

**BURBO BANK  
EXTENSION  
OFFSHORE  
WIND FARM**



DONG Energy Burbo Extension (UK) Ltd.

**Clarification Note: lesser black-backed gull Morecambe Bay SPA**

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Burbo Bank Extension Offshore Wind Farm

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DONG Energy Burbo Extension (UK) Ltd.

Prepared by: NIRAS Consulting

Checked by: Allen Risby (Environmental Manager, DONG Energy)

Accepted by: Stuart Livesey (Consents Project Manager, DONG Energy)

Approved by: Ferdinando Giammichele (Project Development Manager, DONG Energy)

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#### Burbo Bank Extension Offshore Wind Farm

c/o DONG Energy Burbo Extension (UK) Ltd.

33 Grosvenor Place

London

United Kingdom

SW1X 7HY

Telephone: +44 020 7811 5235

Website: [www.burbobankextension.co.uk](http://www.burbobankextension.co.uk)

Email: [burbobankextension@dongenergy.co.uk](mailto:burbobankextension@dongenergy.co.uk)

#### *Name & registered office:*

DONG Energy Burbo Extension (UK) Ltd.

Watson, Farley & Williams LLP

15 Appold Street

London

United Kingdom

EC2A 2HB

Company No. 07307131

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**Clarification Note: Lesser black-backed gull feature of  
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The following personnel are designated contacts for queries relating to this document:

| <b>Name</b> | <b>Job Title</b>    | <b>Telephone</b> | <b>Email</b>  |
|-------------|---------------------|------------------|---------------|
| Tim Norman  | Managing Director   | 01223 370181     | TNO@niras.com |
| Ian Ellis   | Principal Ecologist | 01223 370181     | IEL@niras.com |

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## **1. Introduction**

1.1 DONG Energy Burbo Extension (UK) Ltd. ("the Applicant") made an Application to the Planning Inspectorate (PINS) on 22<sup>nd</sup> March 2013 for a Development Consent Order (DCO) for the Burbo Bank Extension Offshore Wind Farm ("the Project") located in Liverpool Bay.

1.2 This Paper provides further clarification on the Burbo Bank Extension ornithological impact assessment, specifically on the information presented concerning the in-combination assessment for lesser black-backed gull. This Paper has been prepared in response to Natural England's Written Representations dated 28 October 2013; particularly Dr Alex Banks' Expert Report paragraphs 146-147.

1.3 This paper supports and expands upon the papers produced in September 2013, specifically Paper 8 – PBR analysis (NIRAS Consulting, 2013). Paper 8 presented a collision assessment on lesser black-backed gull for the Project site alone and in-combination with other projects. The focus of this paper is the refinement of the analysis of the potential in-combination effect on Morecambe Bay SPA, which supports a qualifying feature of breeding lesser black-backed gull. The analytical refinements described in this paper provide a more accurate and robust interpretation of the potential in-combination effects of the proposed Burbo Bank Extension offshore wind farm on lesser black-backed gull than has previously been available.

1.4 A further objective of this paper is to update the in-combination assessment using the tiered approach recently developed by JNCC and Natural England (October 2013), which is detailed in Annex 1 of the Natural England's Written Representations.

1.5 In summary, this paper re-evaluates the in-combination assessment carried out for lesser black-backed gull taking into account the following:

- Updated regional population data;
- A more accurate understanding of the location of the breeding colony in relation to the proposed wind farm and the likelihood that foraging birds from the colony would be exposed to collision risk;
- More accurate information about the actual effects of other wind farms within foraging range of the breeding colony;
- Adjustment of the predicted effects of other wind farms in light of historical changes in SPA population size; and
- Application of JNCC and Natural England's tiered approach to addressing in-combination effects.

## **2. Methodology**

### **Overview**

2.1 This assessment focuses on the lesser black-backed gull breeding feature of the Morecambe Bay SPA in response to the issues raised by Natural England in its Written Representations (Dr Alex Banks Expert Report paragraphs 146 and 147). However, the analytical approach outlined in this section also has implications for the in-combination collision risk assessment for the lesser black-backed gull features of the Ribble & Alt Estuaries SPA and Bowland Fells SPA. The potential effect on these SPAs is detailed in Appendix 1.

2.2 The assessment is undertaken in stages. Stages 1 - 4 are methodological updates to the assessment and investigate corrections and adjustments applied to collision risk estimates for the Project Site and other offshore wind farm sites considered in the in-combination assessment. Once

these refinements have been made, the tiered approach to in-combination assessment suggested by JNCC and Natural England is defined and applied.

2.3 Collision risk estimates are taken from Paper 8 in the first instance and are based, on a precautionary basis, on Option 2 of the Band (2012) Collision Risk Model.

#### **Stage 1: Updated population data**

2.3 The analysis presented in Paper 8 and developed under guidance from Natural England apportioned collision estimates to source colonies using a foraging range technique (NIRAS Consulting, 2013). Source colonies include both colonies designated as SPA and other colonies that are located within foraging range of the Project. To inform this analysis data held within the JNCC SMP Database was utilised.

2.4 An atlas survey of the breeding birds of Lancashire and North Merseyside for the period 2008-2011 (White *et al.* 2013), has been published subsequent to the publication of Paper 8. This provides details on lesser black-backed gull populations not included in the JNCC SMP database and, in some cases, colony data more contemporaneous to the Project site-specific bird survey dates.

2.5 These data are considered highly relevant to the in-combination assessment and comply with the approach developed with Natural England<sup>1</sup>. In some cases, White *et al.* (2013) count data are given for broadly defined areas (e.g. 'Liverpool population') and not all or some of its constituent colonies. In such cases, the number of breeding birds has been evenly distributed between the constituent SMP sites, modified in accordance with any site specific information provided by White *et al.* (2013).

2.6 The inclusion of this updated regional population data for lesser black-backed gulls leads to adjustment of the apportioning of collision effects predicted for the Project site and other sites considered in-combination. These results are presented, together with the refinements arising from Stage 2 (below), in Table 4.

#### **Stage 2: Foraging range definition and apportioning**

2.7 In this stage, more accurate information about the precise location of the breeding colony within the SPA is used to refine the understanding of the distance between the breeding colony and the proposed wind farm and the likelihood that birds from the colony will forage within the wind farm area.

2.8 Paper 8 apportioned predicted collision rates to different wind farms within foraging range of the SPA colony. This analysis used the mean-maximum foraging distance (Thaxter *et al.*, 2012) of lesser black-backed gulls and compared this to the distance between each wind farm and the colony. This distance was calculated, though, by measuring the distance between the wind farm site boundary and the nearest part of the SPA boundary. In the case of Morecambe Bay, which is a very large SPA, this introduces inaccuracies. The lesser black-backed gull colony of this SPA is confined to a single location and this analysis is updated here to account for Natural England's advice that the distance between the Project site and the precise colony location should be used<sup>2</sup>. This allows greater precision in determining the likely source of lesser black-backed gulls in a given area.

2.9 In addition, in this stage, the collision risk results obtained for projects considered in-combination have also been re-apportioned to take account of the colony size at the time of the survey

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<sup>1</sup> The Project site specific summer surveys were restricted to summer 2011, and so census data up to and including that summer are likely to be most appropriate. This approach is in accordance with the advice received from Natural England (A. Banks pers. comm. 25<sup>th</sup> July 2013).

<sup>2</sup> This technique was used for Burbo Bank Extension and Walney Extension in Paper 8 although not for other sites considered in-combination.

(e.g. surveys for Ormonde were undertaken in 2004 so that apportionment is now based on the colony size during that year).

2.10 This analysis also takes account of the updates undertaken in Stage 1 (i.e. update of colony data from White *et al.*, 2013).

**Stage 3: CRM scenarios used for projects considered in-combination**

2.11 Collision risk model (CRM) estimates sourced from planning application documents for other wind farm sites were used by NIRAS Consulting (2013) in the in-combination assessment presented in Paper 8 without further modification. These collision values were based on models using the worst case turbine array scenario which for bird collision risk would typically be those design envelope (Rochdale Envelope) scenarios involving the greatest rotor swept area.

2.12 Modelling outputs and the scenarios used to inform them are available for West of Duddon Sands (RPS, 2006a) and Walney I and II (RPS, 2006b). The scenarios used in modelling for both sites are notably different to the arrays that have actually been constructed, in both cases far fewer turbines were constructed than had originally been proposed (and assessed in their respective Environmental Statements). Consequently, the predicted collision risk estimates of these projects are likely to be significant over estimates and, in reality, the rates actually occurring will be lower than those used in Paper 8 (NIRAS Consulting, 2013).

2.13 Table 1 presents the number of turbines used in the CRM presented in the Environmental Statements for West of Duddon Sands and Walney I and II, and that which was subsequently constructed. Information indicates that 3.6 MW Siemens turbines were used in both the modelling process and subsequently then constructed at both sites.

**Table 1: Walney I & II and West of Duddon Sands modelled and constructed turbine scenarios and the resulting correction factor to be applied to in-combination assessment.**

| Specification               | Walney I & II | West of Duddon Sands |
|-----------------------------|---------------|----------------------|
| No. of turbines used in CRM | 152           | 139                  |
| No. of turbines constructed | 102           | 108                  |
| <b>Correction factor</b>    | <b>-32.9%</b> | <b>-22.3%</b>        |

2.14 The number of turbines constructed at Walney I and II (102) represents a 32.9% reduction from the scenario modelled. The number of turbines constructed at West of Duddon Sands (108) represents a 22.3% reduction from the scenario modelled.

2.15 It is assumed that a reduction in turbines will translate into a corresponding reduction in collisions. To investigate the relationship in the Band (2012) collision risk model of turbines and collision estimates experimental numbers of turbines were entered into the model. This indicated a direct linear relationship between the number of turbines and the collision estimates produced (i.e. if turbine number doubles, collision risk also doubles). Therefore, for the purposes of the in-combination assessment the predicted collision rates for other wind farms have been corrected to take account of any differences in the number of turbines proposed (and on which collision rate predictions were based) and the final build. The correction factors used are as shown in Table 1 (the results of this correction are presented in Table 5).

**Stage 4: Contemporaneous colony size relationship with CRM outputs**

2.16 Surveys of several projects considered in-combination were undertaken much earlier than those at Burbo Bank Extension. At the time of those surveys, the size of the populations of lesser black-



backed gulls and their distribution were different to those now and at the time that the baseline surveys for Burbo Bank Extension were undertaken. These differences will have influenced the predicted collision rates previously undertaken as it is assumed that the observed density of gulls at sea will be related to the size of the breeding population.

2.17 Any correction factor implemented to account of these changes requires assumptions in the relationship between colony size and at sea density which cannot be comprehensively tested. However, the changes in population for Bowland Fells and Morecambe Bay SPAs since the surveys were undertaken to inform Walney I and II, West of Duddon Sands (2005) and Ormonde (2004) have been dramatic (Table 2) and some attempt must be made to account for these population changes. Therefore, in the absence of any other information, it is assumed that any change in colony size translates, directly, into a change in collision risk. Collision rates for other wind farms included in the in-combination assessment have, therefore, in Stage 4 of this analysis, been corrected in accordance with Table 2 (see Table 6 for the results of this correction) to provide an indication of the influence of historical changes in colony size.

**Table 2: Colony population size changes since surveys for Walney I and II, West of Duddon Sands and Ormonde.**

| Wind farm                              | Year relevant to site-specific surveys | SPA                    | Contemporaneous colony size | Current colony size (individuals) | Change (%) |
|--|--|------------------------|-----------------------------|-----------------------------------|------------|
| Walney I & II and West of Duddon Sands | 2005                                   | Morecambe Bay          | 23,420                      | 16,260                            | -30.6%     |
|  |  | Bowland Fells          | 16,525                      | 10,937                            | -33.8%     |
|  |  | Ribble & Alt Estuaries | 6,696                       | 6,696 <sup>3</sup>                | 0          |
| Ormonde                                | 2004                                   | Morecambe Bay          | 24,400                      | 16,260                            | -33.36     |
|  |  | Bowland Fells          | 15,483                      | 10,937                            | -29.46     |
|  |  | Ribble & Alt Estuaries | 6,696                       | 6,696 <sup>4</sup>                | NC         |

### Potential Biological Removal

2.18 Table 3 presents the Potential Biological Removal (PBR) values calculated for the Morecambe Bay SPA as presented in Paper 8. The PBR value for the SPA will be compared to the outcomes of each analytical stage in order to indicate the level of change determined.

2.19 The breeding population of lesser black-backed gulls at Morecambe Bay SPA is declining and so a recovery factor (“*r*”) value of 0.3 is appropriate and used throughout this assessment<sup>5</sup>.

<sup>3</sup> Proposed colony size post-cull

<sup>4</sup> Proposed colony size post-cull

<sup>5</sup> See Paper 8 (NIRAS Consulting, 2013) Section 4.4 for the appropriate selection of recovery factors.

**Table 3: The breeding population size and PBR value for lesser black-backed gull at Morecambe Bay SPA for a given year and a range of recovery factors ( $f$ )**

| SPA                   | Morecambe Bay SPA |
|-----------------------|-------------------|
| No. of breeding birds | 16,280 (2011)     |
| $f$                   | PBR value         |
| 0.1                   | 89                |
| 0.2                   | 177               |
| 0.3                   | 266               |
| 0.4                   | 354               |
| 0.5                   | 443               |
| 1.0                   | 886               |

### 3. In-combination assessment

#### Tiered approach to in-combination assessment

2.20 Recent guidance regarding in-combination assessment produced by JNCC and Natural England (2013) outlines a suggested approach for determining the confidence in the assessment performed. The approach introduces a framework that details the process in which other plans or projects should be included into the assessment.

2.21 The structured approach, critically, allows the level of uncertainty associated with the assessment tiers (and the data used within each tier) to be highlighted. Following this guidance the data sourced for each project considered in-combination with the Project for lesser black-backed gull collision is designated to one of six tiers (where confidence decreases with increasing tiers). An outline of the tier system suggested by JNCC and Natural England is included in Appendix 2.

2.22 Walney I & II and Ormonde are all classed as Tier 1 projects as both sites are operational, with pre-construction and post-construction surveys having been carried out. West of Duddon Sands is classed as Tier 2 as post-construction monitoring has not yet been started. Walney Extension is classified as a Tier 4 project as environmental characterisation survey data, and associated analyses, are available. Rhiannon is classified as a Tier 5 project, as although environmental characterisation data is available as preliminary results in the Celtic Array Zonal Appraisal and Planning Report (Centrica Energy, 2012), these data are potentially subject to significant change.

#### In-combination assessment: Tiers 1 - 3

3.1 The following sections detail changes to the lesser black-backed gull in-combination assessment taking account of projects included in Tiers 1, 2 and 3. These are considered to be projects where a lesser degree of uncertainty is likely in data presented to characterise the baseline environment.

3.2 Table 4 presents the changes to the collision values presented in Paper 8 (NIRAS Consulting, 2013) as a result of updated colony census data from White *et al.*, (2013) and changes to take into account:

- the distance from the wind farm site to the colony locations within Morecambe Bay SPA (Stages 1 and 2).

- changes to collision risk estimates as a result of changes to the number of turbines constructed compared with the number on which original collision risk modelling was based. Data is only available for Walney I and II and West of Duddon Sands for this exercise (Stage 3).
- corrections for changes in Morecambe Bay SPA and Bowland Fells SPA colony populations (Stage 4).

**Table 4: Updated lesser black-backed gull collision risk estimates taking into account of refinements in Stages 1 to 4**

| Stage      | Description                                   | No. of collisions apportioned to Morecambe Bay SPA |               |                      |           |            | % of PBR    |
|------------|---|--|---------------|----------------------|-----------|------------|-------------|
|            |   | Burbo Bank Extension                               | Walney I & II | West of Duddon Sands | Ormonde   | Total      |             |
|            | Collisions as presented in Paper 8            | 34   | 74            | 107                  | 45        | 260        | 97.7        |
| <b>1-2</b> | Changes to foraging range and population data | 31 (-3)  | 76 (+2)       | 112 (+5)             | 43 (-2)   | 262 (+2)   | 98.5        |
| <b>3</b>   | Turbine reduction                             | 31 (0)   | 51 (-25)      | 87 (-25)             | 43 (0)    | 212        | 79.7        |
| <b>4</b>   | Contemporaneous colony size correction        | 0  | -14           | -24                  | -13       | 161        | 60.5        |
|            | <b>Final collision risk estimate</b>          | <b>31</b>  | <b>37</b>     | <b>63</b>            | <b>30</b> | <b>161</b> | <b>60.5</b> |

3.3 Application of the Stage 1–4 refinements for the projects in Tiers 1-3 leads to an in-combination collision rate of 161. This equates to 60.5% of the Morecambe Bay SPA PBR at  $f = 0.3$  (266 birds).

3.4 Paper 9, Table 4 (NIRAS Consulting, 2013a) notes the absence of collision risk data for lesser black-backed gull in the environmental assessment for the Barrow offshore wind farm. This small Round 1 wind farm off Morecambe Bay has been operational since 2006 and so a case can be made that any effect from this wind farm may be considered part of the existing baseline conditions for this area.

3.5 Gwynt y Mor is a Tier 2 project (currently under construction) and Paper 9, Table 4 (NIRAS Consulting, 2013a) notes the absence of CRM data for lesser black-backed gull. That Paper (section 3.14) also notes that the Appropriate Assessment for that project included an assessment in-combination with Burbo Bank, Rhyl Flats and North Hoyle. An in-combination annual total of 17 lesser black-backed gull collisions was predicted. This yearly total (not partitioned to breeding season) was not apportioned to colony and was calculated using an earlier version of the Band model. The Paper notes that the majority of any collisions at these sites would be allocated to the Ribble and Alt Estuaries SPA as the closest SPA where lesser black-backed gull is a qualifying feature.

**In-combination assessment: Tiers 1 – 4**

3.6 The approach described for Tiers 1-3 to has been repeated, but with the inclusion of Tier 4 projects. The only project in Tier 4 is Walney Extension, for which an application was submitted to the Planning Inspectorate in June 2013.

3.7 In Paper 8 (NIRAS Consulting, 2013) CRM results presented for Walney Extension were calculated using Option 3 of the Band (2012) CRM. In this analysis the results from Option 2 of the Band (2012) CRM have been used to provide consistency with the Project CRM and this is reflected in Table 5. The changes to Tiers 1-3 presented in Table 5 are the net changes when the individual changes for each wind farm are combined.

3.8 Stages 3 and 4 are not applicable to Tier 4 projects. However, Table 5 presents the net change for Tiers 1-3 taking into account Stages 3 and 4, in order to aid understanding of the final comparison between cumulative collision risk estimates and the PBR value for Morecambe Bay SPA.

**Table 5: Updated collision risk estimates taking into account additional changes (Stages 2 and 3) for projects classified as Tiers 1 - 4**

| Stage(s) | Description  | No. of collisions |                  |            | % of PBR    |
|----------|--|-------------------|------------------|------------|-------------|
|          |  | Tiers 1-3         | Walney Extension | Total      |             |
| -        | Collisions as presented in Paper 8 (including changes to CRM data) | 260               | 17               | 277        | 104.1       |
| 1-2      | Collisions from Stages 1 and 2                                     | 262               | 17               | 279        | 104.9       |
| 3        | Collisions from Stage 3  | -50               | 17               | 229        | 86.1        |
| 4        | Collisions from Stage 4  | -51               | 17               | 178        | 67.9        |
|          | <b>Final collisions</b>  | <b>161</b>        | <b>17</b>        | <b>178</b> | <b>67.9</b> |

3.9 Application of the Stage 1 – 4 refinements for the projects in Tiers 1-4 leads to an in-combination collision rate of 178. This equates to 67.9% of the Morecambe Bay SPA PBR at  $f = 0.3$  (266 birds).

**In-combination assessment: Tiers 1 – 5**

3.10 This section represents a repeat of the in-combination assessment of Tiers 1 -4 with the addition of sites deemed to be within Tier 5. This refers to Rhiannon only, for which an application has not yet been submitted. Preliminary collision risk estimates are presented through a Zonal Appraisal and Planning (ZAP) Report (Centrica Energy, 2012). These results are considered open to change so that uncertainty in the confidence in the assessment of this Tier 5 project is significant. Results are indicated in Table 6.

**Table 6: Updated collision risk estimates taking into account additional changes (Stages 2 and 3) for projects classified as Tiers 1 - 5**

| Stage | Description                | No. of collisions |          |       | % of PBR |
|-------|----------------------------|-------------------|----------|-------|----------|
|       |                            | Tiers 1-4         | Rhiannon | Total |          |
| 1-2   | Collisions from Stages 1-2 | 279               | 76       | 355   | 133.5    |
| 3     | Collisions from Stage 3    | -50               | 76       | 305   | 114.7    |
| 4     | Collisions from Stage 4    | -51               | 76       | 254   | 95.5     |

| Stage | Description             | No. of collisions |           |            | % of PBR    |
|-------|-------------------------|-------------------|-----------|------------|-------------|
|       |                         | Tiers 1-4         | Rhiannon  | Total      |             |
|       |                         |                   |           |            |             |
|       | <b>Final collisions</b> | <b>178</b>        | <b>76</b> | <b>254</b> | <b>95.5</b> |

3.11 Application of the Stage 1–4 refinements for the projects in Tiers 1 - 5 leads to an in-combination collision rate of 254. This equates to 95.5% of the Morecambe Bay SPA PBR at  $f = 0.3$  (266 birds).

#### 4. PBR recovery factors

4.1 Table 7 and Table 8 present the comparison between final collision risk estimates calculated in Tables 4, 5, and 6 against PBR values for Morecambe Bay SPA at a range of recovery factors. The highlighted cells indicate the recovery factor at which the Morecambe Bay PBR is surpassed for each of the cumulative tiers. Table 7 presents CRM figures when analytical Stages 1 -3 are considered while Table 8 considers Stages 1-4.

**Table 7: Predicted cumulative collision mortality rate (individuals per breeding season) for lesser black-backed gull attributed to Morecambe Bay SPA compared to PBRs at a range of recovery factors for analytical Stages 1-3.**

| SPA           | $f$        | PBR        | Tiers 1-3         |           | Tier 4            |           | Tier 5            |            |
|---------------|------------|------------|-------------------|-----------|-------------------|-----------|-------------------|------------|
|               |            |            | No. of collisions | % of PBR  | No. of collisions | % of PBR  | No. of collisions | % of PBR   |
| Morecambe Bay | 0.1        | 89         | 212               | 238       | 229               | 257       | 305               | 342        |
|               | 0.2        | 177        | 212               | 120       | 229               | 129       | 305               | 172        |
|               | <b>0.3</b> | <b>266</b> | <b>212</b>        | <b>80</b> | <b>229</b>        | <b>86</b> | <b>305</b>        | <b>114</b> |
|               | 0.4        | 354        | 212               | 60        | 229               | 65        | 305               | 86         |
|               | 0.5        | 443        | 212               | 48        | 229               | 52        | 305               | 69         |
|               | 1          | 886        | 212               | 24        | 229               | 26        | 305               | 34         |

**Table 8: Predicted cumulative collision mortality rate (individuals per breeding season) for lesser black-backed gull attributed to Morecambe Bay SPA compared to PBRs at a range of recovery factors for analytical Stages 1-4.**

| SPA           | $f$ | PBR | Tiers 1-3         |          | Tier 4            |          | Tier 5            |          |
|---------------|-----|-----|-------------------|----------|-------------------|----------|-------------------|----------|
|               |     |     | No. of collisions | % of PBR | No. of collisions | % of PBR | No. of collisions | % of PBR |
| Morecambe Bay | 0.1 | 89  | 161               | 181      | 178               | 200      | 254               | 285      |
|               | 0.2 | 177 | 161               | 91       | 178               | 101      | 254               | 144      |

| SPA | <i>f</i>   | PBR        | Tiers 1-3         |           | Tier 4            |           | Tier 5            |           |
|-----|------------|------------|-------------------|-----------|-------------------|-----------|-------------------|-----------|
|     |            |            | No. of collisions | % of PBR  | No. of collisions | % of PBR  | No. of collisions | % of PBR  |
|     | <b>0.3</b> | <b>266</b> | <b>161</b>        | <b>61</b> | <b>178</b>        | <b>67</b> | <b>254</b>        | <b>95</b> |
|     | 0.4        | 354        | 161               | 45        | 178               | 50        | 254               | 72        |
|     | 0.5        | 443        | 161               | 36        | 178               | 40        | 254               | 57        |
|     | 1          | 886        | 161               | 18        | 178               | 20        | 254               | 29        |

## 5. Discussion

5.1. The Inclusion of analytical Stages 1-4 indicates that in-combination collision estimates do not surpass the Morecambe Bay PBR value at  $f = 0.3$  even when projects from all Tiers are considered (Table 8).

5.2. When only Stages 1 -3 of the analysis are undertaken, collision estimates for Projects deemed to be within Tiers 1-4 do not surpass the PBR value at  $f = 0.3$ . Only when Tier 5 projects are considered is the  $f = 0.3$  value exceeded. The figures for the Tier 5 project are preliminary and represent significant uncertainty.

5.3. Appendix 1 presents the results of the above assessment when it is applied to the cumulative collision risk applied to the Ribble & Alt Estuaries SPA and Bowland Fells SPA. The cumulative collision risk apportioned to the Ribble & Alt Estuaries SPA is well below the PBR value at a recovery factor of 0.5. Further to this, the cumulative collision risk apportioned to this SPA remains below the PBR value at recovery factors of 0.3 and above. The apportioned collision risk for Bowland Fells SPA does not exceed the PBR value at any of the recovery factors presented.

## 6. References

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## 7. Appendices

### Appendix 1 – Implications for other SPAs within foraging range

#### *Ribble & Alt Estuaries SPA*

7.1 Table 9 presents the SPA apportioning results for the Ribble & Alt Estuaries SPA taking into account the various levels of correction and adjustment. The final cumulative collision risk is then compared to the relevant PBR value (Paper 8, Table 13).

**Table 9: SPA apportioning results for lesser black-backed gull at the Ribble & Alt Estuaries SPA taking into account corrections and adjustments**

| Stage | Description                               | No. of collisions    |               |                      |          |                  |           |           | % of PBR  |
|-------|---|----------------------|---------------|----------------------|----------|------------------|-----------|-----------|-----------|
|       |   | Tiers 1-3            |               |                      |          | Tier 4           | Tier 5    | Total     |           |
|       |   | Burbo Bank Extension | Walney I & II | West of Duddon Sands | Ormonde  | Walney Extension | Rhiannon  |           |           |
| -     | Data as presented in Paper 8 <sup>6</sup> | 59                   | 7             | 13                   | 2        | 2                | 37        | 120       |           |
| 1-2   | Changes to distances and population data  | 53                   | 5             | 8                    | 2        | 2                | 32        | 102       |           |
| -     | BAE Warton cull                           | 44                   |               |                      |          | 1                | 26        | 86        |           |
| 3     | Turbine reduction                         |                      | 4             | 6                    |          |                  |           | 83        |           |
| 4     | Contemporaneous SPA Apportioning          |                      | 2             | 3                    | 1        |                  |           | 77        |           |
| 5     | <b>Final collisions</b>                   | <b>44</b>            | <b>2</b>      | <b>3</b>             | <b>1</b> | <b>1</b>         | <b>26</b> | <b>77</b> | <b>42</b> |

<sup>6</sup> The data for Walney Extension uses Option 2 of the Band (2012) CRM and as such is not taken from Paper 8



*Bowland Fells SPA*

7.2 Table 10 presents the SPA apportioning results for Bowland Fells SPA taking into account the various levels of correction and adjustment. The final cumulative collision risk is then compared to the relevant PBR value (Paper 8, Table 13).

**Table 10: SPA apportioning results for lesser black-backed gull at Bowland Fells SPA taking into account corrections and adjustments**

| Stage | Description                               | No. of collisions    |               |                      |          |                  |           |           | % of PBR  |
|-------|---|----------------------|---------------|----------------------|----------|------------------|-----------|-----------|-----------|
|       |   | Tiers 1-3            |               |                      |          | Tier 4           | Tier 5    | Total     |           |
|       |   | Burbo Bank Extension | Walney I & II | West of Duddon Sands | Ormonde  | Walney Extension | Rhiannon  |           |           |
| -     | Data as presented in Paper 8 <sup>6</sup> | 20                   | 6             | 8                    | 2        | 2                | 25        | 62        |           |
| 1     | Changes to distances and population data  | 18                   | 6             | 8                    | 3        | 2                | 24        | 61        |           |
| 2     | Turbine reduction                         |                      | 4             | 6                    |          |                  |           | 57        |           |
| 3     | Contemporaneous SPA Apportioning          |                      | 3             | 4                    | 2        |                  |           | 53        |           |
| 4     | <b>Final collisions</b>                   | <b>18</b>            | <b>3</b>      | <b>4</b>             | <b>2</b> | <b>2</b>         | <b>24</b> | <b>53</b> | <b>30</b> |

## Appendix 2 – Tiered approach for cumulative assessment

**Table 11: Suggested tiers for undertaking a staged cumulative impact assessment Tier description.**

| Consenting or construction stage |   | Data availability  |
|----------------------------------|---|--|
| <b>Tier 1</b>                    | Built and operational projects should be included within the cumulative assessment where they have not been included within the environmental characterisation survey, i.e. they were not operational when baseline surveys were undertaken, and/or any residual impact may not have yet fed through to and been captured in estimates of “baseline” conditions e.g. “background” distribution or mortality rate for birds. | Pre-construction (and possibly post-construction) survey data from the built project(s) and environmental characterisation survey data from proposed project (including data analysis and interpretation within the ES for the project). |
| <b>Tier 2</b>                    | Tier 1 + projects under construction  | As Tier 1 but not including post-construction survey data  |
| <b>Tier 3</b>                    | Tier 2 + projects that have been consented (but construction has not yet commenced)   | Environmental characterisation survey data from proposed project (including data analysis and interpretation within the ES for the project) and possibly pre-construction survey data from built project.                                |
| <b>Tier 4</b>                    | Tier 3 + projects that have an application submitted to the appropriate regulatory body that have not yet been determined   | Environmental characterisation survey data from proposed project (including data analysis and interpretation within the ES for the project)  |
| <b>Tier 5</b>                    | Tier 4 + projects that the regulatory body are expecting an application to be submitted for determination (e.g. projects listed under the Planning Inspectorate programme of projects)  | Possibly environmental characterisation survey data (but strong likelihood that this data will not be publicly available at this stage).   |
| <b>Tier 6</b>                    | Tier 5 + projects that have been identified in relevant strategic plans or programmes (e.g. projects identified in Round 3 wind farm zone appraisal and planning (ZAP) documents)   | Historic survey data collected for other purposes/by other projects or industries or at a strategic level.   |