Scapa Flow
Proposed Special Protection Area (pSPA)
NO. UK9020321

SPA Site Selection Document:
Summary of the scientific case for site selection
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1. Introduction

This document provides Scottish Natural Heritage’s (SNH) advice on the proposed classification of a Special Protection Area (SPA) in the marine waters of “Scapa Flow” for inshore wintering waterfowl and shag and foraging areas for breeding red-throated diver. It summarises the evaluation for each of the species of interest according to the SPA site selection guidelines (JNCC, 1999) and provides an overview of how the site boundary was developed.

Scapa Flow has been selected to provide protection to important wintering grounds used for feeding, moulting and roosting by non-breeding shag and by waterfowl, many of which migrate to Scotland every year to overwinter or to stop off at as one of their staging posts while on migration. The inshore area is also selected as an important foraging area for breeding red-throated diver, falling within foraging range of a high concentration of nesting territories, including those of the Hoy SPA. The protection of these inshore waters will make a key contribution to the maintenance of these species in their natural range in UK marine waters and form part of a coherent network of sites at a European level.

The importance of the marine environment for birds which spend all or part of their lives around our coasts is well recognised, particularly in Scotland. A total of 106 species of bird are thought to use UK marine waters of which 45 occur in numbers greater than fifty each year and are dependent on the marine environment for a large part of their lifecycle. All of these 45 species except one (black guillemot\(^1\)) are considered rare or vulnerable bird species (Annex 1), or regularly occurring migratory species by the Birds Directive (EC Directive on the conservation of wild birds (amended) - 2009/147/EC). This means that all Member States are obliged to take account of the requirements of Article 4.1 of the Birds Directive for each of these 44 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, taking into account their protection requirements in the geographical sea and land area where this Directive applies”. EU guidance on the establishment of SPAs in the marine environment (2007) sets out the groups of marine birds for which SPAs should be considered in the marine environment. This includes sites for wintering waterfowl and shags and feeding areas for breeding divers, including those used by birds from existing terrestrial SPAs to ensure they have continued access to key food sources.

In the UK, whilst some coastal SPAs include marine waters below the Mean High Water Springs (MHWS) there are only four entirely marine SPAs classified: Outer Thames Estuary SPA (England), Liverpool Bay/Bae Lerpwl SPA (England/Wales) and Bae Caerfyrddin/Carmarthen Bay SPA (Wales) and Belfast Lough - Open Water SPA (Northern Ireland). In Scotland, 31 marine extensions to seabird colony SPAs

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\(^1\) Nature Conservation Marine Protected Areas were designated in August 2014 for black guillemot.
have also been classified. The existing suite of sites is not considered sufficient to meet the requirements of Article 4.1 because it currently does not include suitable territories at sea for all of the species that the UK has a responsibility for.

This site is being proposed as part of a suite of marine sites that aim to fulfil the requirements for SPAs in the marine environment for rare or vulnerable birds and regularly occurring migratory birds in the UK. As required by Article 4 of the Directive, the classification of this site will enable the application of special conservation measures concerning the habitat of Annex 1 and regularly occurring migratory birds in order to ensure their survival and reproduction in their area of distribution.

Full details of the site survey methodologies, data and analysis used to inform the proposed selection of this site are provided in Lawson et al (2015) for non-breeding inshore waterfowl and shag and Black et al (2014) for breeding red-throated diver. All scientific work received full external independent peer review at key stages.

2. Site summary

The Scapa Flow proposed Special Protection Area (pSPA) (Figure 1) is located within the Orkney Islands. Scapa Flow is an enclosed sea area, sheltered by Orkney Mainland to the north, Hoy, South Walls and Flotta to the west and south and Burray and South Ronaldsay to the east. The Flow is linked to the Pentland Firth on the south through the Sound of Hoxa, and to the Atlantic Ocean on the west through Hoy Sound. The site also includes nearshore waters to the east of Orkney, extending from South Ronaldsay to Deerness and including the sheltered shallow waters of Holm Sound, between Burray and East Mainland. Prior to construction of the Churchill Barriers in World War II, there were openings between Scapa Flow and Holm Sound to the North Sea.

The area included within the pSPA supports a population of European importance of the following Annex 1 species:

- Great northern diver (*Gavia immer*)
- Red-throated diver (*Gavia stellata*)
- Black-throated diver (*Gavia arctica*)
- Slavonian grebe (*Podiceps auritus*)

It also supports migratory populations of European importance of the following species:

- European shag (*Phalacrocorax aristotelis*)
- Common eider (*Somateria mollissima*)
- Long-tailed duck (*Clangula hyemalis*)
- Common goldeneye (*Bucephala clangula*)
- Red-breasted merganser (*Mergus serrator*)

Scapa Flow pSPA comprises in total an area of 370.66km$^2$. 
The main part of Scapa Flow is typically around 30metres (m) deep, but there is a deeper trench at Brings Deeps reaching just over 60m depth. There are numerous shallower bays in the surrounding land, particularly to the north and east, including Bay of Ireland, Houton, Swanbister, Waukmill, Scapa, St Mary’s, Water Sound and Holm Sound. Shallower waters are also found around islands such as Flotta, Cava and Fara.

Sediments in the main basin and shallow bays are primarily muddy sands which support communities of seapens, polychaete worms, urchins and bivalve shellfish (Murray et al 1999). In Hoy and Hoxa Sounds, greater tidal flows are associated with cleaner sands and gravels. Kelp forests occur on bedrock and boulder slopes around the Flow and there are maerl beds in the vicinity of Graemsay. These varied habitats, together with more localised features such as horse mussel beds and numerous wrecks, support a high diversity of marine life while the Flow’s topography provides numerous sheltered areas where birds can moult, roost, rest and feed.

Divers, mergansers and shags feed on a wide variety of fish that are associated with a range of seabed substrates. These birds catch fish by diving from the surface and pursuing their prey underwater. The fish species taken will be influenced by what is locally most readily available, but the diet of divers and mergansers can include haddock Melanogrammus aeglefinus, cod Gadus morhua, herring Clupea harengus, sprats Sprattus sprattus and gurnard Eutrigla gurnardus along with smaller species such as sand-eels Ammodytidae, pipefish Syngathidae, gobies Gobiidae, flatfish Pleuronectidae and butterfish Pholis gunnellus. Sand-eels are favoured by shags during the breeding season, but adult birds take a wide variety of species.

Slavonian grebe feed on small fish species but their diet also includes small amphipods and other crustaceans. Great northern divers also feed opportunistically on small crustaceans.

Common eider and long-tailed duck feed almost exclusively on molluscs and small crustaceans, diving from the surface to pluck their prey from the seabed. Common goldeneye also feed mainly on invertebrates such as molluscs, worms, and crustaceans but will take also small fish.

Diving activity varies among species but average foraging dive depths for most are shallower than 15m. However, substantially greater maximum dive depths have been recorded for some species, particularly shag and great northern diver.

The presence of high densities of wintering waterfowl in Scapa Flow and adjacent waters is indicative of the importance of these sheltered, shallow and productive waters at this time of year when frequent storms affect the surrounding North Sea and eastern Atlantic. Shag and eider are resident throughout the year, but long-tailed duck, goldeneye, great northern diver, black-throated diver and Slavonian grebe migrate long distances from their northern breeding grounds to reach wintering grounds such as Scapa Flow. Red-breasted mergansers are typically short distance migrants, using coastal areas in winter.

Orkney is a stronghold for breeding red-throated diver which feed almost exclusively at sea within a limited foraging range. During the summer months, Scapa Flow is an
important foraging area for a high concentration of red-throated diver nesting territories on adjacent islands and Hoy SPA and Orkney Mainland Moors SPA.

Figure 1. Location of the Scapa Flow pSPA
3. Bird survey information

Inshore wintering waterfowl (divers, grebes and seaduck)²

Areas of search
Existing data (including Wetland Bird Surveys (WeBS), Important Bird Areas (IBA) under BirdLife International, existing survey data and an atlas of seabird distributions) and information from published scientific literature were used to determine which initial areas might be important for inshore wintering waterfowl. Based on this initial assessment, 46 areas of search were identified across the UK, with 22 of these in Scotland. Scapa Flow was one of the areas of search identified as holding potentially large numbers of birds and therefore merited further survey.

A combination of aerial survey and shore-based surveys were conducted between 2007 and 2009.

Aerial transect (2002/03-2005/06)
Line transect aerial surveys were carried out on 5 occasions on 12th December 2002, 12th February 2004, 7th March 2005 and 29th January and 22nd February 2006. The count in December 2002 was confined to Scapa Flow itself. All of these surveys were conducted by the Joint Nature Conservation Committee (Lawson et al 2015). Surveys were conducted between November and March to enable estimates of non-breeding populations to be made. No data were collected during migration periods or for aggregations of moulting birds.

The data from the aerial transect surveys were used to produce density distribution maps for great northern diver, common eider, long-tailed duck and red-breasted merganser but were not used to calculate mean maximum counts of number of individuals (population estimates). Data collected from the shore-based and boat counts were used to calculate the population estimates.

Shore-based and boat surveys
Aerial surveys are one of the most effective methods for surveying inshore concentrations of birds over large areas. However, certain species are not amenable to survey from aircraft and some species that remain very close to the shore may often be missed, as the aircraft makes sharp turns at the shoreline. Grebe species are not easily detected during aerial surveys and diver species are often not easily identified to species during aerial surveys, particularly in areas where several species may be present.

Accordingly, shore-based and boat-based surveys were also carried out in the winter seasons (November–March) of 1998/99, 2000/01 and 2006/07 to compliment the aerial survey. These comprised shore-based surveys of 43 near-shore sections of Scapa Flow and boat-based survey of the central area of the Flow.

² Full details of the methodologies, data and analysis used are provided in the JNCC Report 567: Lawson et al 2015 and the JNCC generic document ‘Identification of important marine areas for inshore wintering waterbirds’. JNCC Report 567 received full external independent peer review.
Wetland Bird Survey data were limited to small areas in the eastern Flow; those from 2006/07-2010/11 were assessed, but not used to provide population estimates.

The data from the shore based counts only were used to calculate mean maximum count of number of individuals (population estimate) for each species of interest. The population estimates were compared against the relevant national and/or biogeographic reference population estimates (Musgrove et al 2013 or Wetlands International 2014) to provide a percentage of the reference population for each species of interest (Lawson et al 2015).

**Feeding areas of breeding red-throated divers**

The breeding distribution of red-throated divers in the UK is limited to Scotland and is largely restricted to the north and west of the country, with major strongholds in Shetland, Orkney, and the Outer Hebrides (Gibbons et al 1993, Dillon et al 2009).

Four main survey areas were chosen at which to undertake detailed data collection. These were selected to focus on the most important breeding areas, representing the geographical spread of breeding areas, and be practical in terms of field work logistics. The selected study areas were Unst, Yell and Fetlar (northern Shetland); Shetland Mainland; Isle of Hoy (Orkney); and North Uist (Outer Hebrides).

A full national survey of red-throated diver was undertaken in 2006 (Dillon et al 2009) which provides data on breeding populations. Models were then developed to map predicted foraging distributions within maximum foraging flight range of breeding sites (Black et al, 2015). These models used observed correlations between environmental variables and diver distribution, as recorded in boat-based transect surveys and by visual or radio tracking of individual birds in four areas between 2003 and 2007, to predict areas that divers are likely to use in un-surveyed areas of sea. The data underpinning the models included locations in Orkney (around Hoy) where boat survey and visual tracking data were collected in summer 2005.

**Estimating numbers of birds within an SPA boundary**

SPA boundaries were drawn only for those inshore wintering waterfowl species which occurred in qualifying numbers in the area of search (section 4) and for which suitable aerial survey data were available (section 5). For inshore wintering waterfowl, ArcGIS was used to calculate the area [km²] of each 1km x 1km cell, or partial cell, located within the new boundary. For each grid cell the total number of individuals for each species was then estimated by multiplying the cell area with the species densities within each individual cell. The total of individuals for each species within the new boundary was provided by summing all cell totals within the boundary by species and season. For red-throated diver, the population estimate was calculated by from breeding pairs within foraging distance (calculated as maximum distance observed from radio tracking plus 1km foraging area) to the new boundary.

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3 Full details of the methodologies, data and analysis used are provided in the Joint Nature Conservation Committee (JNCC) Report 541: Black et al 2014 and the JNCC generic document ‘Red-throated diver marine SPA identification: Data collection and analysis’ JNCC Report received full external independent peer review.
The number of birds within the SPA boundary was then reassessed against the UK SPA Selection Guidelines to ensure the site still qualified for consideration as an SPA.

4. Assessment against the UK SPA Selection Guidelines

The UK SPA Selection Guidelines establish a two stage process for SPA identification (JNCC, 1999). Stage 1 allows identification of areas that are likely to qualify for SPA status.

Stage 1

To qualify under Stage 1 the area needs to meet one or more of the following four guidelines:

1.1. The area is used regularly by 1% or more of the Great Britain population of a species listed in Annex I to the Birds Directive in any season.
1.2. The 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. The area is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) or 20,000 seabirds in any season.
1.4. The area meets the requirements of one or more of the Stage 2 guidelines in any season, where the application of Stage 1 guidelines 1.1-1.3 for a species does not identify an adequate suite of most suitable areas for the conservation of that species.

Additionally, it is established practice to apply a minimum threshold of 50 individuals to be regularly present on a site before it can be considered for site selection. Exception to this rule however applies where its application would preclude the selection of any suitable territories and therefore prevent the fulfilment of UK obligations under the Birds Directive.

Stage 2

Those areas that meet one or more of the Stage 1 guidelines undergo further consideration using one or more of the ecological judgements set out in Stage 2. There are seven Stage 2 judgements. These judgments are used to facilitate the selection of the most suitable areas from the areas identified at Stage 1 to produce a network of marine SPAs in Scotland. The Stage 2 judgements are:

2.1 Population size and density
2.2 Species range
2.3 Breeding success
2.4 History of occupancy
2.5 Multi-species area
2.6 Naturalness
2.7 Severe weather refuges
Application of Stage 1.4

Ten species of non-breeding migratory waterfowl and seabirds (non-Annex 1) frequently occur in Scottish marine waters in substantial numbers. All of these species have very large biogeographic populations often spread over extensive areas. This means that applying guideline 1.2 (area regularly used by 1% or more of the biogeographical population of a regularly occurring migratory species), which has been helpful in identifying important areas on land, would largely fail to identify important areas at sea for these non-breeding migratory species. It is SNH and JNCC’s view that the absence of these species from a suite of marine SPAs would not satisfy the requirements of Article 4.1 of the Birds Directive.

Therefore, to ensure these species are represented they were considered using guideline 1.4. This is specifically designed to capture cases where a species’ population status, ecology or movement patterns may mean that an adequate number of areas cannot be identified from guidelines 1.1-1.3 alone.

Our experience is that marine bird ‘hotspots’ usually support several species in substantial numbers potentially resulting in an SPA with rich biodiversity. In applying this fourth guideline, SNH only considered sites that had already been identified as potential SPAs for one or more species using guidelines 1.1-1.3. This approach allows for all ten species of non-breeding migratory birds (non-Annex 1) to be represented in the proposed SPA suite. Without prejudice to any forthcoming review of marine SPA sufficiency, our view is that inclusion of these species in the proposed suite will provide an adequate number of areas for these species.

To assess which sites may be considered as suitable areas for those migratory birds that did not meet the threshold of 1% or more of their biogeographical population, SNH focused on three of the Stage 2 judgments (population size and density, species range and multi-species area).

To provide a consistent and quantifiable population threshold for species that may be considered using guideline 1.4, species only became candidates for inclusion in a site where they occurred in numbers in excess of 1% of their GB population. This population threshold is consistent with the population threshold used to identify named qualifiers of a waterbirds or seabird assemblage selected under guideline 1.3.

At this pSPA, common eider, long-tailed duck, common goldeneye and red-breasted merganser have been identified using this approach (>1% GB population), each with a high proportion of their distribution overlapping qualifying Annex 1 species. The approach has been reviewed and supported by SNH’s Scientific Advisory Committee.

Assessment against Stage 1 of the UK SPA Selection Guidelines

Great northern diver, black-throated diver, red-throated diver and Slavonian grebe are Annex 1 species and were present in numbers at or above 1% of the GB population. These species all met Stage 1.1 of the SPA guidelines (Table 1).
European shag is a regularly occurring migratory species present in numbers at or above 1% of the biogeographical population. This species therefore met Stage 1.2 of the SPA guidelines (Table 1).

Common eider, long-tailed duck, common goldeneye and red-breasted merganser, all regularly occurring migratory species did not occur in numbers at or above 1% of their biogeographical population and therefore did not meet Stage 1.2 of the guidelines. All three species did however exceed 1% of the GB population and could therefore be considered under Stage 1.4 (Table 1).

Table 1. Assessment against Stage 1

<table>
<thead>
<tr>
<th>Species and season</th>
<th>Annex 1 or migratory</th>
<th>Population size in site</th>
<th>% of GB population</th>
<th>Stage 1 guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great northern diver (non-breeding)</td>
<td>Annex 1</td>
<td>506</td>
<td>20.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Red-throated diver (breeding)</td>
<td>Annex 1</td>
<td>81 (pairs)</td>
<td>7.6</td>
<td>1.1</td>
</tr>
<tr>
<td>Black-throated diver (non-breeding)</td>
<td>Annex 1</td>
<td>57</td>
<td>9.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Slavonian grebe (non-breeding)</td>
<td>Annex 1</td>
<td>135</td>
<td>12.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Common eider (non-breeding)</td>
<td>Migratory</td>
<td>1,994</td>
<td>3.3 (0.19)</td>
<td>1.4</td>
</tr>
<tr>
<td>Long-tailed duck (non-breeding)</td>
<td>Migratory</td>
<td>1,393</td>
<td>12.7 (0.09)</td>
<td>1.4</td>
</tr>
<tr>
<td>Common goldeneye (non-breeding)</td>
<td>Migratory</td>
<td>219</td>
<td>1.1 (0.02)</td>
<td>1.4</td>
</tr>
<tr>
<td>Red-breasted merganser (non-breeding)</td>
<td>Migratory</td>
<td>539</td>
<td>6.4 (0.32)</td>
<td>1.4</td>
</tr>
<tr>
<td>European shag (non-breeding)</td>
<td>Migratory</td>
<td>2,929</td>
<td>2.9 (1.5)</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Assessment against Stage 2 of the UK SPA Selection Guidelines

One or more of the Stage 2 guidelines are used to identify the most suitable areas for classifying as SPA from those areas that meet the Stage 1 guidelines. The focus for considering which areas were most suitable concentrated on three of the seven judgements; population size and density, species range and multi-species areas. Population densities were only considered for non-breeding Annex 1 species.

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4 The population estimates are based on the mean maximum population estimates provided in Lawson et al 2015 for all inshore aggregations of non-breeding waterfowl, Black et al 2014 for red-throated diver and amended, where appropriate to the site boundary.
5 Reference populations are from Musgrove et al 2013 and Wetlands International 2014.
6 The %s of the bio-geographic populations are given in parentheses.
Fourteen areas around Scotland (from the initial 22) were identified as meeting Stage 1.1 for non-breeding Annex 1 species (great northern diver, black-throated diver, red-throated diver and Slavonian grebe). To help identify the most suitable sites for SPAs from the initial 14 areas, the non-breeding Annex 1 species were ranked for each site according to their population size, density and number of other non-breeding qualifying species also present within each area. Particular emphasis was placed on identifying areas that function as “hotspots” for many species rather than just a few. The results of the ranking exercise for Scapa Flow are provided in Table 2.

Table 2: Summary of initial Annex 1 ranking and overlapping multi-species interest.
nb = non-breeding, b = breeding

<table>
<thead>
<tr>
<th>Assessment/Qualifying feature</th>
<th>Ranked importance for non-breeding Annex 1 species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great northern diver</td>
<td>4th most important site in Scotland</td>
</tr>
<tr>
<td>Black-throated diver</td>
<td>Most important site in Scotland</td>
</tr>
<tr>
<td>Red-throated diver</td>
<td>Not qualifying</td>
</tr>
<tr>
<td>Slavonian grebe</td>
<td>Most important site in Scotland</td>
</tr>
</tbody>
</table>

Scapa Flow has been selected because it supports three non-breeding Annex 1 species, with it being the most important site for black-throated diver and Slavonian grebe and fourth most important site for great northern diver in Scotland. Scapa Flow also supports the largest concentration of wintering European shag in GB, one of only two sites holding numbers in excess of the 1% bio-geographical population threshold. Additionally, this site supports some of the largest concentrations of other non-breeding waterfowl, so is an important multi-species site. Of these, Scapa Flow represents the only concentration of black-throated divers in the north of their GB range and the population of great northern diver is the largest in the east and north of Scotland.

Stage 2 judgements were also assessed for the other non-breeding (non-Annex 1) species considered at stage 1.4 on the basis of their populations exceeding 1% of the GB population (common eider, long-tailed duck, goldeneye and red-breasted merganser) to ensure it was appropriate to include these species within the Scapa Flow site (Table 3).

For these remaining species, which are more widely distributed, Scapa Flow is one of the main concentrations in the north of their GB wintering ranges.

With regard to the other Stage 2 judgements, all sites where considered largely ‘natural’, judgements on breeding success was irrelevant for inshore wintering waterfowl and no information was available to provide further consideration to ‘severe weather refuge’.

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7 Ranking was only applied to non-breeding Annex 1 species to provide an initial short-listing of most suitable areas that could then be subject to further checks for other marine bird interests. Ranking combines population size, density and multi-species interest to provide an overall rank.
Further details on the selection process and the final suite of sites being proposed is provided in the SNH supplementary document ‘Site selection of the marine SPA suite’ (SNH, 2016).
Table 3: Summary of assessment against Stage 2 of the UK SPA Selection Guidelines.

nb – non-breeding, b – breeding

<table>
<thead>
<tr>
<th>Stage 2 judgement/ Qualifying features</th>
<th>Population size</th>
<th>Species range</th>
<th>Influence on site boundary?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great northern diver (nb)</td>
<td>3rd largest population in Scotland.</td>
<td>Important component in the north and easterly part of their range in GB.</td>
<td>Pre-dominate species influencing boundary</td>
</tr>
<tr>
<td>Black-throated diver (nb)</td>
<td>2nd largest population in Scotland.</td>
<td>Largest concentration in the north and easterly part of their range in GB.</td>
<td>No influence on boundary.</td>
</tr>
<tr>
<td>Slavonian grebe (nb)</td>
<td>Largest population in Scotland and GB</td>
<td>Largest concentration in the north and easterly part of their range in GB.</td>
<td>No influence on boundary.</td>
</tr>
<tr>
<td>Common eider (nb)</td>
<td>4th largest population in Scotland.</td>
<td>Largest concentration in the north of their range in GB.</td>
<td>Influences southern boundary as single species.</td>
</tr>
<tr>
<td>Long-tailed duck (nb)</td>
<td>3rd largest population in Scotland.</td>
<td>Largest concentration in the north of their range in GB.</td>
<td>Influence on eastern boundary as single species.</td>
</tr>
<tr>
<td>Goldeneye (nb)</td>
<td>3rd largest population in Scotland.</td>
<td>Largest concentration in the north of their range in GB.</td>
<td>No influence on boundary.</td>
</tr>
<tr>
<td>Red-breasted merganser (nb)</td>
<td>Largest population in Scotland.</td>
<td>Largest concentration in the north of their range in GB.</td>
<td>Influence in multi-species areas only$^8$</td>
</tr>
<tr>
<td>European shag (nb)$^{10}$</td>
<td>2nd largest population in Scotland.</td>
<td>Largest concentration in the north of their range in GB.</td>
<td>Influences a slightly extended distribution at some locations beyond that of great northern diver.</td>
</tr>
<tr>
<td>Red-throated diver (b)</td>
<td>3rd largest of sites selected.</td>
<td>Important component in the northern part of their range in GB.</td>
<td>No influence on boundary</td>
</tr>
</tbody>
</table>

$^8$ Population estimates from Lawson et al 2015 for inshore wintering waterfowl
$^9$ Areas of multi-species interest lying outwith the great northern diver species-specific boundary and European shag distribution.
$^{10}$ Largest population is at the Moray Firth which was identified from European Seabird at Sea data analysis Kober et al 2012
### Stage 2 judgement (whole site)

| Multi-species area | Three non-breeding Annex 1 species (great northern diver, black-throated diver and Slavonian grebe) with four other inshore waterfowl species occur in nationally important numbers during winter in close association, together with European shag (>1% bio-geographical population). The pSPA makes a contribution to each species range representation. In addition, a further Annex 1 species, the red-throated diver, uses at least part of the area for feeding during the breeding season. A total of nine qualifying species regularly occur in the pSPA. |
| History of occupancy | Scapa Flow and surrounding waters have long been recognised for presence of non-breeding waterfowl (e.g. Buckley and Harvie- Brown 1891, Baxter & Rintoul 1953, Booth et al 1984, Lack 1986) and this site's importance to the species listed was confirmed by initial systematic surveys in the 1970s (Lea, 1980). Wintering shags have been recorded in Scapa Flow for over 50 years (Lack, 1986) and Lea (1980) estimated presence of several thousand birds. Place names in Orkney indicate presence of breeding red-throated divers since Norse times and since the 1980s regular surveys on Hoy indicate that the population is being maintained at high densities (Booth et al 1984, E.J. Williams, unpublished data and Orkney Bird Reports). |
5. Site status and boundary

The proposed name for this site is the “Scapa Flow SPA”.

Marine sites present no visual surface features by which a seaward boundary can be identified. A site boundary was developed by reviewing the distribution of each species and selecting those areas which contained the highest densities. Great northern diver, common eider and long-tailed duck were recorded in good numbers from aerial survey and these data were used to establish mean density surfaces for each species and then applying maximum curvature to determine a density threshold. Threshold densities identified by maximum curvature were: 0.27 birds.km$^{-2}$ (great northern diver), 3.98 birds.km$^{-2}$ (common eider), 1.30 birds.km$^{-2}$ (long-tailed duck) and 0.22 birds.km$^{-2}$ (red-breasted merganser). A line was then drawn around all cells that exceed the density threshold to produce a species-specific boundary.

The area covering the species-specific boundary for great northern diver (qualifying under guideline 1.1) was then compared with the distributions of black-throated diver and Slavonian grebe (qualifying under guideline 1.1), European shag (qualifying under guideline 1.2) and other non-breeding species (qualifying under guideline 1.4) to establish the degree of overlap. At Scapa Flow pSPA, the distribution of great northern diver, together with the other three qualifying 1.1 and 1.2 species encompasses a substantial proportion of the species-specific boundaries for the 1.4 qualifiers common eider, long-tailed duck and red-breasted merganser, as well as the most important shore count sectors for common goldeneye. These combined distributions were used to produce an inshore wintering waterfowl and European shag composite species boundary.

The final boundary was created by drawing the boundary as tight as possible to the composite species boundary ensuring all cells exceeding density thresholds (maximum curvature) where included within the boundary. To avoid creating an over-complex boundary however some rationalisation of the final boundary was required, resulting in small areas with cells not exceeding the density threshold also being included in the final boundary. Whilst these areas did not exceed the density threshold, they are still likely to support lower densities of the qualifying species.

The pSPA boundary encompassing the inshore wintering waterfowl and European shag composite distributions was further checked for overlapping interests with respect to other marine bird interests. The boundary included an area of maximum curvature, derived from models, identified for foraging red-throated diver during the breeding season. Analysis of numbers of breeding pairs of red-throated diver within foraging range of the pSPA showed that the proposed site was important for more than 1% of the GB breeding red-throated diver population and therefore, breeding red-throated diver also qualified as an additional feature for the site. The inclusion of breeding red-throated diver however had no influence on the boundary.

During the development of a draft SPA at Pentland Firth and Scapa Flow, the initial proposed boundary extended to include Arctic tern (qualifying under guideline 1.1) and common guillemot (qualifying under guideline 1.3). Further to the SPA
stakeholder workshop in March 2016 a decision was taken to split the inshore species from the two seabird species. The site currently being proposed is for inshore wintering waterfowl and breeding red-throated divers in Scapa Flow. Further details on the proceedings from the SPA stakeholder workshop are provided in the workshop report (SNH, 2016).

The proposed site extends to 370.66 km². Boundary co-ordinates for the pSPA are given on the site map in Annex 1.

6. Information on qualifying species

Great northern diver
Great northern divers were present on all aerial surveys distributed generally throughout deeper and relatively more sheltered waters (Figure 2). Numbers of the species exceeded the Stage 1.1 threshold of 1% of the Great Britain population (25 birds) and the default site selection threshold of 50 birds (for those scarce species with a small population or where the population is not known with certainty) in all 4 of the aerial survey days during the period 2003/04-2005/06. The maximum population estimate of 275 birds was in January 2006. However in shore-based surveys numbers of great northern diver exceeded the above stage 1 thresholds on all nine survey occasions between November 1998 and February 2007 thereby meeting the definition of regularly occurring, with a maximum count of 781 birds in March 1999. Overall the data indicate a mean of peak annual non-breeding population estimates of 506 great northern divers (20.2% of the current Great Britain population estimate) in the Scapa Flow pSPA, clearly exceeding the Stage 1.1 threshold.

Population size and density
The northern and western seaboards of Scotland are the non-breeding strongholds of the great northern diver population of Great Britain. The area supports the third largest population of great northern divers (506 birds) in the proposed SPA suite. This is by far the largest population on the east and north coasts of Scotland, rivalling those of the western seaboard, with only that off the west coast of the Hebrides being larger. Densities detected by aerial surveys within the proposed site ranged from less than 0.1 birds/km² to 1.8 birds/km² with much of Scapa Flow supporting the higher densities.

Distribution within the site
Great northern diver was the main species influencing the extent of the proposed boundary (Figure 8).

Species range
The species occurs during winter round much of the British coastline. The maximum concentrations are to the north and west of Scotland, numbers being sparse or local south of Duncansby Head in Caithness and around the Clyde estuary. The west of Ireland, and to a considerable degree, its south coast are also important. This pSPA is an important component of the north and easterly part of the range.
History of occupancy
There is no evidence to suggest that this area has ever been anything but important for the species. The earliest record of its occurrence relate to the first half of the 19th century and its continued presence has been noted many times throughout the 20th and 21st centuries, suggesting this area has true long-term viability (Buckley & Harvie-Brown 1891, Baxter & Rintoul 1953, Lea, 1980, Booth et al 1984, Lack 1986, Forrester & Andrews 2007).

Figure 2. The distribution of great northern divers in the Scapa Flow pSPA.

Black-throated diver
Black-throated divers were noted most frequently in Scapa Flow around the shores of Hoy, Mainland and South Ronaldsay (Figure 3). With a mean of peaks estimate of 57 individuals during the period 1998/99-2006/07, numbers of black-throated diver exceeded the Site Selection Stage 1.1 (1% or more of the GB population of an Annex 1 species), which for black-throated diver is 6 birds. It was also one of only two sites that exceeded the default level of 50 birds for species with small total population numbers (for black-throated diver estimated to be currently about 600 birds in Great Britain). This is the largest concentration of two locations in the proposed marine SPA network and the second largest of all the areas surveyed in Scotland; (only the Wester Ross Sea Lochs supported more (61 birds)).

Population size and density
Four non-breeding concentrations of black throated divers are known around the shores of Great Britain. Fifty seven individuals is the largest population in the proposed marine SPA suite and the second largest known in Scotland. The population within the pSPA boundary exceeds the 1% of the Great Britain population level for Annex 1 species. This is a scarce wintering species such that average density across the pSPA is low (0.15 birds km$^{-2}$) but actual densities within favoured inshore areas are substantially greater (Figure 3).

Distribution within the site
The black-throated diver distribution at this site falls entirely within that identified for great-northern diver and/or European shag, and therefore this species does not influence the site boundary. See Figure 3.

Species range
As a scarce non-breeding species in Great Britain only four concentrations have been identified; the largest with just over 100 birds on the south Cornwall coast. This site, along with the West Coast of the Outer Hebrides and south Cornwall, gives good representation of the species range around Great Britain.

History of occupancy
The species has undoubtedly been present in small numbers for over a century although records are few, especially in the 19$^{th}$ century. However with the increase in popularity of bird watching its presence is confirmed throughout the last 50 years of the 20$^{th}$ century into the 21$^{st}$ century (Lack 1986).
Figure 3. The distribution of black-throated divers in the Scapa Flow pSPA. Point symbols represent the relative number of black-throated divers in each count sector.
Slavonian grebe
Slavonian grebes occurred in the coastal areas of Scapa Flow, most numerously along the south-eastern shore of Mainland and the northern shores of Burray and South Ronaldsay (Figure 4). Overall the mean of the peak annual non-breeding populations was 135 birds (12.3% of the Great Britain population).

Population size and density
The north and west seaboard of Great Britain are the stronghold of this species in Great Britain and, whilst there are other Scottish locations with concentrations, notably the Firth of Forth area and the Moray Firth in Scotland, Orkney along with the Outer Hebrides and Shetland stand out. The island groups of Orkney and Shetland are clearly important as a whole to the species but Scapa Flow stands out as an individually important location in the former with the largest of all populations recorded in the areas of search. The mean annual number in the Scapa Flow proposed SPA is 135 individuals (up to 12.3% of the GB population). The average density of 0.36 birds km-2 across the whole site is considerably exceeded in the sheltered bays, particularly on the east side of the Flow, that are favoured by this species.

Distribution within the site
The Slavonian grebe distribution at this site falls entirely within that identified for great-northern diver and/or European shag, and therefore this species does not influence the site boundary (Figure 4).

Species range
The species occurs in small numbers round the coasts of Great Britain with concentrations in specific localities. There are few significant populations and Scapa Flow supports the largest concentration in Great Britain and therefore is an important component in range representation for Scotland and Great Britain.

History of occupancy
Records are sparse in the 19th and early 20th centuries. However, over at least a 60 year period, through the second half of the 20th century and first few years of the 21st century the species has been recorded in significant numbers and the consistent importance of this area confirmed (Lack 1986, Forrester et al 2007). Lea (1980) recorded up to 52 birds in the mid-1970s.
Figure 4. The distribution of Slavonian grebes in the Scapa Flow pSPA. Point symbols represent the relative number of Slavonian grebes in each count sector.
Common eider
Eiders in mainland Great Britain belong to the biogeographical race *Somateria m. mollissima* whilst those in Shetland belong to a different and more restricted biogeographic race *Somateria m. faeroensis* (Furness *et al.* 2010). The race of those residing in Orkney is, as yet, undetermined. On a precautionary basis current numbers in Orkney are assessed against the mainland race, but judgements would be similar if assessed against the far scarcer Faeroe race.

In contrast to great northern diver, common eider occurred around the more shallow areas of Scapa Flow especially off the south-east coast of Hoy and right across the western and southern reaches of the Flow, even round the exposed southern and eastern coasts of South Ronaldsay (Figure 5). Numbers did not exceed those needed to meet the Stage 1.2 guideline (1% or more of the biogeographic population), 10,300 birds. However numbers considerably exceeded the level of 1% of the Great Britain total (600 birds) in all of the four aerial surveys conducted between 2004 and 2006 and all nine of the shore-based counts between 1998 and 2007. In most years the population estimate was between 1,000-2,000 birds but the maximum estimate in February 2004 was approximately 2,500. Overall the mean peak annual non-breeding population for the years of 1998/99 to 2006/07 was 1,994 birds (3.3 % of the GB population).

Population size and density
Throughout the early years of the 21st century Scapa Flow has consistently supported a sizeable population of eiders. For a species which has a very sizeable biogeographic population of about 1,030,000 birds no location in Great Britain nearly reaches the 1% selection level to meet the Stage 1.2 Guideline. Nevertheless Great Britain supports a large national population, with most in Scotland, and hence, a mean of peak estimates population of 1994 birds (3.3% of the Great Britain population), identifies Scapa Flow as an important site included in the SPA suite under SPA site selection guideline 1.4.

Density estimates derived from aerial surveys ranged from 0.2 – 19.4 birds/km² comparable with those on the West Coast of the Outer Hebrides but lower than maxima in the Firths of Tay and Forth where there are sizeable local breeding colonies.

Distribution within the site
The common eider distribution at this site fell largely within that identified for great northern diver. However, most notably their distribution extends round the exposed southern and eastern coasts of South Ronaldsay where it is a single species interest (Figure 5). Prior to the boundary change to split the original site into two, this distribution had overlapped with Arctic tern.

Species range
Whilst eiders are widely distributed and, during winter, may occur round virtually the whole UK coastline the range is predominantly in northern England and especially mainland Scotland and the Scottish island groups. Scapa Flow is one of the main non-breeding concentrations of eider in the Northern Isles, and along with the Firths of Forth & Tay, Montrose Basin and Aberdeen Bay on the east mainland coast, representing the north of this distribution.
History of occupancy
The presence of eiders in Orkney has been long noted; records going back to the first half of the 19th century with detailed records since the second half of the 20th century (MacGillivray 1837, Buckley & Harvie-Brown 1891, Lack 1986, Forrester et al 2007). In the 1970s, 2000 eider were estimated to winter in Scapa Flow (Lea, 1980).

Figure 5. The distribution of common eiders in the Scapa Flow pSPA.
**Long-tailed duck**

Long-tailed duck were recorded in wide areas of the shallower coastal fringes of Scapa Flow but were noticeably concentrated in two areas; in the west between north-east Hoy and Mainland, and to the east between Burray and east Mainland (Figure 6). Numbers of long-tailed duck did not exceed those needed to meet the Stage 1.2 guideline (16,000 birds) but considerably exceeded the level of 1% of the Great Britain total (110 birds) in four of the aerial surveys conducted between 2004 and 2006 and all nine of the shore-based counts between 1998 and 2007. Overall the area supported a mean peak annual non-breeding population for the survey years of 1,393 birds (12.7% of the GB population).

**Population size and density**

The population of long-tailed ducks in Scapa Flow, albeit only a small proportion of the biogeographic population, is one of the largest in Scotland (and Great Britain) when compared to the other notable concentrations on east mainland Scotland, elsewhere in Orkney, Shetland and on the west coast of the Outer Hebrides. Whilst the population in the Moray Firth and Firth of Forth/Tay are the largest in Great Britain, that in Scapa Flow is the third largest and hence the most important in the Northern Isles. The maximum density recorded in aerial surveys was 15.7 birds km$^{-2}$ and the mean peak count of 1,393 birds represents an average density across the pSPA of 3.76 birds km$^{-2}$.

**Distribution within the site**

The long-tailed duck distribution at this site fell largely within that identified for great northern diver, although the species-specific boundary for long-tailed duck does extend the eastern boundary (Figure 6).

**Species range**

The species occurs right round the coast of Great Britain during winter, but the main distribution is eastern Scotland and the island groups. Within that broad range, locations where long-tailed duck are abundant are few and widely spaced except in Scotland. The Scapa Flow pSPA, in the Orkney Isles, is an important component in the northern part of that range.

**History of occupancy**

The written record refers to long-tailed ducks being common in the area in the first few decades of the 19th century. However detailed numerical data are relatively few until the second half of the 20th century; from then till the present, a period exceeding 50 years, birds have been consistently recorded. Buckley & Harvie-Brown 1891, Baxter & Rintoul 1953, Lack 1986, Owen 1986, Forrester & Andrews 2007, Balmer et al 2013). Lea (1980) recorded over 2000 long-tailed duck in Scapa Flow in the 1970s.
Figure 6. The distribution of long-tailed ducks in the Scapa Flow pSPA.
Common goldeneye
Common goldeneye were widely distributed in the coastal areas of Scapa Flow but, like long-tailed duck, noticeably concentrated in two broad areas in the west and east (Figure 7). Numbers of goldeneye did not exceed those needed to meet the Stage 1.2 guideline (11,400 birds). However numbers did considerably exceed the level of 1% of the Great Britain total (200 birds) in the 3 years of shore-based counts between 1998/99 and 2006/07. Overall a mean peak annual non-breeding population in the proposed SPA for the survey years was estimated to be 219 birds (1.1% of the Great Britain population).

Population size and density
The goldeneye is most commonly present in Great Britain during the winter. With the exception of south and west England and south Wales, it is widespread around the GB coastline and on inland waters. However, abundance tends to be northerly and greatest in Scotland, especially on or around the east coast and Orkney. Even in Scotland sizeable concentrations tend to be scarce. That in Scapa Flow, with a mean of peak estimates of 219 birds (1.1% of Great Britain population) is one of the largest in Scotland. Average density across the pSPA is 0.59 birds km\(^{-2}\) but given distribution within the site maximum densities are considerably higher.

Distribution within the site
The goldeneye distribution at this site falls entirely within that identified for great-northern diver and/or European shag, and therefore this species does not influence the site boundary (Figure 7).

Species range
The species occurs right across Great Britain, except south and south western England and Wales, during winter, with the main coastal distribution being eastern mainland Scotland and Orkney. The Scapa Flow proposed SPA population is the most sizeable in the north of the core range.

History of occupancy
**Figure 7** The distribution of common goldeneye in the Scapa Flow pSPA. Point symbols represent the relative number of common goldeneye in each count sector.
Red-breasted merganser

Red-breasted merganser occurred mainly in coastal waters often in the narrower stretches between islands (Figure 8). Numbers of red-breasted merganser in the proposed SPA did not exceed those needed to meet the Stage 1.2 guideline (1,700 birds). However numbers did considerably exceed the level of 1% of the Great Britain total (84 birds) in 2 out of the 4 aerial surveys conducted between 2003/04 and 2005/06 and in each of the 3 years of shore-based counts between 1998/99 and 2006/07. In most years the population estimate was between 300-500 birds with the maximum of 628 recorded in November 1998. Overall a mean peak annual non-breeding population in the area for the survey years of 539 birds (6.4% of the GB population) was estimated.

Population size and density

The non-breeding red-breasted merganser population is distributed inshore in relatively sheltered areas throughout the United Kingdom and the Republic of Ireland with most areas supporting between 100-300 birds. In Scotland the species is notably concentrated around the west mainland, the Outer Hebrides and the Northern Isles. On the mainland birds tend to number around 150-200 although numbers in the Northern Isles tend to be greater. The Scapa Flow pSPA with a mean population of peak estimates of 539 birds (6.4% of the Great Britain population), along with the Moray Firth and the Firths of Forth and Tay, support the largest populations in eastern Scotland. The population estimates derived from boat and shore based counts give an average density across the site of 1.45 birds km$^{-2}$ while the aerial survey data (Figure 8) indicate considerable variation in densities across the site.\(^{11}\)

Distribution within the site

Red-breasted merganser is one of two inshore wintering waterfowl species that influence the boundary at North Bay (Figure 8).

Species range

The red-breasted merganser occurs right round the coastline of the UK and the Republic of Ireland but is notably concentrated in west mainland Scotland, the Outer Hebrides and the Northern Isles with only local abundance on the east mainland. The Scapa Flow area is the most significant population in Orkney and Shetland in the north of the range.

History of occupancy

Whilst in the early years records are sparse, the presence of red-breasted merganser in the area has been noted for almost two hundred years with more detailed data available from the second half of the 20\(^{th}\) century (Buckley and Harvie-Brown 1891, Lack 1986, Balmer et al 2013). Lea (1980) recorded a population of 350 red-breasted merganser in Scapa Flow in the mid-1970s.

\(^{11}\) Note that, given relatively low detectability of this species in aerial surveys, average density derived from inshore-based and boat surveys is higher than the relative density figures derived from aerial surveys shown in Figure 8.
Figure 8. The distribution of red-breasted mergansers in the Scapa Flow pSPA.
European shag
The European shag is one species, along with great northern diver, which frequents the open deeper waters of Scapa Flow as well as the coastal areas (Figure 9). During winter numbers of European shag in the area exceeded those needed to meet the Stage 1.2 guideline (1% or more of the biogeographic population), in this case 2,000 birds, in each of the three seasons of shore-based surveys between 1998/99 and 2006/07.

Population size and density
Whilst non-breeding shags are widely distributed they are concentrated in the north of Great Britain round all the coasts and islands of Scotland, with only a local concentration in England in the south-west. All significant inshore counts are in the north, particularly in Orkney and Shetland. 2,929 birds (1.5% of the biogeographic population) in Scapa Flow is the largest by far, representing an average density of 7.98 birds km$^{-2}$. Only populations identified in the Moray Firth during analysis of European Seabird at Sea data were shown to be larger overall (Kober et al. 2012).

Distribution within the site
The distribution of European shag largely overlaps the distribution of great northern diver, extending it slightly into Bay of Ireland and Switha Sound (Figure 9).

Species range
In Great Britain shags during winter are distributed very much round the whole coastline. However, in contrast to cormorants, the bulk of the inshore population is distributed round Scottish coasts, especially the north and west. Hence this site lies in the core distribution of the species.

History of occupancy
There are records of shags in the area for over 50 years (Lack 1986) and Lea (1980) noted the use of Scapa Flow by several thousand wintering shag in the 1970s.
Figure 9. The distribution of European shags in the Scapa Flow pSPA. Point symbols represent the relative number of European shag in each count sector.
**Red-throated diver**

The breeding range of red-throated divers in Great Britain is restricted to Scotland, with the coastal waters adjacent to many nesting localities being of particular importance for feeding. The birds able to forage in the Scapa Flow pSPA (81 pairs in 2006; 7.6% of the Great Britain (GB) population) nest on the surrounding islands ([Figure 10](#)) and form one of two large concentrations in Orkney towards the northern extent of the core Scottish range.

Nesting territories tend to be traditional and are occupied repeatedly with birds habitually using the marine areas within 10km of the nest site for foraging. Nesting territories are reported present on surrounding and adjacent land every year ([annual Orkney Bird Reports](#)). Hence, feeding within the pSPA can be assumed and there is high confidence in regularity of use of the site for foraging by breeding red-throated divers.

**Population size and density**

The National survey (2006) identifies 81 pairs of red-throated diver nesting within a 10km foraging range of the pSPA. The Scapa Flow pSPA forms the biggest potential feeding site for red-throated diver in Orkney and the third largest in the site suite after the two in Shetland.

**Distribution within the site**

The red-throated diver distribution at this site falls entirely within the inshore wintering waterfowl composite boundary (Figure 10).

**Species range**

Red-throated divers nest only in the northern and western Highlands of Scotland and in the offshore island groups with the core range being the north mainland and the three island groups. During the breeding season birds feed in coastal waters with suitable habitat around all these areas. Scapa Flow is part of the core of these feeding areas.

**History of occupancy**

Red-throated divers have been known to nest in Orkney for 200 years. Feeding habits are unlikely to have greatly changed over that period and detailed information on birds in the Scapa Flow area are most available from the 2nd half of the 20th century ([Dillon et al](#) 2009, annual Orkney Bird Reports).
Figure 10. The predicted distribution of feeding red-throated divers in Orkney, including the Scapa Flow pSPA.
7. References


Black, J., Dean B.J., Webb A., Lewis, M., Okill D. and Reid J.B., (2015), Identification of important marine areas in the UK for red-throated divers (Gavia stellata) during the breeding season. JNCC Report No 541. JNCC, Peterborough.


JNCC generic documents: [Identification of important marine areas for inshore wintering waterbirds](http://ec.europa.eu/environment/nature/natura2000/marine/docs/marine_guidelines.pdf)


Orkney Bird Reports. Published annually by The Orkney Bird Report Committee.


SNH, JNCC & MS 2016. Summary report of the marine Special Protection Area (SPA) stakeholder workshop.


Annex 2. Citation


CITATION FOR PROPOSED SPECIAL PROTECTION AREA (SPA)

SCAPA FLOW (UK9020321)

Site Description:
The Scapa Flow proposed Special Protection Area (SPA) is located within the Orkney Islands. Most of the site lies within Scapa Flow, which is an enclosed sea area, sheltered by Orkney Mainland to the north, Hoy, South Walls and Flotta to the west and south and Burray and South Ronaldsay to the east. The Flow is linked to the Pentland Firth on the south through the Sound of Hoxa, and to the Atlantic Ocean on the west through Hoy Sound. The site also includes nearshore waters to the east of Orkney, extending from South Ronaldsay to Deerness and including the sheltered shallow waters of Holm Sound, between Burray and East Mainland. Prior to construction of the Churchill Barriers in World War II, there were openings between Scapa Flow and Holm Sound to the North Sea.

Much of Scapa Flow is between 20 and 30m deep but there is a deeper trench at Brings Deeps reaching just over 60m depth. There are numerous shallower bays in the surrounding land, particularly to the north and east, including Bay of Ireland, Houton, Swanbister, Waukmill, Scapa, St Mary’s, Water Sound and Holm Sound. Shallower waters are also found around islands such as Flotta, Cava and Fara.

The pSPA includes a diverse range of seabed habitats, including muddy sands, tide swept sands and gravels, kelp forests and maerl beds, which support a high diversity of marine life. These rich sheltered waters support large numbers of waterfowl, particularly in the winter months when frequent storms affect the surrounding North Sea and eastern Atlantic. Orkney is also a stronghold for breeding red-throated diver which feed almost exclusively at sea close to their breeding sites.

Qualifying Interest:
The Scapa Flow proposed Special Protection Area (SPA) qualifies under Article 4.1 by regularly supporting a non-breeding population of European importance of the following Annex 1 species: great northern diver *Gavia immer* (a mean peak annual non-breeding population of 506 birds (20.2% of the GB population) for the years 1998/99-2006/7), black-throated diver *Gavia arctica* (a mean peak annual non-breeding population of 57 birds (9.5% of the GB population) for the years 1998/99-2006/7) and Slavonian grebe *Podiceps auritus* (a mean peak annual non-breeding population of 135 birds (12.3% of the GB population) for the years 1998/99-2006/7).

The site also qualifies under Article 4.1 by regularly supporting a population of European importance of the following Annex 1 species during the breeding season:
red-throated diver *Gavia stellata* (up to 81 pairs (7.6% of the GB population) in 2006).

The site further qualifies under Article 4.2 by regularly supporting populations of European importance of the following migratory species: common eider *Somateria mollissima* (a mean peak annual non-breeding population of 1994 birds (3.3% of the GB population) for the years of 1998/99 to 2006/07), long-tailed duck *Clangula hyemalis* (a mean peak annual non-breeding population of 1,393 birds (12.7% of the GB population) for the years of 1998/99 to 2006/07), common goldeneye *Bucephala clangula* (a mean peak annual non-breeding population of 219 birds (1.1% of the GB population) for the years 1998/99 to 2006/07), red-breasted merganser *Mergus serrator* (a mean peak annual non-breeding population of 539 birds (6.4% of the GB population) for the years of 1998/99 to 2006/07), and European shag *Phalacrocorax aristotelis* (a mean peak annual non-breeding population of 2929 birds (1.5% of the biogeographic population) for the years of 1998/99 to 2006/07).

Area: 370.66 km² (37065.53 ha).  
Location: 58° 52.200’ N  3° 2.693’ W  
OS Sheet 1:50,000 – 6 & 7  

04/05/16  
Scottish Natural Heritage