DRAFT DEPARTMENTAL BRIEF

Irish Sea Front potential SPA

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Contents

Summary

The Irish Sea Front potential Special Protection Area (pSPA) lies in the Irish Sea, to the southwest of the Isle of Man and to the northwest of Anglesey.

The Irish Sea Front pSPA qualifies under **Article 4.2** of the Birds Directive (2009/147/EC) by regularly supporting a population of European importance of the following migratory species, foraging at sea during the breeding season:

- Manx shearwater (*Puffinus puffinus*).

As required by Article 4 of Directive 2009/147/EC, the purpose of this pSPA is to enable the application of special conservation measures concerning the habitat of Annex 1 and regularly occurring migratory species in order to ensure their survival and reproduction in their area of distribution.

Location and Habitats

The Irish Sea Front potential SPA (pSPA) is situated in the Irish Sea about 35 km southwest of the Isle of Man and about 36 km northwest of Anglesey. It covers 180 km^2 of the UK offshore waters around Wales. Within the pSPA, the bathymetry changes rapidly as small 'trenches' in the seabed stretch from the southwest to the northeast; water depths range between 45 m at the eastern limit of the location and 80m at the southern limit of the location. The combined effect of currents and waves creates a moderate-energy seabed environment, comprised of either coarse sediments or sand and muddy sand (McBreen et al. 2011).

About 15 km to the west of the pSPA, a large channel up to 150 m deep stretches from North to South. To the southwest of the Isle of Man, a dome of thermally stratified waters forms over this channel during spring due to the seasonal warming of the surface waters. South to the Isle of Man the sea is shallower and tidal currents are strong enough to mix the water column, thereby preventing stratification. Between these two bodies of stratified and mixed waters, a tidal-mixing front appears known as the 'Western Irish Sea Front'. In spring, this front forms mainly south and east of the stratified waters; it establishes over the summer and disintegrates again in late summer when the air temperature cools down (Simpson and Hunter 1974). Fronts are known to aggregate marine organisms, creating a patch of high density of prey which can make feeding profitable for shearwaters even when targeting small prey items (Vlietstra et al. 2005). In the Western Irish Sea highest aggregations of zooplankton are found at the frontal region (Scrope-Howe and Jones 1985). It is possible that small herring, an important prey species for Manx shearwaters in this region (Brook 1990), aggregate at the front area due to circulatory patterns or due to responses to thermal or salinity gradients (Schneider 1990).

Bird Survey Information

The European Seabirds at Sea database

The European Seabirds at Sea (ESAS) database is a collation of information from surveys of seabirds at sea made for a wide range of purposes in northwest European waters. It contains data on seabirds, collected from ships and aircraft, using standardised methods described by Tasker et al. (1984), Webb and Durinck (1992) and Camphuysen et al. (2004). Data collected between 1980 and 2006 were used to identify the scale and location of

hotspots for seabirds across the UK within the British Fishery Limit. Further information on ESAS and the analytical methods is summarised in 'Marine SPAs for seabirds' [1].

The analysis of the ESAS data identified the Irish Sea Front pSPA as an important area for Manx shearwaters. It determines the overall importance of the location for the qualifying species, provides the extent of the area, an estimate of the number of birds present at the location and information on how regularly they occur.

Boat survey data collected within the Irish Sea Zone for a Zonal Appraisal and Planning (ZAP) Report

Between March 2010 and September 2011, Centrica Energy conducted a series of monthly boat surveys to assess bird distributions at sea in the 'Irish Sea Zone', one of the areas identified under The Crown Estate's 'Round 3' programme for offshore windfarm development. The aim was to assess the likely impacts to seabird populations of developing wind farms within the potential development area. Their survey area covered over 2,100 km^2 of sea south of the Isle of Man, and it partially overlapped with the Irish Sea Front pSPA at its western extent (Centrica Energy 2012). The methods applied largely followed and expanded on the COWRIE recommendations (Camphuysen et al. 2004).

These boat survey data provide some background on the spatial and temporal distribution of Manx shearwaters recorded in the overall area south of the Isle of Man, including parts of the Irish Sea Front pSPA. They support the findings of the ESAS analysis by identifying an area of high densities of Manx shearwaters in the western extent of the study area, where it overlaps with the Irish Sea Front pSPA. Data were collected in 2010 and 2011, thus provide an independent analysis on more recent data that indicates the bird populations recorded for Irish Sea Front pSPA in the ESAS database are likely to be present in more recent years.

Tracking data from Manx shearwater colonies on Copeland, Skomer and Lundy

During the incubation period and chick rearing period of 2009, 2010 and 2011, Dean et al. (2012) fitted 83 birds from the colony at Copeland, Northern Ireland, and 85 birds from the colony at Skomer Island, Wales, with GPS loggers and geolocator-immersion loggers. With help of Hidden Markov models, they identified seabird activities from the data, such as foraging, direct flight and sitting. Kernel Density Distribution models were then used to map areas where the birds showed these behaviours. During the incubation period, the modelled foraging distributions of individuals from both colonies overlap with the Irish Sea Front pSPA in some years. The exact location of the main foraging areas varied annually, but the general area of the front and particularly surrounding the deep channel west of the front (and west of the pSPA) were consistently part of the main foraging areas of the observed individuals (Dean et al. 2012).

In 2009 and 2010, Dean et al. (2010) fitted 31 chick-rearing Manx shearwaters with GPS loggers at Lundy, England. The mapped tracks indicate that individuals from Lundy are present in the Irish Sea Front pSPA.

In June to August 2004 – 2006, Guildford et al. (2008) fitted 34 breeding Manx shearwaters from Skomer Island in Wales with Global Positioning Devices. Although none of the recorded locations appear to be in the Irish Sea Front pSPA, some are close by and suggest that birds might move through the general area.

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[1] Marine SPAs for seabirds.

The tracking studies indicate that breeding Manx shearwaters from at least three different colonies around the Irish Sea are likely to use the Irish Sea Front pSPA to forage during the breeding season, thereby establishing a link between these colonies and the pSPA. They highlight the potential significance of the pSPA as a foraging area for the Manx shearwater breeding population across the Irish Sea region.

Seabird Census and Seabird Monitoring Programme

Information on the size of the Manx shearwater populations at the linked colonies at the Skomer and Skokholm SPA, the Lundy colony and the Copeland colony are available from periodic censuses of seabird colonies across the UK (undertaken in 1969-70, 1985-88 and 1998-2002). Some counting of colonies occurs between censuses and the results are also collated by the seabird monitoring programme [2].

The information from the seabird colony counts is used to supplement ESAS data to provide evidence of regular occurrence of species at colonies which are most likely to provide birds that forage in the Irish Sea Front pSPA.

Assessment against the UK SPA selection guidelines

The SPA Selection Guidelines set out a two stage process for SPA identification in the UK. Stage 1 identifies areas that are likely to qualify for SPA status based mainly on population size and regular usage. Stage 2 re-assesses the areas identified under Stage 1 to select from these the most suitable territories in number and size for SPA classification, based on ecological criteria.

Guidelines under Stage 1:

> 1.1. An area is used regularly by 1% or more of the Great Britain population (or in Northern Ireland, the all-Ireland population) of a species listed in Annex I to the Birds Directive (2009/147/EC) in any season.
>
> 1.2. An area is used regularly by 1% or more of the biogeographical population of a regularly occurring migratory species (other than those listed in Annex I) in any season.
>
> 1.3. An area is used regularly by an assemblage of over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) or 20,000 seabirds in any season.
>
> 1.4. An area which meets the requirements of one or more of the Stage 2 guidelines in any season, where the application of Stage 1 guidelines 1, 2 or 3 for a species does not identify an adequate suite of most suitable sites for the conservation of that species.

Guidelines under Stage 2:

> 2.1. Population size. Areas holding or supporting more birds than others and/or holding or supporting birds at higher concentrations are favoured for selection.

[2] http://jncc.defra.gov.uk/smp/

2.2. Species range. Areas selected for a given species provide as wide a geographic coverage across the species' range as possible.

2.3. Breeding success. Areas of higher breeding success than others are favoured for selection.

2.4. History of occupancy. Areas known to have a longer history of occupation or use by the relevant species are favoured for selection.

2.5. Multi-species areas. Areas holding or supporting the larger number of qualifying species under Article 4 of the Directive are favoured for selection.

2.6. Naturalness. Areas comprising natural or semi-natural habitat are favoured for selection over those which do not.

2.7. Severe weather refuges. Areas used at least once a decade by significant proportions of the biogeographical population of a species in periods of severe weather in any season, and which are vital to the survival of a viable population, are favoured for selection.

The analysis of 26 years of ESAS data gave a modelled population value of 12,039[3] Manx shearwaters using the Irish Sea Front pSPA during the breeding season. The population of Manx shearwaters therefore exceeds 11,000 birds or 1% of the biogeographic population (Mitchell et al. 2004), the threshold used under guideline 1.2 of the UK SPA selection guidelines (Stroud et al. 2001). Note that there is a recent population estimate for the Manx shearwater colony at Skomer (Perrins et al. 2012) not considered in the population estimate from Mitchell et al. (2004). This estimate suggests that the current biogeographic population could be much larger than estimated by Mitchell et al (2004), which would raise the 1% population threshold to 17,600 individuals. The application of the adjusted threshold is controversial (see Annex 4 for details), however, if applied it would not have changed the outcome of JNCC's application of Stage 1 or Stage 2 of the UK SPA selection guidelines. See Annex 4 for details.

Although the population threshold is exceeded by Manx shearwater numbers estimated to be present in the Irish Sea Front pSPA, the analysis was unable to show that the qualifying numbers for a pSPA were present on a regular basis: it could only be shown that numbers above the threshold were present in 3 out of 5 years of data, while a minimum of 2/3 of all years would have been required (Kober et al. 2012). Because the pSPA missed the criterion of regularity only by a narrow margin, JNCC considered it further as a potential site under 1.4 of the guidelines. Under 1.4, seabird population sizes within the site do not have to exceed the threshold of 1% of the biogeographic population on a regular basis, but an assessment applying the Stage 2 guidelines is required instead. This assessment concluded that the Irish Sea Front pSPA holds a sufficient number of Manx shearwaters to justify proposing this location under 1.4 of the guidelines. For details on JNCCs assessment of locations with Stage 2 refer to the document 'Application of Stage 2' [4].

[3] The population figure is based on spatial interpolation and taken directly from the modelled output; whilst a precise figure is quoted it should only be considered an indication of the scale of the population size rather than an absolute measurement.

[4] Application of Stage 2

Table 1. JNCC's assessment of the Irish Sea Front pSPA against Stage 1 of the UK SPA selection guidelines.

Species and season	Status	Population size in the Irish Sea Front pSPA	Relevant population threshold for qualification	Stage 1 guideline
Manx shearwater, breeding	migratory	12,039 birds 3	11,000 birds [a]	1.4

[a] based on 1% of biogeographic population of 1,110,000 birds (Mitchell et al. 2004). But refer also to Annex 4 for further information on the biogeographic population used.

Table 2. Assessment of the Irish Sea Front pSPA against Stage 2 of the UK SPA selection guidelines.

Feature	Qualification	Assessment
1. Population size and density	✓	The Irish Sea Front pSPA is the third largest marine aggregation of breeding Manx shearwaters identified in UK waters (Kober et al. 2012). It is an area where the estimated number of Manx shearwaters exceeded the 1% biogeographic population threshold. The site is likely to be used as a foraging area by shearwaters from at least three different colonies throughout the overall Irish Sea. A total of over 394,000 breeding pairs of Manx shearwaters occur within a distance equatingl to their foraging range from the pSPA.
2. Species range	-	The location of the pSPA in the Irish Sea places it central to the breeding ranges of Manx shearwaters in the UK. A total of 18 colonies are within the shearwater foraging range of the Irish Sea Front pSPA.
3. History of occupancy	✓	The oldest account of Manx shearwaters in waters around the Isle of Man stems from Njal's Saga, which describes that in 1014 a Viking fleet anchoring off the Calf of Man colony suffered nocturnal avian most from Manx shearwaters (Williamson 1973). More recently, ESAS data suggests that the Irish Sea Front pSPA was used in 3 out of 5 years with sufficient data in significantly higher numbers than elsewhere (1990, 1991, 1998).
4. Multi-species area	-	Although the Irish Sea Front pSPA is used also by other seabirds, only Manx shearwater reach qualifying numbers in the area.
5. Naturalness	-	The Irish Sea Front pSPA is a largely natural site.
6. Severe weather refuge	-	No information available.

Site status and boundary

The proposed name for this site is the "Irish Sea Front SPA" (Figure 1).

The boundary of the Irish Sea Front pSPA is based on the extent of the important aggregation of Manx shearwaters identified through analysis of available data. The analysis, with the aim to determine the extent and the limits of the Manx shearwater aggregation, is illustrated in Figure 2 and described in the following steps:

(1) The raw observations of Manx shearwaters from all relevant surveys are extracted from the ESAS database (Figure 2a).

(2) A geostatistical interpolation technique[5] used the raw observations to predict Manx shearwater densities in un-surveyed areas between the existing data, producing an estimate of Manx shearwater densities in every 6x6 km grid cell (Figure 2b). The size of the grid cells was chosen to make the best use of the data, given the spatial precision of the original observations (Kober et al. 2010).

(3) A scoring system was applied to all grid cells on the map to pick out cells with high Manx shearwater densities, particularly when these cells were also next to other high density cells. The cells with the top 1% highest ranking scores were chosen, they identify where Manx shearwaters aggregate most. Selected cells neighbouring each other were merged into bigger areas (Figure 2c).

(4) To identify areas that in theory meet the UK SPA selection guideline, each area with an aggregation was assessed if it holds a Manx shearwater population in excess of 1% of their population on a regular basis. Two areas off the Pembrokeshire coast and close to the Skomer and Skokholm SPA met this criterion fully. The Irish Sea Front pSPA holds the required number of individuals to qualify. However, it does not meet the strict criterion of regularity but was nevertheless included into the consideration as it was a close near-miss (instead being present in 2/3 of all years with data, this location was shown to be present only in 3 out of 5 years). A boundary was drawn around its outer limits (Figure 2d).

For a more detailed description of the methods see 'Marine SPAs for seabirds' [6]. For the technical reports on the methods, see Kober et al. (2010; 2012).

[5] The technique used was Poisson kriging, as this is the most suitable technique for zero-inflated data with varying sampling effort, such as the seabird data in ESAS (Kober et al. 2010).

[6] Marine SPAs for seabirds

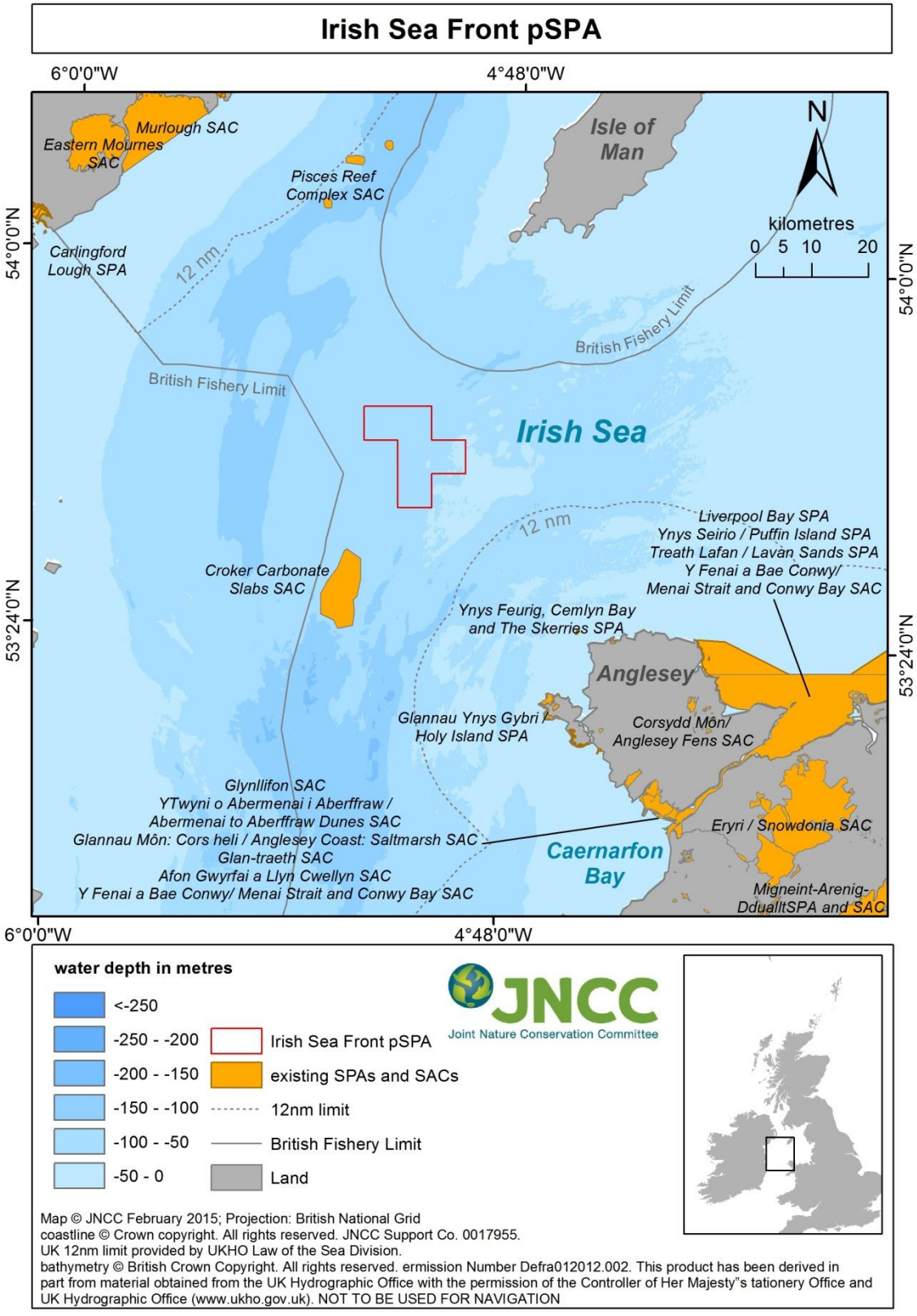

Figure 1. Location of the Irish Sea Front pSPA together with other marine Natura sites in the region.

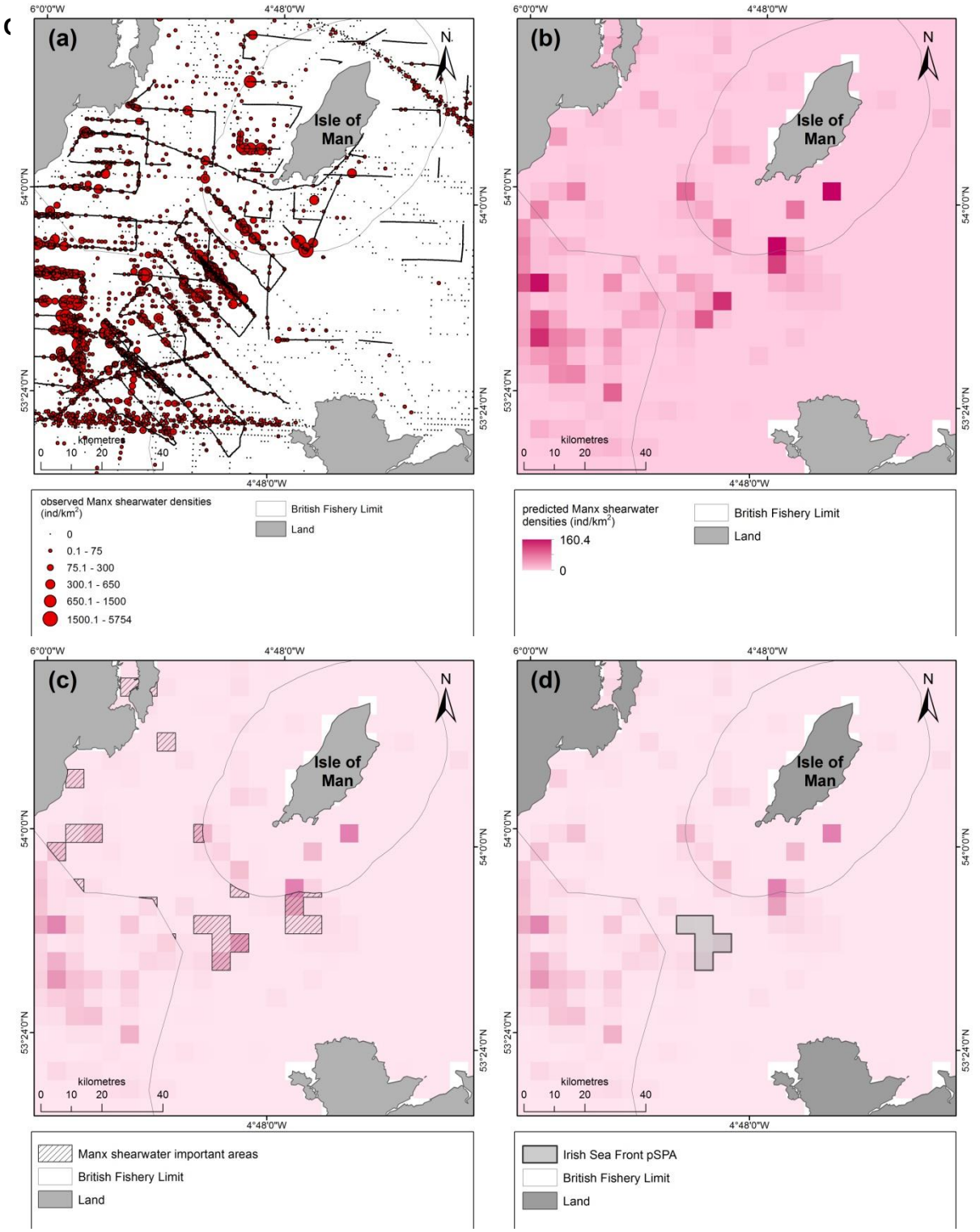

Figure 2. Analytical steps to identify the most important area for Manx shearwaters in the Irish Sea. (a) raw ESAS observations on Manx shearwaters during the breeding season, (b) predicted densities of Manx shearwaters, (c) important areas for Manx shearwaters within the British Fishery Limit, and (d) boundary of the Irish Sea Front pSPA, the only important area holding >1% of the biogeographic population on a near-regular basis in the region and which is located within UK offshore waters.

Information on the qualifying species, the Manx shearwater

Manx Shearwater

Population size and density

Based on observations of Manx shearwaters at sea, obtained from the ESAS database, the population at the Irish Sea Front potential SPA is estimated to be approximately 12,000 birds. The estimated densities of Manx shearwater range between 27 birds/km^2 and 136 birds/km^2.

The population estimate of Manx shearwaters at the Irish Sea Front pSPA was based on ESAS data collected in the area between 1983 and 1998. To assess if the observed population size is likely to be at comparable level in more recent years, an investigation by Centrica Energy was considered, which collected data on distribution of Manx shearwaters in a large survey area south of the Isle of Man in 2010 and 2011 (Centrica Energy 2012). These data also indicate the presence of a location with particular high Manx shearwater densities in the area of the Irish Sea Front pSPA; thus they suggest that the distribution pattern described by the ESAS data in earlier years persists into more recent years.

Maximum shearwater densities observed during the boat surveys by Centrica Energy of 34 birds/km^2 were at the lower end of the range of maximum densities observed during ESAS surveys between 1983 and 1998 (0 – 2035 birds/km^2). The data on Manx shearwater densities show a high annual variability, i.e. Centrica Energy found a pronounced peak in shearwater numbers in August 2010 but not in 2011 (Centrica Energy 2012). In addition, foraging Manx shearwaters tend to cluster in large foraging aggregations and rafts, which lead to clumped distributions and highly variable density observations within individual surveys. It is therefore possible that the observed lower densities in recent years are due to the high natural variability in the data, they do not necessarily show a genuine decrease in numbers of shearwaters at the Irish Sea Front pSPA.

Population estimates of Manx shearwaters in colonies where a link was established to the Irish Sea Front pSPA through tracking studies (i.e. Lundy, Copeland and Skomer) can be used as an (indirect) indicator of whether the overall population size of Manx shearwaters could have been declined over the years. Table 3 shows shearwater population estimates available from these colonies do not suggest that an overall population decline was taking place. In the absence of any other evidence to the contrary, JNCC assume the current population size in the Irish Sea Front pSPA is comparable to the scale of what was originally estimated based on the analysis of the ESAS data.

Overall, 18 Manx shearwater colonies fall within a distance typical foraging range of shearwater (330 km, Thaxter et al. 2012) of the Irish Sea Front pSPA: Skomer, Skokholm, Bardsey, Copeland, Lundy, Middleholm, Bishop & Clerks and Ramsey, Treshnish Isles, Calf of Man, Sanda, Great Saltee, Little Saltee, Lambay, Ailsa Craig, Inchmarnock, Howth Head, Bray Head, and Irelands Eye. The combined most recent population estimates of all of these colonies suggest that over 394,000 pairs of breeding Manx shearwaters would be able to use the Irish Sea Front pSPA in theory (Table 4). However, Manx shearwater are nocturnal birds that breed in burrows on remote islands and obtaining breeding population sizes is therefore extremely difficult; i.e. the largest and most recent population size from Skomer was obtained with by a new method which yielded a population estimate much larger than the previous one obtained with a conventional census method (Table 3, Perrins et al. 2012). But even when this uncertainty is taken into account, the estimated population

size of approximately 12,000 birds in the Irish Sea Front pSPA seems to be a feasible number for a foraging area in reach of all of the above colonies.

Distribution within the site

Manx shearwaters are found throughout the entire extent of the Irish Sea Front potential SPA.

Species range

The biogeographic population of Manx shearwater is estimated as 370,000 pairs (Mitchell et al. 2004), most of which occur in Britain and Ireland. The British population is estimated at 295,000 pairs (Mitchell et al. 2004), however, this estimate might need to be revised, given that a more recent assessment at the Welsh island of Skomer alone is currently estimating 316,000 breeding pairs (Perrins et al. 2012), albeit using a revised survey method to count the birds. Smaller populations are also known to occur at the Faeroe Islands, France, Iceland, Portugal, Spain and Canada.

Within Britain, the breeding strongholds of this species are on the Scottish Island of Rum and the Welsh Island of Skomer. Both host numbers of well over 100,000 pairs, and both are located west of Britain. Accordingly, highest at-sea numbers of shearwaters are found in the Irish Sea and the Minches (Kober et al. 2010).

History of occupancy

Manx shearwater observations at sea in the area around the Isle of Man and the Western Irish Sea Front go back as long as to 1014, when recounted by Njal's Saga, a Viking fleet anchoring off the Calf of Man colony suffered nocturnal avian attacks, which are likely to be Manx shearwaters (Williamson 1973). More recently, high densities of Manx shearwaters along the Western Irish Sea Front were observed by several authors (Begg and Reid 1997; Durazo et al. 1998).

On land, the importance of various colonies was recognised by McPherson (c. 1898), who listed Shetland, Orkney, St Kilda, Rum, Eigg, Skye Islets, Treshnish Isles, Annet, Skomer and mainland Gwynedd, Rathlin, Great Skellig and Lambay as breeding sites. In 1888, Skomer was described by Barrington as probably one of the largest colonies of Manx shearwaters in Europe (Barrington 1888). The most recent data provided for Copeland, Lundy and Skomer suggest that there is still a strong presence of Manx shearwaters in these colonies with direct link to the pSPA (Table 3).

To determine if important aggregations of Manx shearwaters were present on a regular basis in the marine site, the raw ESAS data on Manx shearwaters were consulted to see during how many years the observed shearwater densities within the site were significantly higher than the densities usually observed in British waters (for details of the analysis see marine SPAs for seabirds 6). Manx shearwaters were observed in the Irish Sea Front pSPA during 6 out of 7 years when data were collected at the Irish Sea Front pSPA. During 5 of these years (1983, 1990, 1991, 1995, 1998 and 2000), data were sufficient to conduct a significance test and Manx shearwater densities were significantly higher than outwith important areas during 3 out of these 5 years (1990, 1991, 1998).

Table 3. Changes in population size of Manx shearwater at Copeland Island SPA, Lundy and Skomer. (Seabird Monitoring Programme (SMP) database, pers. comm. R. Mavor, JNCC).

Colony	Details	Year of count	Number of occupied burrows
Copeland, Northern Island	Copeland Island SPA[1],	1985	533
		2000	5,867
		2002	5,047
	Copeland Island [2]	2007	4,850
Lundy, England		2001	297
		2008	1,081
		2013	3,451
Skomer, Wales	[3]	1998	101,800
	[4]	2011	316,070

[1] Combined counts from Big Copeland Island and Lighthouse Island.
[2] Colony count by Stewart and Leonard (2007).
[3] Estimate from Smith et al. (2001) based on conventional census.
[4] Estimate from Perrins et al. (2012), based on extrapolation from plot estimates and call responses.

Table 4. Most recent population sizes of Manx shearwaters at all colonies within foraging range (330 km, Thaxter et al. 2012) of the Irish Sea Front pSPA. Given are only colonies with available population estimates. Colonies not counted are referred to by 'nc'.

Colony	Last count (AOB)	Year of last count	Reference
Skomer	316,070	2011	(Perrins et al. 2012)
Skokholm	46,200	1998	(Mitchell et al. 2004)
Bardsey	16,183	2001	SMP, http://jncc.defra.gov.uk/smp/
Copeland	4,850	2007	(Stewart and Leonard 2007)
Lundy	3,451	2013	SMP, http://jncc.defra.gov.uk/smp/
Middleholm	3,000	1998	(Mitchell et al. 2004)
Bishop & Clerks and Ramsey	2,387	2007	SMP, http://jncc.defra.gov.uk/smp/
Treshnish Isles	1,283	2000	(Mitchell et al. 2004)
Calf of Man	424	2014	SMP, http://jncc.defra.gov.uk/smp/
Sanda	300	2006	SMP, http://jncc.defra.gov.uk/smp/
Great Saltee	150	2002	(Mitchell et al. 2004)
Little Saltee	100	2001	(Mitchell et al. 2004)
Lambay	25	2002	(Mitchell et al. 2004)
Ailsa Craig	3	2001	SMP, http://jncc.defra.gov.uk/smp/
Inchmarnock	1	2002	(Mitchell et al. 2004)
Howth Head	nc, several	na	(Mitchell et al. 2004)
Bray Head	nc, 10 AOB	na	(Mitchell et al. 2004)
Irelands Eye	nc, <20 AOB	na	(Mitchell et al. 2004)

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Annex 1: Citation

Citation

Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (this is the codified version of Directive 79/409/EEC as amended)

CITATION FOR PROPOSED SPECIAL PROTECTION AREA (SPA)

Irish Sea Front

(UKXXXXXXX)

Site Description:

The Irish Sea Front proposed Special Protection Area (SPA) is located in UK marine waters situated 35 km southwest of the Isle of Man and about 36 km northwest of Anglesey. It covers 180 km^2 of UK offshore waters. The site is associated with the Western Irish Sea front, an area likely to provide increased densities of potential prey for Manx shearwaters.

Qualifying Interest:

The Irish Sea Front proposed Special Protection Area (SPA) qualifies under **Article 4.2** by supporting populations of international importance of the migratory species **Manx shearwater** (*Puffinus puffinus*) with a population of 12,039 birds during the breeding season (1.1% of the biogeographic population).

Area: 18,000 ha.

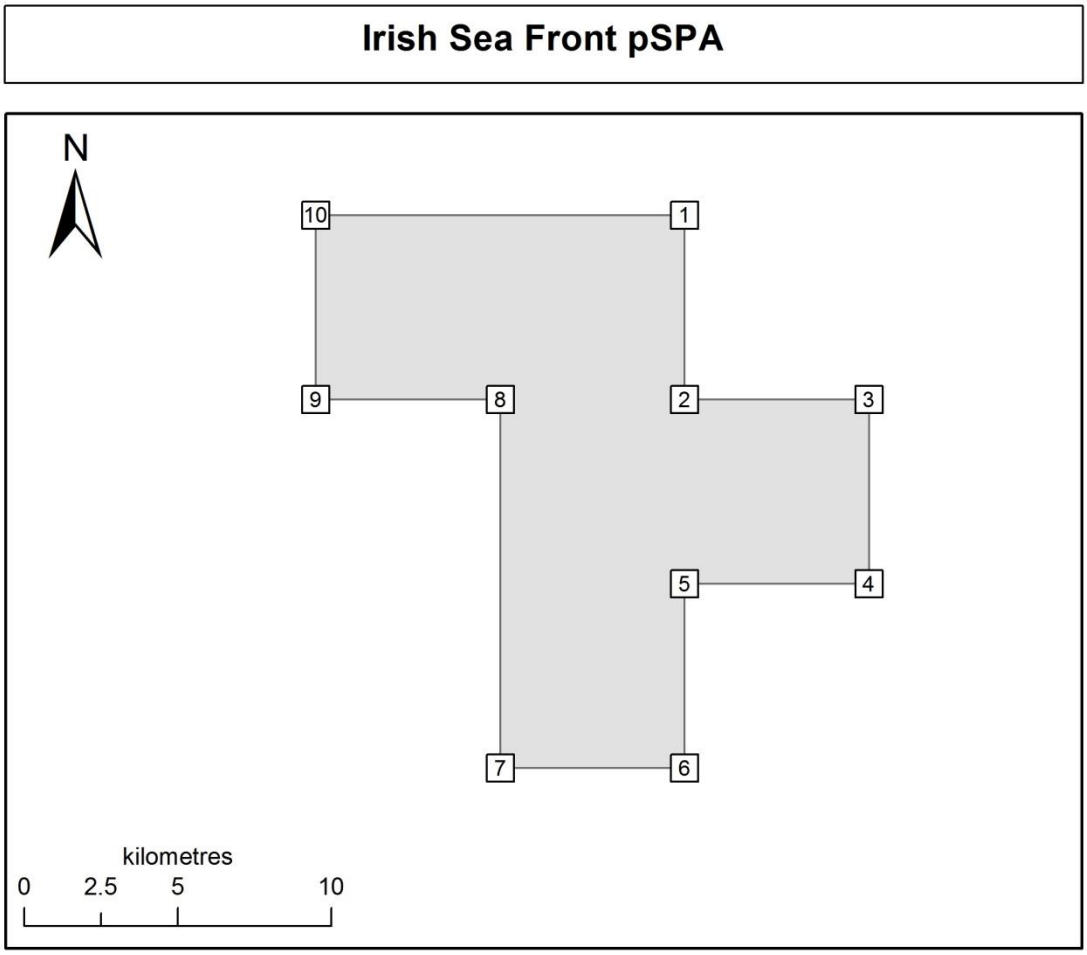
Date: XXXX

Annex 2: Evidence standards

Evidence Standards

JNCC's evidence standard: http://jncc.defra.gov.uk/default.aspx?page=6675

Annex 3: Site Map



Irish Sea Front pSPA

Point	Latitude	Longitude
1	53° 46.3817' N	5° 1.2110' W
2	53° 43.1501' N	5° 0.9792' W
3	53° 43.2853' N	4° 55.5305' W
4	53° 40.0534' N	4° 55.3063' W
5	53° 39.9185' N	5° 0.7481' W
6	53° 36.6868' N	5° 0.5178' W
7	53° 36.5480' N	5° 5.9519' W
8	53° 43.0108' N	5° 6.4271' W
9	53° 42.8673' N	5° 11.8743' W
10	53° 46.0983' N	5° 12.1200' W

JNCC
Joint Nature Conservation Committee

Annex 4: Size of the biogeographic population

For the assessment against UK SPA selection criteria, Manx shearwater numbers within the pSPA were compared to the biogeographic population of 1,110,000 individuals[7] (Mitchell et al. 2004). Mitchell et al. (2004) provide the latest biogeographic assessment which includes a full evaluation of the UK population from the Seabird 2000 national sensus. Since the UK data were collected for Seabird 2000, some of the Manx shearwater colonies have been re-counted and updated population estimates are available. These are provided in Table A.4.1.

The most recent colony count from Skomer (Perrins et al. 2012), one of the largest Manx shearwater colonies in the UK, was obtained with a new method which yielded a population estimate much larger than the previous one obtained with a conventional census method. It is unclear if the recent large count is due to a population increase on Skomer, if it is an artefact of the use of a new method, or if the reason is a mixture of both. Due to this uncertainty, the Perrins et al. (2012) estimate was not used in this Departmental Brief for the assessment against UK SPA selection guidelines.

The aim of this Annex 4 is to assess the impact of using the most recent seabird population information available for the assessment against UK SPA selection guidelines, including the population estimate obtained for Skomer by Perrins et al. (2012). The biogeographic population has increased from an estimated 1,110,000 individuals during the Seabird 2000 assessment (Mitchell et al. 2004) to 1,760,000 individuals[8] (Table A1). The 12,039 individuals in the Irish Sea Front pSPA would amount to 0.68% of the most recent biogeographic population, compared to 1.08% when assessed against the biogeographic population described in Mitchell et al. (2004). As Manx shearwater at this pSPA qualifies based on Stage 1.4, there is no population threshold that would need to be exceeded for qualification and the potential change in population size would not affect the outcome of the assessment against Stage 1 of the guidelines. However, under Stage 2 JNCC selects the most suitable areas for classification of SPAs by using *inter alia* a threshold of 0.5% of the biogeographic population which would need to be present at the area under consideration (see Application of Stage 2 [9]). Holding 0.68% of the population, the Irish Sea Front pSPA would still exceed this JNCC criterion under Stage 2 of the guidelines. In summary, an updated biogeographic population estimate does not have any ramification for the site proposal.

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[7] Mitchell et al. (2004) give a range of 339,893 - 407,597 pairs of Manx shearwaters worldwide, with a midpoint of 373,745 pairs, rounded to 370,000 pairs. The use of a conversion factor of 3 to obtain a number of individuals (approximating that each pair stands for two adults and one none breeder in the population) leads to a biogeographis population of 1,110,000 individuals.

[8] Table A.4.1 gives a biogeographic population estimate of 588,297 pairs. The use of a conversion factor of 3 to obtain a number of individuals leads to a biogeographis population of 1,760,000 individuals.

[9] Application of Stage 2

Country	Site	Count from Seabird 2000			Updated count where available		
Channel Islands	Jethou	5	pairs	(1999)	na		
	Sark	5	pairs	(1999)	na		
England	Lundy	297	pairs	(2001)	3,451	pairs	(2013)
	Annet	123	pairs	(2000)	89	pairs	(2006)
	Gugh	22	pairs	(2000)	9	pairs	(2006)
	Round Island	34	pairs	(2000)	43	pairs	(2006)
	Shipman Head Island	12	pairs	(2000)	13	pairs	(2006)
	St Agnes Island	5	pairs	(2000)	8	pairs	(2006)
	St Helen's Island	5	pairs	(2000)	9	pairs	(2006)
Isle Of Man	Calf of Man	34	pairs	(2001)	424	pairs	(2014)
Scotland	Sanda Islands	200	pairs	(1999)	300	pairs	(2006)
	Inchmarnock (West)	1	pairs	(2002)	na		
	Lunga	1,283	pairs	(2000)	na		
	Ailsa Craig	3	pairs	(2001)	na		
	Eigg	250	pairs	(1999)	na		
	Canna and Sanday	2	pairs	(2001)	na		
	Rum	120,000	pairs	(2001)	na		
	Lamb Hoga	7	pairs	(2002)	na		
	Dun	222	pairs	(1999)	na		
	Hirta	4,581	pairs	(1999)	na		
Wales	Ramsey Island	950	pairs	(1999)	3,835	pairs	(2012)
	Middleholm	3,000	pairs	(1998)	na		
	Skokholm	46,200	pairs	(1998)	na		
	Skomer	101,800	pairs	(1998)	316,070	pairs	(2011)
	Bardsey Island	16,183	pairs	(2001)	na		
Great Britain, Channel Isles & Isle of Man		**295,224**	**pairs**		**515,993**	**pairs**	
Northern Ireland	Big Copeland Island	1,947	pairs	(2002)	1,406	pairs	(2007)
	Old Lighthouse Island	2,867	pairs	(2000)	3,444	pairs	(2007)
Republic of Ireland	Lambay	25	pairs	(2002)	na		
	Cruagh	3286	pairs	(2001)	na		
	High Island	22	pairs	(2001)	na		
	Inishshark	51	pairs	(2001)	na		
	Inishnabro	5611	pairs	(2000)	na		
	Inishtooskert	9696	pairs	(2000)	na		
	Deenish	351	pairs	(2000)	na		
	Great Blasket	3584	pairs	(2001)	na		
	Great Skellig	738	pairs	(2001)	na		
	Inishvickillane	643	pairs	(2001)	na		
	Puffin Island Whole	6329	pairs	(2000)	na		
	Scariff	1960	pairs	(2000)	na		
	Great Saltee Island	150	pairs	(2002)	na		
	Little Saltee	100	pairs	(2001)	na		
All Ireland		**37,360**	**pairs**		**37,396**	**pairs**	
Faeroe Island		**25,000**	**pairs**	**(1995)**	**na**		
France		**192**	**pairs**	**(1999)**	**188**	**pairs[1]**	**(2012)**
Iceland		**8,500**	**pairs**	**(1990)**	**4,000**	**pairs[2]**	**(1991)**
Portugal		**700**	**pairs**	**(1991-97)**	**3,428**	**pairs[1]**	**(1996-2004)**
Spain		**350**	**pairs**	**(1987)**	**625**	**pairs[1]**	**(1997-2003)**
Canada		**3**	**pairs**		**7**	**pairs[3]**	
Worldwide		**367,329**	**pairs**		**588,297**	**pairs**	

[1] information obtained from Article 12 reporting at the European Topic Centre on Biological Diversity; http://bd.eionet.europa.eu/article12/summary

[2] Erpur S. Hansen, Jóhann Óli Hilmarsson & Broddi R. Hansen unpubl.

[3] Fraser et al (2013). Prospects for the Manx shearwater colony on Midle Lawn Island, Newfoundand, Canada. Marine Ornithology 41: 137–140

Document version control

Version and date	Amendments made	Issued to and date
V1	First draft	
V1.2	Advanced Draft	High level QA, 30/03/2015
V1.3	Advanced Draft with comments addressed	High level QA, 13/04/2015
V2	Draft for MPA Sub Group	MPA Sub Group
V3	Addressed comments from Sub group	High level QA, 11/12/12
V4	Addressed comments	Reviewed on Directors level, few further comments
V5	Finalised Draft	signed off 18/12/15