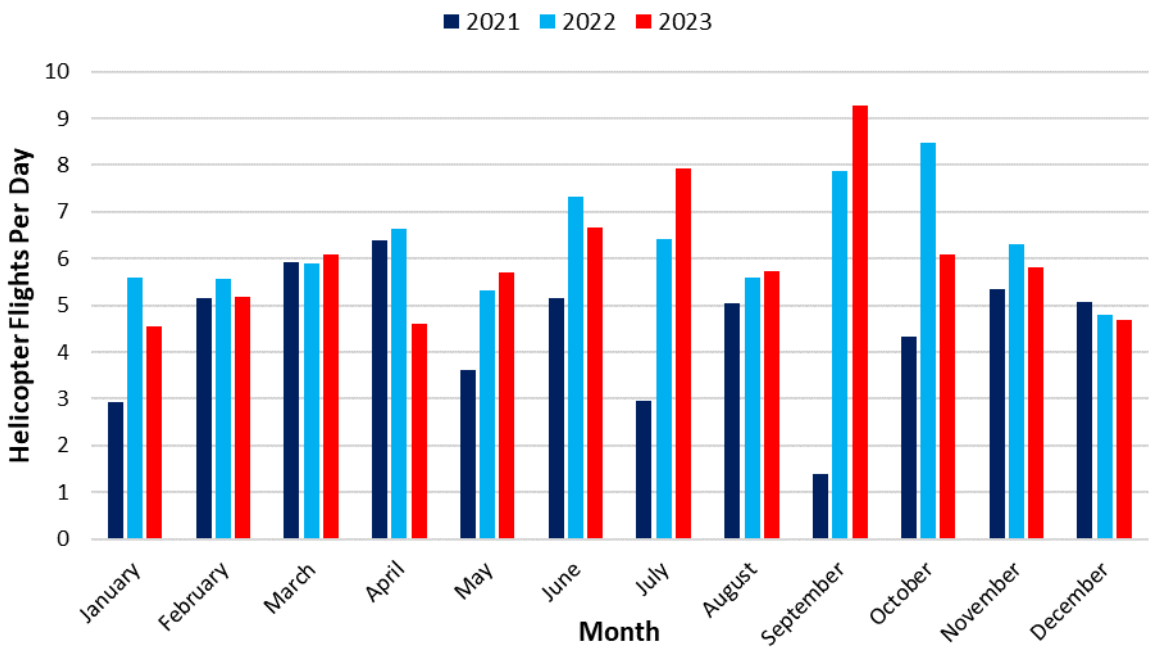

Figure 2.3 Helicopter Flights per Day per Month Within 2km of the Morecambe Impact Area (2021 – 2023)

Over the three-year period, an average of five to six flights per day were recorded within the Morecambe Impact Area. A slightly lower frequency of flights was recorded in 2021, with four to five flights per day, influenced by a lower than average number of flights recorded in September and July. In 2022 and 2023, approximately six flights per day were recorded within the Morecambe Impact Area.

2.3 Altitude within Morecambe Impact Area

Figure 2.4 presents the distribution of altitudes reported by helicopters within 2km of the Morecambe Impact Area. Altitude information was available for 99% of helicopter positions reported within 2km of the Morecambe Impact Area.

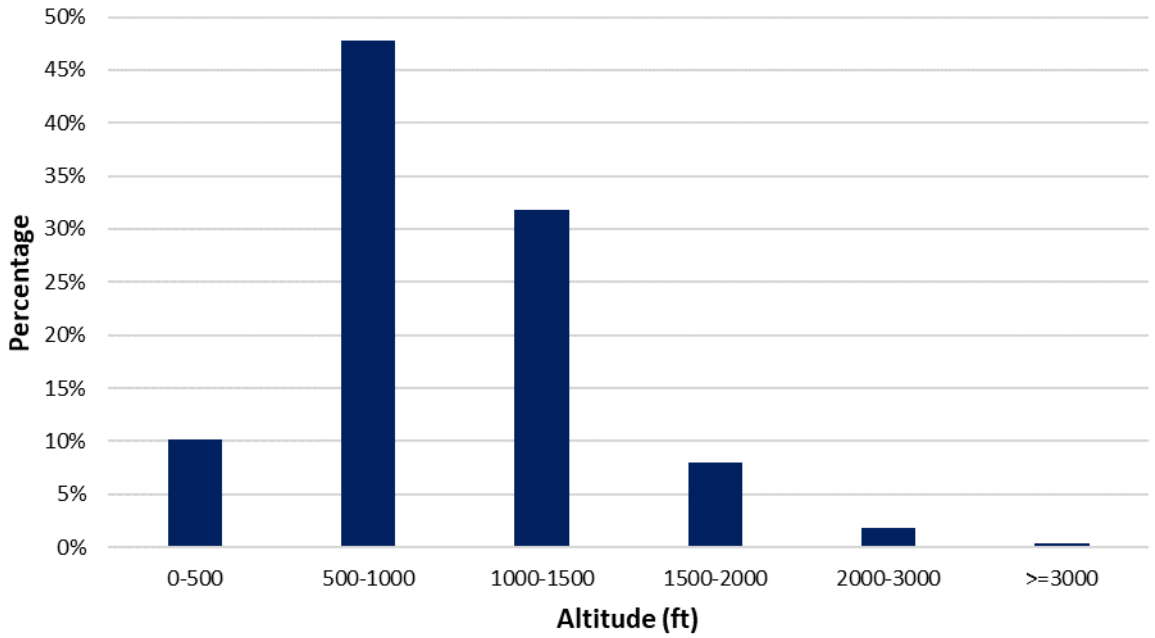

Figure 2.4 Distribution of Helicopter Altitudes Recorded within 2km of the Morecambe Impact Area (2021 – 2023)

The vast majority (80%) of altitudes reported within 2km of the Morecambe Impact Area were between 500 and 1500 feet, with helicopters between 500 and 1000 feet making up the bulk (48%) of this. Only 10% of helicopters were recorded flying at altitudes below 500 feet, with less than 1% flying at greater than 3000 feet. The highest altitude recorded within 2km of the Morecambe Impact Area was 3975 feet, with average altitude being 963 feet.

2.4 Presence of Morecambe Offshore Wind Farm

The presence of the Morecambe Offshore Wind Farm is expected to result in slight deviations to helicopter routing in the area. This could lead to a shift to the north for helicopters currently flying through the southern part, or to the south, of the Morecambe Impact Area, as they may be required to fly a dog leg around the wind farm.

Appendix 2 – Review of existing vessel activity within the potentially impacted area

NASH MARITIME

MORECAMBE OWF

Technical Note on Liverpool Bay SPS – Vessel Traffic Analysis

Offshore Wind Limited

Document No: 21-NASH-0193 | R02-00

22-Nov-24

PROJECT INFORMATION

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ABBREVIATIONS

Abbreviation	Detail
AIS	Automatic Identification System
CTV	Crew Transfer Vessel
IoMSPC	Isle of Man Steam Packet Company
LOA	Length Overall
NRA	Navigation Risk Assessment
OWF	Offshore Wind Farm
Ro-Ro	Roll On – Roll Off
SPA	Special Protection Area
WoDS	West of Duddon Sands

1. INTRODUCTION

This technical note has been prepared by NASH Maritime on behalf of Morecambe Offshore Windfarm Limited ('the Applicant) to provide information on the existing levels of vessel disturbance to Red Throated Divers within the Liverpool Bay Special Protection Area (SPA), with a particular focus on the area uniquely impacted by the Morecambe Offshore Windfarm (OWF) Project, hereafter referred to as 'the Project'.

This note is based on analysis of AIS data for the full year of 2022. Although it is not guaranteed to be fully comprehensive of all vessel activity, it is expected to be representative of the vast majority of traffic in the area.

This report considers:

- The frequency and types of vessel movements within the original, pre-2017, Liverpool Bay SPA;
- The frequency and types of vessel movements within the Morecambe Impact Area (this term is explained in Section 2);
- The typical speeds of vessels through the original, pre-2017, Liverpool Bay SPA;
- The typical speeds of vessels through the Morecambe Impact Area; and
- How the presence of the Project may affect the frequency of vessel movements, or the time vessels spend within the original, pre-2017, Liverpool Bay SPA.

2. VESSEL TRAFFIC OVERVIEW

AIS Data for the full year 2022 from MarineTraffic was used to understand the frequency and types of vessel movements through the Liverpool Bay SPA and through a smaller area of the SPA, uniquely impacted by the Project, termed the 'Morecambe Impact Area'. **Figure 1** presents the annualised vessel traffic density for 2022 within the Liverpool Bay SPA, and the Morecambe Impact Area, based on tracks intersecting the individual grid cells. The figure shows high vessel traffic density to the south of the SPA, due to the traffic heading in and out of Liverpool, and just north of the Morecambe Impact Area, due to the key traffic routes running to and from Heysham. With the exception of the approaches to Heysham and Liverpool, the eastern part of SPA sees the least activity due to proximity to the coast.

In comparison to the rest of the SPA, the Morecambe Impact Area and its 2km buffer has a similar level of vessel activity to the region of the SPA just east of the Project (<160 transits/month), and less activity to that seen in the north and south of the SPA (>320 transits / month).

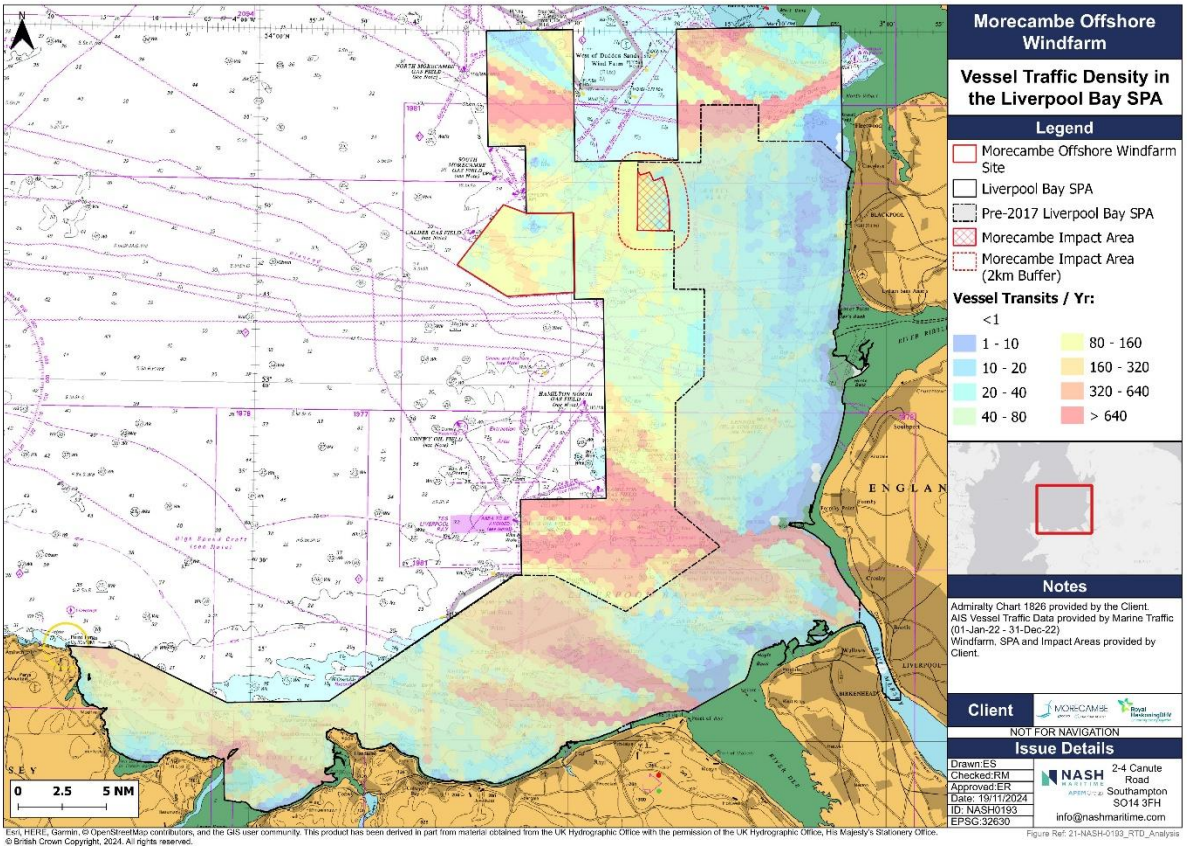

Figure 1: Vessel Traffic Density (2022) Through the Liverpool Bay SPA.

A detailed breakdown of the vessel activity within the SPA and the Morecambe Impact Area is provided in **Section 3.1** and **Section 3.2**, respectively.

3. VESSEL TRAFFIC ACTIVITY

This section provides a breakdown of the frequency and types of vessel movements through the Pre-2017 Liverpool Bay SPA and the Morecambe Impact Area.

3.1 LIVERPOOL BAY SPA (PRE-2017)

3.1.1 Vessel Traffic by Type

In total, 33,324 vessel movements were identified within the pre-2017 Liverpool Bay SPA in 2022 (~91 transits/day). The majority of these transits were by Tug & Service vessels (40%) or Passenger vessels (31%). **Figure 2** displays the total transit counts of each vessel type observed within the SPA in 2022.

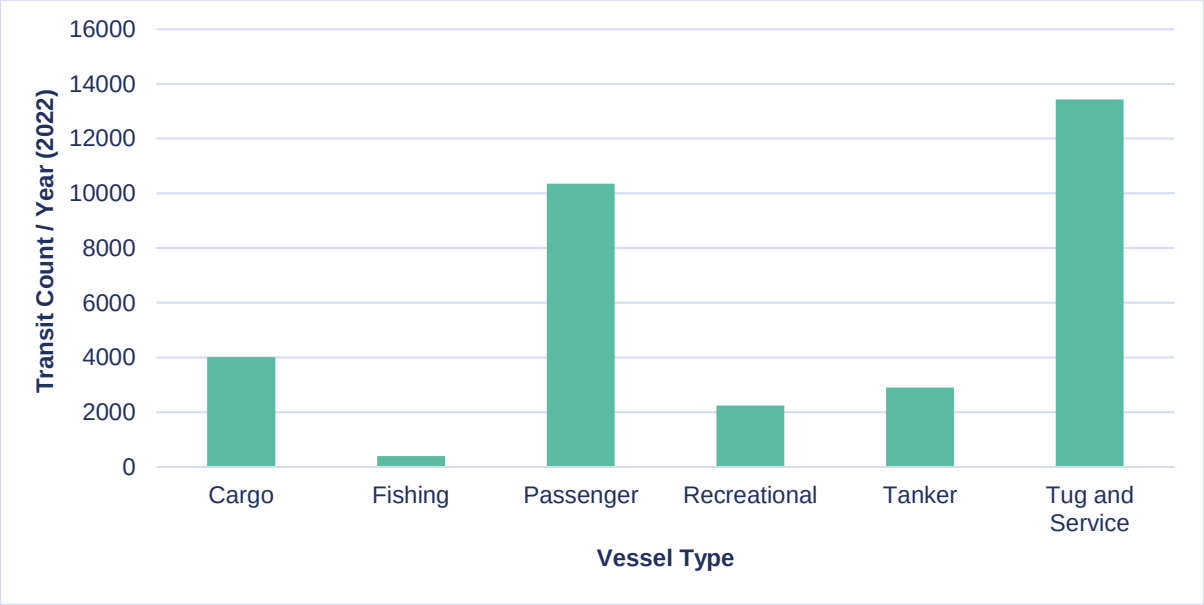

Figure 2: Vessel Transit Counts Through the SPA by Vessel Type (2022).

Tug & Service vessels account for the majority of transits through the SPA due to the offshore oil and gas infrastructure and existing offshore windfarms operating in the Irish Sea. Crew Transfer Vessels (CTVs), for instance, operate between Operation & Maintenance (O&M) bases and the existing OWFs, Walney and West of Duddon Sands (WoDS) to the north, and Burbo Bank and Gwynt y Mor to the southwest. Oil and gas associated supply ships and standby safety vessels also have a high intensity around where platforms are located.

The next most frequent vessel type in the SPA was Passenger vessels, due to the large number of ferry routes through the area. These routes are operated by Stena Line, Isle of Man Steam Packet Company (IoMSPC) and CLdN Ro-Ro Ltd (formerly Seatruck Ferries). There was also a significant amount of commercial vessel activity (>20%) as a result of the commercial routes that run in and out of Heysham and Liverpool.

3.1.2 Vessel Traffic by Season

Figure 3 and **Figure 4** show the transit counts per month and season, respectively, through the pre-2017 Liverpool Bay SPA in 2022. The seasons have been defined as follows:

- Spring – March, April, May;
- Summer – June, July, August;
- Autumn – September, October, November; and
- Winter – December, January and February.

The vessel transits through the SPA are also presented spatially in **Figure 5.**

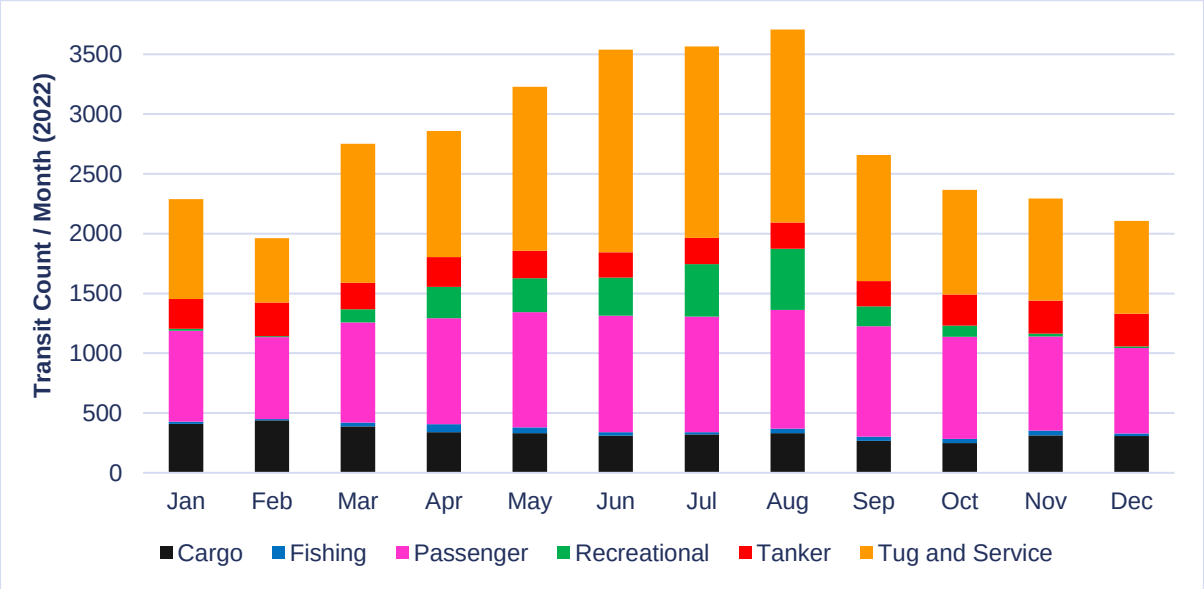

Figure 3: Vessel Transit Counts per Month within the SPA (2022).

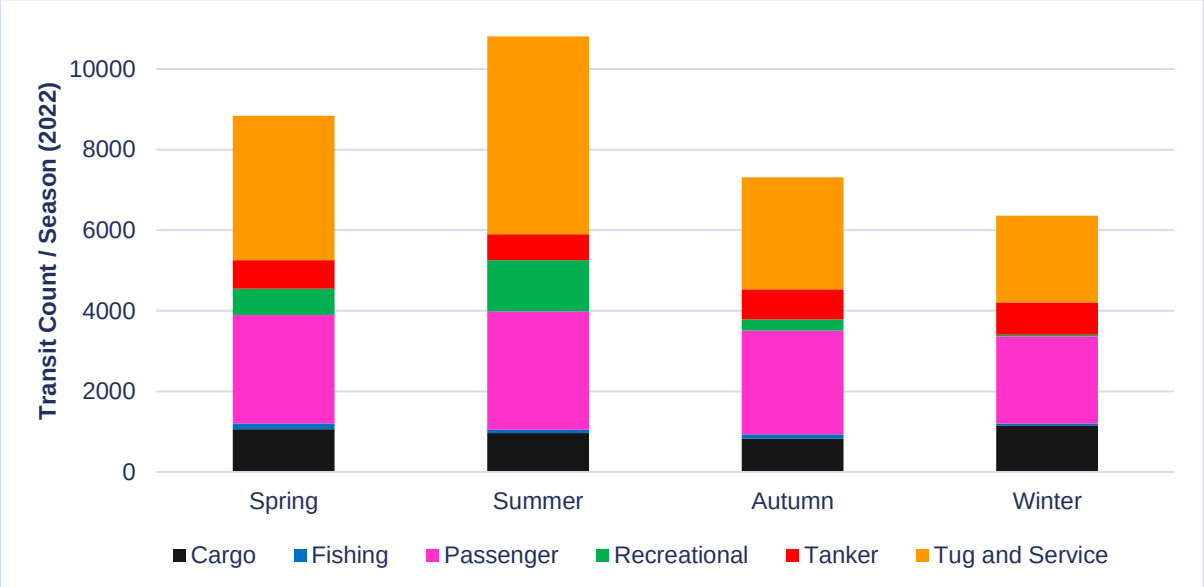

Figure 4: Vessel Transit Counts per Season within the SPA (2022).

Vessel traffic within the SPA peaks during summer, with a steady incline each month from the beginning of Spring (March), reaching its highest transit counts in August. The increase in Summer is due partly to the increase in ferry service operations, although these are relatively constant through Spring and Summer and only really reduce throughout Autumn and Winter. The largest drivers of the Summer peak are Tug & Service vessels and Recreational vessels, which accounted for 4909 transits (37% increase compared to the Spring transit count) and 1269 transits (94% increase compared to the Spring transit count), respectively. These increases are primarily due to better weather during the summer. This means that conditions are both more favourable for Recreational vessels and for wind farms to conduct maintenance campaigns, contributing to the increased Tug & Service vessel activity during this period.

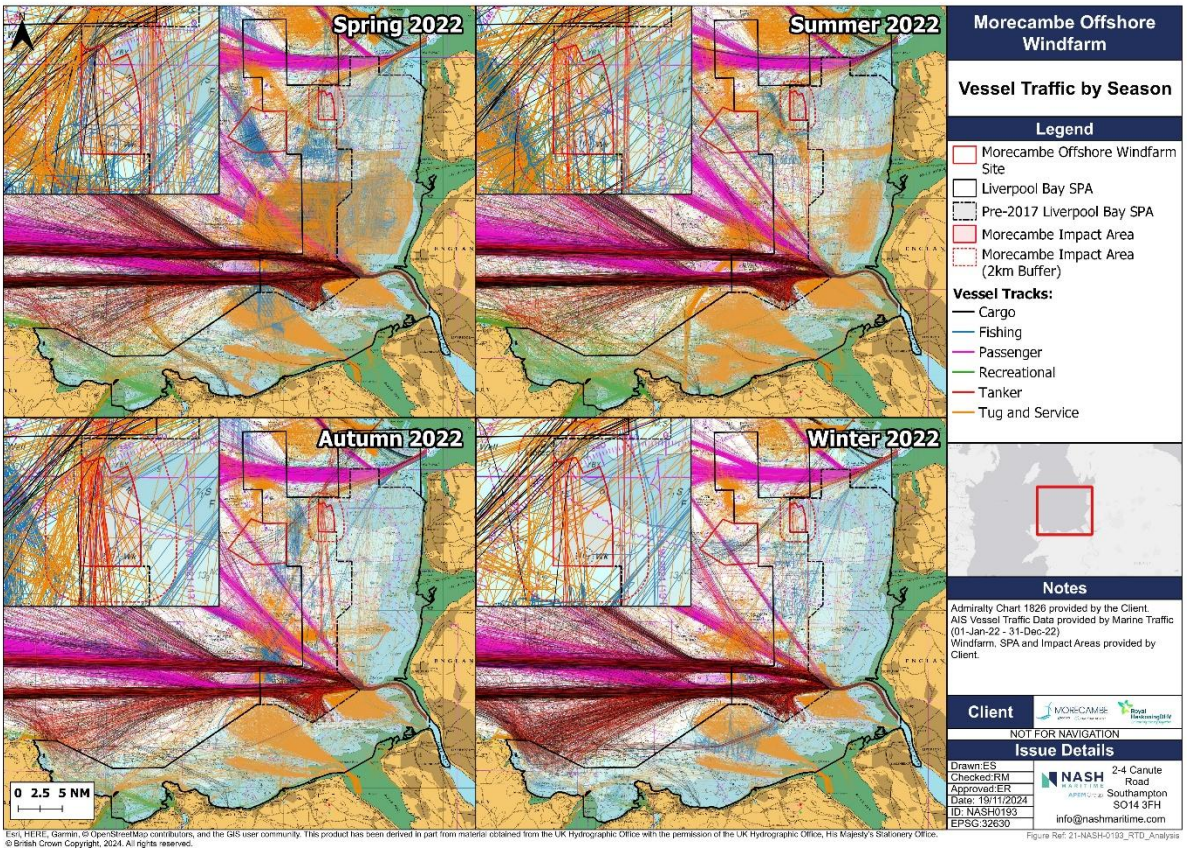

Figure 5: Vessel Tracks Through the SPA and Morecambe Impact Area by Season (2022).

3.1.3 Vessel Traffic by Length

Figure 6 shows a breakdown of the vessels observed within the Liverpool Bay SPA in 2022 by length overall (LOA). In general, most vessels observed transiting through the Liverpool Bay SPA are less than 50 m LOA (45%) or between 100 m and 150 m LOA (26%).

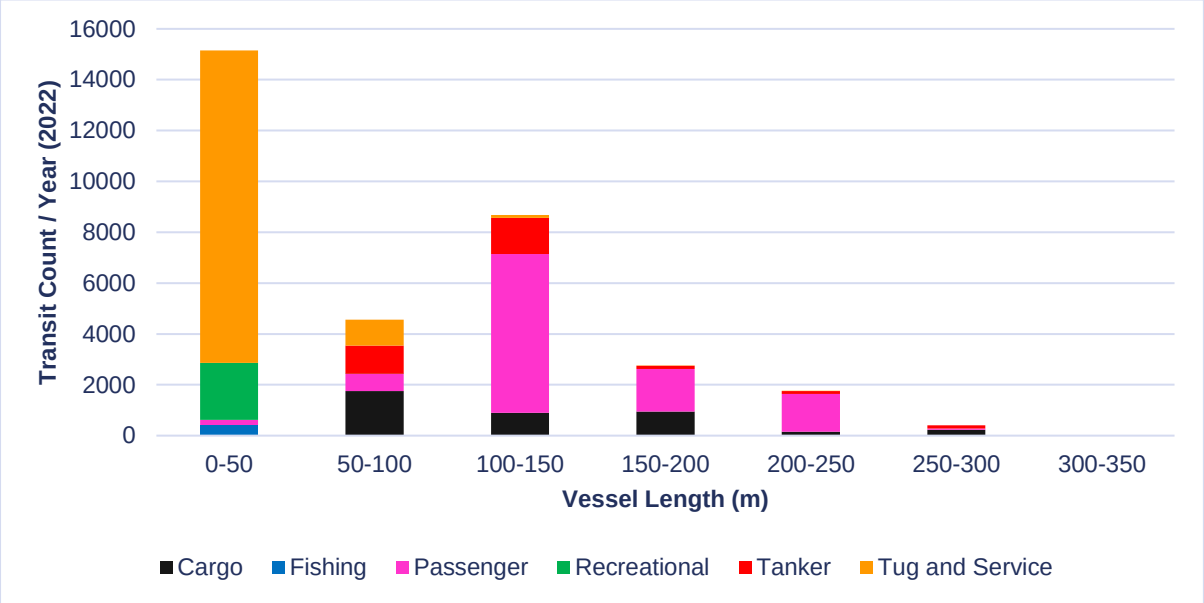

Figure 6: Vessel Transit Counts by Length Within the SPA (2022).

Over 91% of all the Tug & Service vessels observed in the SPA were smaller than 50 m LOA, contributing to the vessel length breakdown presented in **Figure 6.** Similarly, most (~60%) of the Passenger vessels, which accounted for over 30% of the total vessel transits through the SPA (**Section 3.1.1**), were Ro-Ro Ferries between 100 m and 150 m LOA. Some cruise vessels were observed in the SPA, accounting for 85% of the vessels between 200 m and 250 m LOA, and over 70% of the vessels > 200 m LOA observed within the SPA in 2022. Only 20 vessel transits by vessels > 300 m LOA were identified within the pre-2017 Liverpool Bay SPA in 2022.

3.1.4 Vessel Traffic by Speed

Section 2 concluded that the eastern region of the SPA (north of the entrance to the River Mersey) experiences on average the most similar level of vessel activity to that seen in the Morecambe Impact Area. As a result, for a better comparison, speed analysis has been conducted on just this eastern region of the SPA. The exact region used to undertake the speed analysis is shown in **Figure 7**. A total of 24,294 vessel transits were observed within the eastern portion of the pre-2017 Liverpool Bay SPA in 2022 (73% of those observed in the entire pre-2017 SPA).

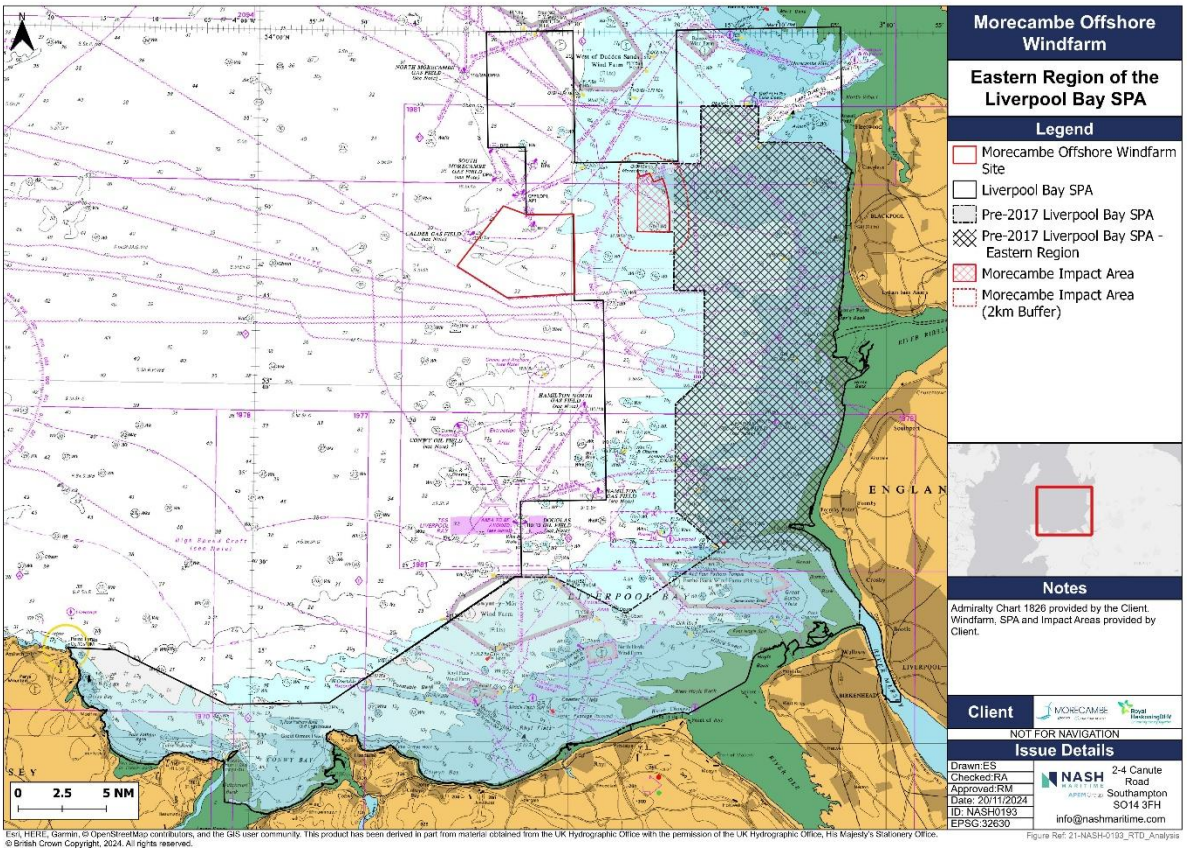

Figure 7: Eastern Region of the Pre-2017 Liverpool Bay SPA Used for Speed Analysis.

Figure 8 shows a breakdown of the 24,294 vessel tracks observed within the eastern portion of the Liverpool Bay SPA in 2022 by the average vessel speed. In general, most vessels (40%) observed transiting through this section of the Liverpool Bay SPA did so at between 15 kts and 20 kts, driven by the Ro-Ro Passenger ferries and some faster moving Tug & Service vessels. > 99% of the commercial vessels observed, transited through the area at between 5 kts and 15 kts.

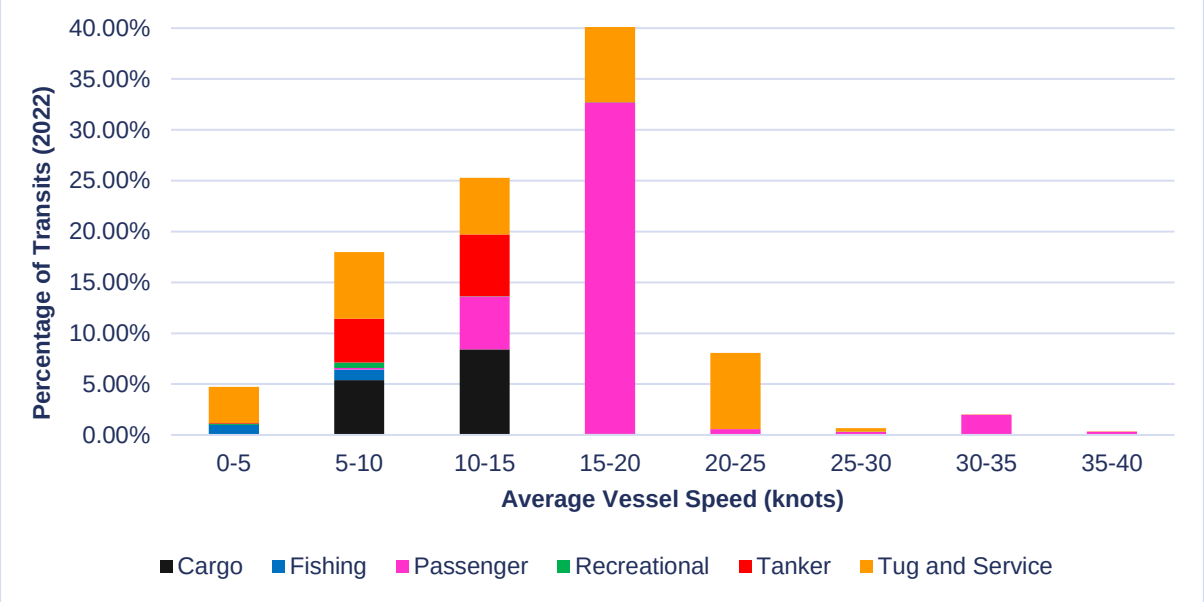

Figure 8: Percentage of Vessel Transits by Speed Within the SPA (2022).

3.2 MORECAMBE IMPACT AREA

3.2.1 Vessel Traffic by Type

In total, 365 vessel movements were identified within the Morecambe Impact Area of the Liverpool Bay SPA in 2022 (~1 transit/day). The majority of these transits were by Tug & Service vessels (62%) or Fishing vessels (16%). **Figure 9** displays the total transit counts of each vessel type observed within the SPA in 2022.

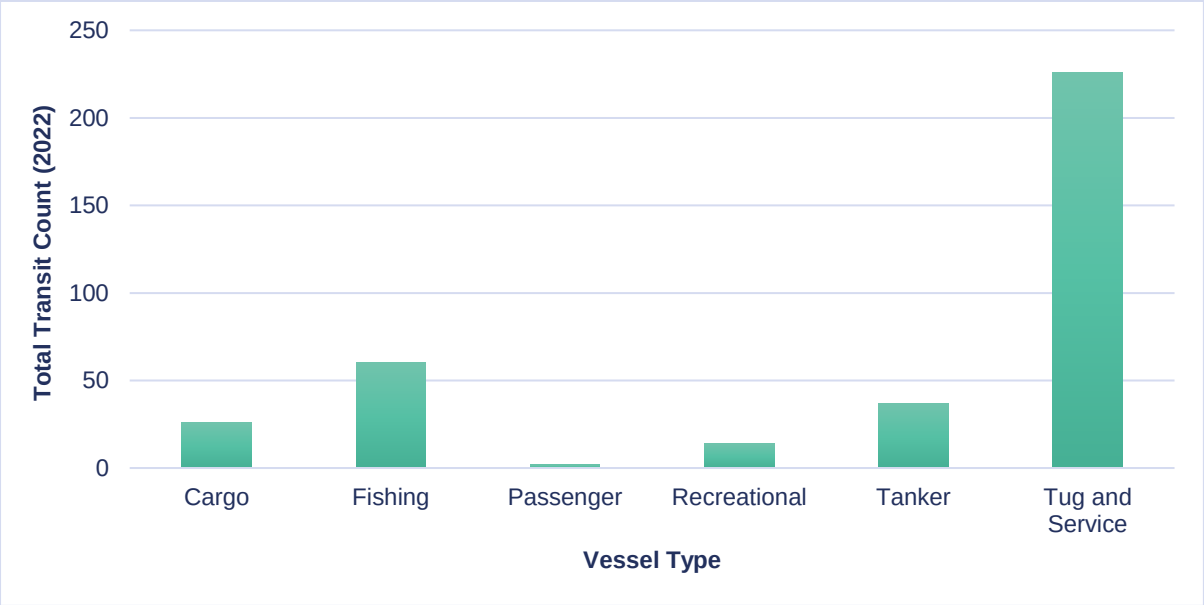

Figure 9: Transit Counts Through the Morecambe Impact Area by Vessel Type (2022).

Similar to the rest of the SPA, Tug and Service vessels account for the majority of transits (62%) through the Morecambe Impact Area due to the offshore oil and gas infrastructure and existing offshore windfarms operating in the Irish Sea. However, unlike other areas in the SPA, no major ferry routes intersect the Morecambe Impact Area, so only two Passenger vessel transits were observed in this area in 2022. The second most frequent vessel type in the Morecambe Impact Area was Fishing vessels, which accounted for 16% of transits through the Morecambe Impact Area in 2022 and occur throughout the Irish Sea year-round. A similar proportion of commercial (Cargo and Tanker) vessels were observed in the Morecambe Impact Area (17%) compared to the entire pre-2017 SPA (20%).

3.2.2 Vessel Traffic by Season

Figure 10 and **Figure 11** show the transit counts per month and season, respectively, through the Morecambe Impact Area in 2022.Transits through the Morecambe Impact Area are shown spatially within the inset maps within **Figure 5.**

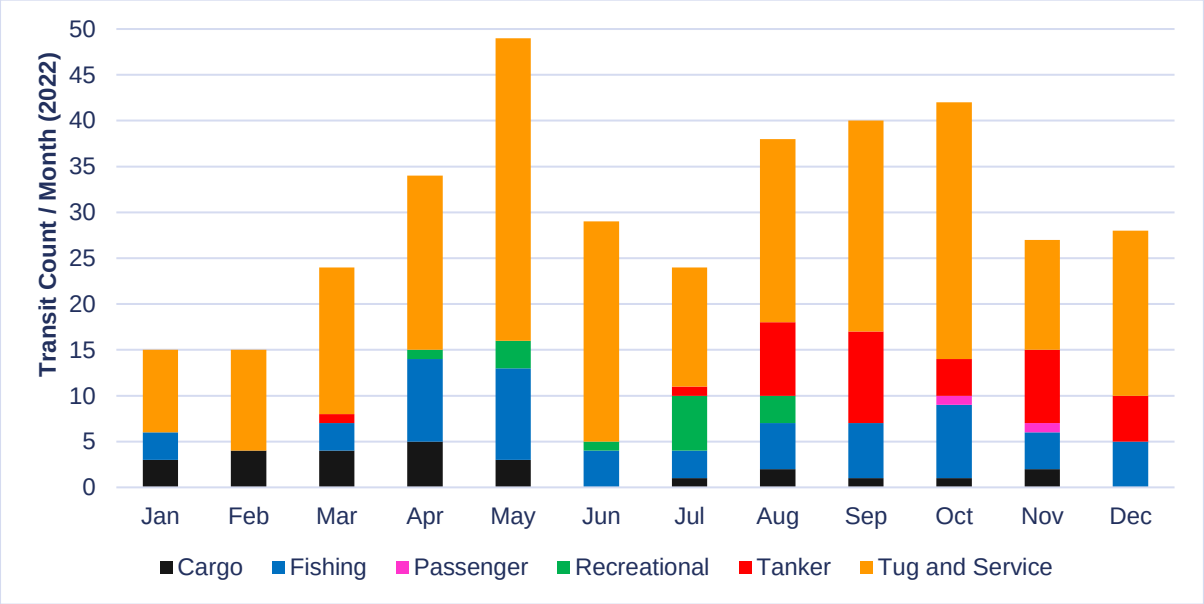

Figure 10: Vessel Transit Counts per Month within the Morecambe Impact Area (2022).

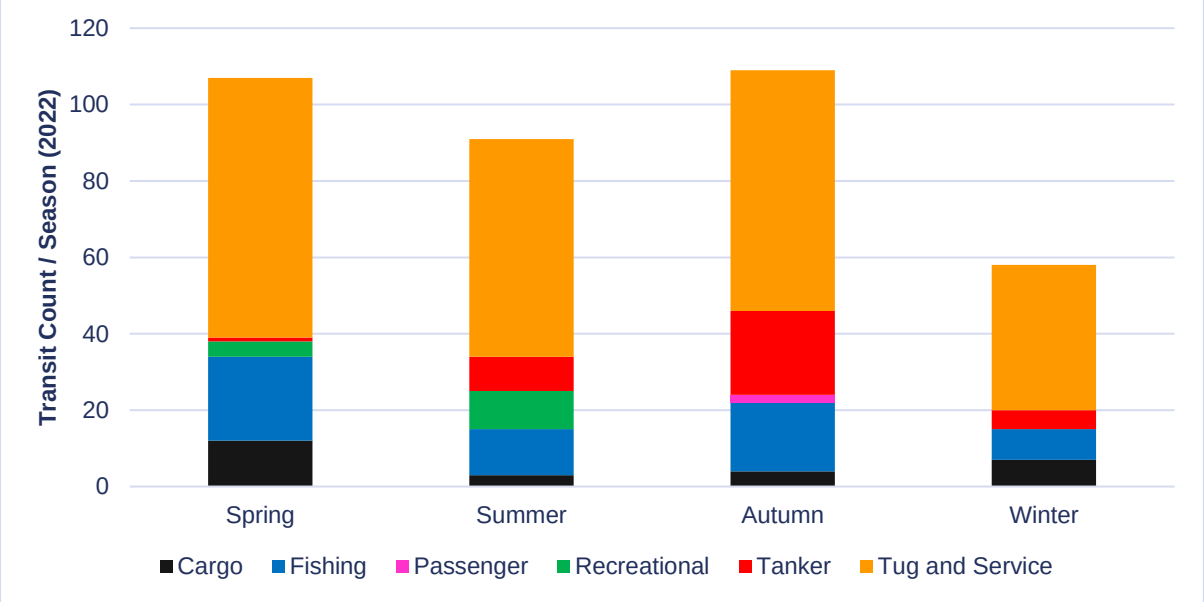

Figure 11: Vessel Transit Counts per Season within the Morecambe Impact Area (2022).

Vessel traffic within the Morecambe Impact Area peaks during spring and autumn, with a maximum amount of activity during May and a second slightly lower peak in October, with a reduction in June and July. Given the lack of Passenger vessels through this area, the largest drivers of the seasonal variation are Tug & Service vessels, Tankers, and Fishing vessels. In general, Tug & Service vessel activity remains relatively constant (between 19 and 23 transits/month on average) throughout spring, summer and autumn, only reducing sharply in winter. However, the Tug & Service vessel activity peaks significantly in May and October (33 and 28 transits, respectively (>16% higher than the next highest number of transits in June)), largely contributing to the overall peaks in these months. Fishing vessels are the next largest contributor to the seasonal variation, also peaking in May and October, in line with the Fishing seasons in the east Irish Sea. Tankers also transit through the area much more frequently in autumn compared to the other seasons, responding to oil demand, contributing the autumn high.

3.2.3 Vessel Traffic by Length

Figure 12 shows a breakdown of the vessels observed within the Morecambe Impact Area in 2022 by length overall (LOA). In general, most vessels observed transiting through the Morecambe Impact Area are less than 50 m LOA (45%) or between 100 m and 150 m LOA (26%).

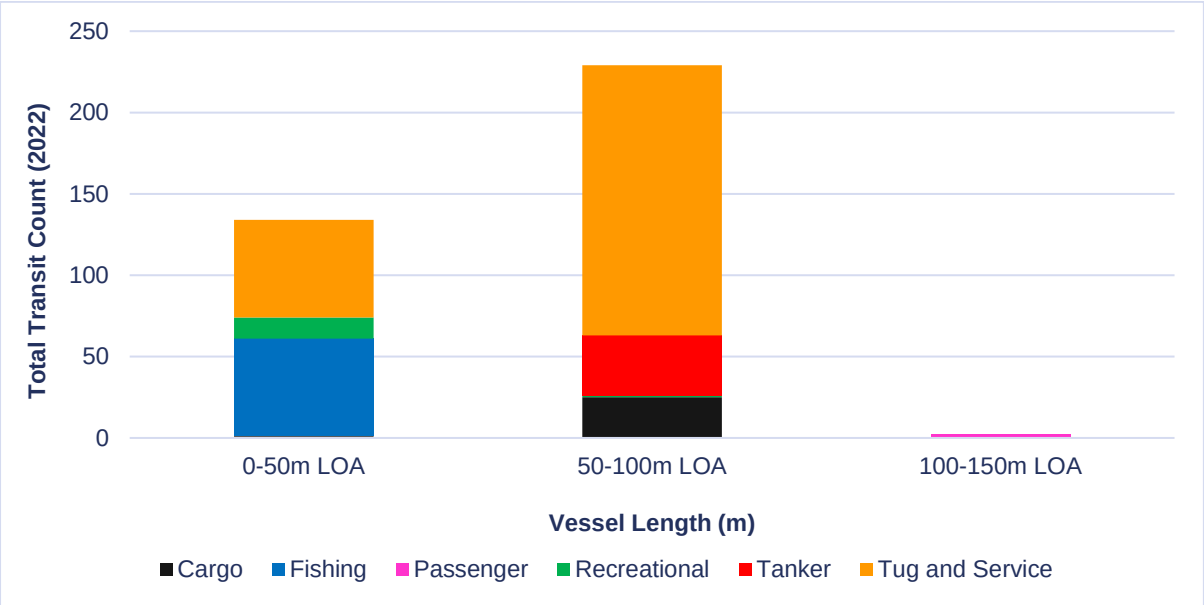

Figure 12: Vessel Transit Counts by Length Within the Morecambe Impact Area (2022).

Over 91% of all the Tug & Service vessels observed in the Morecambe Impact Area were smaller than 50 m LOA, contributing to the vessel length breakdown presented in **Figure 6.** Similarly, most (~60%) of the Passenger vessels, which accounted for over 30% of the total vessel transits through the SPA (**Section 3.1.1**), were Ro-Ro Ferries between 100 m and 150 m LOA. Some cruise vessels were observed in the SPA, accounting for 85% of the vessels between 200 m and 250 m LOA, and over 70% of the vessels > 200 m LOA observed within the SPA in 2022. Only 20 vessel transits by vessels > 300 m LOA were identified within the pre-2017 Liverpool Bay SPA in 2022.

3.2.4 Vessel Traffic by Speed

To understand the speed of vessels as they transited through the Morecambe Impact Area, and enable comparison to those within the entire eastern SPA (**Section 3.1.4**), the average vessel speeds were calculated based on the recorded vessel speeds through the 2km buffer of the Morecambe Impact Area. The 2km buffer was selected in order to increase the number of AIS data points from which the speeds were recorded, thus increasing the accuracy and reliability of the average speed calculations.

Figure 13 shows a breakdown of the vessel transits observed within the Morecambe Impact Area in 2022 by their average speed through the 2km buffer area. In general, most (55%) of the vessels observed within the Morecambe Impact Area transited through at between 5 kts and 10 kts. 71% of the transits were undertaken at an average speed < 10 kts, and 90% were undertaken at an average speed < 15 kts. The Morecambe Impact Area is located just 5nm southeast of the existing WoDS windfarm, so some of the service vessels observed may be slowing down as they approach the windfarm. Equally, the Morecambe Impact Area is located within 15nm of the ports of Heysham and Fleetwood, so speeds may be lower on their exit or entry from/to the port.

Fishing vessels, accounting for 16% of the transits through the Morecambe Impact Area, largely transited through the area at between 5 kts and 10 kts, typical of beam trawlers, which target this area of the Irish Sea for sole, thornback ray, plaice and brown shrimp.

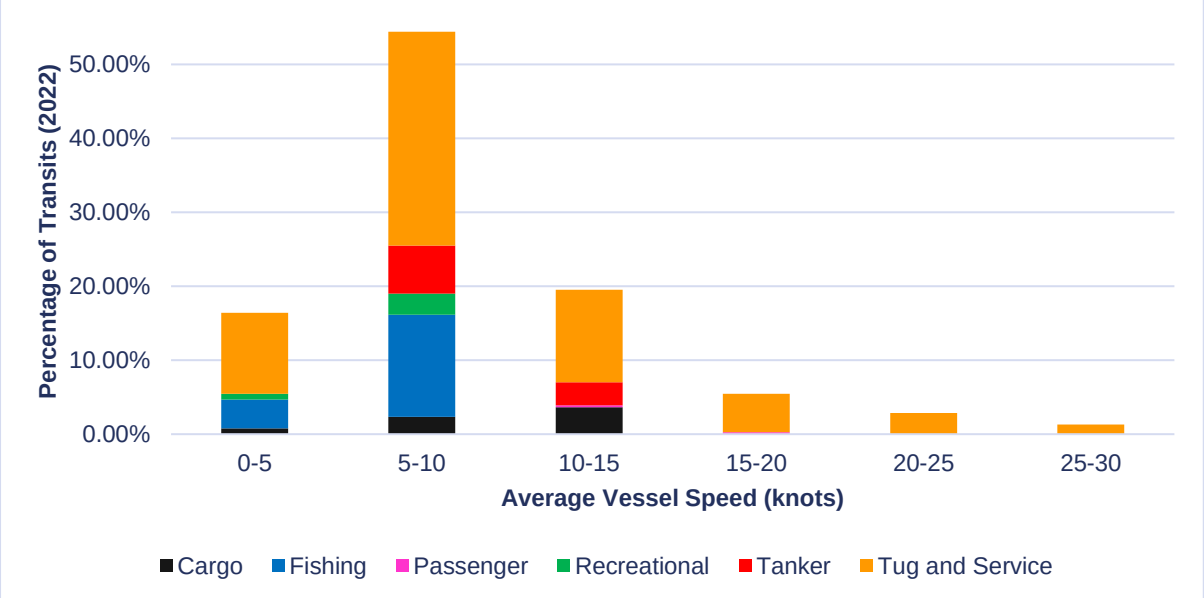

Figure 13: Vessel Transit Counts by Speed Within the Morecambe Impact Area (2022).

3.2.5 Vessel Traffic Quantity in Comparison to Similar-Sized Areas of the SPA

To understand how the level of activity within the Morecambe Impact Area compares to the activity elsewhere in the pre-2017 Liverpool Bay SPA, analysis was undertaken to obtain the number of transits that intersected other areas of the SPA of a similar size (~18 km^2) to the Morecambe Impact Area. The similar-sized areas, along with their transit count in 2022, is shown in **Figure 14.**

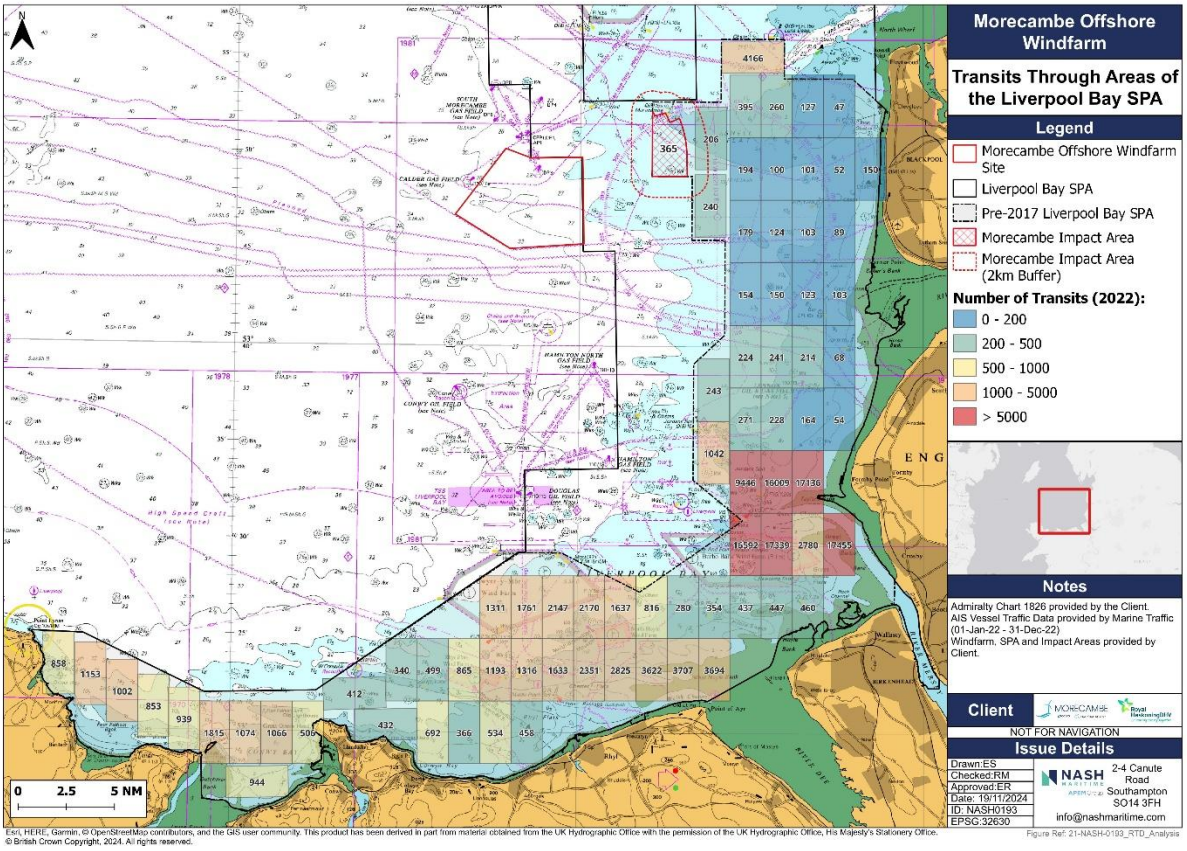

Figure 14: Transits Through 18km^2 Areas of the Liverpool Bay SPA (2022).

In general, the average transit count through an 18 km^2 area of the Liverpool Bay SPA in 2022 was 2,047, compared to 365 transits through the Morecambe Impact Area. The average for the entire SPA is driven by the high vessel density through the southern portion of the SPA, due to the vessels transiting in and out of Liverpool. Excluding the portion of the SPA south of the entrance to the River Mersey (those highlighted red in Figure 12, and southward), the average transit count through an 18 km^2 area of the SPA was 327, only 38 less than those within the Morecambe Impact Area.

4. FUTURE CASE TRAFFIC THROUGH THE SPA

Further analysis was undertaken to understand whether potential changes in vessel traffic as a result of the Project could affect the number of transits through the SPA or the amount of time the transits are within the SPA.

It is concluded within the Navigation Risk Assessment (NRA) for the Project (APP-073) that only one typical route is affected by the presence of the Project alone and would require a deviation as a result of the Project. This route is operated by Stena Line and runs between Liverpool and Belfast (east of Isle of Man, and east of Calder). This would require a deviation to the west of Calder of an additional 1.6nm distance. The base case and future case passage plans for this route were therefore examined in the context of the original, pre-2017, Liverpool Bay SPA. **Figure 15** shows the two passage plans overlaying the Liverpool Bay SPA.

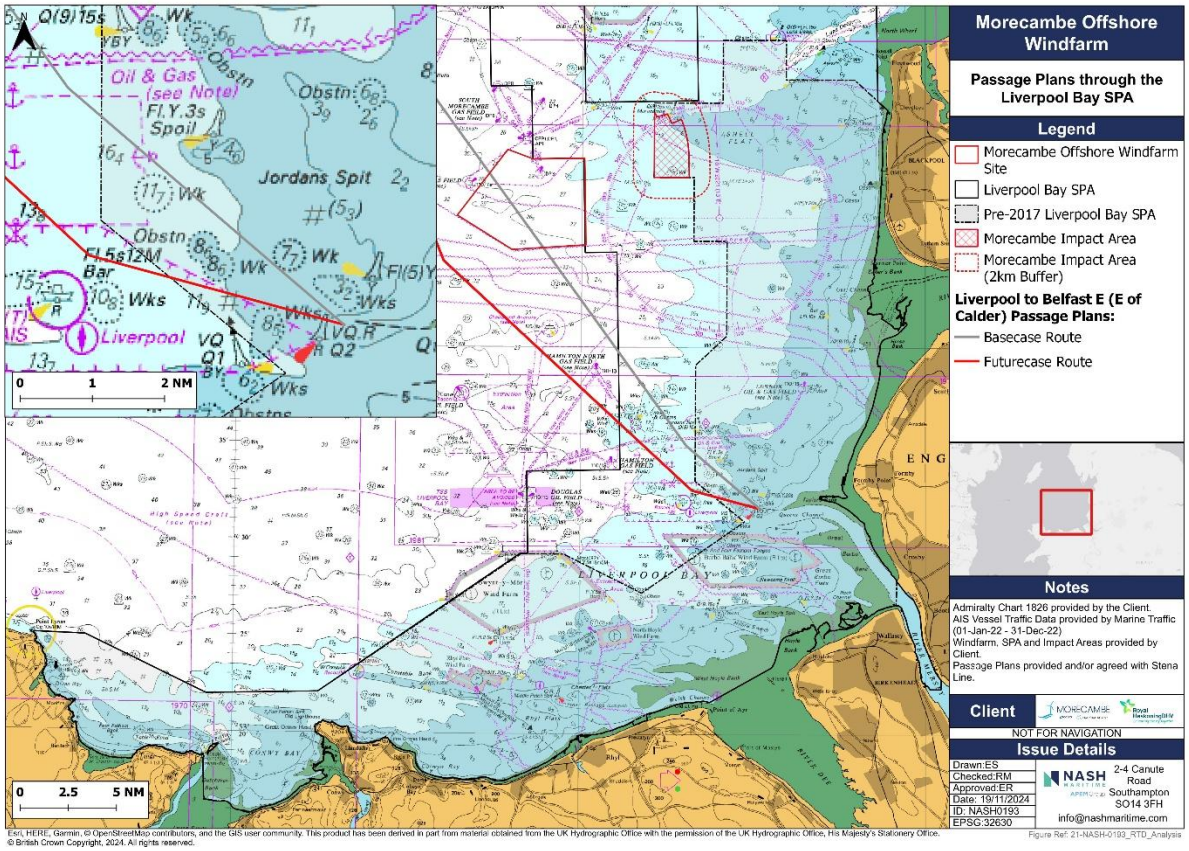

Figure 15: Liverpool - Belfast E (E of Calder) Base case and Future case Passage Plans within the SPA.

Both passage plans intersect the SPA en route into or out of Liverpool. The base case passage plan presented in Figure 13 transits within the SPA for 8.2 km. The future case passage plan, deviated to the southwest slightly, intersects the SPA further south and, as a result, only transits within the SPA for 4.6 km. Therefore, with the presence of the Project, and the required deviation of 1.6nm to the southwest of the Liverpool-Belfast E (E of Calder) route, each transit taking this route will transit through the SPA 3.6 km less than in the base case scenario. Assuming 196 transits take this route per year (as in 2022), vessels will transit through the SPA for approximately 705.6 km less per year compared to the base case scenario.

5. SUMMARY

In summary, the evidence presented above supports the following statements:

1. The southern part of the pre-2017 Liverpool Bay SPA has a much higher density of traffic compared to other areas (including the Morecambe Impact Area) due to the transits in and out of Liverpool.
2. The Morecambe Impact Area experiences ~365 transits/year, a similar level of vessel activity to that seen within other similar-sized areas within the eastern region of the pre-2017 Liverpool Bay SPA (327 transits/year on average)
3. Tug & Service vessels account for the 40% and 62% of transits within the SPA and Morecambe Impact Area, respectively.
4. Passenger vessels account for 31% of transits within the SPA, but very few within the Morecambe Impact Area.
5. Vessels transiting within the Morecambe Impact Area are generally smaller and travel slower compared elsewhere in the SPA.
6. While it is unlikely that the presence of Morecambe Offshore Windfarm: Generation Assets will affect the number of transits through the SPA, it is likely to reduce the distance travelled by some vessels within the SPA (by up to 706 km/year).

REFERENCES

Morecambe Offshore Windfarm: Generation Assets (2024). Volume 5, Appendix 14.1 Navigation Risk Assessment. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010121/EN010121-000266-5.2.14.1%20Appendix%2014.1%20Navigation%20Risk%20Assessment.pdf

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