SPA SITE SELECTION DOCUMENT

THE SCIENTIFIC CASE SUPPORTING SITE SELECTION

Seas off St Kilda SPA

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Introduction

This document forms part of the Joint Nature Conservation Committee's (JNCC's) advice to Marine Scotland on the classification of the Seas off St Kilda Special Protection Area (SPA). It describes the scientific case supporting the protection of the qualifying features under the Birds Directive (2009/147/EC), including a description of the data, the methods used to identify the Seas off Foula SPA as an important area for the qualifying features, a description of how the boundary was established, and an assessment of the available information on the qualifying features against the UK SPA selection guidelines (Stroud *et al.* 2001).

Special Protection Areas (SPAs) are a conservation measure under Article 4 of the Directive 2009/147/EC on the conservation of wild birds (Birds Directive) to protect rare and vulnerable bird species listed in Annex 1 of the Directive and regularly occurring migratory species. Article 4.1 states that "Member States shall classify in particular the most suitable territories in number and size as special protection areas for the conservation of these species in the geographical sea and land area where this Directive applies." At the moment, there is only a limited number of existing SPAs in the marine environment for seabirds, and particularly foraging areas offshore are not well represented in the previously classified SPAs. The Seas off St Kilda SPA will therefore provide additional protection for northern gannet *Morus bassanus* by safeguarding that key foraging areas remain accessible for this important species. In addition, the individual species comprising the seabird assemblage feature that occur in large numbers in the area will also benefit from the protection of their foraging areas.

A total of 106 bird species use UK waters, 44 occur regularly in sufficient numbers[1] that are eligible for protection in SPAs through the Birds Directive. As a result, UK administrations are required to classify SPAs which provide conservation measures through the protection of supporting marine habitats and prey for these Annex 1 and migratory species where appropriate. Over the last decade or so JNCC and the other statutory nature conservation agencies have jointly collected and collated data to support a UK-wide analysis to identify the most important marine areas for these species. The Seas off St Kilda SPA was identified by these analyses and is part of a network of marine protected areas for seabirds and waterbirds to fulfil the requirements of the Birds Directive in the marine environment.

Summary

The Seas off St Kilda Special Protection Area (SPA) surrounds St Kilda archipelago, which consists of the most westerly islands of the Outer Hebrides.

Seas off St Kilda SPA qualifies under **Article 4.2** of the Birds Directive (2009/147/EC) by supporting regularly[2] occurring populations of European importance of the following migratory species, foraging at sea during the breeding season:

- northern gannet (*Morus bassanus*),
- northern fulmar (*Fulmarus glacialis)* as part of an assemblage,
- common guillemot (*Uria aalge*) as part of an assemblage, and
- Atlantic puffin (*Fratercula arctica*) as part of an assemblage.

[1] Defined as >50 individuals in UK waters each year, assessed based on expert judgement and records of the Birtish Birds Rarities Committee.

[2] For a definition of regularity see JNCC Report 431.

Seas off St Kilda SPA qualifies under **Article 4.1** of the Birds Directive (2009/147/EC) by supporting regularly2 occurring populations of national importance of the following Annex 1 species, foraging at sea during the breeding season:

- European storm-petrel (*Hydrobates pelagicus)* as part of an assemblage.

As required by Article 4 of Directive 2009/147/EC, the purpose of this SPA 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 Seas off St Kilda SPA is located in Scottish marine waters situated about 50 km northwest of North Uist in the Western Isles of Scotland. It covers 3,995 km^2 of mainly offshore waters and encloses the St Kilda archipelago, consisting of the four islands of Hirta, Dun, Soay and Boreray, and the sea-stacs of Stac an Armin, Stac Lee and Levenish.

In the site, water depths range mainly between 40m and 410m; shallow areas with less than 100m depth occur only at the very east of the site, while depths of more than 250m are reached only in the northwest (see Figure 2). The bathymetry shows that Seas off St Kilda SPA lies very close to the continental shelf edge, with water depth quickly increasing to the west and to the north of its limits. Shelf-break fronts are a typical phenomenon at the shelf edge and, like almost all fronts, are regions of enhanced plankton production, leading to a higher fish production (Mann and Lazier 1991). Shelf edges might also have a function in concentrating marine organisms both in acting as a barrier to species confined to shallower waters, and as a geological feature guiding the migration of fish species (pers. comm. D. Tobin).

The combined effect of current and waves creates low-energy seabed environments in most of the site. In the vicinity of the archipelago, however, moderate-energy seabed environments also occur (McBreen *et al.* 2011). In the southwest of the site, rock and reef habitats are prevalent; the northwest is dominated by a mosaic of subtidal coarse sediments and sand and muddy sand habitats (McBreen *et al.* 2011).

Like most of the continental shelf edge, Seas off St Kilda is an area of high intensity nursery grounds of mackerel *Scomber scombrus* (Coull *et al.* 1998; Ellis *et al.* 2012). Northern gannets typically have a highly varied fish diet (Nelson 2002) and common species consumed in UK waters include mackerel *Scomber scombrus*, sandeel *Ammodytes marinus*, sprat *Sprattus sprattus* and herring *Clupea harengus* (Hamer *et al.* 2000).

Bird Survey Information

The European Seabirds at Sea database

The European Seabirds at Sea (ESAS) database is a collation of 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). The data were used to identify the scale and location of hotspots for seabirds across the UK within the British Fishery Limit, based on data collected between 1980 and 2006. Further information on ESAS and the analytical methods is summarised in marine SPAs for seabirds.

At Seas off St Kilda, the analysis of the ESAS data determines the overall importance of the location for the qualifying species. It provides in particular the extent of the area under study,

an estimate of the number of birds present at the site and information on how regularly they occur.

Seabird Census and Seabird Monitoring Programme

Information on the size of the populations of birds at the adjacent St Kilda colony SPA is 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 this is also collated by the seabird monitoring programme. The information is used to supplement ESAS data to provide evidence of regular occurrence of species at the colonies most likely to be providing birds that forage in Seas off St Kilda.

Tracking data from St Kilda SPA

In 2010, Wakefield *et al*. (2013) fitted 21 adult northern gannets from the St Kilda gannetry with Platform Terminal Transmitter tags during chick-rearing period (June to August). As well as presenting foraging tracks of individual birds, this study used kernel density analysis to identify areas of importance to the birds. Seas off St Kilda falls completely within the 75% utilization distribution of the tagged birds.

The study shows that breeding northern gannets from St Kilda use Seas off St Kilda to forage during the breeding season. It highlights the importance of the marine site to the breeding population at this particular gannetry.

Assessment against the UK SPA selection guidelines

The SPA Selection Guidelines set out a two stage process for SPA identification in the UK. Both stages are applied individually by the relevant statutory advisor, i.e. by the country agencies for site selection in their respective territorial waters and by JNCC for site selection in offshore waters. The selection process, in particularly under Stage 2, therefore differs between the respective responsible advisors.

Stage 1

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[3], where the application of Stage 1 guidelines 1, 2 or 3 for a species does not identify an adequate network of most suitable sites for the conservation of that species.

The analysis of the ESAS data found that 50,332 northern gannets[4] regularly use Seas off St Kilda during the breeding season. The population of northern gannets therefore exceeds 9,670 birds or 1% of the biogeographic population, the site selection threshold used under guideline 1.2 of the UK SPA selection guidelines (Stroud *et al.* 2001).

The ESAS data also showed that a breeding seabird assemblage of 67,372 birds4 used Seas off St Kilda. The population size of the assemblage therefore exceeds 20,000 birds, the site selection threshold under guideline 1.3 of the UK SPA selection guidelines (Stroud *et al.* 2001). This estimate was based on ESAS data collected in the region between 1980 and 2003. However, the latest available data on seabird trend information indicate, based on plot counts of northern fulmar and common guillemot at the St Kilda colony up to 2011, show that seabird populations of these two species decreased in the sample plots by 41% and 39% respectively (unpub. Seabird Monitoring Program data, pers. comm. R. Mavor, JNCC). Assuming that the sample plots are representative of the entire colony, the scale of the overall seabird population at St Kilda will have decreased and the assemblage at Seas off St Kilda will be smaller today. In spite of this, we still expect the assemblage at the marine site to be exceeding 20,000 birds.

[3] The UK SPA Selection Guidelines suggest to use the same ecological criteria outlined under Stage 1.4 to identify ecologically important areas and under Stage 2 to select the most suitable areas. Note that even though the same ecological criteria are used, guideline 1.4 and the Stage 2 process are not identical and serve different purposes: e.g. an area could be identified as a possibly important area under 1.4 because it supports an aggregation with high numbers of a particular species. However, when compared with other areas under Stage 2 it might not be rated as most suitable because another area close by, with a comparable number of individuals of the same species, is deemed to be more suitable as it supports in addition also a range of other species in high numbers.

[4]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.

Table 1. Assessment of Seas off St Kilda against Stage 1 of the UK SPA selection guidelines.

Species and season	Status	Population estimate in Seas off St Kilda	Relevant population threshold for qualification	Stage 1 guideline
northern gannet, breeding	migratory	50,332 birds[1]	9,670 birds [2]	1.2
assemblage of breeding seabirds		67,372 birds[3]	20,000 birds	1.3
northern fulmar, breeding	migratory	3,310 birds[3]	2,000 birds	1.3[5]
European storm-petrel, breeding	Annex 1	954 birds	780 birds[4]	1.3[5]
common guillemot, breeding	migratory	3,147 birds[3]	2,000 birds	1.3[5]
Atlantic puffin, breeding	migratory	6,198 birds	2,000 birds	1.3[5]

[1] the figure differs from Kober *et al.* (2012) as the boundary around St Kilda is now adjusted to abut St Kilda SPA.

[2] based on 1% of biogeographic population of 967,000 birds (CSR5, Delany *et al*. 2011).

[3] trend information obtained from sample plots at St Kilda SPA for northern fulmar and common guillemot indicate that their breeding population sizes decreased. As a result, they reached in 2011 only 59% and 61% of their Seabird 2000 populations, respectively. Nevertheless, populations estimated for the marine Seas off St Kilda site were feasible, i.e. numbers of breeding birds at St Kilda SPA exceed the population number estimated for Seas off St Kilda.

[4] based on 1% GB population of 26,000 AON or 78,000 birds (assuming (AoN*3)=birds, Musgrove *et al.* 2011).

[5] named species of assemblage.

Stage 2

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.

2.2. 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 Stage 2 selection process of the most suitable areas in the offshore environment rests mainly on the Stage 2 criterion of population size, as this provides an easily comparable estimate of the significance of a location for the overall population of a species. For many of the other criteria, i.e. history of occupancy, naturalness and severe weather refuges, there is a lack of information from the offshore environment to enable the use of these criteria in a comparison between potential areas. The criterion of species range is often not applicable as there are usually very few possible locations available from which to select areas.

A total of 21 possible areas, which are fully or partly in offshore waters, is available for JNCC's selection of most suitable areas in offshore waters. The selection under Stage 2 takes place in four steps, which add - one by one - areas to the final selection of most suitable areas:

1. Select all areas which fully meet the UK SPA selection guidelines under Stage 1.1 – 1.3. These are the most important areas as these hold the largest numbers of birds on a regular basis.

2. Select all areas which were identified under Stage 1.4 as areas which could be ecologically important, but which do not regularly hold the number of birds required for fully meeting the guidelines under Stage 1.1 – 1.3. However, the selected areas should hold at least half of the population size required to fully meet the guidelines under Stage 1.1 – 1.3.

   The selection of areas in this step is a precautionary measure. This measure was taken as the ESAS analysis provides only approximate estimates of population sizes based on modelled data ("best estimates", in contrast to precise population estimates), which makes the strict application of the original population thresholds inadvisable.

3. Select those additional reas which are contained within or which substantially overlap already selected areas under step 1 or 2. This step aims to increase the conservation value of the selected areas by adding features without incurring an extra 'cost' in terms of extending the area protected.

4. Select areas where expert knowledge indicates - in light of all available evidence - that further investigation is likely to provide a strong case for classification as a UK-wide important area. Expert knowledge could also remove areas from the selection if it suggested that the area may not be very important or regularly used by high numbers of birds, however, this did not apply in practice.

Following these steps, Seas off St Kilda is a most suitable area as it fully meets the Stage 1.2 guideline for northern fulmar (Step 1). For more details of the Stage 2 selection process see this document. A further brief assessment of Seas off Foula against all Stage 2 ecological criteria is provided in Table 2.

Further details on the selection process and the final network of sites is provided in 'Overview of the Scottish marine Special Protection Area selection process' (SNH, 2018).

Table 2. Assessment of Seas off St Kilda against Stage 2 of the UK SPA selection guidelines.

Stage 2 guideline	Qualification	Assessment
1. Population size and density	✓	Seas off St Kilda SPA has the largest regularly occurring marine aggregation of breeding **northern gannet** identified in UK waters (Kober *et al.* 2012). This is the only area where northern gannet exceeded the 1% biogeographic population threshold on a regular basis. The site is used as a foraging area by gannets from St Kilda, the most important gannetry in the UK. St Kilda is also the most important breeding colony of northern fulmar and Atlantic puffin in Britain (both are named components of the **breeding seabird assemblage**). It is likely that the breeding birds of these species also use the marine Seas off St Kilda site as a foraging area.
2. Species range	✓	Seas off St Kilda is at the northwest limit of the British breeding range of **northern gannets**.
3. History of occupancy	✓	The **gannetry** at St Kilda has been established for over 2,100 years, as confirmed by remains of gannets harvested by the human population living on St Kilda. It is likely that these birds also used the marine Seas off St Kilda site as a foraging area, similar to the contemporary gannets. More recently, regular usage of the marine site was demonstrated as gannets used the site during 8 out of 12 years between 1980 and 2001.
4. Multi-species area	✓	Seas off St Kilda is used by a significant **aggregation of breeding seabirds**, the most important components of which are northern fulmar, European storm-petrel, northern gannet, common guillemot and Atlantic puffin.
5. Naturalness	-	Seas off St Kilda is a largely natural site.
6. Severe weather refuge	-	No information available.

Boundary delineation

The seaward boundary of the Seas off St Kilda SPA has been based on the extent of the important aggregation of northern gannet (Figure 2). The analysis, with the aim to determine the extent and the limits of the northern gannet aggregation, is illustrated in Figure 1 and is described by the following steps:

(1) The raw observations of northern gannets from all relevant surveys are extracted from the ESAS database (Figure 1a).

(2) A geostatistical interpolation technique[5] used the raw observations to predict northern gannet densities in un-surveyed areas between the existing data, producing an estimate of gannet densities in every 6x6 km grid cell (Figure 1b). 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 gannet 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 gannets aggregate most. Selected cells neighbouring each other were merged into bigger areas (Figure 1c).

(4) To identify areas that in theory meet the UK SPA selection guideline, each area was assessed if it holds a northern gannet population in excess of 1% of their population on a regular basis. Only one area - Seas off St Kilda - met this criterion fully and a boundary was drawn around its outer limits (Figure 1d). To avoid overlap with the existing St Kilda SPA, which provides protection for northern gannet already, this area is omitted from Seas off St Kilda.

For a more detailed description of the methods see marine SPAs for seabirds. 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).

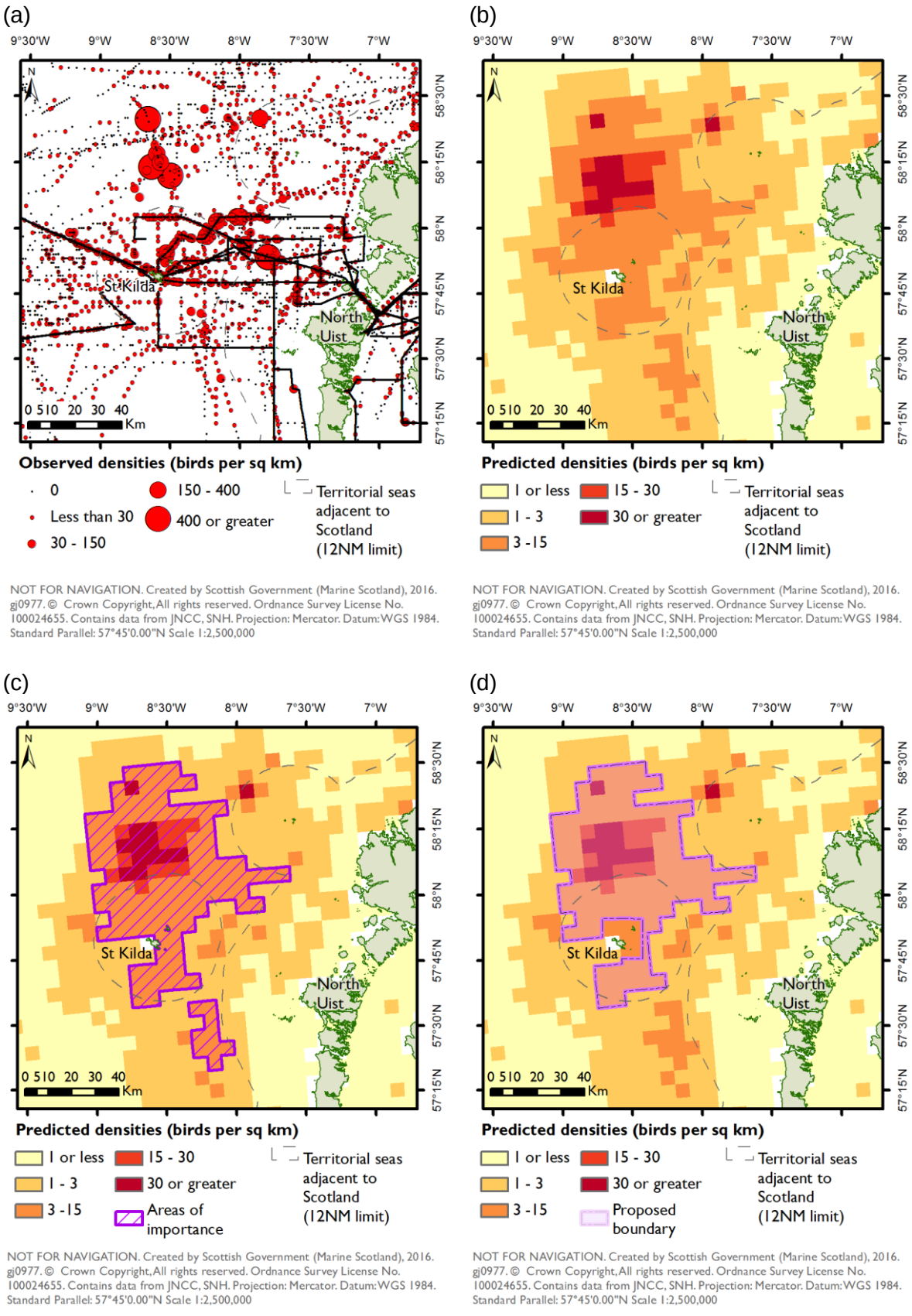

Figure 1. Analytical steps to identify the most important area for northern gannet at St Kilda. (a) raw ESAS observations on northern gannet, (b) predicted densities of northern gannet, (c) important areas for northern gannet, and (d) boundary of Seas off St Kilda, the only important area holding >1% of the biogeographic population on a regular basis.

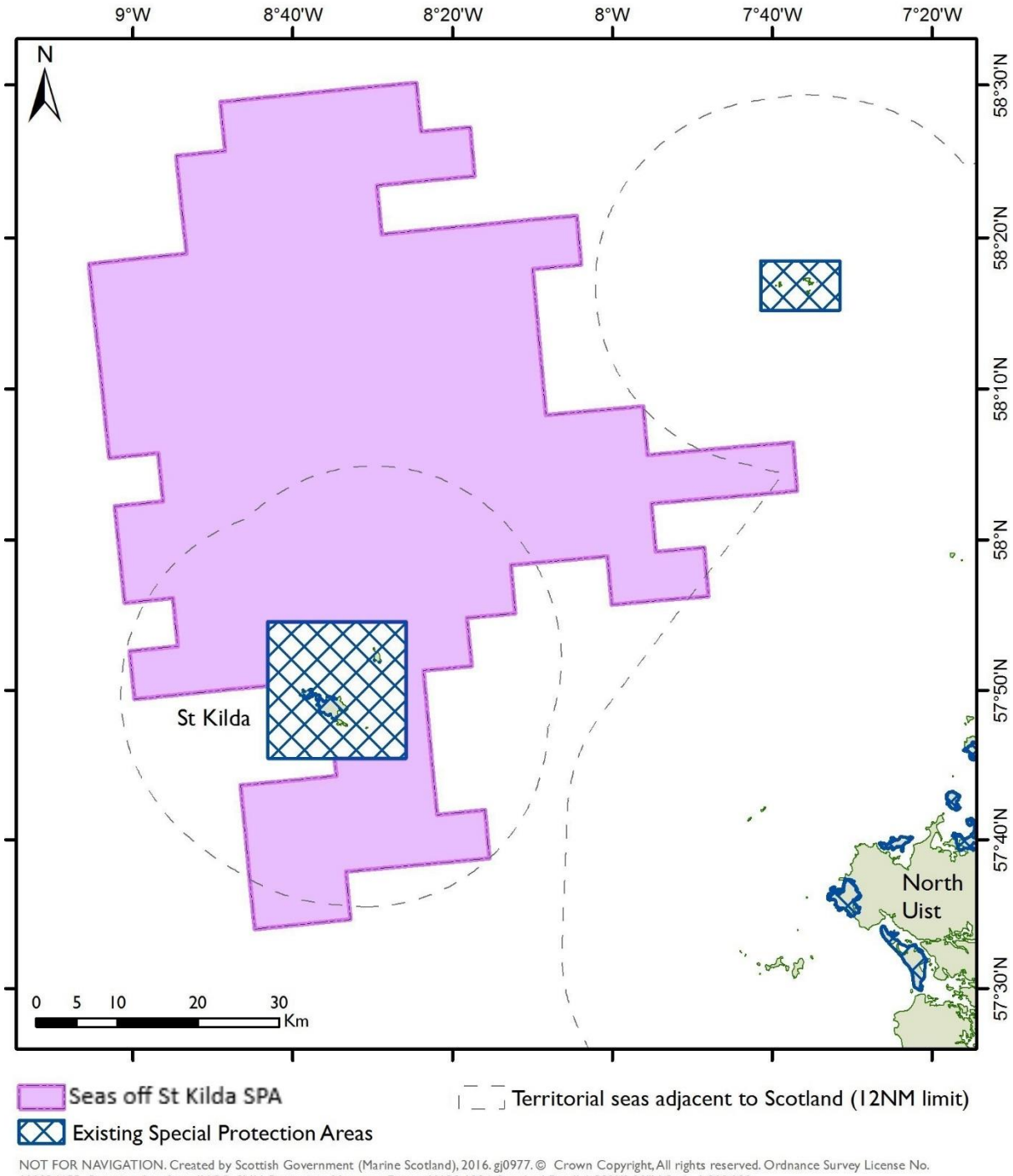

Figure 2. Seas off St Kilda SPA.

Information on qualifying species

Northern gannet

Population size and density

The analysis of the ESAS data (Kober *et al.* 2012) indicated that, after application of Stage 1 of the UK SPA Site Selection Guidelines, five hotspots were to be considered under Stage 2 for the protection of northern gannet during the breeding season (Table 3). Two of these were selected by JNCC as most important areas in offshore waters for northern gannet during the breeding season in the Stage 2 selection process: hotspot 7 which forms the basis of the Seas off St Kilda SPA, and hotspot 10 which is incorporated into the Outer Firth of Forth and St Andrews Bay Complex SPA currently under consideration. Of all available hotspots, these two provide for the largest and second largest population estimates for northern gannets.

Table 3. Hotspots considered for classification for northern gannet during the breeding season.

Hotspot number	Estimated population	Rank according to population size	Fate
Hotspot 7	51,784 individuals	1	Seas off St Kilda dSPA
Hotspot 8	1,489 individuals	5	Dismissed in Stage 2 selection
Hotspot 9	1,598 individuals	4	In inshore waters, therefore not considered by JNCC
Hotspot 10	7,915 individuals	2	Selected under Step 2 of Stage 2 selection, Outer Firth of Forth and St Andrews Bay Complex dSPA
Hotspot 11	5,276 individuals	3	In inshore waters, therefore not considered by JNCC

Based on observations of northern gannet at sea, obtained from the ESAS database, the population at Seas off St Kilda is estimated as 50,332 birds during the breeding season. Densities of breeding northern gannets range between 0.12 birds/km^2 at the edges of the site and 110.54 birds/km^2 in the middle.

The foraging range of northern gannet is large, with a mean max of 229 ± 124 km (Thaxter *et al.* 2011). Breeding gannets from the gannetries of the Flannan Isles and Sula Sgeir are therefore – in theory – within foraging distance and could use Seas off St Kilda.

Distribution within the site

Northern gannet are found throughout the entire extent of Seas off St Kilda.

Species range

Northern gannet are endemic to the North Atlantic with two separated populations, one in eastern Canada and one in the northeast Atlantic. The biogeographic population comprises 967,000 birds (AEWA 2012), of which a large proportion of 660,000 birds (estimated from 220,000 pairs given by Musgrove *et al.* 2013) breed in Britain.

In Britain, Seas off St Kilda holds not only the largest at-sea aggregation of northern gannets during the breeding season, it is also the only marine area defined for gannets in UK waters which exceeds 1% of the biogeographic population on a regular basis.

Gannets foraging at Seas off St Kilda are most likely to come from the gannetry at St Kilda SPA. Thus, there is a strong link between the marine site and the population breeding on the islands of St Kilda, which with currently 60,290 pairs is by far most important gannetry in the Britain (Table 4).

Over the course of four gannet censuses in 1968-70, 1984-85, 1994-1995 and 1998-2000 gannet numbers consistently increased in Britain and Ireland. This trend is largely reflected by the population at St Kilda, the colony shows substantial numbers of breeding gannets from the first count in 1985 on up until 2013 (Mitchell *et al.* 2004) (Table 4). For Seas off St Kilda, the original at-sea population estimate was based on ESAS data mainly collected before 2000. However, given a population of 60,290 pairs currently breeding at St Kilda, the original ESAS at-sea population estimate of 50,332 birds still appears to be feasible figure.

History of occupancy

In the past, northern gannets have been an important source of food for humans. At St Kilda, remains of gannets date back to over 2,100 years ago and therefore indicate that the birds were established at the archipelago for a very long time. The first written record of gannets at St Kilda stems from Martin Martin, who visited St Kilda in 1698 (Martin 1703). It is likely that these birds also used the marine Seas off St Kilda site as a foraging area, similar to the contemporary gannets.

To determine if important aggregations of gannets were present on a regular basis in the marine site, the raw ESAS data on northern gannets were consulted to see during how many years the observed gannet 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). Northern gannets were observed in Seas off St Kilda during all 12 years of data collection. Moreover, in the site, northern gannet densities were significantly higher during 8 out of 12 years with sufficient data for the (1980, 1986–1989,1998, 2001 and 2003).

Table 4. Population of northern gannet at St Kilda SPA (SMP database, pers. comm. R. Mavor, JNCC).

Year of count	Number of occupied sites
1985	50,050
1994	60,428
2004	59,622
2013	60,290

Northern fulmar

Population size and density

Based on observations of northern fulmar at sea, obtained from the ESAS database, the population of northern fulmar at Seas off St Kilda is estimated as 3,310 birds during the breeding season. Densities range between 0.03 birds/km^2 and 11.29 birds/km^2. Throughout most of the site they remain below 1 bird/km^2, but increase noticeably towards the north of the site, where water depth increases, and the influence of the shelf edge is presumably stronger.

The foraging range of northern fulmar is large, with a mean max of 400 ±246 km (Thaxter *et al.* 2011), although an estimate based on absences from the nest of St Kilda fulmars suggests a potential foraging range of 245 km at this colony (Hamer *et al.* 1997). If similar foraging ranges are assumed for the other fulmar colonies at the west coast and north coast of Scotland, Seas off St Kilda is - in theory – a potential foraging area for all of them. Large parts of the northern and western continental shelf edge is well within reach of all of these colonies and a modelled distribution of northern fulmar during breeding, based on ESAS data, suggests that a lot of it is highly frequented by fulmars (Kober *et al.* 2010; Pollock *et al.* 2000).

Distribution within the site

Northern fulmar are found throughout the entire extent of Seas off St Kilda.

Species range

Northern fulmar are distributed around the North Atlantic and North Pacific, with strongholds in Iceland, Russia and the USA (Mitchell *et al.* 2004). In Scotland, the subspecies *glacialis* is present, which has an estimated population of 2.7–4.1 million breeding pairs throughout the North Atlantic. The British breeding population consists of 500,000 pairs (Mitchell *et al.* 2004).

Distribution maps of breeding northern fulmar in UK waters, based on ESAS data, suggest that this species uses most intensively the shelf edge to the north and the west of Scotland (Kober *et al.* 2010) although the maps show usage in the Seas off St Kilda, particularly where it is closest to the shelf edge. In Great Britain, St Kilda is the oldest and most important colony for northern fulmar. During the last complete census (1998–2002) it accounted for more breeding pairs than the second and third biggest colonies combined (Mitchell *et al.* 2004). Breeding fulmars foraging at Seas off St. Kilda are highly likely to come from this important colony.

Whilst the population of northern fulmar has been rapidly increasing during the past 150 years, numbers declined from 1990 onwards (Mitchell *et al.* 2004). At St Kilda, this trend was not reflected, numbers there increased by 9% between the SCR Census (1985-88) and the Seabird 2000 census (1998-2002) (Table 5). However, a trend analysis conducted by the JNCC suggests that numbers might have been decreasing by us much as 41% since then (unpub. Seabird Monitoring Program data, pers. comm. R. Mavor, JNCC). It is highly likely that such a decrease would impact the numbers using Sea off St. Kilda as a foraging area. However, even if a current number of about 40,000 birds is extrapolated from the trend analysis, it would still be feasible to assume that >2,000 birds use the marine site as a foraging area.

History of occupancy

In 1878, northern fulmars were recorded at Foula for the first time during a southward colonization from Iceland. Prior to 1878, St Kilda was the only northern fulmar colony in Britain.

Fulmars were an important source of food for the human population at St Kilda and they were available from at least the Iron Age onwards (Forrester *et al.* 2007). It can be assumed that these historical birds also used Seas off St Kilda as a foraging site, just like the present-day St Kilda fulmars.

Table 5. Population of northern fulmar at St Kilda SPA. (SMP database, pers. comm. R. Mavor, JNCC.)

Year of count	Number of occupied sites
1987	62,786
1999-2003	68,438

European storm-petrel

Population size and density

Based on observations of European storm-petrel at sea, obtained from the ESAS database, the population at Seas off St Kilda is estimated as 954 birds during the breeding season. In the site, densities are ranging between <0.01 birds/km^2 and 2.62 birds/km^2. Like for gannets, highest densities are found in the middle of the site and lowest towards its edges.

The foraging range of European storm-petrel is estimated as being larger than 65 km. Storm-petrels breeding on St Kilda can therefore presumably forage throughout the entire Seas off St Kilda site.

Distribution within the site

European storm-petrel are found throughout the entire extent of Seas off St Kilda.

Species range

European storm-petrel breeding in Britain and Ireland belong to the subspecies *pelagicus*, which is breeding on islands all along the east Atlantic coast of Europe, as far north as Norway and as far south as the Canary Islands. An estimate of the biogeographic population for the north-eastern Atlantic ranges between 300,000 and 680,000 birds. For Britain, a total of 26,710 breeding pairs is estimated (Mitchell *et al.* 2004).

A distribution map of breeding storm-petrels in UK waters, based on ESAS data, suggest that this species is found in highest densities north and west of Scotland, in particular in the broad area of the continental shelf edge, and in the Celtic sea (Kober *et al.* 2010). Seas off St Kilda belongs to the areas with elevated densities of storm-petrels.

European storm-petrel foraging at Seas off St Kilda most likely come from the breeding sites on St Kilda. The latest survey at St Kilda estimated 1,121 pairs of storm-petrels (Table 6), which means that St Kilda is a comparably small breeding site for European storm-petrel in Britain (Mitchell *et al.* 2004). Assuming that the population on the islands did not change much, a population estimate of storm-petrels of 954 birds in the marine site appears to be feasible.

History of occupancy

Martin Martin provided the first record of European storm-petrels at St Kilda from his visit to the island in 1697 (Martin 1703). This is also the first record of this species in Scotland. It can

be assumed that these birds also used the marine Seas off St Kilda site, just like the present-day storm-petrels breeding on St Kilda.

Table 6. Population of European storm-petrel at St Kilda SPA (SMP database, pers. comm. R. Mavor, JNCC).

Year of count	Number of occupied sites
1999/2000	1,121

Common guillemot

Population size and density

Based on observations of common guillemot at sea, obtained from the ESAS database, the population at Seas off St Kilda is estimated as 3,147 birds during the breeding season. Densities of common guillemot range between 0 and 10.02 birds/km^2 in the site. While most of the site holds very low densities (below 1 bird/km^2), highest densities are found around St Kilda and in the eastern extension of the site.

The foraging range of common guillemot has a mean maximum of 84 ± 50 km (Thaxter *et al.* 2012). Based on this it can be assumed that Seas off St Kilda is within foraging range of guillemots not only from the St Kilda colony, but also of the colony at the Flannan Isles (14,638 birds during the Seabird 2000 census) and smaller colonies on the Isle of Lewis and North Uist.

Distribution within the site

Common guillemot are found throughout the entire extent of Seas off St Kilda.

Species range

In Scotland, breeding common guillemot belong to the subsp. *aalge*, which has a large biogeographic breeding population of 4.8 million birds distributed throughout the North Atlantic region and the Baltic Sea (AEWA 2012). Guillemots are a common species with 1.56 million birds breeding in Britain and Ireland (Mitchell *et al.* 2004). About 75% of these breed in Scotland, with largest concentrations at Caithness, Orkney, Shetland, Sutherland and the Western Isles.

A distribution map of breeding common guillemots in UK waters, based on ESAS data, indicates that aggregations appear to be concentrated mostly in the outer Firth of Forth, the Moray Firth and around Orkney, The region around St Kilda holds elevated densities of the species and higher densities of guillemots can be found in the site in the vicinity of the colony (Kober *et al.* 2010).

Most common guillemots present at Seas off St Kilda are likely to come from the colony on St Kilda. With 23,393 birds counted in 1999 (Seabird Monitoring Programme, pers. comm.. R.Mavor, JNCC), St Kilda is a medium-sized colony for guillemots in Britain.

Over the course of the three national censuses, conducted in 1969–1970, in the mid-1980s and in 2000, numbers of breeding common guillemots have strongly increased, although the rate of increase has slowed down considerably in the later years. This trend was reflected in numbers of breeding guillemots counted on St Kilda (Table 7). However, information on seabird trends obtained from plot counts on St Kilda, indicate that the common guillemot

population might have dropped by 39% between 1998 and 2011 (unpub. Seabird Monitoring Program data, pers. comm. R. Mavor, JNCC). Even if this decrease can be verified for the entire colony and it is assumed that the colony holds currently about 14,270 birds, these are still substantial numbers and an estimate of 3,147 birds in the marine Seas off St Kilda site appears to be feasible.

History of occupancy

Common guillemots are known to have bred at St Kilda for more than 300 years. One of the earliest written accounts of common guillemots on St Kilda is a report of Robert Moray (1670s), describing how the St Kildans harvested guillemots to eat them (Love 2009). It is very likely that these historical birds also used the marine Seas off St Kilda site, just like the present-day guillemots breeding on St Kilda.

Table 7. Population of common guillemot at St Kilda SPA. (SMP database, pers. comm. R. Mavor, JNCC).

Year of count	Number of birds
1987	22,705
1999	23,393

Atlantic puffin

Population size and density

Based on observations of Atlantic puffin at sea, obtained from the ESAS database, the population at Seas off St Kilda is estimated as 6,198 birds during the breeding season. Densities are ranging between 0.02 birds/km^2 and 10.94 birds/km^2. While throughout the entire northern half of the site densities of below 1 bird/km^2 prevail, higher densities are found in the southern half of the site within 20-30 km distance to St Kilda, as well as in the eastern extension of the site.

The foraging range of Atlantic puffin has a mean maximum of 105 ± 46 km (Thaxter *et al.* 2012). Foraging ranges observed from puffins at St Kilda, however, showed that the majority appeared to feed within 40km of the colony (Leaper *et al.* 1988). If a similar foraging range is assumed for the Flannan Isles, the birds of this colony SPA could potentially also use in particular the northeastern parts of Seas off St Kilda. In 2001, 6,112 occupied burrows were counted at the Flannan SPA[6].

Distribution within the site

Atlantic puffin are found throughout the entire extent of Seas off St Kilda.

Species range

Atlantic puffin are distributed throughout the North Atlantic and the adjacent Atlantic Ocean. Their breeding range stretches from the high Arctic to the South of Brittany, the strongholds being the low Arctic coasts of Iceland and north Norway (Mitchell *et al.* 2004). The British

[6] (http://jncc.defra.gov.uk/smp/)

population (without subspecies differentiation) is estimated as 579,500 breeding pairs, the majority of these (493,042 pairs) breed in Scotland (Mitchell *et al.* 2004).

A marine distribution map of breeding Atlantic puffin in British waters, based on ESAS data, shows that large puffin aggregations are found mostly in the outer Firth of Forth, around Shetland (particularly west of it, including Seas off Foula), around Sule Skerry in the North, and around the Outer Hebrides and St Kilda in the West (Kober *et al.* 2010). Seas off St Kilda therefore belongs to the areas with increased densities of Atlantic puffin.

Puffins using the Seas off St Kilda site are likely to have come from the St Kilda colony. St Kilda is by far the most important colony of Atlantic puffin in Britain, accounting for 142,264 breeding pairs during the last national census in 1999/2000, which is larger than the second and third biggest colonies combined (Mitchell *et al.* 2004). This colony therefore held always substantial numbers of puffins, as documented by the first census in 1987 and onwards (Table 8). The population of 6,198 birds within Seas off St Kilda is therefore a feasible figure for this site close to the biggest colony of puffins in Britain.

The three big national seabird censuses indicate that overall numbers of breeding Atlantic puffin have substantially increased since the first Operation Seafarer census in 1969-70. On St Kilda, however, the population decreased by 8% between 1985-88 and 1998-2002 (Table 8).

History of occupancy

The Western Isles, in particular the islands of the St Kilda group, have always been a stronghold in the distribution of Atlantic puffin around the British coast. Atlantic puffin has bred here for at least 250 years. The earliest description of puffins at St Kilda stems from Macaulay (1764), indicating that at that time already very large numbers were populating the island. It is very likely that the puffins back then used the same foraging areas as they do today, so a certain amount will have used Seas off St Kilda.

Table 8. Population of Atlantic puffin at St Kilda SPA (SMP database, pers. comm. R. Mavor, JNCC)

Year of count	Number of occupied borrows/bird on land
1987	154,001
1999/2000	142,264

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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 SPECIAL PROTECTION AREA (SPA)

Seas off St Kilda

(UK9020332)

Site Description:

The Seas off St Kilda Special Protection Area (SPA) is located in Scottish marine waters situated about 50 km northwest of North Uist in the Western Isles of Scotland. It covers 3,995 km^2 of mainly offshore waters and encloses the St Kilda archipelago. The site lies very close to the continental shelf edge, with water depth quickly increasing to the west and to the north of its limits. Like most of the continental shelf edge, Seas off St Kilda is an area of key nursery grounds of mackerel *Scomber scombrus.*

Qualifying Interest:

The Seas off St Kilda Special Protection Area (SPA) qualifies under **Article 4.2** by regularly supporting populations of international importance of the migratory species **northern gannet** (*Morus bassanus*) with a breeding population of 50,332 birds (5.2% of the biogeographic population).

It also qualifies by regularly supporting an **assemblage of breeding seabirds** of 67,372 birds. Under **Article 4.1** European storm-petrel *Hydrobates pelagicus* (954 birds) qualifies as a main component of the breeding seabird assemblage. Under **Article 4.2** northern fulmar *Fulmarus glacialis* (3,310 birds), European storm-petrel *Hydrobates pelagicus* (954 birds), northern gannet *Morus bassanus* (50,332 birds), common guillemot *Uria aalge* (3,147 birds) and Atlantic puffin *Fratercula arctica* (6,198 birds) qualify as main components of this assemblage.

Area: 3995.47 km^2 (399,546.90 ha)

Location: 58º 5.7579’ N 8º 31.3411’ W

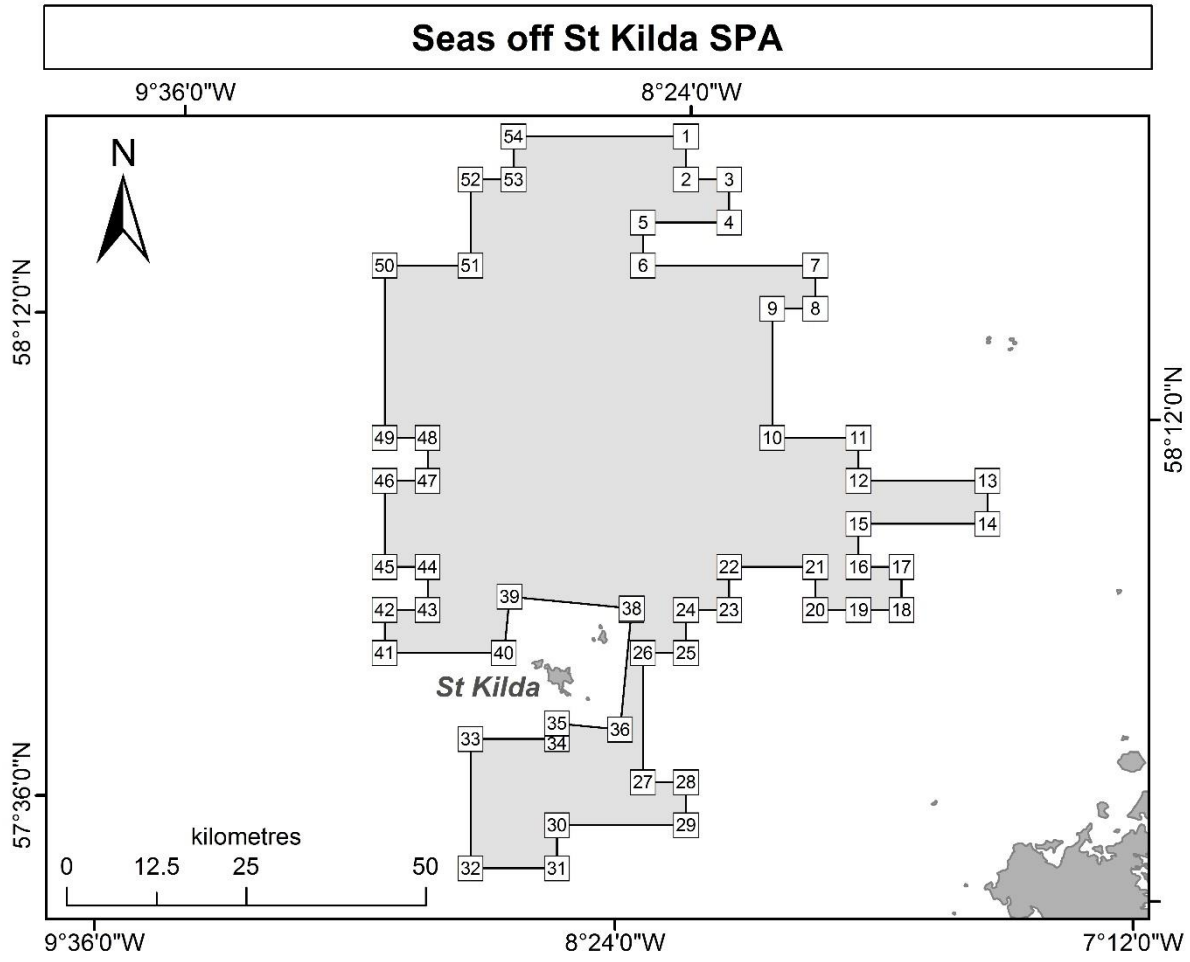
Date: 03/12/2020

Joint Nature Conservation Committee

Annex 2: Evidence standards

Evidence Standards (Evidence Quality Assurance Policy)

Annex 3: Site Map



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3	8° 17' 42.4678" W	58° 27' 17.0609" N	30	8° 33' 15.8154" W	57° 37' 51.2353" N
4	8° 17' 7.9394" W	58° 24' 4.2127" N	31	8° 32' 41.0009" W	57° 34' 38.4603" N
5	8° 29' 22.4494" W	58° 23' 27.4449" N	32	8° 44' 38.4719" W	57° 34' 0.5581" N
6	8° 28' 46.9475" W	58° 20' 14.6680" N	33	8° 46' 26.4190" W	57° 43' 38.6324" N
7	8° 4' 19.6283" W	58° 21' 26.8866" N	34	8° 34' 25.8149" W	57° 44' 16.7691" N
8	8° 3' 46.4446" W	58° 18' 13.9542" N	35	8° 34' 38.6877" W	57° 45' 27.3696" N
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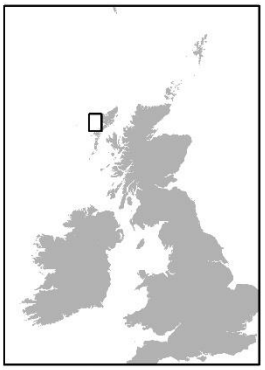
Seas off St Kilda SPA Land

JNCC
Joint Nature Conservation Committee



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Projection: British National Grid
Coastline: contains data © 2017 Oil & Gas Authority.

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Document version control

Version	Amendments made	Issued to and date
V1	First draft	High level internal QA, 30/05/2014
V2	Finalised draft for sign-off	MPA Sub Group, 30/05/2014, High level and Director level QA 20/06/2014
V3	Refined version	More comments from Marine Scotland in general on Site Selection Documents after Stakeholder workshop on 8-9 March 2016
V4	Addressed comments from Marine Scotland	MPA Sub Group, 24/05/2016
V4.1	Addressed further comments from MPA Sub-Group	
V5	Finalised draft for sign-off	
V6	Finalised draft for submission to government	
V7	Typo in Citation corrected and citation amended to follow NatureScot format	16/12/2020