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Scottish marine Special Protection Area network assessment

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1. Executive summary

This report presents the findings of a network-level assessment commissioned by Marine Scotland covering the 15 marine proposed Special Protection Areas (SPAs) (Figure 1) that were the subject of public consultation in 2016/17.

The purpose of the network assessment is to clearly set out why the groups of sites proposed are considered the most suitable territories and confirm the contribution the proposed SPAs and the species represented make to the Scottish Marine Protected Areas (MPA) network. Specifically, Marine Scotland requested that the network assessment address the following points:

- Why we have a particular number of sites for individual species;
- Why sites for the same species are required in the vicinity of each other; and
- Why it is necessary to incorporate migratory species for which the UK has a small proportion of the biogeographic population.

SPAs are selected using the UK SPA Selection Guidelines (JNCC, 1999). Advice to Scottish Government on the scientific case for the selection of SPAs is provided by Scottish Natural Heritage (SNH) and the Joint Nature Conservation Committee (JNCC); SNH advising on SPA proposals in Scottish territorial waters (within 12 nautical miles (nm)) and JNCC advising on proposals in offshore waters adjacent to Scotland (beyond 12 nm). Following assessment against the UK SPA Selection Guidelines, all 15 proposed SPAs were selected as the most suitable territories for the range of species they support.

The network assessment is designed to provide an indication of the relative value of protected areas in Scotland's marine environment to the conservation of each species in Europe. It aims to provide a transparent, repeatable and robust approach which results in a clear conservation justification for the number of proposed SPAs being considered for each species.

The assessment involves a three-step process and is summarised in Figure 2:

- Step 1 – species assessments - to provide an indication of the relative value that protected areas in Scotland's marine environment could make to the conservation of each species in Europe and provide an indication of what is considered to be appropriate in terms of a minimum level of representation in marine SPAs for each species.
- Step 2 – contribution of the SPA network - to assess the contribution that would be made by the existing and proposed SPAs for each species and relevant season(s) (breeding and/or non-breeding season).
- Step 3 – network assessment – to compare the provision afforded to each species by the 15 proposed SPAs and existing marine SPAs (Step 2) with what is considered to be an appropriate level of representation as identified through the species assessments (Step 1).

The network assessment includes 39 species of marine birds, 38 of which occur regularly in Scottish waters. In total assessments were completed for 53¹ species-season combinations, taking account of species that occur in both the breeding and non-breeding seasons. It was not possible to complete a full species assessment for roseate tern (breeding) because of the significant declines in the Scottish population and the consequent absence of breeding adults at SPA colonies.

¹ Including two subspecies of common eider *Somateria mollissima mollissima* and *S. m. faeroensis*

The assessment uses published sources of data as far as possible to provide an objective assessment of the proposed SPAs and their contribution to the Scottish MPA network. The outcomes have been sense-checked by SNH, JNCC and Marine Scotland Science (MSS) marine ornithologists to ensure they are reasonable. The approach has been developed by SNH with advice from MSS and JNCC and in collaboration with Marine Scotland.

The level of representation in the marine proposed SPA network was shown to match the minimum level of representation expected for 23 species-seasons. The network assessment provides a clear conservation justification for the number of proposed SPAs for these species. A further 23 species-seasons were identified as being below the minimum level of representation expected. Of these, 12 species-seasons are not represented in the Scottish pSPA network at all. For many of the species-seasons falling below the minimum level of representation, the SPA programme of marine bird surveys did not identify potential sites where the species met one of the UK SPA Selection Guidelines Stage 1 population estimate thresholds. It is recognised that further SPA provision for some species may not be achievable and preliminary advice on where additional conservation measures could be considered as part of a wider conservation strategy is provided.

Six species-seasons (common scoter (non-breeding), common goldeneye (non-breeding), common eider *mollissima* subspecies (non-breeding), long-tailed duck (non-breeding), red-breasted merganser (non-breeding) and common tern (breeding)) were identified as exceeding the expected minimum level of representation.

The network assessment also identified species-seasons that are qualifying features of more than one proposed SPA in the vicinity of each other, irrespective of whether they matched the minimum level of representation or not. This facilitated a focused review of the scientific case for these species at these sites. Eight species-seasons (great northern diver (non-breeding), Slavonian grebe (non-breeding), red-throated diver (breeding), European shag (non-breeding), common guillemot (breeding), common eider *mollissima* subspecies (non-breeding), long-tailed duck (non-breeding) and red-breasted merganser (non-breeding) were identified as having more than one proposed SPA in the vicinity of each other. For the purpose of this report, these species were considered to have 'local geographic replication'.

The six species-seasons exceeding the minimum level of representation and those identified as having local geographic replication were reviewed by an Advisory Panel. The Advisory Panel includes SNH, JNCC and MSS and was established specifically to review cases where the network assessment indicates possible over-representation of proposed SPAs.

The Advisory Panel fully supports the inclusion of:

- Common scoter (non-breeding), common tern (breeding), great northern diver (non-breeding), Slavonian grebe (non-breeding) and common guillemot (non-breeding) at all proposed SPAs where they occurred in qualifying numbers.
- Common goldeneye (non-breeding) at the Outer Firth of Forth and St Andrews Bay Complex pSPA and Moray Firth pSPA.
- Common eider *mollissima* subspecies (non-breeding) at Outer Firth of Forth and St Andrews Bay Complex pSPA, Moray Firth pSPA, Scapa Flow pSPA, West Coast of the Outer Hebrides pSPA, Coll and Tiree pSPA and Sound of Gigha pSPA.
- Long-tailed duck (non-breeding) at the Outer Firth of Forth and St Andrews Bay Complex pSPA, Moray Firth pSPA, Scapa Flow pSPA and West Coast of the Outer Hebrides pSPA.
- Red-breasted merganser (non-breeding) at the Outer Firth of Forth and St Andrews Bay Complex pSPA, Moray Firth pSPA, Scapa Flow pSPA, West Coast of the Outer Hebrides pSPA and Sound of Gigha pSPA.

- Red-throated diver (breeding) at Scapa Flow pSPA, Bluemull and Colgrave Sounds pSPA, East Mainland Coast, Shetland pSPA, West Coast of the Outer Hebrides pSPA and Rum SPA.
- European Shag (non-breeding) at Outer Firth of Forth and St Andrews Bay Complex pSPA, Moray Firth pSPA and Scapa Flow pSPA.

The Advisory Panel advises that following species-seasons at the respective proposed SPAs provide the weakest cases for retention based on the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe are:

- Common goldeneye (non-breeding) at Scapa Flow pSPA.
- Common eider *mollissima* subspecies (non-breeding) at North Orkney pSPA.
- Long-tailed duck (non-breeding) at North Orkney pSPA and East Mainland Coast, Shetland pSPA.
- Red-breasted merganser (non-breeding) at North Orkney pSPA and East Mainland Coast, Shetland pSPA
- Red-throated diver (breeding) at North Orkney pSPA.
- European Shag (non-breeding) at North Orkney pSPA.

These species-seasons could be considered for removal as qualifying features from their respective proposed SPAs resulting in changes to the qualifying features at three proposed SPAs:

- North Orkney proposed SPA (removal of 5 species as qualifying features)
- Scapa Flow proposed SPA (removal of 1 species as qualifying features)
- East Mainland Coast, Shetland proposed SPA (removal of 2 species as qualifying features)

The removal of these species as qualifying species from the respective proposed SPAs however would not result in any changes to the number of marine SPAs being proposed or the boundaries of these proposed SPAs. Additionally, the changes are unlikely to make a significant difference to future management of the proposed SPAs, except North Orkney pSPA. At North Orkney pSPA, the removal of red-throated diver as a qualifying feature may result in changes to management advice particularly with respect to proposals during the breeding season. However, some aspects of management advice (such as disturbance and barrier effects) will continue to be considered through functional links with nesting territories in existing terrestrial SPAs.

The species that could be considered for removal as qualifying features are likely to continue to benefit from the management of the proposed SPAs for the remaining qualifying features. However, these benefits and the enhanced biodiversity contribution associated with a multi-species site will not be accounted for in the Scottish MPA network.

2. Background

In Scotland, advice on the scientific case for the selection of SPAs is provided by SNH and JNCC; SNH advising Scottish Government on SPA proposals in Scottish territorial waters (within 12 nautical miles (nm)) and JNCC on proposals in offshore waters adjacent to Scotland (beyond 12 nm). The marine SPA selection process has been on-going since 2010 when indicative SPAs were initially identified from the programme of survey and analysis carried out by JNCC. The development of the proposed SPA network has undergone a number of iterations from this indicative stage, to draft SPAs (submitted to Marine Scotland in June 2014) and the consultation on the 15 proposed SPAs during 2016/early 2017 (Figure 1). SNH, JNCC and Natural England have worked together to progress areas where they are either cross-border or include both inshore and offshore waters.

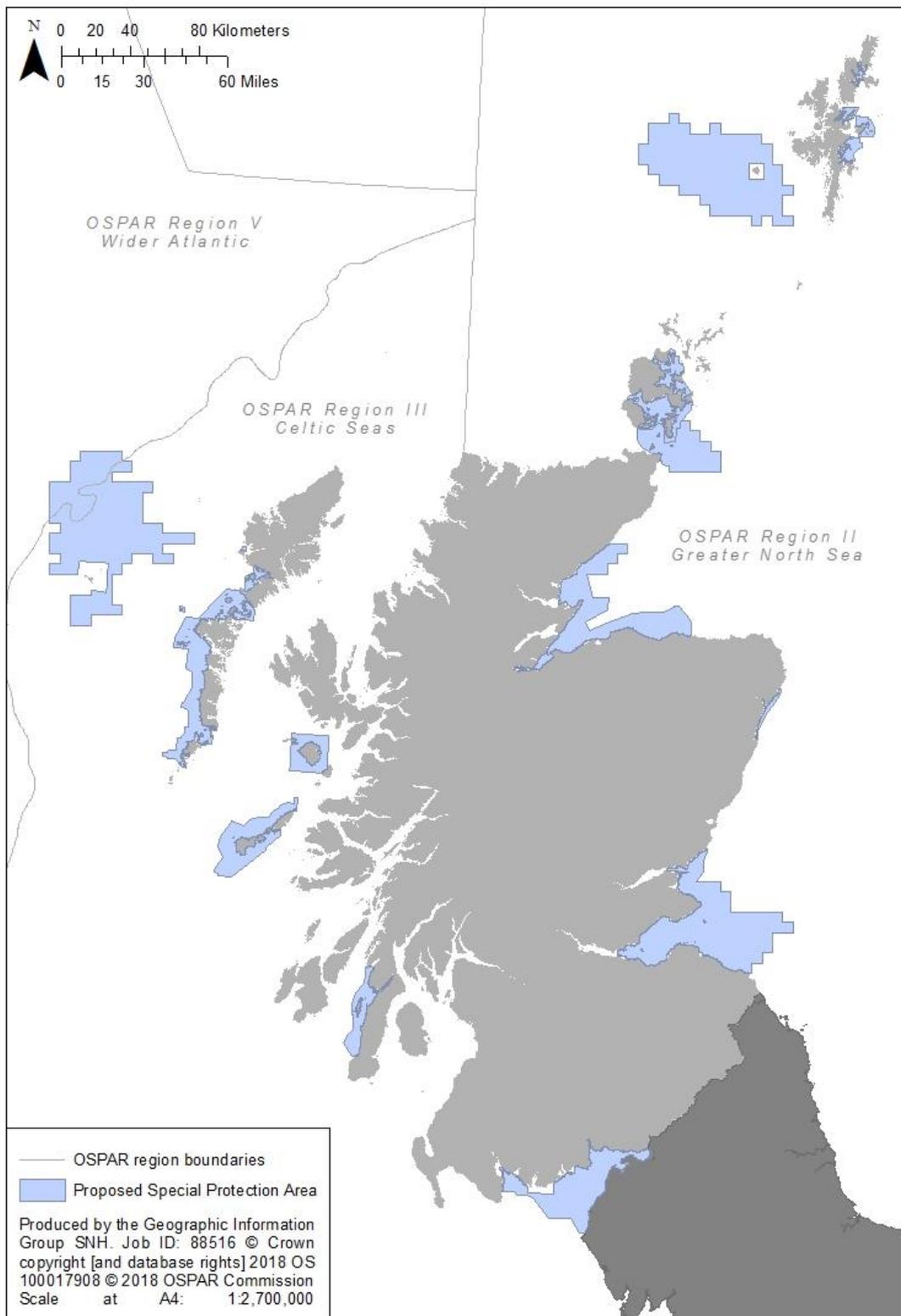


Figure 1: Map showing proposed SPAs

Both SNH and JNCC used the UK SPA Selection Guidelines (JNCC, 1999) to select the network of proposed SPAs. The species represented in each proposed SPA met one of the relevant population thresholds (as set out in Stage 1 of the Guidelines and Scotland's multi-species approach for candidate migratory species under Stage 1.4 (SNH, 2018a)). Each potential area was considered using one or more of the Stage 2 guidelines to select the most suitable areas from a longer list of potential sites supporting birds with qualifying numbers.

In accordance with the UK SPA Selection Guidelines, the 15 proposed SPAs were selected as the most suitable territories for the range of species they support. The 15 proposed SPAs include 31 of the 44 marine birds (Table 1) regularly occurring in UK waters. The site selection process is detailed in supporting documents (SNH, 2018a and JNCC, 2016) and is not described in detail as part of this report.

Responses to specific comments on the application of the UK SPA Selection Guidelines made by stakeholders during the consultation process will be provided in the 'Consultation Report on a network of marine proposed Special Protection Areas in UK waters' (SNH, JNCC and Natural England, *in prep.*).

3. Purpose

The purpose of the network assessment is to provide Marine Scotland with an analysis of the conservation justification for the proposed SPAs selected as most suitable territories, thereby confirming the contribution they and the species represented in them make to the Scottish Marine Protected Areas (MPA) network. Specifically, Marine Scotland have requested that the network assessment address the following points:

- Why we have a particular number of sites for individual species;
- Why sites for the same species are required in the vicinity of each other; and
- Why it is necessary to incorporate migratory species for which the UK has a small proportion of the biogeographic population.

4. Scope

The 15 proposed SPAs have been selected as the most suitable territories in accordance with the UK SPA Selection Guidelines. The network assessment goes beyond the remit of the Stage 2 guidelines by introducing concepts such as European conservation status and replication, which are not found in the Stage 2 guidelines. Consequently, the network assessment should be regarded as additional information providing clarity on the conservation justification for the number of proposed SPAs for each species. This is based on an assessment of the relative value of protected areas in Scotland's marine environment to the conservation of each species in Europe.

The network assessment includes 39 of the 44 species identified as regularly occurring in UK waters (Annex 1). This includes 53 species-seasons combinations taking account of species that occur in both the breeding and non-breeding seasons. Of the 44 species identified as regularly occurring in UK waters, 5 species are considered not to be regularly occurring in Scottish waters. The distributions of Cory's shearwater, Balearic shearwater and Mediterranean gull largely do not extend far enough north and glaucous gull and Iceland gull occur irregularly in small numbers in Scottish waters. These species were therefore scoped out early in the process and no species assessments were undertaken. It was also not possible to complete a full species assessment for roseate tern (breeding) because of the significant declines in the Scottish population and the consequent absence of breeding adults at SPA colonies.

Table 1: Marine species regularly occurring in UK waters

(Species in *italic's* are not represented in the 15 proposed SPAs)

Annex 1 species	Regularly occurring migratory species
Great northern diver	Greater scaup
Black-throated diver	Common eider (<i>S. m. mollissima</i> & <i>S. m. faeroeensis</i>)
Red-throated diver	Long-tailed duck
Slavonian grebe	Common scoter
Common tern	Velvet scoter
Arctic tern	Common goldeneye
Sandwich tern	Red-breasted merganser
Little tern	Goosander
<i>Roseate tern</i>	<i>Great crested grebe</i>
Little gull	Manx shearwater
<i>Balearic shearwater</i>	Northern fulmar
<i>Cory's shearwater</i>	Northern gannet
<i>Sooty shearwater</i>	<i>Great cormorant</i>
European storm petrel	European shag
<i>Leach's storm petrel</i>	Arctic skua
	Great skua
	Black-legged kittiwake
	Black-headed gull
	Common gull
	<i>Mediterranean gull</i>
	<i>Iceland gull</i>
	<i>Lesser black-backed gull</i>
	Herring gull
	<i>Great black-backed gull</i>
	<i>Glaucous gull</i>
	Common guillemot
	Razorbill
	Atlantic puffin
	<i>Little auk</i>

The scope of the network assessment does not include an assessment of functional connectivity or coherence within the SPA network and wider Scottish MPA network.

5. Approach to the Scottish SPA network assessment

The approach to the network assessment has been developed by SNH with advice from MSS and JNCC and in collaboration with Marine Scotland. Two workshops attended by SNH, JNCC and MSS were held on 20th December 2017 and 26th February 2018 to discuss the conservation status attributes, data sources, key considerations and approach to scoring.

The assessment involves a three-step process and is summarised in Figure 2:

- Step 1 – species assessments - to provide an indication of the relative value that protected areas in Scotland’s marine environment could make to the conservation of each species in Europe and provide an indication of what is considered to be appropriate in terms of a minimum level of representation in marine SPAs for each species.
- Step 2 – contribution of the SPA network - to assess the contribution that would be made by the existing and proposed SPAs for each species and relevant season(s) (breeding and/or non-breeding season).
- Step 3 – network assessment – to compare the provision afforded to each species by the 15 proposed SPAs and existing marine SPAs (Step 2) with what is considered to be a minimum level of representation as identified through the species assessments (Step 1).

A standardised template was used to provide a consistent approach across all species assessments for steps 1 and 2.

5.1 Step 1: Species assessment

5.1.1 Species account

The species accounts establish a “relative value of protected areas in Scotland’s marine environment to the conservation of the species in Europe” using a set of species conservation status attributes. The “relative value” provides an indication of the relative importance of site-based protection for the Scottish population of each species-season in a European context. The assessment uses published sources of data as far as possible to provide an objective assessment of the proposed SPAs and their contribution to the Scottish MPA network. The species accounts consider the following conservation status attributes:

Attribute 1: GB marine distribution and significance of Scotland’s seas in a GB context

The relative importance of Scotland’s seas in a GB context is established by identifying whether the species has a highly restricted, restricted or widespread distribution and what percentage of the GB population occurs in Scotland. For inshore wintering waterfowl, the relative abundance in Scotland compared to England and Wales was also used to establish the significance of Scotland’s seas in a GB context.

Attribute 2: Contribution to the biogeographic population

The relative importance of the GB population to the relevant biogeographic population is derived by identifying the proportion of the biogeographic population held in GB waters.

The inclusion of the GB proportion of the biogeographic population as one of the conservation status attributes is to specifically address the contribution the GB population makes to the conservation of the relevant biogeographic population for regularly occurring

migratory² species qualifying under Stage 1.4 of the UK SPA Selection Guidelines. This attribute ensures the proportion of the GB population to the relevant biogeographic population is a key factor taken into account in the network assessment.

GB populations that support 30% or more of the relevant biogeographic population are considered to make an important contribution to conservation of that population. This is consistent with the threshold adopted by the UK for identifying regionally (NE Atlantic – OSPAR) important populations of ‘Nationally Important Marine Features’ (NIMF). Species-seasons where the UK supports 1% or less of the relevant biogeographic population are scored low.

Attribute 3: European conservation status

The relative importance of the conservation status is derived directly from the species EU conservation concern status (BirdLife International, 2017). Representation in the proposed SPA network is considered appropriate for all species identified as ‘critically endangered’, ‘endangered’, ‘vulnerable’, ‘near threatened’, ‘declining’ or ‘depleted’, even where the UK supports a low proportion of the relevant biogeographic population.

All data sources and the approach to scoring, including the thresholds used are detailed in [Annex 2](#). The relative importance of each attribute for each species-season is assigned High, Medium or Low based on category boundary values set out in Annex 2. The final score is derived by combining the scores from each attribute to provide a ‘relative value’ of protected areas in Scotland’s marine environment to the conservation of the species in Europe. This can be Very High, High, Medium, Low or Very Low. No single attribute is considered in isolation however, extra weighting is given to the ‘GB marine distribution and significance of Scotland’s seas in a GB context’ attribute to ensure the Scottish proposed SPA network focuses on species where Scotland holds a high proportion of the GB population and therefore has a particular responsibility.

5.1.2 Establishing a minimum level of species representation in the proposed SPA network:

There are no guidelines set out in the UK SPA Selection Guidelines on the number of SPAs required for each species. Generally the number of SPAs selected for any one species is based on expert judgement and knowledge of the significance of the proposed SPAs in a Scottish and UK context in applying the Stage 2 guidelines to identify the most suitable territories. In the terrestrial environment, SPA selection has been followed by UK sufficiency assessments to establish if there are any gaps in the SPA network (Stroud *et al.*, 2001 and 2016).

To provide a clear and transparent logic for the number of SPAs selected for each species, the network assessment adopted a scaled approach to providing a minimum level of representation for each species. This approach reflects the importance of Scotland’s seas for individual species and is based on the relative value of protected areas in Scotland’s marine environment to conservation of the species in Europe, derived from the combined score of the attributes outlined in section 5.1.1. Essentially, the higher the relative value the higher the expected number of SPAs where the species is represented. For species where Scotland’s seas are of particular importance both in the UK and Europe, an ecologically coherent network of SPAs is expected to cover the full geographic range of that species in

² For consistency across species, the attribute is also included to Annex 1 species, although the relevant population threshold for inclusion of Annex 1 species in SPAs is the national population not the relevant biogeographic population.

Scotland (as reflected in Stage 2 of the UK SPA Selection Guidelines “Areas selected for a given species provide as wide a geographic coverage across the species’ range as possible”).

The starting point for setting a scale of minimum levels of species representation is based on the highest number of proposed SPAs within which any one species is represented in the 15 proposed SPAs (at the top end) and no expectation of the species being represented in the proposed SPA network (at the bottom end). Therefore, a minimum level of being represented ‘more than twice’ in each OSPAR region was considered appropriate for the top of the scale. This ensures that as wide a geographic coverage across the species range (Stage 2 guidelines) for any species where Scotland’s seas are identified as being of particular importance is represented in the proposed SPA network. It is also considered an absolute minimum on the basis that the 15 proposed SPAs are already a result of a refined longer list of potential sites (where some species had met the Stage 1 population thresholds) to identify the most suitable territories in the UK (under Stage 2). Essentially, for any species where the relative value of Scotland’s seas is Very High it is appropriate for that species to be represented in all of the proposed SPAs where it qualifies and conversely, there is no expectation of any species with a Very Low score being represented in the proposed SPA network.

The gradation from no expectation of a species being represented in the proposed SPA network to representation in all sites where the species qualifies is governed by the increasing importance of Scotland’s seas for individual species and therefore, the increasing number of proposed SPAs required ensuring full coverage of a species geographic range.

The categories used to set a minimum level of representation for each relative value derived from the conservation status attributes are:

Very High: Expectation of the species being included in all pSPAs where it has been identified as a qualifying feature and of being represented more than twice in each OSPAR region overlapping its Scottish distribution, ensuring full geographic coverage of the species range in Scotland; replication of representation in regions is considered necessary to enhance species resilience.

High: Expectation of the species being represented at least twice in each OSPAR region overlapping its Scottish distribution, ensuring full geographic coverage of the species range in Scotland; replication of representation in regions is considered necessary to enhance species resilience.

Medium: Expectation of the species being represented once or twice in each OSPAR region overlapping its Scottish distribution; replication of representation in regions would enhance species resilience.

Low: Expectation of the species being represented once or twice in the Scottish SPA network.

Very Low: No expectation of the species being represented in the Scottish SPA network.

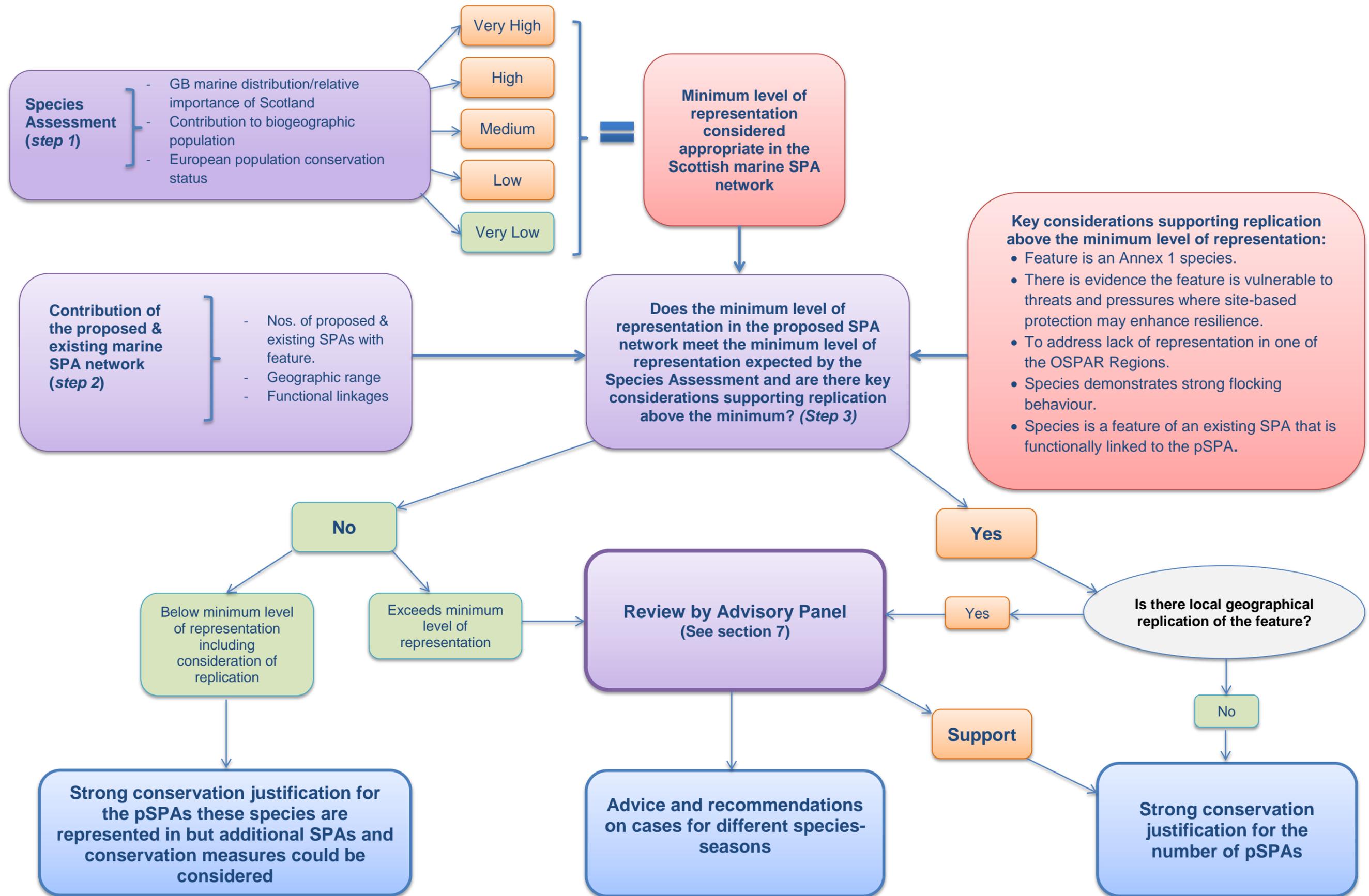


Figure 2: Schematic diagram illustrating 3-step process for the Scottish marine pSPA network assessment

5.2 Step 2: Contribution of the Scottish SPA network to the species

5.2.1 Species occurrence in the SPA network

Step 2 considers the occurrence of each species-season within each proposed SPA where it is a qualifying feature. It summarises:

- The population size represented in each pSPA (Representation).

Identifies the GB population supported in each pSPA as detailed in the [Site Selection Documents](#) presented at consultation.

- The number of pSPAs (and existing SPAs) the species is represented in (Replication).

Identifies the number of both proposed and existing SPAs for the species-season and whether there is replication of proposed SPAs across OSPAR regions.

- The extent to which the pSPAs reflect the geographic range of each species (Geographic range).

Identifies the geographic coverage of proposed SPAs and where species are represented in more than one proposed SPA in the vicinity of each other (local geographic replication).

- Linkages between the species at the pSPA and any other SPA (Functional links).

Identifies known linkages between proposed SPAs and existing SPAs where the feature is a qualifying feature of both. Additional information is also provided on potential linkages.

The network assessment includes a regional dimension to assessing the contribution of each species-season to the Scottish SPA network. The marine bird species included in the proposed SPA network have very different distributions, with species distributions often also differing between seasons (for example, some species have small ranges, others are wide ranging, some occur throughout Scotland and others are restricted to specific locations). This makes hard and fast rules on defining ecologically derived regions a challenge. The network assessment has therefore adopted the OSPAR regions as representative of the different broad-scale biogeographic characteristics defining Scotland's seas. OSPAR regions are similarly used to underpin assessment of the contribution that Nature Conservation MPAs make to the Scottish MPA network. The categories used in Step 1 (section 5.1.2) to establish a minimum level of representation for each species (and season) are defined through reference to replication within the OSPAR regions and the Scottish MPA network.

5.2.2 Key considerations for replication in the network:

Step 1 establishes a minimum level of representation expected in the Scottish SPA network based on three conservation status attributes.

The network assessment also includes a number of key considerations established to identify circumstances when replication above the minimum level of representation is considered appropriate. The key considerations are:

- The species is listed on Annex 1 (rare and vulnerable) of the Birds Directive (Table 1).

- There is evidence in UK waters of high and/or medium impacts at a population level from threats and pressures in the marine environment. Replication is recommended to enhance resilience of species scoring Very High, High or Medium.
- There is evidence in UK waters of high and/or medium impacts at a population level from threats and pressures in the marine environment. Replication/representation could be considered to enhance resilience of species scoring Low or Very Low.
- The species demonstrates strong flocking behaviour.
- The species are functionally linked to existing SPAs for that species.
- To address a lack of replication in one of the OSPAR regions.

Threats and pressures generating a high or medium impact on marine bird populations in UK waters were identified using Furness ([2016, unpublished report](#)). Key references identified by Furness (2016) were reviewed in detail and reference was also made to Bradbury *et al.*, 2017. This analysis of threats and pressures provided the basis for consideration of replication above the minimum level of representation for those species.

SNH, JNCC and MSS also recognise there are other relevant ecological attributes which are important considerations with respect to species suitability for site-based protection, such as degree of aggregation or habitat limitations. Species that are known to demonstrate particularly strong flocking behaviours were considered appropriate for replication as species that exhibit this trait can be most effectively managed through site-based conservation measures.

Additionally, species that are a qualifying feature of a proposed SPA that is functionally linked with an existing SPA (for example, foraging areas associated with breeding colonies or coastal SPAs where the species is using intertidal and subtidal habitats) were considered appropriate for replication. This recognises the added conservation benefit achieved for the SPA network by encompassing the full range of habitats used by the species.

Commentary on the appropriateness of replication above the minimum level of representation for each species is provided in the summary section of the species assessments. Where replication is considered appropriate in OSPAR regions the aim is to ensure as wide a geographic coverage across the species' range as possible (Stage 2, UK SPA Selection Guideline) with examples, where appropriate to their Scottish distribution, in the Northern Isles, east mainland coast, west mainland coast and the Hebrides (*Figure 3*).

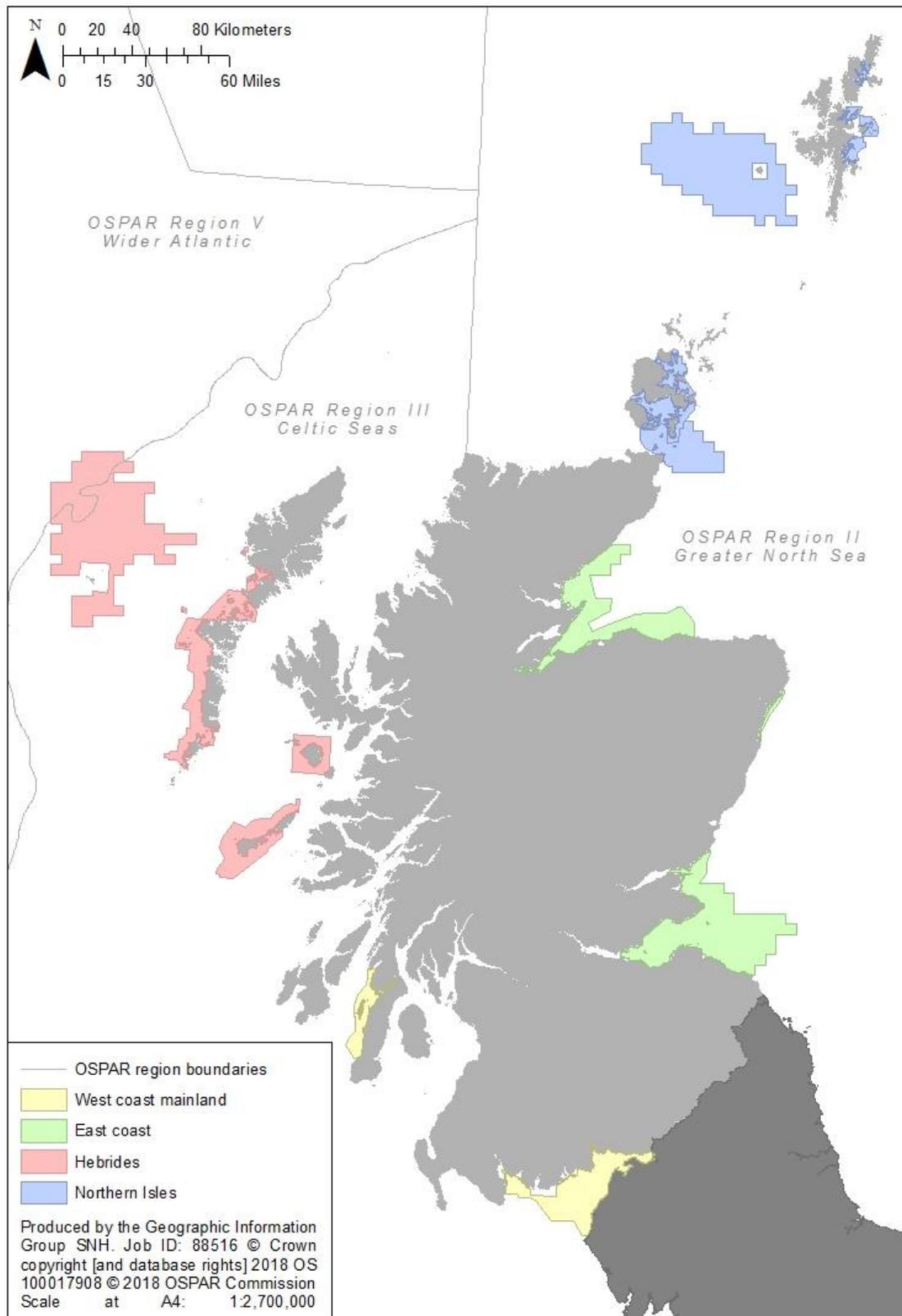


Figure 3: Map showing areas used to support the assessment of replication within local geographic areas

5.3 Step 3: Network assessment

The final part of the assessment compares the minimum level of representation indicated by Step 1 and any considerations for replication, with the actual number of proposed SPAs for each species-season as presented in Step 2. This allows an assessment of whether the number of proposed SPAs for species-season is appropriate to the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe.

Step 3 identifies three groups of species:

- a) *Species-season where the number of proposed SPA is appropriate:*
These species match the expected minimum level of representation indicated by the species assessment, including considerations of requirements for replication. In our view, the network assessment provides a clear conservation justification for the number of proposed SPAs for that species.
- b) *Species-season where the number of proposed SPAs is lower than the minimum level of representation expected:*
These species fall below the minimum level of representation indicated by the species assessment. In our view, the network assessment provides a clear conservation justification for the species to be included in all the proposed SPAs it qualifies in. This assessment does not mean that in all cases additional SPA provision should be considered. For many of the species-seasons, the SPA programme of marine bird surveys did not identify potential sites where these species met one of the UK SPA Selection Guidelines Stage 1 population estimate thresholds. For all species, however, preliminary advice on additional conservation measures is provided. This advice is intended to help inform priorities for future Scottish marine bird conservation action in conjunction with other UK initiatives.
- c) *Species-season where the number of proposed SPAs exceeds the minimum level of representation expected:*
These species exceed the minimum level of representation indicated by the species assessment (for example, a species with a Low relative value is represented in proposed SPAs at a level considered appropriate to a species with Medium relative value).

The species falling into group (c) were presented to an Advisory Panel for a critical review of the species and number of proposed SPAs the species is represented in. Additionally, species that are represented in proposed SPAs where there is local geographic replication also underwent further review by the Panel.

6. Advisory Panel

6.1 Purpose

The main purpose of the Advisory Panel is to review the findings of the network assessment and provide advice and recommendations for consideration by MS and SNH's Scientific Advisory Committee (MPA sub-group) on the species identified as having exceeded the expected minimum level of representation in the network and those where local geographic replication occurs.

The Advisory Panel included representatives from SNH, MSS and JNCC.

6.2 Key considerations

The key considerations reviewed by the Advisory Panel were similar to those established to identify circumstances when replication above the minimum level of representation is considered appropriate (i.e. evidence of pressures, continuity with existing SPAs). The Panel also took account of the relative importance of the GB population represented in each proposed SPA and considerations on threats and pressures were expanded to focus specifically on the potential effectiveness of site-based protection to mitigate documented threats and pressures. The key considerations reviewed by the Advisory Panel were:

- Proportion of GB population represented in each pSPA.
- Threats and pressures potentially impacting on in the marine environment that can be mitigated by site-based protection.
- Species that demonstrate strong flocking behaviour.
- Species present in marine sites that are functionally linked to existing SPAs for that species.
- Any lack of replication in one of the OSPAR regions.

7. Results

Fifty-three species assessments were completed (SNH, 2018b). Examples of species assessments from the three groups identified in section 5.3 are provided in ([Annex 3](#)).

7.1 Number of sites for individual species

The level of representation in the marine proposed SPA network was shown to match the minimum level of representation derived from the species assessments for 23 species-seasons ([Annex 4](#), [Table 1](#) and [Table 4](#)). This included two species-seasons (northern gannet (non-breeding) and little auk (non-breeding)) not represented in the proposed SPA network which matched the assessment of no expectation of the species being represented in the Scottish SPA network. For those species represented in the network, the species assessments confirm there is a strong conservation justification for the number of proposed SPAs they are represented in, based on the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe. The number of proposed SPAs for all 23 species-seasons is therefore considered appropriate.

The level of representation in the marine proposed SPA network was below the minimum level of representation expected for a further 23 species-seasons ([Annex 4](#), [Table 2](#) and [Table 4](#)). Of these, 12 species-seasons are not represented in the Scottish proposed SPA network ([Annex 4](#), [Table 4](#)). For the species-seasons with representation in the proposed SPA network, there is a strong conservation justification for the proposed SPAs they are represented in.

For many of the species-seasons falling below the minimum level of representation, the SPA programme of marine bird surveys did not identify site options where the species met one of the UK SPA Selection Guidelines Stage 1 population estimate thresholds. It is recognised that further SPA provision for some species may not be achievable. Consideration could be given to additional conservation measures for these species-seasons as part of a wider conservation strategy. Therefore, recommendations for additional conservation measures are made for 35 species-seasons falling below the minimum level of representation and for those species-seasons where replication above the minimum may be appropriate but is currently not proposed. Wider seas conservation measures are highlighted for 16 of these species-seasons where management at a broader scale than afforded by site-based protection is considered most appropriate.

The level of representation in the marine proposed SPA network exceeded that expected for six species-seasons (common scoter (non-breeding), common goldeneye (non-breeding), common eider *mollissima* subspecies (non-breeding), long-tailed duck (non-breeding), red-breasted merganser (non-breeding) and common tern (breeding)) (Annex 4, [Table 3](#)). For these species-seasons, the conservation justification for the species-season to be represented in all of the proposed SPAs they are a qualifying feature is not as strong.

7.2 Local geographic replication

The network assessment identified eight species (great northern diver (non-breeding), Slavonian grebe (non-breeding), red-throated diver (breeding), European shag (non-breeding), common guillemot (breeding), common eider *mollissima* subspecies (non-breeding), long-tailed duck (non-breeding) and red-breasted merganser (non-breeding) where there is local geographic replication in some of the proposed SPAs in the Northern Isles where they are qualifying features.

7.3 Inclusion of migratory species where the UK has a small proportion of the biogeographic population

The inclusion of the GB proportion of the biogeographic population as one of the conservation status attributes ensures the relevance of the GB population to the relevant biogeographic population is a key factor taken into account when considering the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe.

A summary of the conservation status attributes influencing the relative value of protected areas in Scotland's marine environment to the conservation of the species with a low (less than 1% of biogeographic population) proportion of the relevant biogeographic population is provided in Table 2.

Table 2: Consideration of species-seasons where % GB population is a low proportion of the biogeographic population.

nb – non-breeding, b – breeding

Feature (season)	GB % of biogeographic population	Species Account: Relative value of Scottish population	Conservation status attributes influencing the relative value of the Scottish population
Long-tailed duck (nb)	0.7	Medium	Long-tailed duck have a restricted distribution in GB inshore waters, almost entirely confined to Scotland meaning Scotlands' seas are of high importance in a GB context. Additionally, the European Conservation Concern Status is 'Vulnerable' meaning conservation measures to protect the European population are considered a high priority. The combined score takes account of the very high biogeographic population of which a low proportion occurs in GB.
Velvet scoter (nb)	0.55	High	Velvet scoter have a highly restricted distribution in GB inshore waters, with Scotland supporting the highest numbers meaning Scotlands' seas are

			of high importance in a GB context. The European Conservation Concern Status is 'Vulnerable' meaning conservation measures to protect the European population are considered a high priority. The combined score takes account of the relatively small biogeographic population of which a low proportion occurs in GB.
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7.4 Species-seasons reviewed by the Advisory Panel

The Advisory Panel was asked to review the number of proposed SPAs for six species-seasons (common scoter (non-breeding), common goldeneye (non-breeding), common eider *mollissima* subspecies (non-breeding), long-tailed duck (non-breeding), red-breasted merganser (non-breeding) and common tern (breeding)) including local geographic replication in the Northern Isles of three of these species (common eider *mollissima* subspecies (non-breeding), long-tailed duck (non-breeding) and red-breasted merganser (non-breeding)).

In addition, the Advisory Panel was asked to review local geographic replication in the Northern Isles of five other species-seasons (great northern diver (non-breeding), Slavonian grebe (non-breeding), red-throated diver (breeding), European shag (non-breeding) and common guillemot (breeding)). The network assessment results have shown that the number of proposed SPAs for these species-seasons is appropriate to (great northern diver, Slavonian grebe and red-throated diver) or below the minimum level of representation expected (European shag and common guillemot) based on the relative value of protected areas in Scotland's marine environment to conservation of these species in Europe. However, Marine Scotland has specifically requested that the network assessment addresses the requirement for proposed SPAs in the vicinity of each other for the same species.

7.5 Summary of Advisory Panel advice and recommendations

All proposed SPAs are considered the most suitable territories in accordance with the UK SPA Selection Guidelines. The full Advisory Panel species-season reviews are provided in [Annex 5](#).

In summary, the Advisory Panel fully supports the inclusion of:

- Common scoter (non-breeding) at all proposed SPAs.
- Common goldeneye (non-breeding) at the Outer Firth of Forth and St Andrews Bay Complex pSPA and Moray Firth pSPA.
- Common eider *mollissima* subspecies (non-breeding) at Outer Firth of Forth and St Andrews Bay Complex pSPA, Moray Firth pSPA, Scapa Flow pSPA, West Coast of the Outer Hebrides pSPA, Coll and Tiree pSPA and Sound of Gigha pSPA.
- Long-tailed duck (non-breeding) at the Outer Firth of Forth and St Andrews Bay Complex pSPA, Moray Firth pSPA, Scapa Flow pSPA and West Coast of the Outer Hebrides pSPA.
- Red-breasted merganser (non-breeding) at the Outer Firth of Forth and St Andrews Bay Complex pSPA, Moray Firth pSPA, Scapa Flow pSPA, West Coast of the Outer Hebrides pSPA and Sound of Gigha pSPA.
- Common tern (breeding) at all proposed SPAs.
- Great northern diver (non-breeding) at all proposed SPAs.
- Slavonian grebe (non-breeding) at all proposed SPAs.

- Red-throated diver (breeding) at Scapa Flow pSPA, Bluemull and Colgrave Sounds pSPA, East Mainland Coast, Shetland pSPA, West Coast of the Outer Hebrides pSPA and Rum SPA.
- European Shag (non-breeding) at Outer Firth of Forth and St Andrews Bay Complex pSPA, Moray Firth pSPA and Scapa Flow pSPA.
- Common guillemot (non-breeding) at all proposed SPAs.

The Advisory Panel advises that the following species-seasons at the respective proposed SPAs provide the weakest cases for retention, based on the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe:

- Common goldeneye (non-breeding) at Scapa Flow pSPA.
- Common eider *mollissima* subspecies (non-breeding) at North Orkney pSPA.
- Long-tailed duck (non-breeding) at North Orkney pSPA and East Mainland Coast, Shetland pSPA.
- Red-breasted merganser (non-breeding) at North Orkney pSPA and East Mainland Coast, Shetland pSPA
- Red-throated diver (breeding) at North Orkney pSPA.
- European Shag (non-breeding) at North Orkney pSPA.

Notwithstanding the above, should the preference be to remove these species as qualifying features from the respective proposed SPAs this will not result in any changes to the number of marine SPAs being proposed or the boundaries of these proposed SPAs.

Similarly, there is unlikely to be any change to management advice at all of the proposed SPAs except North Orkney pSPA. At North Orkney pSPA, the removal of breeding red-throated diver as a qualifying feature may result in changes to management advice particularly with respect to proposals during the breeding season. However, some aspects of management advice (such as disturbance and barrier effects) will continue to be considered through functional links with nesting territories in existing terrestrial SPAs.

Whilst those species that could be considered for removal as qualifying features will continue to benefit from the management of the proposed SPAs for other qualifying species, the multi-species interest and associated biodiversity of the proposed SPAs will be reduced.

8. Discussion

The assessment provides an indication of the relative value of protected areas in Scotland's marine environment to the conservation of the qualifying species in Europe. The value is determined using three conservation status attributes to produce a combined score which provides minimum level of representation (number of sites) expected in the Scottish SPA network for individual species-seasons. There are however limitations to the approach. These are summarised briefly below:

- Some relevant ecological attributes which are important considerations with respect to species suitability for site-based protection, such as degree of aggregation or habitat constraints (i.e. sessile prey, diving depths or foraging range) cannot readily be meaningfully quantified for the range of marine species occurring in Scottish waters. For example, some species may have very restricted foraging ranges, with others having an extensive foraging range but are still constrained to forage in association with very specific habitat/features (e.g. fronts). Consequently, on face value the 'relative value' is not truly representative of what would be expected in terms of site-based conservation for some species given their broader ecological traits. This necessitated these valid ecological attributes to be considered qualitatively alongside

the conservation status attributes used in the species assessments rather than being included in the species scores.

- There is no one-stop shop that provides data on the GB population estimates or distributions for all species included in the assessment. Therefore complete consistency across data sources used for each species is not possible. The selection of referenced sources used to score the attributes depended on the feature type and for GB distribution, their overall distribution (e.g. predominantly coastal or more marine) within GB and Scottish seas. Details on the approach to scoring are provided in [Annex 2](#). Whilst the choice of data sources appropriate to given species and seasons affects the details of how the 'relative value' is calculated, the overall principle is the same irrespective of source.
- The commentary on threats and pressures only references documented evidence at the individual species level. It does not include evidence of impacts on similar species (i.e. evidence presented on black-throated diver is not implied for other diver species). There are likely to be other threats and pressures acting on species that have not yet been documented.
- Where additional SPA provision is considered desirable, further data collection or assessment work may be required for some features to inform decisions between options and in some cases to provide greater confidence in supporting data (e.g. Leach's storm petrel in OSPAR Region V). For most of these species the JNCC programme of surveys and analysis undertaken to identifying areas with qualifying numbers did not locate any additional areas of search/hotspots meeting the relevant UK SPA Selection population thresholds.

9. Conclusions

SNH, JNCC and MSS are satisfied that there are strong conservation justifications for the groups of sites being proposed. There are six season-species where retention as a qualifying species in all sites currently identified is not considered necessary. These species-seasons could be considered for removal as qualifying features from some of their respective proposed SPAs resulting in changes to the qualifying features at three proposed SPAs:

- North Orkney proposed SPA (removal of 5 species as qualifying feature)
- Scapa Flow proposed SPA (removal of 1 species as a qualifying feature)
- East Mainland Coast, Shetland proposed SPA (removal of 2 species as qualifying feature)

Should the above changes be considered appropriate by Marine Scotland and SNH's Scientific Advisory Committee (MPA sub-group), there would be no changes to the number of marine SPAs being proposed or the boundaries of these proposed SPAs. Furthermore, these changes would not lead to any changes in management advice at at Scapa Flow proposed SPA or East Mainland Coast, Shetland proposed SPA. Some change in seasonal advice to reflect removal of breeding red-throated diver as a qualifying feature at North Orkney pSPA may be required.

10. References

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Annex 1: Table showing marine species regularly occurring in UK waters and proposed SPAs where species are qualifying features.

ROM – Regularly Occuring Migratory, nb – non-breeding, b – breeding

OSPAR Region	II: Greater North Sea									III: Celtic Seas (part of Seas off St Kilda in Region V: wider Atlantic)					
Species (season)	Bluemull and Colgrave Sounds	East Mainland Coast, Shetland	Seas off Foula	North Orkney	Scapa Flow	Pentland Firth	Moray Firth	Ythan Estuary, Sands of Forvie & Meikle Loch	Outer Firth of Forth & St Andrews Bay Complex	Solway Firth	Sound of Gigha	Coll and Tiree	Rum	West Coast Outer Hebrides	Seas off St Kilda
Annex 1 species															
ROM species															
Great northern diver (nb)		x		x	x		x				x	x		x	
Black-throated diver (nb)					x									x	
Red-throated diver (b)	x	x		x	x								x	x	
Red-throated diver (nb)							x		x	x					
Slavonian grebe (nb)		x		x	x		x		x		x			x	
Greater scaup (nb)							x								
Common eider (nb) (<i>S. m. mollissima</i>)				x	x		x		x		x	x		x	
Common eider (nb) (<i>S. m. faeroeensis</i>)		x													
Long-tailed duck (nb)		x		x	x		x		x					x	
Common scoter (nb)							x		x	x					
Velvet scoter (nb)				x			x		x						
Common goldeneye (nb)					x		x		x						
Red-breasted merganser (nb)		x		x	x		x		x		x			x	

OSPAR Region	II: Greater North Sea									III: Celtic Seas (part of Seas off St Kilda in Region V: wider Atlantic)					
Species (season)	Bluemull and Colgrave Sounds	East Mainland Coast, Shetland	Seas off Foula	North Orkney	Scapa Flow	Pentland Firth	Moray Firth	Ythan Estuary, Sands of Forvie & Meikle Loch	Outer Firth of Forth & St Andrews Bay Complex	Solway Firth	Sound of Gigha	Coll and Tiree	Rum	West Coast Outer Hebrides	Seas off St Kilda
Annex 1 species ROM species															
Goosander (nb)										x					
<i>Great crested grebe (nb)</i>	No proposed SPAs identified														
Common tern (b)									x						
Arctic tern (b)						x			x						
Sandwich tern (b)								x							
Little tern (b)								x							
Roseate tern (b)	No proposed SPAs identified														
Little gull (nb)								x							
Balearic shearwater (nb)	Distribution largely does not extend to Scottish waters therefore not considered as part of the Scottish network assessment														
Cory's shearwater (nb)	Distribution largely does not extend to Scottish waters therefore not considered as part of the Scottish network assessment														
Sooty shearwater (nb)	No proposed SPAs identified														
European storm petrel (b)															x
Leach's storm petrel (b)	No proposed SPAs identified														
Manx shearwater (b)									x						
Northern fulmar (b)			x												x
Northern fulmar (nb)			x												
Northern gannet (b)									x						x
<i>Northern gannet (nb)</i>	No proposed SPAs identified														
<i>Great cormorant (b)</i>	No proposed SPAs identified														

OSPAR Region	II: Greater North Sea									III: Celtic Seas (part of Seas off St Kilda in Region V: wider Atlantic)					
Species (season) Annex 1 species ROM species	Bluemull and Colgrave Sounds	East Mainland Coast, Shetland	Seas off Foula	North Orkney	Scapa Flow	Pentland Firth	Moray Firth	Ythan Estuary, Sands of Forvie & Meikle Loch	Outer Firth of Forth & St Andrews Bay Complex	Solway Firth	Sound of Gigha	Coll and Tiree	Rum	West Coast Outer Hebrides	Seas off St Kilda
<i>Great cormorant (nb)</i>	<i>No proposed SPAs identified</i>														
European shag (b)							x		x						
European shag (nb)				x	x		x		x						
Arctic skua (b)			x			x									
Great skua (b)			x												
Great skua (nb)			x												
Black-legged kittiwake (b)									x						
Black-legged kittiwake (nb)									x						
Black-headed gull (nb)									x	x					
Common gull (nb)									x	x					
Mediterranean gull (nb)	<i>Distribution largely does not extend to Scottish waters therefore not considered as part of the Scottish network assessment</i>														
Iceland gull (nb)	<i>Occurring irregularly in small numbers in Scottish waters therefore not considered as part of the Scottish network assessment</i>														
Lesser black-backed gull (b)	<i>No proposed SPAs identified</i>														
Lesser black-backed gull (nb)	<i>No proposed SPAs identified</i>														
Herring gull (b)									x						
Herring gull (nb)									x	x					
Great black-backed gull (b)	<i>No proposed SPAs identified</i>														
Great black-backed gull (nb)	<i>No proposed SPAs identified</i>														
Glaucous gull (nb)	<i>Occurring irregularly in small numbers in Scottish waters therefore not considered as part of the Scottish network assessment</i>														
Common guillemot (b)			x			x			x						x

OSPAR Region	II: Greater North Sea									III: Celtic Seas (part of Seas off St Kilda in Region V: wider Atlantic)					
Species (season) Annex 1 species ROM species	Bluemull and Colgrave Sounds	East Mainland Coast, Shetland	Seas off Foula	North Orkney	Scapa Flow	Pentland Firth	Moray Firth	Ythan Estuary, Sands of Forvie & Meikle Loch	Outer Firth of Forth & St Andrews Bay Complex	Solway Firth	Sound of Gigha	Coll and Tiree	Rum	West Coast Outer Hebrides	Seas off St Kilda
Common guillemot (nb)			x						x						
<i>Razorbill (b)</i>	<i>No proposed SPAs identified</i>														
Razorbill (nb)									x						
Atlantic puffin (b)			x						x						x
<i>Atlantic puffin (nb)</i>	<i>No proposed SPAs identified</i>														
<i>Little auk (nb)</i>	<i>No proposed SPAs identified</i>														

Annex 2 – Approach to scoring

This document relates to the species assessments. It sets out how the scores for the four species status attributes in Table 1 of each assessment are derived and how these scores are combined to provide the final species assessment scores. It also sets out the decision principles for interpretation of the final species scores with respect to anticipated level of representation in the Scottish marine proposed SPA network.

Overarching principles applied to scoring were that:

- metrics used to derive scores are derived from publically accessible quantitative data that can be objectively compared across species.
- boundary values used to establish scoring categories should be defined with reference to either a) existing conventions (e.g. GB is scored of Low importance to biogeographic populations for which it holds less than 1%) or b) observed patterns in underlying data sets (e.g. with respect to observed occurrence in GB seas).
- the data used should not be over-interpreted; figures are treated as single estimates without confidence intervals and no more than 3 categories have been defined for any one attribute).

This approach is robust with respect to objective application of available data to score the attributes considered across species. However, the reliance on quantitative data across all species does not enable inclusion of other relevant attributes, such as degree of aggregation in the marine environment, within the overall species scores. Where relevant, such attributes are taken into account and discussed in the species assessment summary text.

Species status

1. GB distribution and importance of Scottish population

These attributes consider the overall distribution of the species in GB seas and the relative importance of Scotland within GB. They are combined to give a single score indicative of the reliance of the species on Scotland's seas in a GB context.

As detailed below, a number of different reference sources are used to score these attributes, depending on the feature type and overall distribution (e.g. predominantly coastal or more marine) within GB and Scottish seas. The choice of most relevant data sources affects the details of how the combined score is calculated, but the overall principle is the same irrespective of source. The combined score is highest for species with a restricted distribution in GB waters and for which the highest densities are predominantly in Scottish seas (or southern Scotland is at northern edge of GB range) and lowest for species with widespread GB marine distribution for which Scotland is not of notable importance.

a) Inshore wintering waterfowl species that have predominantly coastal distributions

There are 10 inshore wintering waterfowl species with predominantly coastal distributions that are poorly represented by the aerial and boat-based survey data sets used by Bradbury *et al.* (2017) to model at-sea distributions of waterbirds around the UK (see following section). Hence, the data sources used to describe the GB distribution of these species and relative importance of Scotland are the (terrestrial) Bird Atlas 2007-11 (Balmer *et al.*, 2014) and annual WeBS surveys. Neither of these surveys were specifically designed to assess distribution of waterfowl within coastal and nearshore waters, but they are the only systematic datasets from which relevant information can be obtained.

The Atlas survey included coverage of tetrads within 1,088 of the 1,176 10km squares in GB that contain coastline and BTO provided data on the percentage of both coastal and inland squares³ occupied by each of these 10 waterfowl species. The WeBS survey data used to score GB occurrence are the percentages of all estuarine count sectors counted in GB between 2011/12 and 2015/16 occupied by each species.

The selection of category boundary values for the GB distribution attribute (see Table A2.1) is purely to enable objective categorisation of the species considered with respect to their occurrence. The boundary values reflect the characteristics of the supporting data sets and have no inherent biological significance. The distributions of the percentages of WeBS coastal core sectors and BTO Atlas coastal squares occupied are shown in Figure A2.1a and A2.1b with the respective boundary values. In both data sets the boundary value sits within an obvious “step” in the data and to the nearest 5%, with c.50% of species below and c. 50% above the boundary. For the WeBS data, a step change in the data is apparent between Slavonian grebe (17.3%) and goosander (25.8%). A boundary value of 20% or 25% occupied count sectors could equally have been chosen providing the same results.

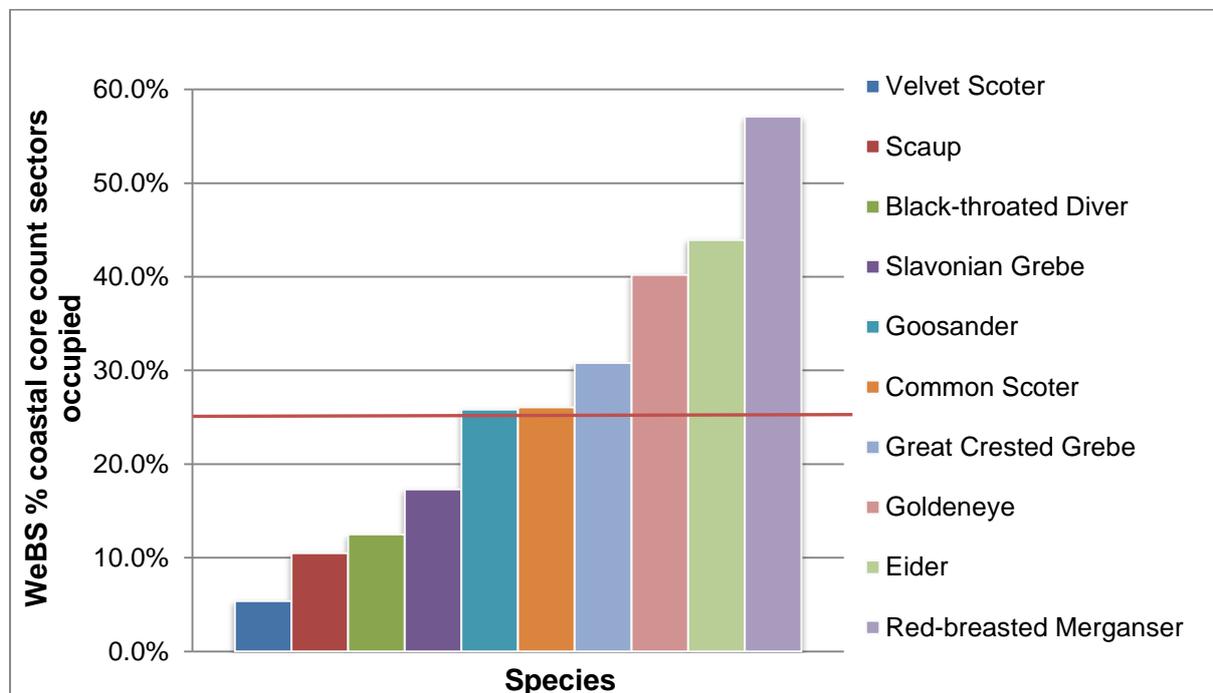


Figure A2.1a: Distribution of WeBS scores

For the BTO Atlas data, a step change in the data is apparent between great crested grebe (42.1%) and common scoter (47.8%). A boundary value of 45% occupied squares was chosen as nearest 5% in step change.

³ Coastal squares were defined as 10km squares containing <100ha of land

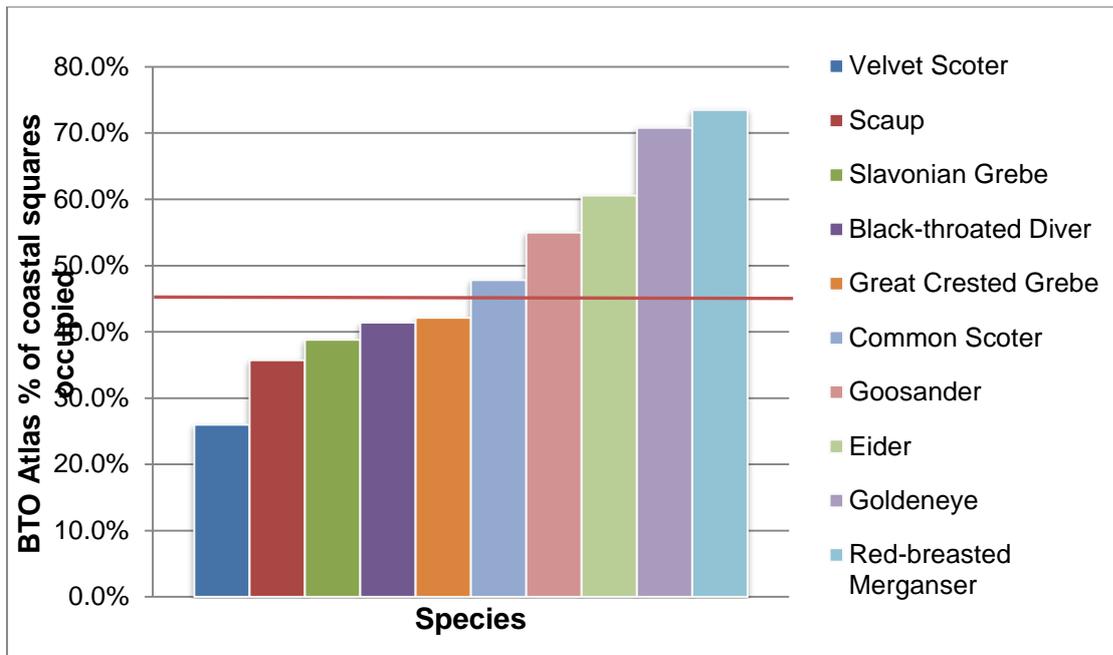


Figure A2.1b: Distribution of BTO Atlas scores

As shown in Figure A2.2, there is a strong positive correlation (correlation coefficient 0.923) between percentage of estuarine WeBS count sectors occupied, and percentage of coastal Atlas squares occupied, which increases confidence in use of these two sources for this group of species to describe and categorise overall GB distribution.

Occupancy of inland (i.e. non-coastal²) Atlas squares was also considered in categorising species as restricted or widespread because some species, such as goosander, great crested grebe, goldeneye and to a lesser extent scaup also occur widely in freshwater habitats in the non-breeding season.

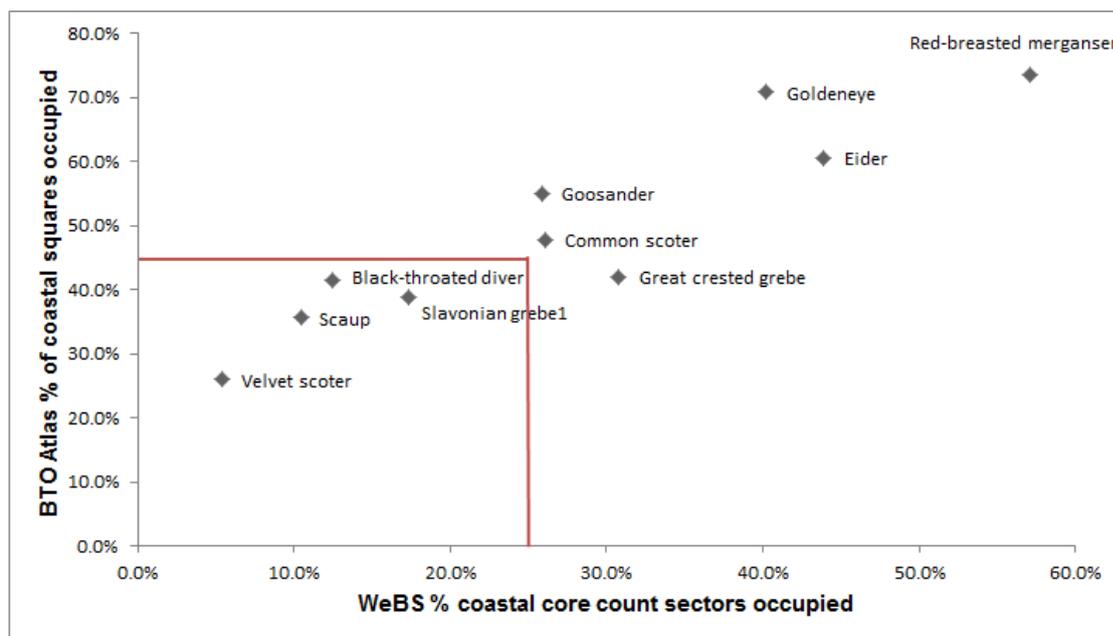


Figure A2.2: Correlation between different measures of occurrence in GB waters for coastal wintering waterfowl

The relative importance of Scotland is determined by visual inspection of the relative abundance maps in the BTO Bird Atlas Mapstore⁴ and consideration of the relative numbers of WeBS count sectors in Scotland, as compared to GB as a whole, holding notable numbers (≥ 10 , ≥ 50 or ≥ 100 as appropriate) of each species.

The scoring boundary values for each attribute and derivation of the combined distribution score are shown in Table A2.1.

Table A2.1: GB distribution and relative importance of Scottish population: Inshore wintering waterfowl with predominantly coastal distributions

Relative importance of Scotland	Areas of highest relative abundance mostly in Scottish coasts or seas <u>or</u> (southern) Scotland at northerly edge of range in GB	Areas of highest relative abundance not mostly in Scottish coasts or seas
GB coastal or marine distribution		
Restricted: $\leq 25\%$ WeBS coastal count sectors AND $\leq 45\%$ of coastal 10km squares AND $\leq 30\%$ inland squares occupied	High	Medium
Widespread: $> 25\%$ WeBS coastal count sectors AND ($>45\%$ of coastal 10km squares OR $>30\%$ of inland 10km squares)	Medium	Low

b) Seabirds and inshore wintering waterfowl with more marine distributions

The primary data source for these features is Bradbury *et al.* (2017, which includes modelled density surface maps derived from both the European Seabirds at Sea data base and from a variety of systematic aerial surveys. The scoring of UK distribution is based on previous analyses undertaken by JNCC ([unpublished](#)) of the underlying modelled datasets in Bradbury *et al.* (2017). This JNCC analysis, defines occupancy as percentage of cells within the UK marine area in which the modelled density value exceeded 1% of the 95th centile density value (excluding cells in which CV was >0.5). The selection of category boundary values for this attribute (see Table A2.2) is based on characteristics of the supporting data sets and has no inherent biological significance. The distribution of the occupancy scores rounded to the nearest 5% for the 24 species and 36 species-season combinations for which scores could be calculated for breeding and/or non-breeding season distributions in UK waters is shown in Figure A2.3. Species were divided into widespread, moderately restricted and highly restricted corresponding to the rapidly rising, shoulder and plateau areas of this distribution.

For non-breeding seabirds the contribution of Scotland to overall distribution within GB is derived from visual inspection of the density distribution maps in the Bradbury *et al.* (2017) report and with reference to Furness (2015). For breeding seabirds, the contribution of Scotland is primarily determined by reference to the results of the Seabird 2000 census (Mitchell *et al.*, 2004), with cross-check to the marine distribution shown in Bradbury *et al.* (2017).

The scoring category boundary values for each attribute and derivation of the combined distribution score are shown in Tables A2.2a and A2.2b.

⁴ <https://app.bto.org/mapstore/StoreServlet>.

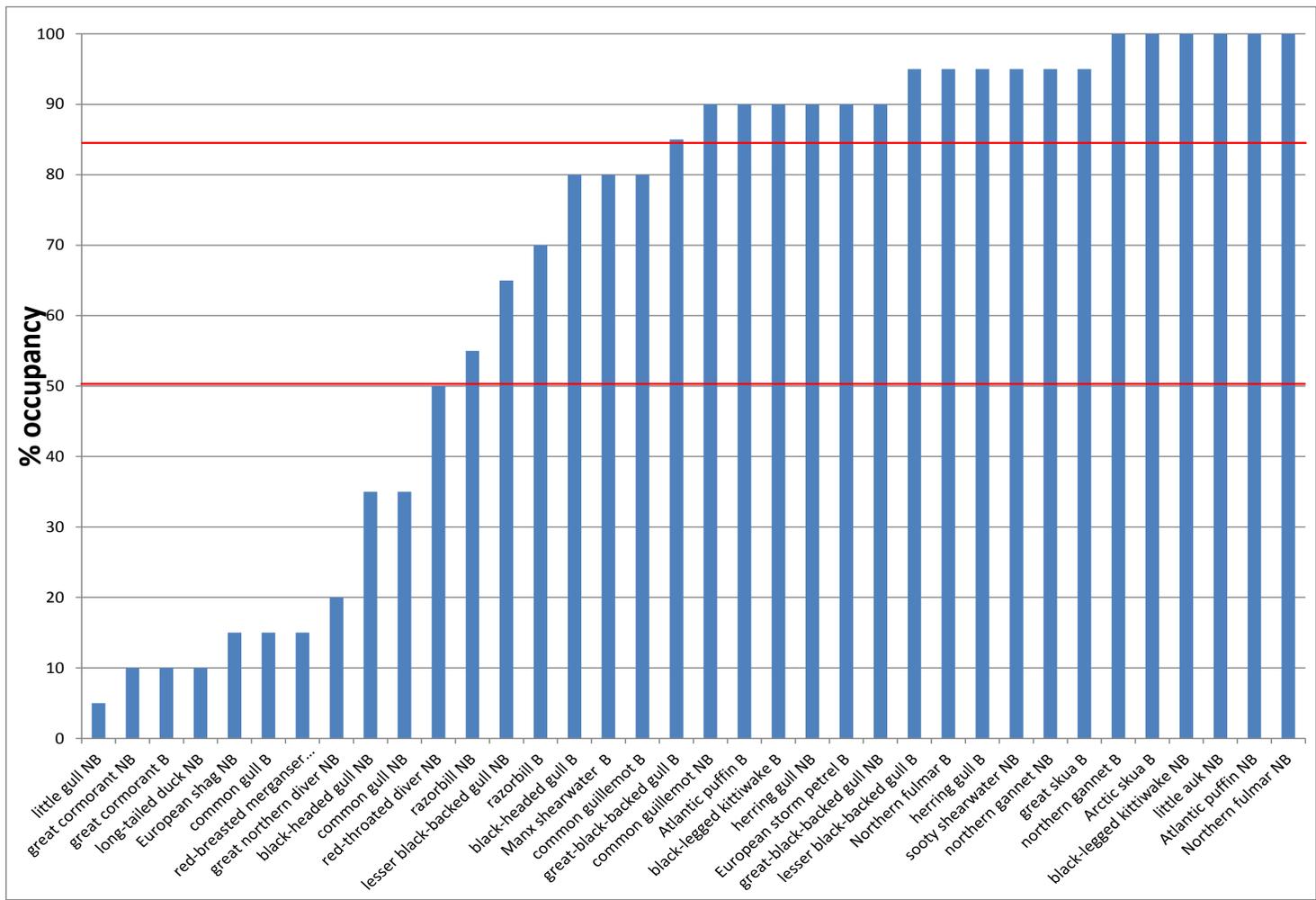


Figure A2.3: Distribution of UK marine area occupancy scores

Table A2.2a: UK distribution and relative importance of Scottish population: Non-breeding seabirds (and some inshore wintering waterfowl)

Relative importance of Scotland	High: Areas of highest relative abundance mainly in Scottish seas and/or $\geq 75\%$ of GB wintering population in Scottish waters or (southern) Scotland at northerly edge of range in GB	Moderate: Areas of highest relative abundance found both in Scottish and English/Welsh seas and/or 51-75% of GB wintering population in Scottish waters	Low: Areas of highest relative abundance mainly in English/Welsh waters and/or $\leq 50\%$ of GB wintering population in Scottish waters
UK marine distribution			
Highly restricted – range score $\leq 50\%$	High	High	Medium
Restricted – range score 51 – 84 %	High	Medium	Low
Widespread - range score $\geq 85\%$	Medium	Low	Low

Table A2.2b: GB distribution and relative importance of Scottish population: Breeding seabirds

Relative importance of Scotland	$\geq 75\%$ of GB breeding population in Scotland (and consistent with marine distribution)	51-75% of GB breeding population in Scotland (and consistent with marine distribution)	$\leq 50\%$ of GB breeding population in Scotland (and consistent with marine distribution)
GB marine distribution			
Highly restricted – range score $\leq 50\%$	High	High	Medium
Restricted – range score 51 – 84 %	High	Medium	Low
Widespread - range score $\geq 85\%$	Medium	Low	Low

2. Contribution of GB to biogeographic population and European Conservation Status

These attributes consider the European conservation status and the importance of the GB population to the relevant biogeographic population and are combined to give a score that indicates the importance of GB to the conservation of the species internationally.

For waterfowl (breeding and non-breeding) and wintering gulls (except little gull and kittiwake) and for non-breeding shag and cormorant the source for GB populations is Musgrove *et al.* (2013) and for biogeographic populations is Wetlands International, 2015. For breeding seabirds the source for both GB (Scottish) and biogeographic populations is Mitchell *et al.* (2004). For non-breeding seabirds (other than those listed above) the sources used are Furness (2015) for UK and biogeographic populations and Forrester *et al.* (2007) for Scottish populations. For all species, the European conservation status is derived from BirdLife International (2017).

The derivation of the (uncorrected) combined score for European conservation status and GB international importance are shown in Table A2.3. The 30% category boundary value between medium and high for importance in relation to biogeographic population is based on NIMF/BAP approach under which the UK is considered important to the regional (NE Atlantic – OSPAR) population of a species if it holds more than 30% of that regional population. For the Scottish Network Assessment the ‘regional’ population is taken to be the relevant biogeographic population for each species. In Table B, where the percentage of a population within GB (UK) is uncertain and is given as a range by the sources listed, the higher estimate is used.

Table A2.3: European conservation status and importance of GB to biogeographic population (raw scores)

European conservation status	High: Critically endangered, Endangered or Vulnerable	Medium: Near threatened, declining or depleted	Low: Least concern
Contribution to biogeographic population			
High: >30% in GB	High	High	Medium
Medium: 1-30% in GB	High	Medium	Low
Low: <1% in GB	Medium	Low	Low

The raw combined scores for this element, as derived in Table A2.3, are then adjusted to take account of very large or very small international populations. Scores are adjusted down by one category (i.e. from High to Medium or from Medium to Low) for species with international (European/biogeographic) populations of millions or tens of millions of individuals and up by one category (i.e. from Low to Medium or from Medium to High) for species with international (European/biogeographic) populations of hundreds or thousands of individuals.

3. Establishing appropriate level of species representation in Scottish marine SPAs

To derive an overall score of the relative value of protected areas in Scotland’s marine environment to the conservation of each species, the scores derived in Tables A2.1 or A2.2 for importance of Scotland to GB marine distribution and from Table A2.3 (adjusted) for importance of GB to international conservation status are combined as shown in Table A2.4.

Table A2.4: Overall species score

Status/population element (Table A2.3)	High	Medium	Low
Importance of Scotland to GB distribution element (Table A2.1 or A2.2 (a or b) as appropriate to species group)			
High	Very high	High	Medium
Medium	High	Medium	Low
Low	Medium	Low	Very low

4. Decision principles on level of representation in pSPA network:

The level of species representation judged appropriate in the Scottish marine pSPAs is based on the combined scoring of the species status attributes as detailed above. The following decision principles have been applied:

- No single attribute is considered in isolation.
- When combining different scores (Tables A2.3 and A2.4) the combined score will default to medium where the two attributes to be combined are high and low.
- The combined decision matrix (Table A2.4) gives higher weight to the 'Importance of Scotland' attribute score by bumping scores up when high and down when low thereby highlighting those species of particular relevance to Scotland.
- The final score (Very High, High, Medium, Low or Very Low) identifies a pre-determined level of representation based on the species status considered appropriate within the Scottish pSPA network. These are defined in Table A2.5.

Table A2.5: Expectations on minimum level of representation in the Scottish pSPA network

Combined score	Level of minimum representation in the Scottish pSPA network
Very High	<u>Expectation of</u> species being included in all pSPAs where it has been identified as a qualifying feature and of being represented more than twice in each OSPAR region overlapping its Scottish distribution ensuring full geographic coverage of the species range in Scotland; replication of representation in regions is considered necessary to enhance species resilience.
High	<u>Expectation of</u> species being represented at least twice in each OSPAR region overlapping its Scottish distribution ensuring full geographic coverage of the species range in Scotland; replication of representation in regions is considered necessary to enhance species resilience.
Medium	<u>Expectation of</u> species being represented once or twice in each OSPAR region overlapping its Scottish distribution; replication of representation in regions would enhance species resilience.
Low	<u>Expectation of</u> species being represented once or twice within Scottish SPA network.
Very Low	<u>No expectation</u> of species being represented in the Scottish SPA network.

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Annex 3 - Species Assessments

Examples:

- A) *Species-season where the number of proposed SPA is appropriate.*
- B) *Species-season where the number of proposed SPAs is lower than the minimum level of representation expected.*
- C) *Species-season where the number of proposed SPAs exceeds the minimum level of representation expected.*

Example A: Species-season where the number of proposed SPA is appropriate.

Scottish SPA Network Assessment
Species Assessment
Red-throated diver (non-breeding)

Document version control for template			
Version	Date	Author	Reason / Comments
1	12/02/2018	Kate Thompson	First draft
2	16/03/2018	Kate Thompson, Emma Philip	Second draft to address recommendations from Workshop 2.
3	29/03/2018	Kate Thompson	Third draft
4	04/04/2018	Emma Philip	Final draft – conclusion added
5	09/05/2018	Emma Philip	Final version – included as example assessment in the final draft marine SPA network assessment report.

Distribution list			
Format	Version	Issue date	Issued to
Electronic	3	29/03/2018	Emma Philip
Electronic	5	09/05/2018	Sally Thomas (SNH) (as example in draft network assessment report)

Red-throated diver (non-breeding)

1. Introduction

Red-throated diver is an Annex 1 species. Red-throated diver (non-breeding) is being considered for inclusion within three marine proposed SPAs. These are shown in Figure 1.

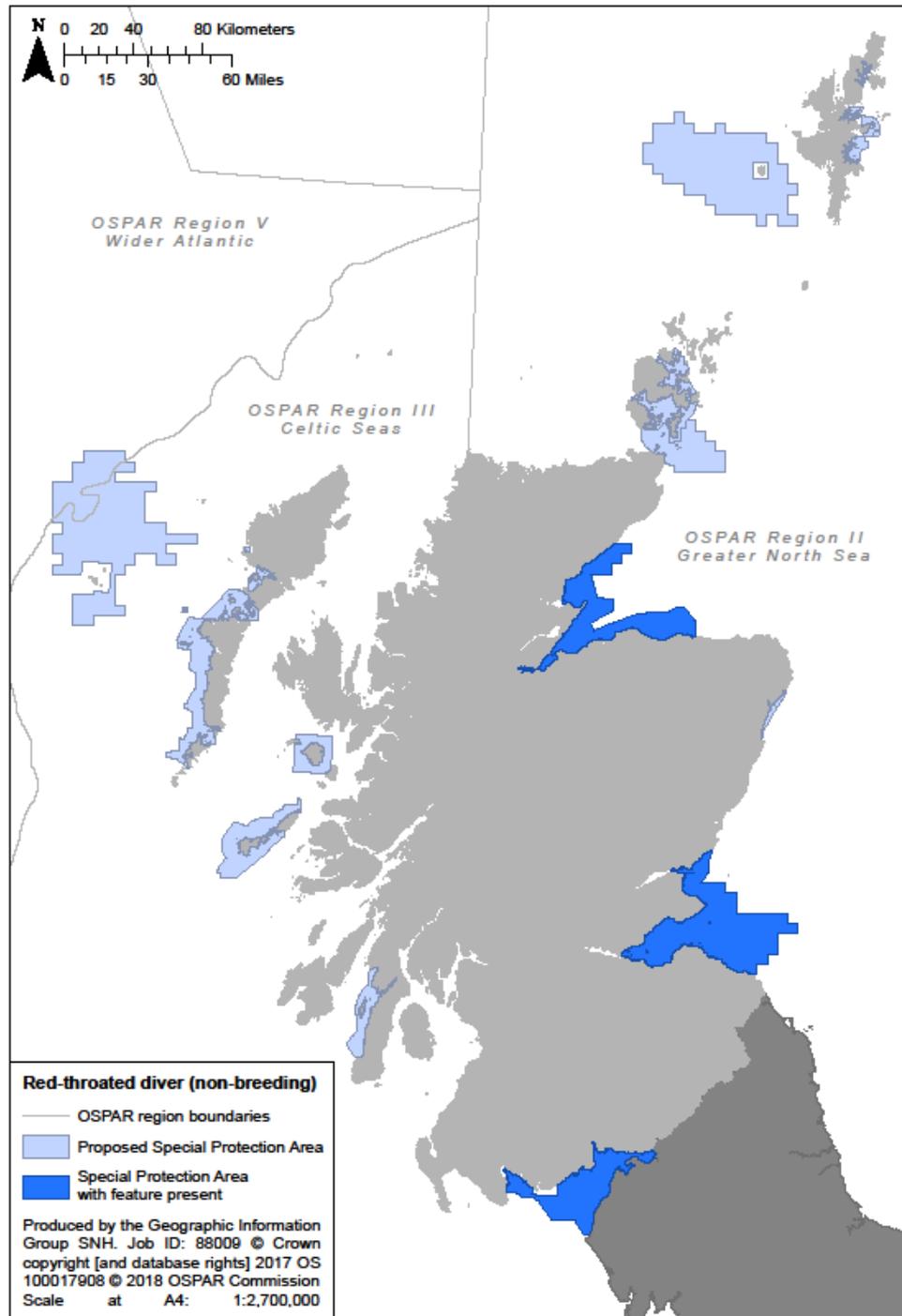


Figure 1: Map showing marine proposed SPAs for red-throated diver (non-breeding)

2. Species account

Table 1: Summary of status of red-throated diver (non-breeding)

Species status	Score (See Annex 2)	Notes
GB marine distribution	Restricted	Red-throated diver (non-breeding) have a restricted distribution in the GB marine environment (JNCC range score 48.4%⁵). Red-throated diver occur in coastal waters throughout Britain in winter (Austin <i>et al.</i> , 2017, Balmer <i>et al.</i> , 2014) but also range further offshore (O'Brien <i>et al.</i> , 2008).
Significance of Scotland's seas in GB context	Low	The majority of the GB wintering population of 17,000 occur off eastern England, with 44% in the Greater Thames area (O'Brien <i>et al.</i> , 2008). Other notable concentrations occur off parts of Wales and in Liverpool Bay. Scotland holds some 2000 of the GB wintering population concentrated in east coast Firths and coasts bordering the North Channel in the southwest (ibid; Bradbury <i>et al.</i> , 2017).
Contribution to biogeographic population	Medium	The GB wintering population of this Annex 1 species is 17,000 birds (O'Brien <i>et al.</i> , 2008; Musgrove <i>et al.</i> , 2013) equivalent to approximately 4-12% of the biogeographic (North-west Europe) population estimated at 150,000 - 450,000 birds (Wetlands International, 2015 & 2018). Red-throated diver breed across the northern hemisphere generally north of 60°, and migrate south in winter to ice-free waters extending in Europe as far south as the coast of Portugal, the Mediterranean Sea and Black Sea. Scottish-breeding birds are thought to travel shorter distances between breeding and wintering areas than other European birds to wintering areas off both east and west coasts of Britain and Ireland (O'Kill, 1994). Birds from breeding grounds in Scandinavia and the Baltic states are thought to migrate mainly to the southern North Sea in winter (Wright <i>et al.</i> , 2012; O'Brien <i>et al.</i> , 2008); while birds from Greenland have been recovered in Scotland (Wernham <i>et al.</i> , 2002). Furness (2015) highlights the importance of Scottish wintering areas to the UK (Scottish) breeding population.
European population conservation status	Depleted	The European population conservation status is Depleted (BirdLife International, 2017). The global conservation status is Least Concern; this reflects the very large size and range of the global population (BirdLife International, 2018)

⁵ Derived from the distribution models in Bradbury *et al.* (2017) and defined as percentage of cells within the UK marine area in which the modelled density value exceeded 1% of the 95th centile density value (excluding cells in which CV was >0.5).

<p>Species status summary and assessment of level of representation in Scottish SPA network.</p>	<p>Red-throated diver (non-breeding) have a Restricted distribution in GB inshore waters, mainly in England. GB is of Medium importance to the biogeographic wintering population of this Annex 1 species and the European population status is Depleted. Accordingly, the overall assessment of the relative value of protected areas in Scotland's marine environment to conservation of red-throated diver (non-breeding) in Europe is Medium.</p> <p>This assessment indicates there is an expectation of red-throated diver (non-breeding) being represented once or twice in each OSPAR region overlapping its Scottish distribution; replication of representation in regions would enhance species resilience.</p>
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Table 2: Vulnerability of red-throated diver (non-breeding) populations to anthropogenic threats and pressures.

<p>Vulnerability to threats and pressures</p>	<p>There is evidence of activities that may take place in UK waters generating pressures or threats likely to have either high or medium impacts on relevant populations of red-throated diver (non-breeding) (Furness, 2016). Red-throated divers exhibit high sensitivity to visual disturbance associated with shipping or recreational craft (Mendel <i>et al.</i>, 2008; Dierschke <i>et al.</i>, 2012; Jarrett <i>et al.</i>, 2018) and are vulnerable to displacement from offshore wind farms (Furness <i>et al.</i>, 2013; Garthe & Hüppop, 2004; Dierschke <i>et al.</i>, 2012, Furness <i>et al.</i>, 2013), although the impacts of displacement are uncertain (Dierschke <i>et al.</i>, 2017). They are also considered vulnerable to pressures including displacement and impacts on prey availability and foraging behaviour associated with aggregate extraction in UK waters (Cook <i>et al.</i>, 2010). Red-throated divers (non-breeding) are also susceptible to impacts associated with fisheries, both through removal of prey (Guse <i>et al.</i>, 2009) and entanglement in fishing nets (Mendel <i>et al.</i>, 2008; Dierschke <i>et al.</i>, 2012; ICES, 2013). Red-throated diver populations wintering in coastal waters off eastern and south-west Britain may be moderately vulnerable (sensitivity scores in top 50% of species rankings) to bycatch in surface gears in the winter months, but there is little empirical evidence of bycatch levels (Bradbury <i>et al.</i>, 2017).</p> <p>Whilst there is no specific evidence on the impacts of climate change to red-throated divers (non-breeding), it is recognised that well-managed protected sites are important to promoting the resilience of species and habitats to the impacts of climate change with larger areas of habitats and species populations providing better opportunities for sustaining diversity (SNH 2016). Marine proposed SPAs can also contribute to adaptation to climate change by reducing other pressures, reducing fragmentation and safeguarding supporting habitats (SNH 2016).</p> <p>Red-throated diver populations are vulnerable to high or medium impacts from a number of different threats and pressures. Replication within OSPAR regions is recommended.</p>
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3. Contribution to Scottish SPA network

This section considers the occurrence of red-throated diver (non-breeding) within the marine proposed SPAs and existing SPAs in Scotland. Red-throated diver (non-breeding) is being considered for inclusion at three marine proposed SPAs and is a feature of one existing estuarine SPA, which is contiguous with one of the marine pSPAs. In addition, during the breeding season, red-throated diver is represented in ten terrestrial SPAs.

Table 3: Summary of occurrence of red-throated diver (non-breeding) within marine proposed SPAs in the Scottish MPA network

Proposed SPAs	Representation	Replication	Geographic range	Linkages
Outer Firth of Forth & St Andrews Bay Complex	Supports up to 5.0% of the GB non-breeding population.	Red-throated diver (non-breeding) is represented within 3 marine proposed SPAs and one existing estuarine SPA (Firth of Forth).	Provides an example on the east mainland coast and represents the core part of the range of this species in Scotland.	Red-throated diver (non-breeding) is a feature of the estuarine Firth of Forth SPA which is contiguous with Outer Firth of Forth & St Andrews Bay Complex pSPA. The red-throated diver population in this area will use both (intertidal) estuarine and (sub-tidal) marine environments.
Moray Firth	Supports up to 1.9% of the GB non-breeding population.	During the breeding season red-throated diver is represented in 10 existing terrestrial SPAs.	Provides an example on the east mainland coast and represents the northern extent of the range of this species in Scotland.	Limited recoveries of ringed adults and chicks from the Shetland breeding population indicates that red-throated divers breeding in Scotland winter over a substantial area including both east and west coasts of Britain and Ireland (O'Kill, 1994). Recent tracking studies of wintering birds captured in the German North Sea indicate that individual birds exhibit high levels of consistency in migration routes, breeding, wintering & moulting areas (Kleinschmidt <i>et al.</i> , 2017). Any direct linkages between terrestrial and marine SPAs for red-throated divers in Scotland are as yet unclear (Furness, 2015).
Solway Firth	Supports up to 3.1% of the GB non-breeding population.	Replication of this feature in the network is proposed in OSPAR Region II	Provides the only example of this species on the west coast of Scotland.	

4. Summary

This assessment indicates there is an expectation of red-throated diver (non-breeding) being represented once or twice in each OSPAR region overlapping its Scottish distribution; replication of representation in regions would enhance species resilience.

The Scottish SPA network includes three marine proposed SPAs for red-throated diver (non-breeding) and one existing estuarine SPA. The marine proposed sites support up to 10% of the GB non-breeding population with proposed sites in OSPAR Regions II and III and replication in OSPAR Region II. The locations of the proposed sites reflect the full geographic range and variation of red-throated diver (non-breeding) in Scotland's marine environment, including both the east and south-west coasts.

The number and distribution of marine proposed sites for red-throated diver (non-breeding) in the Scottish pSPA network as summarised above and in Table 3 is consistent with the species account (Table 1).

Replication in OSPAR Region II is considered appropriate because red-throated diver is an Annex 1 species and there is evidence that red-throated diver (non-breeding) populations may be vulnerable to a number of threats and pressures associated with activities in the marine environment. Site-based protection of areas used regularly by large aggregations is considered an appropriate conservation measure to enhance resilience of red-throated diver (non-breeding) to such threats and pressures.

Together with the existing (estuarine) Firth of Forth SPA, inclusion of the Outer Firth of Forth and St Andrews Bay Complex pSPA in the network provides added conservation value by encompassing the full range of habitats used by red-throated diver (non-breeding) in the Firth of Forth. There is however insufficient evidence to assess linkages among the three marine proposed SPAs and the terrestrial SPAs for breeding red-throated diver.

5. Conclusion

The number and distribution of marine proposed SPAs for red-throated diver (non-breeding) is fully justified based on the relative value of protected areas in Scotland's marine environment to the conservation of red-throated diver (non-breeding) in Europe.

No further SPA provision is considered necessary for red-throated diver (non-breeding).

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Example B: Species-season where the number of proposed SPAs is lower than the minimum level of representation expected

Scottish SPA Network Assessment Species Assessment
European shag (breeding)

Document version control for template			
Version	Date	Author	Reason / Comments
1	01/03/2018	Kate Thompson	
2	17/03/2018	Kate Thompson, Emma Philip	Second draft to address recommendations from Workshop 2.
3	29/03/2018	Kate Thompson	Third draft
4	03/04/2018	Emma Philip	Final draft - conclusion added
5	09/05/2018	Emma Philip	Final version – included as example assessment in the final draft marine SPA network assessment report.

Distribution list			
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Electronic	3	29/03/2018	Emma Philip
Electronic	5	09/05/2018	Sally Thomas (SNH) (as example in draft network assessment report)

European shag (breeding)

1. Introduction

European shag is a regularly occurring migratory species. European shag (breeding) is being considered for inclusion within two marine proposed SPAs. These are shown in Figure 1.

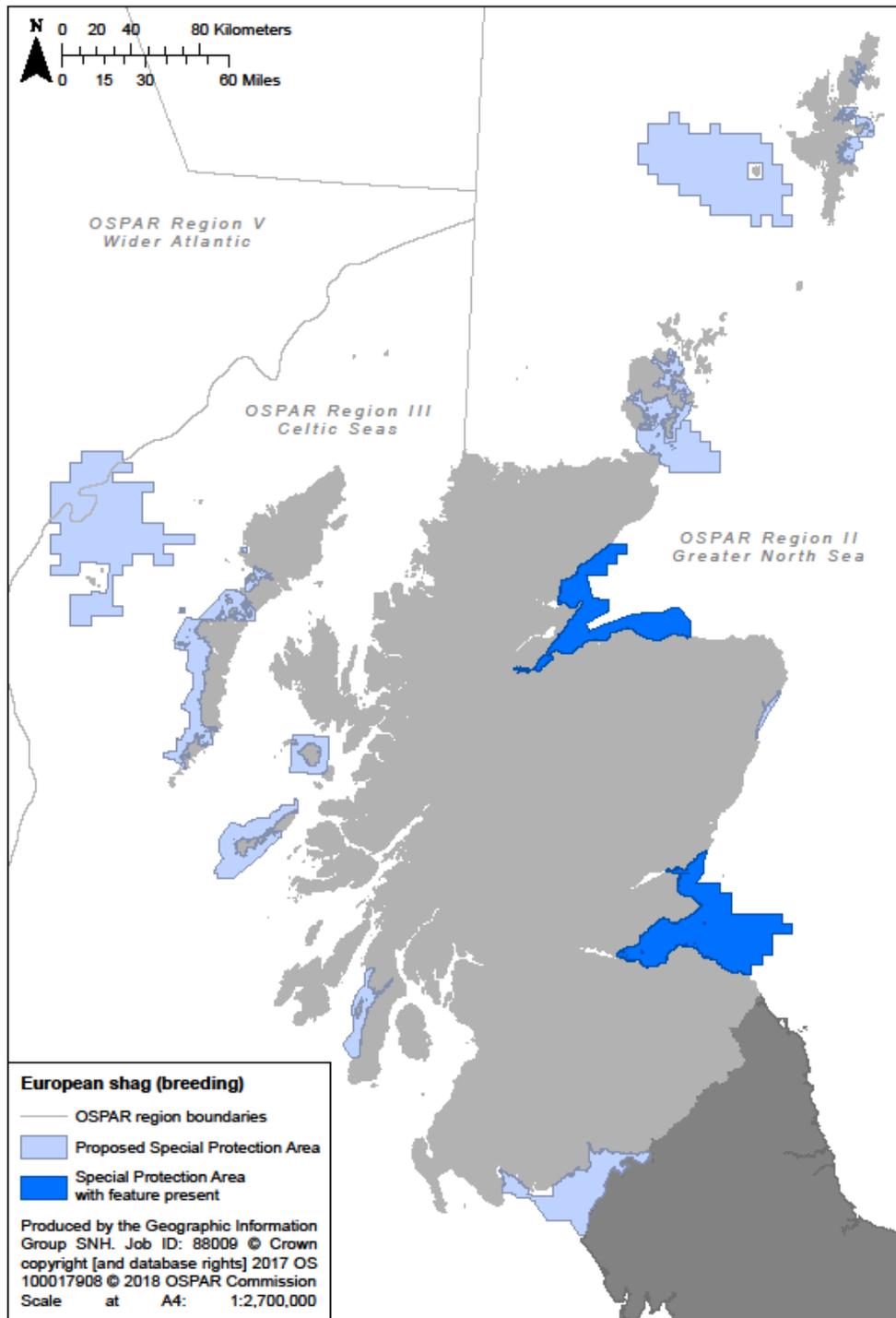


Figure 1: Map showing the marine proposed SPAs for European shag (breeding)

2. Species Assessment

Table 1: Summary of status of European shag (breeding)

Species status	Score (See Annex 2)	Notes
GB marine distribution	Highly restricted	European shag (breeding) have a highly restricted distribution in the GB marine environment (present in 33% of 100km squares in GB waters; JNCC derived from Kober <i>et al</i>, 2010) which reflects their dependence on relatively shallow inshore waters over sandy or rocky substrates, typically within 10-15km of their colonies (Daunt <i>et al.</i> , 2015; Thaxter <i>et al.</i> , 2012; Bradbury <i>et al.</i> , 2017).
Significance of Scotland's seas in GB context	High	European shags in GB breed in coastal colonies throughout Scotland, including the Northern Isles and Outer Hebrides, on the Farne Islands off Northumbria, and in Wales and SW England, but are virtually absent from eastern, SE and NW England (Mitchell <i>et al.</i> , 2004). This is reflected in their marine distribution (Bradbury <i>et al.</i> , 2017). The Seabird 2000 national census of breeding seabirds in Britain and Ireland found a total GB population of 27,667 pairs of which 21,487 (78%) were in Scotland (Mitchell <i>et al.</i> , 2004).
Contribution to biogeographic population	High	The most recent (1998-2002) estimate of the GB breeding population of this regularly occurring migratory species is 27,667 pairs which represents 39.7 – 43.9% of the biogeographic population (<i>aristotelis</i> subspecies NE Atlantic) estimated at 66,000 - 73,000 pairs (Mitchell <i>et al.</i> , 2004). European shag are found along the entire Atlantic coast of Europe, as far north as Finland and Iceland, as far south as the coast of Morocco, and around the entire Mediterranean as well as parts of the Black Sea (BirdLife International, 2018). Nearly 90% of shags belong to the <i>aristotelis</i> subspecies which is confined to the Atlantic coasts of Europe (Mitchell <i>et al.</i> , 2004).
European population conservation status	Declining	The European population conservation status is Declining (BirdLife International, 2017). The global conservation status is Least Concern; this reflects the large size and very extensive range of the population (BirdLife International, 2018).
Species status summary and assessment of level of representation in Scottish SPA network.		Breeding European shag in GB are of High importance to the biogeographic population of this regularly occurring migratory species and the European population status is considered Declining. European shag (breeding) have a highly restricted distribution at sea, with the highest densities in Scotland. Accordingly, the overall assessment based on the relative value of protected areas in Scotland's marine environment to conservation of European shag (breeding) in Europe is Very High .

	<p>This assessment indicates there is an expectation of the species being included in all pSPAs where it has been identified as a qualifying feature and of being represented more than twice in each OSPAR region overlapping its Scottish distribution, ensuring full geographic coverage of the species range in Scotland; replication of representation in regions is considered necessary to enhance species resilience.</p>
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Table 2: Vulnerability of European shag (breeding) populations to anthropogenic threats and pressures.

<p>Vulnerability to threats and pressures</p>	<p>There is evidence of activities that may take place in UK waters generating pressures or threats likely to have high or medium impacts on relevant populations of European shag (breeding) (Furness, 2016). Shag species are susceptible to fatal entanglement in fishing gears (including trammel nets, set gill nets, bottom otter trawls and pots/traps) (ICES, 2013) and in southern Europe such mortality has been linked to local population declines (Tasker <i>et al.</i>, 2000, Zydalis <i>et al.</i>, 2013). European shag are also susceptible to entanglement in netting at fish farms (Bradbury <i>et al.</i>, 2017) but the significance of such mortality is unknown. European shag are identified as among the most potentially sensitive species to bycatch in surface gears, pelagic gears and at depth near the seabed in UK waters (Bradbury <i>et al.</i>, 2017), but there is no systematic data from which to assess bycatch rates or impacts (<i>ibid</i>).</p> <p>There is also potential for individual-level impacts on European shag (non-breeding) through collision with tidal-stream energy generating devices, however potential population-level impacts are currently unknown (Furness <i>et al.</i>, 2012).</p> <p>European shag are susceptible to both direct, in particular increased storminess (Bustnes <i>et al.</i>, 2013; Frederiksen <i>et al.</i>, 2008), and indirect effects of climate change (e.g. shortages of sandeels associated with increases in sea surface temperature)⁶. Breeding populations of European shag in the UK are predicted to suffer moderate or high magnitude declines in response to climate change over the next 40 years under a medium emissions scenario (Pearce-Higgins <i>et al.</i>, 2011). Well-managed protected sites are important to promoting the resilience of species and habitats to the impacts of climate change with larger areas of habitats and species populations providing better opportunities for sustaining diversity (SNH 2016). Marine pSPAs can also contribute to adaptation to climate change by reducing other pressures, reducing fragmentation and safeguarding supporting habitats (SNH 2016).</p> <p>European shag (breeding) populations are vulnerable to high or medium impacts from a number of different threats and pressures. Replication within OSPAR regions is recommended.</p>
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⁶ <http://jncc.defra.gov.uk/page-2877>

3. Contribution to Scottish SPA network

This section considers the occurrence of European shag (breeding) within the marine proposed SPAs and existing Special protection Areas in Scotland. European shag (breeding) are being considered for inclusion at two marine proposed SPAs and are represented in 11 existing colony SPAs, all of which have marine extensions classified to protect areas used by various other cliff-nesting seabird species for maintenance behaviours, such as preening, loafing and roosting, close to the colony

Table 3: Summary of occurrence of European shag (breeding) within proposed SPAs in the Scottish MPA network

Proposed SPAs	Representation	Replication	Geographic range	Linkages
Outer Firth of Forth and St Andrews Bay Complex	Supports foraging shags from the Forth Islands SPA, which when classified in 1990 held 2400 pairs. The average population between 2007 and 2011 was 1009 pairs.	European shag (breeding) is represented within 2 proposed SPAs and 11 existing SPAs, all of which have marine extensions. However, shag is not the species determining the extension.	Provides only example in the southerly part of the range of this species on the east coast of Scotland.	Tracking studies (Daunt <i>et al.</i> , 2015) identified foraging areas within the Outer Firth of Forth and St Andrews Bay Complex pSPA used by birds from the Forth Islands SPA. Parts of the pSPA are also within mean foraging range (5.9km; Thaxter <i>et al.</i> , 2012) of breeding colonies at St Abbs Head to Fast castle SPA.
Moray Firth	Supports a breeding seabird assemblage, including at least 5,494 European shag ⁷ .	Replication of this feature in the network is proposed in OSPAR Region II. No sites were identified in OSPAR Region III.	Provides only example in the core part of the range of this species on the east coast of Scotland.	Birds foraging in the Moray Firth are within mean foraging range (5.9km; Thaxter <i>et al.</i> , 2012) foraging range of the breeding colony at East Caithness cliffs SPA.

⁷ This is an average number of birds within a site, derived from analysis of densities using the ESAS dataset to identify areas of sea that on average held higher and more aggregated densities of birds than other areas (Kober *et al.*, 2010). Essentially the average figure gives an indication of the relative importance of sites; it represents a snapshot of usage because the entire population of the relevant breeding colonies are not at sea at any one time and are not solely confined to those areas identified as pSPAs. The total number of individuals using the site over the breeding season will be well in excess of the estimate used for site selection purposes and will reflect the breeding populations at colonies within foraging range of the site and turnover within the site.

4. Summary

The species assessment (Table 1) indicates there is an expectation of the species being included in all pSPAs where it has been identified as a qualifying feature and of being represented more than twice in each OSPAR region overlapping its Scottish distribution, ensuring full geographic coverage of the species range in Scotland; replication of representation in regions is considered necessary to enhance species resilience.

The proposed Scottish SPA network includes two marine pSPAs for European shag (breeding) that together provide foraging areas for ca.7,500-10,000+ birds. Both of these pSPAs are within OSPAR Region II and together they are within mean foraging range (Thaxter *et al*, 2012) of 3 (of 11) existing colony SPAs. This distribution does not fully reflect that of breeding European shag in Scotland as there are no sites associated with major colonies (e.g. Shiant Isles or Canna and Sanday) in western Scotland (OSPAR Region III) or in Shetland, which in 1998-2002 held 29% of the Scottish population⁸.

The number and distribution of marine proposed sites for European shag (breeding) in the Scottish pSPA network as summarised above and in Table 3 is below the minimum level of representation indicated by the species assessment (Table 1).

Inclusion of the Outer Firth of Forth and St Andrews Bay Complex pSPA and Moray Firth pSPA in the network provides added conservation value by encompassing the full range of habitats used by European shag (non-breeding) in Scotland's largest firths.

Representation in OSPAR Region III and replication in both OSPAR regions would be desirable given the relative value (Very High) of protected areas in Scotland's marine environment to conservation of European shag (breeding) and because there is evidence that European shag (breeding) populations may be vulnerable to a number of threats and pressures associated with activities in the marine environment. Site-based protection of areas used regularly by large aggregations is considered an appropriate conservation measure to enhance resilience of European shag (breeding) to such threats and pressures. Site-based protection also promotes resilience to sporadic population "wrecks" that shags are subject to and which may depress breeding populations over a number of subsequent years (Heubeck *et al*, 2015)⁹.

5. Conclusion

The number and distribution of marine proposed SPAs for European shag (breeding) is fully justified based on the relative value of protected areas in Scotland's marine environment to the conservation of European shag (breeding) in Europe.

Further SPA provision, particularly representation in OSPAR Region III, or additional site-based and/or alternative conservation measures are recommended for European shag (breeding). Potentially suitable additional SPAs could probably be identified with relatively little additional work.

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⁸ Populations at three major colonies in Shetland have subsequently declined by almost 90%, apparently as a consequence of high mortality associated with prolonged gales in the winters of 2003, 2011 and 2014 (Heubeck *et al*, 2015).

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Example C: Species-season where the number of proposed SPAs exceeds the minimum level of representation expected:

Scottish SPA Network Assessment
Species Assessment
Long-tailed duck (non-breeding)

Document version control for template			
Version	Date	Author	Reason / Comments
1	13/12/2017	Kate Thompson & Emma Philip	First draft prepared for SNH, JNCC & MSS workshop (A2465055).
2	26/01/2018	Kate Thompson	Second draft to address recommendations from Workshop 1.
3	19/03/2018	Kate Thompson, Emma Philip	Third draft to address recommendations from Workshop 2.
4	29/03/2018	Kate Thompson	Fourth draft
5	03/04/2018	Emma Philip	Final draft - conclusion added
6	09/05/2018	Emma Philip	Final version – included as example assessment in the final draft marine SPA network assessment report.

Distribution list			
Format	Version	Issue date	Issued to
Electronic	1	15/12/2017	Helen Wade, Greg Mudge (SNH), Kerstin Kober, Matt Parsons (JNCC), Jared Wilson (MSS)
Electronic	3	20/03/2018	Advisory Panel – Greg Mudge & Emma Philip (SNH), Jared Wilson (MSS) and Matt Parsons (JNCC)
Electronic	4	29/03/2018	Emma Philip
Electronic	6	09/05/2018	Sally Thomas (SNH) (as example in draft network assessment report)

Long-tailed duck (non-breeding)

1. Introduction

Long-tailed duck is a regularly occurring migratory species. Long-tailed duck (non-breeding) is being considered for inclusion within six marine proposed SPAs. These are shown in Figure 1.

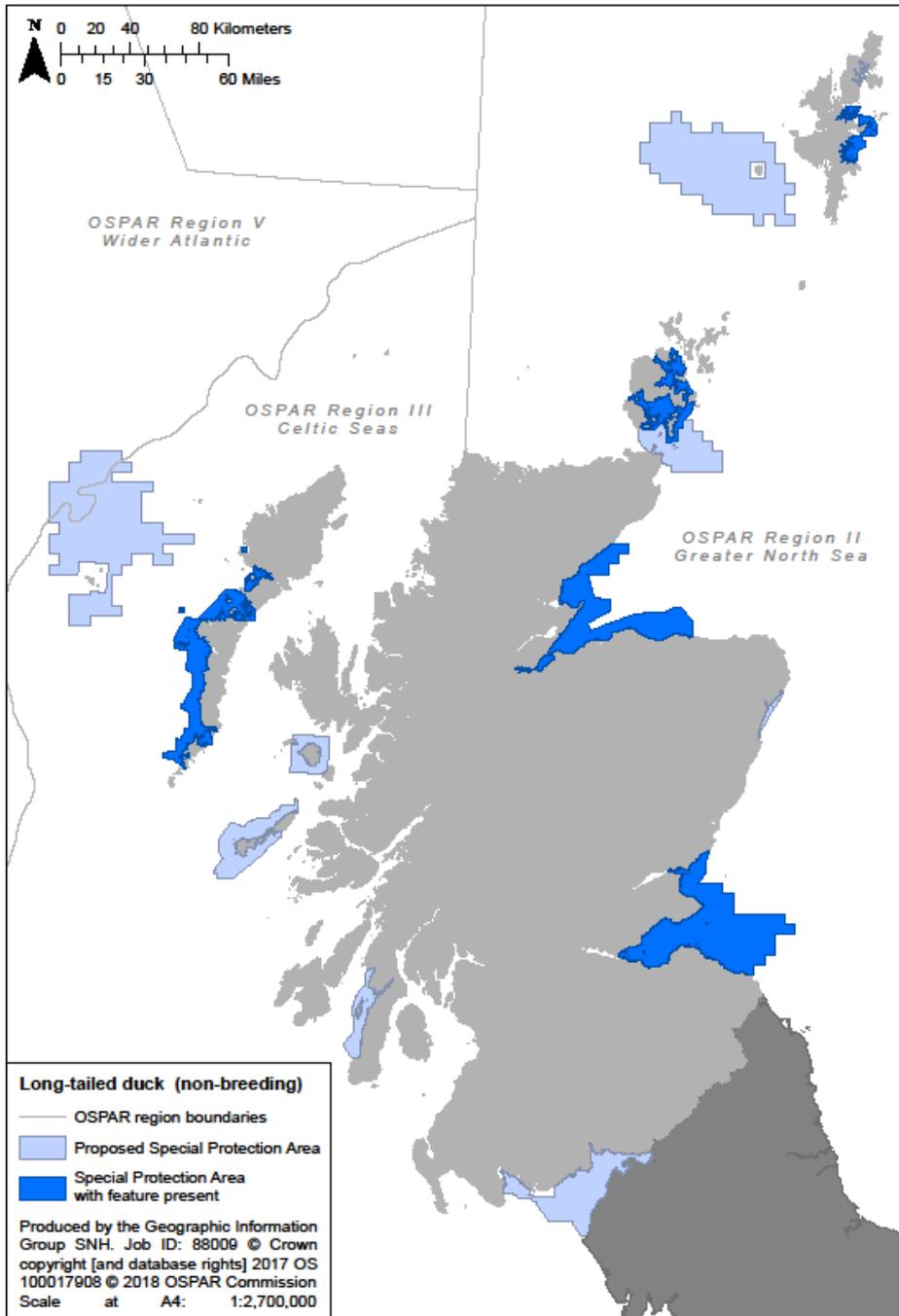


Figure 1: Map showing the marine proposed SPAs for long-tailed duck (non-breeding)

2. Species account

Table 1: Summary of status of long-tailed duck (non-breeding)

Species status	Score (See Annex 2)	Notes
GB marine distribution	Restricted	Long-tailed duck (non-breeding) have a restricted distribution in the GB marine environment (JNCC range score 11.6%¹⁰ and recorded in an average of 17.4% of coastal core WeBS count sectors counted between 2011 and 2015¹¹).
Significance of Scotland's seas in GB context	High	Major concentrations of long-tailed duck are almost entirely confined to Scottish coastal (Austin <i>et al.</i> , 2017) and inshore waters, particularly in east coast Firths and in the Northern and Western Isles (Balmer <i>et al.</i> , 2014; Bradbury <i>et al.</i> , 2017).
Contribution to biogeographic population	Low	<p>The GB wintering population of this regularly occurring migratory species is 11,000 birds (Musgrove <i>et al.</i>, 2013) which represents approximately 0.7% of the very large biogeographic (North-West Europe) population estimated at 1,600,000 birds (Wetlands International, 2015 & 2018). More recent sources (e.g. Lawson <i>et al.</i>, 2015; Austin <i>et al.</i>, 2017) suggest that the GB wintering population may be somewhat larger than currently estimated, although still relatively low compared with the total in NW Europe.</p> <p>Long-tailed duck have a circumpolar breeding distribution across Arctic coasts of North America, Greenland, Europe and Asian Russia migrating south to winter at sea (BirdLife International, 2017b). The GB wintering population is on the south-western edge of the NW Europe biogeographic range. The origins and migration routes of birds wintering around Britain and Ireland are poorly understood; the majority are thought to breed in northern Fennoscandia and northwest Russia, but there is very little supporting evidence (Wright <i>et al.</i>, 2012).</p>
European population conservation status	Vulnerable	Both the European and global population conservation statuses are Vulnerable because of an apparent severe decline detected in the wintering population in the Baltic Sea between the early 1990s and late 2000s (BirdLife International, 2017a & b). Similar declines have been observed in Norway and north-east Scotland (Hearn <i>et al.</i> , 2015).

¹⁰ Derived from the distribution models in Bradbury *et al.* (2017) and defined as percentage of cells within the UK marine area in which the modelled density value exceeded 1% of the 95th centile density value (excluding cells in which CV was >0.5).

¹¹ Data supplied on 14 February 2018 by the British Trust for Ornithology, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee (the last on behalf of the statutory nature conservation bodies: Natural England, Natural Resources Wales and Scottish Natural Heritage and the Department of Agriculture, Environment and Rural Affairs, Northern Ireland) in association with the Wildfowl and Wetlands Trust.

<p>Species status summary and assessment of level of representation in Scottish SPA network.</p>	<p>The long-tailed duck (non-breeding) population wintering in Scotland’s inshore waters is of Low importance to the very large biogeographic population of this regularly occurring migratory species. The European population status is considered Vulnerable and therefore measures to improve conservation status are considered to be of high importance. Long-tailed duck (non-breeding) have a restricted distribution in GB inshore waters, almost entirely confined to Scotland. Accordingly, the overall assessment of the relative value of protected areas in Scotland’s marine environment to conservation of long-tailed duck (non-breeding) in Europe is Medium.</p> <p>This assessment indicates there is an expectation of long-tailed duck (non-breeding) being represented once or twice in each OSPAR region overlapping its Scottish distribution; replication of representation in regions would enhance species resilience.</p>
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Table 2: Vulnerability of long-tailed duck (non-breeding) populations to anthropogenic threats and pressures.

<p>Vulnerability to threats and pressures</p>	<p>There is evidence of activities that may take place in UK waters generating pressures or threats likely to have medium impacts on relevant populations of long-tailed duck (non-breeding) (Furness, 2016). Direct mortality from chemical and oil pollution, including recurrent small-scale incidents, and drowning through entanglement in gillnets are the main pressures identified in the Baltic (Hearn <i>et al.</i>, 2015; Mendel <i>et al.</i>, 2008) but vulnerability to bycatch in British fisheries appears relatively low (Bradbury <i>et al.</i>, 2017).</p> <p>Barrier effects and habitat loss have been documented at offshore wind farms in Sweden and Denmark (Dierschke & Garthe, 2006) and long-tailed duck exhibit a high sensitivity to visual disturbance associated with vessel movements (Jarrett <i>et al.</i>, 2018; Mendel <i>et al.</i>, 2008), but impacts on populations are unknown.</p> <p>Long-tailed duck have been identified as vulnerable to impacts of climate change with potential for a moderate magnitude decline in the UK (Pearce-Higgins <i>et al.</i>, 2011). Well-managed protected sites are important to promoting the resilience of species and habitats to the impacts of climate change with larger areas of habitats and species populations providing better opportunities for sustaining diversity (SNH 2016). Marine proposed SPAs can also contribute to adaptation to climate change by reducing other pressures, reducing fragmentation and safeguarding supporting habitats (SNH 2016).</p> <p>Long-tailed duck populations are vulnerable to medium impacts from to a number of different threats and pressures. Replication within OSPAR regions is recommended.</p>
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3. Contribution to Scottish SPA network

This section considers the occurrence of long-tailed duck (non-breeding) within the marine proposed SPAs and existing Special Protection Areas in Scotland. Long-tailed duck (non-breeding) are being considered for inclusion at six marine proposed SPAs and are represented in two existing estuarine/coastal SPAs.

Table 3: Summary of occurrence of long-tailed duck (non-breeding) within proposed SPAs in the Scottish MPA network

Proposed SPAs	Representation	Replication	Geographic range	Linkages
East Mainland Coast, Shetland	Supports ca 1.5% of the GB non-breeding population.	Long-tailed duck (non-breeding) are represented within 6 proposed SPAs and there are 3 existing estuarine/coastal SPAs for this species in Scotland. Replication of this feature in the network is proposed in OSPAR Region II.	Provides an example in the Northern Isles and represents the northern extent of the range of this species in Scotland.	No known linkages
North Orkney	Supports ca 8.5% of the GB non-breeding population.		Provides an example in the Northern Isles and represents a core part of the range of this species in Scotland.	No known linkages
Scapa Flow	Supports ca 12.7% of the GB non-breeding population.		Provides an example in the Northern Isles and represents a core part of the range of this species in Scotland.	No known linkages
Moray Firth	Supports ca 45.5% of the GB non-breeding population.		Provides an example on the east mainland coast and represents a core part of the range of this species in Scotland.	No known linkages
Outer Firth of Forth & St Andrews Bay Complex	Supports a non-breeding waterfowl assemblage, including long-tailed duck equivalent to ca. 17.7% of the GB non-breeding		Provides an example on the east mainland coast and represents the southern extent of the range of this species in	Long-tailed duck is a feature of the non-breeding waterbird assemblage of the Firth of Forth SPA and Firth of Tay and Eden Estuary SPAs, both of which are

Proposed SPAs	Representation	Replication	Geographic range	Linkages
	population.		Scotland.	contiguous with this marine proposed SPA.
West Coast of the Outer Hebrides	Supports ca 7.5% of the GB non-breeding population.		Provides only example on the west coast of Scotland.	No known linkages

4. Summary

The species assessment (Table 1) indicates there is an expectation of long-tailed duck (non-breeding) being represented once or twice in each OSPAR region overlapping its Scottish distribution; replication of representation in regions would enhance species resilience.

The proposed Scottish SPA network includes six marine pSPAs for long-tailed duck (non-breeding) that together hold up to ca. 90% of the estimated GB population. Five of these pSPAs are within OSPAR Region II and the sixth is in OSPAR Region III. This reflects the geographic range of long-tailed duck (non-breeding) in Scotland from Shetland and Orkney to east coast Firths and the Western Isles. The sites also reflect the varied environments in which long-tailed ducks occur (e.g. from the exposed West Coast of the Outer Hebrides to the more sheltered waters of sites such as Scapa Flow).

The number and distribution of marine proposed sites for long-tailed duck (non-breeding) in the Scottish pSPA network as summarised above and in Table 3 exceeds the minimum level of representation indicated by the species assessment (Table 1).

Replication in OSPAR regions overlapping the Scottish distribution of long-tailed duck (non-breeding) is considered appropriate because there is evidence that long-tailed duck (non-breeding) populations may be vulnerable to a number of threats and pressures associated with activities in the marine environment. Site-based protection of areas used regularly by large aggregations is considered an appropriate conservation measure to enhance resilience of long-tailed duck (non-breeding) to such threats and pressures and the AEWA species action plan (Hearn *et al*, 2015) includes as a goal “A network of protected areas, covering all important sites throughout the lifecycle, is designated and maintained”. Replication in OSPAR Region II may also address lack of replication in OSPAR Region III where there are relatively few major wintering concentrations of long-tailed duck outwith the Outer Hebrides.

There is local geographic replication within OSPAR Region II, with three pSPAs for long-tailed duck (non-breeding) in the Northern Isles; two in Orkney, at North Orkney and Scapa Flow, and one in Shetland. The East Mainland Coast, Shetland pSPA represents the northern extent of this species in GB. North Orkney pSPA and Scapa Flow pSPA represent the core part of the range of this species in Scotland together supporting around a fifth of the GB population, second only to the contribution of the Moray Firth pSPA. Of the two Orkney sites, Scapa Flow pSPA holds the third largest number of long-tailed duck (non-breeding) in the Scottish pSPA network and North Orkney the sixth largest.

The Outer Firth of Forth and St Andrews Bay Complex pSPA is contiguous with two existing estuarine SPAs. Together these three sites encompass the full range of habitats used by long-tailed ducks within the greater Forth.

5. Conclusion

No further SPA provision in Scotland's marine environment is considered necessary for long-tailed duck (non-breeding) however, a review of the level of representation in the proposed SPA network and in particular, the Northern Isles is required by the Advisory Panel.

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Annex 4 - Results of species assessments

Table 1: Species-season where the number of proposed SPA is appropriate

ROM – Regularly Occuring Migratory, nb – non-breeding, b – breeding

Feature (season)	Species Account: Relative value of Scottish population	Is replication above the minimum appropriate?	Does the Scottish pSPA network reflect the species assessment?	Is there local geographic replication?	Conclusion
Annex 1 species ROM species					
Red-throated diver (nb)	Medium	Yes – <i>Annex 1 species, Evidence of threats and pressures and Functional links with existing SPA</i>	Yes	No	Strong conservation justification for the number and distribution of pSPAs.
Velvet scoter (nb)	High	Yes – <i>Evidence of threats and pressures</i>	Yes	No	No further SPA provision is considered necessary.
Goosander (nb)	Low	No	Yes	No	
Black-headed gull (nb)	Low	Yes – <i>Evidence of threats and pressures</i>	Yes	No	
Common gull (nb)	Low	No	Yes	No	
Herring gull (nb)	Low	Yes – <i>Evidence of threats and pressures</i>	Yes	No	
Great northern diver (nb)	Very High	Yes – <i>Annex 1 species and Evidence of threats and pressures</i>	Yes	Yes	Strong conservation justification for the number of pSPAs.
Red-throated diver (b)	High	Yes – <i>Annex 1 species, Evidence of threats and pressures and Functional links with existing SPA</i>	Yes	Yes	No further SPA provision is considered necessary.
Slavonian grebe (nb)	Very High	Yes – <i>Annex 1 species</i>	Yes	Yes	There is local geographic replication.
Black-throated diver (nb)	Medium	Yes – <i>Annex 1 species and Evidence of threats and pressures</i>	Yes	No	Strong conservation justification for the number and distribution of pSPAs.
Sandwich tern (b)	Low	Yes – <i>Annex 1 species, Evidence of threats and pressures and Functional links with existing SPA</i>	Yes	No	Additional site-based and/or alternative conservation measures are recommended.
European storm petrel (b)	Low	Yes – <i>Annex 1 species and Evidence of threats and pressures</i>	Yes	No	
Northern fulmar (b)	Medium	Yes – <i>Evidence of threats and pressures and Functional links</i>	Yes	No	

Feature (season) Annex 1 species ROM species	Species Account: Relative value of Scottish population	Is replication above the minimum appropriate?	Does the Scottish pSPA network reflect the species assessment?	Is there local geographic replication?	Conclusion
		<i>with existing SPA</i>			
Northern gannet (b)	Medium	Yes – <i>Evidence of threats and pressures and and Functional links with existing SPA</i>	Yes	No	Strong conservation justification for the number and distribution of pSPAs. Additional site-based and/or alternative conservation measures are recommended.
Atlantic puffin (b)	Medium	Yes – <i>Evidence of threats and pressures and and Functional links with existing SPA</i>	Yes	No	
Arctic skua (b)	Low	Yes – <i>Evidence of threats and pressures and and Functional links with existing SPA</i>	Yes	No	
Great skua (nb)	Low	Yes – <i>Evidence of threats and pressures</i>	Yes	No	
Black-legged kittiwake (b)	Low	Yes – <i>Evidence of threats and pressures and and Functional links with existing SPA</i>	Yes	No	
Black-legged kittiwake (nb)	Low	Yes – <i>Evidence of threats and pressures</i>	Yes	No	
Herring gull (b)	Low	Yes – <i>Evidence of threats and pressures and and Functional links with existing SPA</i>	Yes	No	
Razorbill (nb)	Low	Yes – <i>Evidence of threats and pressures</i>	Yes	No	

Table 2: Species where the number of proposed SPAs is lower than the minimum level of representation expected

ROM – Regularly Occuring Migratory, nb – non-breeding, b – breeding

Feature (season)	Species Account: Relative value of Scottish population	Is replication above the minimum appropriate?	Does the Scottish pSPA network reflect the species assessment?	Is there local geographic replication?	Conclusion
Annex 1 species ROM species					
<i>Great crested grebe (nb)</i> ¹²	Medium	No	No – below minimum	No	No further SPA provision is considered necessary.
Greater scaup (nb)	Very High	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	Strong conservation justification for the proposed SPAs these species are represented in. Additional site-based and/or alternative conservation measures are recommended.
Common eider (nb) (<i>S. m. faeroeensis</i>)	Very High	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	
Arctic tern (b)	Medium	Yes – <i>Annex 1 species, Evidence of threats and pressures and and Functional links with existing SPA</i>	No – below minimum	No	
Little tern (b)	Medium	Yes – <i>Annex 1 species, Evidence of threats and pressures and and Functional links with existing SPA</i>	No – below minimum	No	
Manx shearwater (b)	Medium	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	
European shag (b)	Very High	Yes – <i>Evidence of threats and pressures and and Functional links with existing SPA</i>	No – below minimum	No	
Great skua (b)	Medium	Yes – <i>Evidence of threats and pressures and and Functional links with existing SPA</i>	No – below minimum	No	
European shag (nb)	Very High	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	Yes	Strong conservation justification for the proposed SPAs these species are represented in.
Common guillemot	High	Yes – <i>Evidence of threats and</i>	No – below	Yes	

¹² See Species Account – existing estuarine provision considered appropriate.

Feature (season) Annex 1 species ROM species	Species Account: Relative value of Scottish population	Is replication above the minimum appropriate?	Does the Scottish pSPA network reflect the species assessment?	Is there local geographic replication?	Conclusion
(b)		<i>pressures and Functional links with existing SPA</i>	minimum		Additional site-based and/or alternative conservation measures are recommended. There is local geographic replication.
Northern fulmar (nb)	Medium	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	Strong conservation justification for the proposed SPAs these species are represented in.
Little gull (nb)	High	Yes – <i>Annex 1 species</i>	No – below minimum	No	
Common guillemot (nb)	Medium	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	No further SPA provision is considered necessary/appropriate. Wider seas conservation measures could be considered.

Table 3: Species-season where the number of proposed SPAs exceeds the minimum level of representation expected.

ROM – Regularly Occuring Migratory, nb – non-breeding, b – breeding

Feature (season) Annex 1 species ROM species	Species Account: Relative value of Scottish population	Is replication above the minimum appropriate?	Does the Scottish pSPA network reflect the species status assessment?	Is there local geographic replication?	Conclusion
Common eider (nb) <i>(mollissima</i> subspecies)	Medium	Yes – <i>Evidence of threats and pressures</i>	No – Exceeds minimum	Yes	The number of pSPAs is higher than expected and for some species-seasons there is local geographic replication. No further SPA provision is considered necessary.
Long-tailed duck (nb)	Medium	Yes – <i>Evidence of threats and pressures, Functional links with existing SPA and Strong flocking tendency</i>	No – Exceeds minimum	Yes	
Common scoter (nb)	Very Low	Yes – <i>Evidence of threats and pressures, Functional links with existing SPA and Strong flocking tendency</i>	No – Exceeds minimum	No	
Common goldeneye (nb)	Low	No	No – Exceeds minimum	No	
Red-breasted merganser (nb)	Medium	No	No – Exceeds minimum	Yes	
Common tern (b)	Very Low	Yes – <i>Annex 1 species, Evidence of threats and pressures and Functional links with existing SPA</i>	No – Exceeds minimum	No	

Table 4: Species-season where there is no marine pSPA representation.

ROM – Regularly Occuring Migratory, nb – non-breeding, b – breeding

Feature (season)	Species Account: Relative value of Scottish population	Is replication above the minimum appropriate?	Does the Scottish pSPA network reflect the species assessment?	Is there local geographic replication?	Conclusion
Annex 1 species ROM species					
Leach's storm petrel (b)	Medium	Yes – <i>Annex 1 species</i>	No – below minimum	No	There are no pSPAs for these species-seasons. Site-based and/or alternative conservation measures are recommended.
<i>Great cormorant (b)</i>	Medium	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	
<i>Great black-backed gull (b)</i>	Medium	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	
<i>Razorbill (b)</i>	High	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	
Roseate tern (b)¹³	No score	Yes – <i>Annex 1 species and Evidence of threats and pressures</i>	N/A	No	There are no pSPAs for these species-seasons.
Sooty shearwater (nb)	Low	Yes – <i>Annex 1 species and Evidence of threats and pressures</i>	No – below minimum	No	Wider seas conservation measures could be considered.
<i>Great cormorant (nb)</i>	Low	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	
<i>Northern gannet (nb)</i>	Very Low	Yes – <i>Evidence of threats and pressures</i>	Yes	No	
<i>Atlantic puffin (nb)</i>	Low	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	
<i>Great black-backed gull (nb)</i>	Low	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	
Lesser black-backed gull (nb) ¹⁴	Low	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	There are no pSPAs for these species-seasons. SPAs are not

¹³ Roseate tern is currently not breeding in Scotland – therefore it was not possible to score relative importance of Scottish population.

¹⁴ Largest densities occur in England and Wales

Lesser black-backed gull (nb) ¹⁴	Low	Yes – <i>Evidence of threats and pressures</i>	No – below minimum	No	considered necessary for these species in Scottish waters.
<i>Little auk (nb)</i>	Very Low	No	Yes	No	

Annex 5 – Advisory Panel species-season reviews

1. *Common scoter (non-breeding)*
2. *Common goldeneye (non-breeding)*
3. *Common eider - mollissima subspecies (non-breeding)*
4. *Long-tailed duck (non-breeding)*
5. *Red-breasted merganser (non-breeding)*
6. *Common tern (breeding)*

Species-season with local geographic replication only:

7. *Great northern diver (non-breeding)*
8. *Slavonian grebe (non-breeding)*
9. *Red-throated diver (breeding)*
10. *European shag (non-breeding)*
11. *Common guillemot (breeding)*

1. Common scoter (non-breeding)

Common scoter (non-breeding) – regularly occurring migratory species			
Relative value of protected areas to the conservation of that species in Europe.	Very Low: No expectation of the species being represented in the Scottish SPA network.		
Number of pSPAs species-season represented	3 pSPAs with 2 pSPAs OSPAR Region II (east coast) and 1 pSPA in OSPAR Region III (west coast).		
Consideration of threats and pressures	There is evidence of activities that may take place in UK waters generating pressures or threats likely to have medium impacts on relevant populations of common scoter (non-breeding) (Furness, 2016). Documented threats and pressures occurring at the individual level include entanglement in set nets, fisheries bycatch, removal of prey species and prey supporting habitat, displacement associated with offshore windfarms, disturbance associated with vessel movement and oil spills.		
Proposed SPAs	UK SPA Selection Guideline: Stage 1	% GB population supported by pSPA	Functional links with existing SPAs
Outer Firth of Forth and St Andrews Bay Complex	1.3	4.7%	Common scoter (non-breeding) is a feature of the non-breeding waterbird assemblage of the Firth of Forth SPA and Firth of Tay and Eden Estuary SPA, both of which are contiguous with this marine proposed SPA. The common scoter population in this area will use both (intertidal) estuarine and (sub-tidal) marine environments.
Moray Firth	1.4	5.5%	No known linkages.
Solway Firth	1.3	1.6%	No known linkages.
Advisory Panel recommendation	The inclusion of common scoter (non-breeding) as a qualifying feature of Outer Firth of Forth and St Andrews Bay Complex pSPA, Moray Firth pSPA and Solway Firth pSPA is supported to enhance resilience to known threats and pressures which can be mitigated by site-based protection. Common scoter exhibits a strong flocking behaviour forming extremely large flocks at a few locations and consequently, making them highly susceptible to local impacts. The three pSPAs reflect the Scottish geographic distribution and highest concentrations of this species. Inclusion of the Outer Firth of Forth and St Andrews Bay Complex pSPA is further supported because of the functional link with two existing SPAs.		

2. Goldeneye (non-breeding)

Goldeneye (non-breeding) – regularly occurring migratory species			
Relative value of protected areas to the conservation of that species in Europe.	Low: Expectation of the species being represented once or twice in the Scottish SPA network.		
Number of pSPAs species-season represented	3 pSPAs in OSPAR Region II (east coast and Northern Isles).		
Consideration of threats and pressures	There is no specifically documented evidence of activities likely to occur in in UK coastal waters generating pressures or threats likely to have either high or medium impacts on relevant populations of common goldeneye (non-breeding) (Furness, 2016). Documented threats and pressures occurring at the individual level include wildfowling, entanglement in set nets and nutrient enrichment of freshwater wintering sites potentially increasing the importance of coastal sites in some areas.		
Proposed SPAs	UK SPA Selection Guideline: Stage 1	% GB population supported by pSPA	Functional links with existing SPAs
Outer Firth of Forth and St Andrews Bay Complex	1.3	2.9%	Common goldeneye is a feature of the non-breeding waterbird assemblage of the Firth of Forth SPA and Firth of Tay and Eden Estuary SPA which are contiguous with this marine proposed SPA. The common goldeneye population in this area will use both (intertidal) estuarine and (sub-tidal) marine environments.
Moray Firth	1.4	4.5%	Common goldeneye is a feature of the non-breeding waterbird assemblage of the Inner Moray Firth SPA which is contiguous with this marine proposed SPA. The common goldeneye population in this area will use both (intertidal) estuarine and (sub-tidal) marine environments.
Scapa Flow	1.4	1.1%	No known linkages to existing SPAs.
Advisory Panel recommendation	<p>The inclusion of common goldeneye (non-breeding) as a qualifying feature of Outer Firth of Forth and St Andrews Bay Complex pSPA and Moray Firth pSPA is supported to match the minimum level of representation expected for this species based on the relative value of protected areas in Scotland’s marine environment to the conservation of the species in Europe. Replication on the east mainland coast is supported because of the functional links between these two proposed SPAs and existing SPAs and because the locations reflect the highest concentrations of the species coastal distribution.</p> <p>Common goldeneye present a weaker case at Scapa Flow pSPA – the GB population is a small proportion (2%) of the biogeographic population and the proposed SPA supports a low % of the GB population qualifying under Stage 1.4. There are no known linkages with existing SPAs.</p>		

3. Common eider *mollissima* subspecies (non-breeding)

Common eider <i>mollissima</i> subspecies (non-breeding) – regularly occurring migratory species			
Relative value of protected areas to the conservation of that species in Europe.	Medium: Expectation of the species being represented once or twice in each OSPAR region overlapping its Scottish distribution; replication of representation in regions would enhance species resilience.		
Number of pSPAs species-season represented	7 proposed SPAs with replication with 4 pSPAs in OSPAR Region II (Northern Isles and east coast) and 3 in OSPAR Region III (west coast).		
Consideration of threats and pressures	There is evidence of activities that may take place in UK waters generating pressures or threats likely to have medium impacts on relevant populations of common eider (non-breeding) (Furness, 2016). Documented threats and pressures occurring at the individual level include entanglement in set nets, fisheries bycatch, removal of prey species and prey supporting habitat, collision with offshore windfarms, disturbance associated with vessel movement and oil spills.		
Proposed SPAs	UK SPA Selection Guideline: Stage 1	% GB population supported by pSPA	Functional links with existing SPAs
Outer Firth of Forth and St Andrews Bay Complex	1.2	35.9%	Common eider – <i>mollissima</i> sub- species is a feature of the non-breeding waterbird assemblage of the Firth of Forth SPA and Firth of Tay and Eden Estuary SPA which are contiguous with the Outer Firth of Forth and St Andrews Bay Complex pSPA. The eider population in this area will use both (intertidal) estuarine and (sub-tidal) marine environments.
Moray Firth	1.4	2.9%	No known linkages.
Scapa Flow	1.4	3.3%	No known linkages.
North Orkney	1.4	2.4%	No known linkages.
West Coast of the Outer Hebrides	1.4	8.5%	No known linkages.
Coll and Tiree	1.4	2.4%	No known linkages.
Sound of Gigha	1.4	2.2%	No known linkages.
Advisory Panel recommendation	The inclusion of common eider – <i>mollissima</i> sub- species (non-breeding) as a qualifying feature of Outer Firth of Forth and St Andrews Bay Complex pSPA, Scapa Flow pSPA, West Coast of the Outer Hebrides pSPA and Sound of Gigha pSPA is supported to provide the best geographic coverage of the species range and match the minimum level of representation		

expected for this species based on the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe. Further replication on the east and west mainland coasts (Moray Firth pSPA and Coll and Tiree pSPA) is supported to reflect the full geographic distribution of this species and enhance resilience to known threats and pressures which can be mitigated by site-based protection.

Common eider – *mollissima* sub- species (non-breeding) present a weaker case at North Orkney pSPA – there is local geographic replication with common eider being represented at two proposed SPAs in Orkney. North Orkney pSPA supports a lower % of the GB population than Scapa Flow pSPA both qualifying under Stage 1.4.

4. Long-tailed duck (non-breeding)

Long-tailed duck (non-breeding) – regularly occurring migratory species			
Relative value of protected areas to the conservation of that species in Europe.	Medium: Expectation of the species being represented once or twice in each OSPAR region overlapping its Scottish distribution; replication of representation in regions would enhance species resilience.		
Number of pSPAs species-season represented	6 proposed SPAs with 5 pSPAs in OSPAR Region II (east coast and Northern Isles) where the highest densities are found and 1 pSPAs in OSPAR Region III (west coast).		
Consideration of threats and pressures	There is evidence of activities that may take place in UK waters generating pressures or threats likely to have medium impacts on relevant populations of long-tailed duck (non-breeding) (Furness, 2016). Documented threats and pressures occurring at the individual level include entanglement in gill nets, fisheries bycatch, displacement and habitat loss associated with offshore windfarms, disturbance associated with vessel movement and oil and chemical population.		
Proposed SPAs	UK SPA Selection Guideline: Stage 1	% GB population supported by pSPA	Functional links with existing SPAs
Outer Firth of Forth and St Andrews Bay Complex	1.3	17.7%	Long-tailed duck is a feature of the non-breeding waterbird assemblage of the Firth of Forth SPA and Firth of Tay and Eden Estuary SPA, both of which are contiguous with this marine proposed SPA. The long-tailed duck population in this area will use both (intertidal) estuarine and (sub-tidal) marine environments.
Moray Firth	1.4	45.5%	No known linkages.
Scapa Flow	1.4	12.7%	No known linkages.
North Orkney	1.4	8.5%	No known linkages.
East Mainland Coast, Shetland	1.4	1.5%	No known linkages.
West Coast of the Outer Hebrides	1.4	7.5%	No known linkages.
Advisory Panel recommendation	The inclusion of long-tailed duck (non-breeding) as a qualifying feature of Moray Firth pSPA, Scapa Flow pSPA and West Coast of the Outer Hebrides pSPA is supported to provide the best geographic coverage of the species range and match the minimum level of representation expected for this species based on the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe. Further replication on the east mainland coast is supported to reflect the full geographic distribution of this species as well as highest concentrations therefore, enhancing		

resilience to known threats and pressures which can be mitigated by site-based protection. Inclusion of the Outer Firth of Forth and St Andrews Bay Complex pSPA is further supported because of the functional link with two existing SPAs

Long-tailed duck (non-breeding) present a weaker case at North Orkney pSPA and East Mainland Coast, Shetland

– The GB population is a small proportion of the biogeographic population and there is local geographic replication with long-tailed duck being represented at three proposed SPAs in the Northern Isles. East Mainland Coast, Shetland pSPA supports a low % of the GB population qualifying under Stage 1.4. Of the two Orkney pSPAs, North Orkney pSPA supports a lower % of the GB population than Scapa Flow pSPA both qualifying under Stage 1.4. There are no known linkages with existing SPAs.

5. Red-breasted merganser (non-breeding)

Red-breasted merganser (non-breeding) – regularly occurring migratory species			
Relative value of protected areas to the conservation of that species in Europe.	Medium: Expectation of the species being represented once or twice in each OSPAR region overlapping its Scottish distribution; replication of representation in regions would enhance species resilience.		
Number of pSPAs species-season represented	7 pSPAs with 5 pSPAs in OSPAR Region II (east coast and Northern Isles) where the highest densities are found and 2 in OSPAR Region III (west coast).		
Consideration of threats and pressures	There is no specifically documented evidence of activities likely to occur in in UK waters generating pressures or threats likely to have either high or medium impacts on relevant populations of red-breasted merganser (non-breeding) (Furness, 2016). Documented threats and pressures occurring at the individual level include entanglement in set nets and disturbance associated with vessel movement.		
Proposed SPAs	UK SPA Selection Guideline: Stage 1	% GB population supported by pSPA	Functional links with existing SPAs
Outer Firth of Forth and St Andrews Bay Complex	5.1%	1.3	Red-breasted merganser (non-breeding) is a feature of the non-breeding waterbird assemblage of the Firth of Forth SPA and the Firth of Tay and Eden Estuary SPA which are contiguous with this marine proposed SPA. The red-breasted merganser population in this area will use both (intertidal) estuarine and (sub-tidal) marine environments.
Moray Firth	1.8%	1.4	Red-breasted merganser (non-breeding) is a feature of the non-breeding waterbird assemblage of the Inner Moray Firth SPA, Cromarty Firth SPA and the Moray and Nairn Coast SPA which are contiguous with this marine proposed SPA. The red-breasted merganser population in this area will use both (intertidal) estuarine/coastal and (sub-tidal) marine environments.
Scapa Flow	6.4%	1.4	No known linkages.
North Orkney	4.1%	1.4	No known linkages.
East Mainland Coast, Shetland	2.8%	1.4	No known linkages.
West Coast of the Outer Hebrides	2.8%	1.4	No known linkages.
Sound of Gigha	1.4%	1.4	No known linkages.

**Advisory Panel
recommendation**

The inclusion of red-breasted merganser (non-breeding) as a qualifying feature of the Outer Firth of Forth and St Andrews Bay Complex pSPA, Scapa Flow pSPA, West Coast of the Outer Hebrides pSPA and Sound of Gigha pSPA is supported to provide the best geographic coverage of the species range and match the minimum level of representation expected for this species based on the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe. Further replication on the east mainland coast is supported to reflect the full geographic distribution of this species and enhanced resilience to known threats and pressures which can be mitigated by site-based protection. Inclusion of the Moray Firth pSPA is further supported because of the functional link with three existing SPAs

Red-breasted merganser (non-breeding) present a weaker case at North Orkney pSPA and East Mainland Coast, Shetland pSPA – There is local geographic replication with red-breasted merganser being represented at three proposed SPAs in the Northern Isles. East Mainland Coast, Shetland pSPA supports a low % of the GB population qualifying under Stage 1.4. Of the two Orkney pSPAs, North Orkney pSPA supports a lower % of the GB population than Scapa Flow pSPA both qualifying under Stage 1.4. There are no known linkages with existing SPAs.

6. Common tern (breeding)

Common tern (breeding) – Annex 1 species			
Relative value of protected areas to the conservation of that species in Europe.	Very Low: No expectation of the species being represented in the Scottish SPA network.		
Number of pSPAs species-season represented	One pSPA in OSPAR Region II.		
Consideration of threats and pressures	There is evidence of activities in UK waters generating pressures or threats likely to have medium impacts on relevant populations of common tern (breeding) (Furness, 2016). Documented threats and pressures occurring at the individual level include depletion of food-fish stocks such as sprats and herring, changes in water turbidity, and coastal breeding sites are potentially vulnerable to increased flooding associated with storm tides.		
Proposed SPAs	UK SPA Selection Guideline: Stage 1	% GB population supported by pSPA	Functional links with existing SPAs
Outer Firth of Forth and St Andrews Bay Complex	1.1	8.8	Birds foraging in the Outer Firth of Forth and St Andrews Bay Complex are within foraging range of breeding colonies at Forth Islands SPA and Imperial Dock Lock, Leith SPA.
Advisory Panel recommendation	The inclusion of common tern (non-breeding) as a qualifying feature of of the Outer Firth of Forth and St Andrews Bay Complex pSPA is supported to enhance resilience to known threats and pressures which can be mitigated by site-based protection and because common tern is an Annex 1 species. Inclusion of the Outer Firth of Forth and St Andrews Bay Complex pSPA is further supported because it reflects the highest concentrations of this species and is within foraging range of two breeding colony SPAs.		

7. Great northern diver (non-breeding)

Great northern diver (non-breeding) – Annex 1 species			
Relative value of protected areas to the conservation of that species in Europe.	Very High: Expectation of the species being included in all pSPAs where it has been identified as a qualifying feature and of being represented more than twice in each OSPAR region overlapping its Scottish distribution, ensuring full geographic coverage of the species range in Scotland; replication of representation in regions is considered necessary to enhance species resilience.		
Number of pSPAs species-season represented	7 pSPAs with 4 pSPAs in OSPAR Region II (east coast and Northern Isles) and 3 pSPAs in OSPAR Region III (Hebrides and west coast).		
Consideration of threats and pressures	There is no specifically documented evidence of activities in UK waters generating pressures or threats likely to have either high or medium impacts on relevant populations of great northern divers during the non-breeding season (Furness, 2016). Documented threats and pressures occurring at the individual level include fisheries bycatch, disturbance associated with vessel movements and related activities and oil spills.		
Proposed SPAs	UK SPA Selection Guideline: Stage 1	% GB population supported by pSPA¹⁵	Functional links with existing SPAs
Moray Firth	1.1	5.8 %	No known linkages.
Scapa Flow	1.1	20.2 %	No known linkages.
North Orkney	1.1	12.4 %	No known linkages.
East Mainland Coast, Shetland	1.1	7.3 %	No known linkages.
West Coast of the Outer Hebrides	1.1	52 %.	No known linkages.
Coll and Tiree	1.1	18.1 %.	No known linkages.
Sound of Gigha	1.1	20.2 %.	No known linkages.

¹⁵ The estimated GB wintering population of this Annex 1 species is 2,500 birds (Musgrove *et al*, 2013), which is **approximately 50% of the biogeographic (European) population** estimated at 5,000 birds (Wetlands International, 2015, 2018) . However, more recent sources (e.g. Austin *et al* 2017; Furness, 2015; Lawson *et al* 2015) indicate that the GB wintering population exceeds 4000 birds. The current national and biogeographic wintering population estimates are awaiting systematic review and it is probable that the relative importance of GB and Scottish waters to the population wintering in Europe may be greater than previously thought.

**Advisory Panel
recommendation**

Inclusion of great northern diver (non-breeding) in all pSPAs is supported to provide full geographic coverage of the species range and match the minimum level of representation expected for this species based on the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe.

Within the Northern Isles, there are three pSPAs for great northern diver (non-breeding); two in Orkney, at North Orkney and Scapa Flow, and one in Shetland. Inclusion of East Mainland Coast, Shetland pSPA is supported because it represents the northern extent of this species in GB. The Panel also supports the inclusion of both North Orkney pSPA and Scapa Flow pSPA as they represent the core part of the range of this species in Scotland and together support up to 32.6% of the GB population, second only to the contribution of the larger West Coast of the Outer Hebrides pSPA. Of the two Orkney sites, Scapa Flow pSPA holds the second largest number of great northern diver (non-breeding) in the Scottish pSPA network and North Orkney the fifth largest.

The GB population is approximately 50% of the relevant biogeographic population with Scotland supporting most of the GB population and the highest concentrations. Great northern diver (non-breeding) is a qualifying feature of one existing in England supporting 3% of GB population (Falmouth Bay to St Austell Bay SPA).

8. Slavonian grebe (non-breeding)

Slavonian grebe (non-breeding) – Annex 1 species			
Relative value of protected areas to the conservation of that species in Europe.	Very High: Expectation of the species being included in all pSPAs where it has been identified as a qualifying feature and of being represented more than twice in each OSPAR region overlapping its Scottish distribution, ensuring full geographic coverage of the species range in Scotland; replication of representation in regions is considered necessary to enhance species resilience.		
Number of pSPAs species-season represented	6 pSPAs with 5 pSPAs in OSPAR Region II (east coast and Northern Isles) and 2 pSPAs in (east coast and Northern Isles) OSPAR Region III.		
Consideration of threats and pressures	There is no specifically documented evidence of activities in UK waters generating pressures or threats likely to have either high or medium impacts on relevant populations of Slavonian grebe during the non-breeding season (Furness, 2016). Documented threats and pressures occurring at the individual level include disturbance and changes in water clarity associated with aggregate extraction or dredging, entanglement in fishing nets and fisheries bycatch.		
Proposed SPAs	UK SPA Selection Guideline: Stage 1	% GB population supported by pSPA	Functional links with existing SPAs
Outer Firth of Forth and St Andrews Bay Complex	1.1	2.7 %	Slavonian grebe (non-breeding) is a feature of the Firth of Forth SPA which is contiguous with this marine proposed SPA. The Slavonian grebe (non-breeding) population in this area will use both (intertidal) estuarine and (sub-tidal) marine environments.
Moray Firth	1.1	3.9 %	No known linkages.
Scapa Flow	1.1	12.3 %	No known linkages.
North Orkney	1.1	10.9 %	No known linkages.
West Coast of the Outer Hebrides	1.1	4.6 %	No known linkages.
Sound of Gigha	1.1	3.4 %	No known linkages.
Advisory Panel recommendation	<p>Inclusion of Slavonian grebe (non-breeding) in all pSPAs is supported to provide full geographic coverage of the species range and match the minimum level of representation expected for this species based on the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe.</p> <p>Within the Northern Isles, there are two pSPAs for Slavonian grebe (non-breeding); North Orkney and Scapa Flow. Inclusion of both North Orkney pSPA and Scapa Flow pSPA is supported as they represent the core stronghold of this species range in Scotland with each pSPA supporting over double the population size of any other pSPA. Together they</p>		

	support up to 23.2% of the GB population, the largest concentration of this species anywhere in Scotland. Of the two Orkney sites, Scapa Flow pSPA holds the largest number of Slavonian grebe (non-breeding) in the Scottish pSPA network and North Orkney the second largest.
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9. Red-throated diver (non-breeding)

Red-throated diver (breeding) – Annex 1 species			
Relative value of protected areas to the conservation of that species in Europe.	High: Expectation of the species being represented at least twice in each OSPAR region overlapping its Scottish distribution, ensuring full geographic coverage of the species range in Scotland; replication of representation in regions is considered necessary to enhance species resilience.		
Number of pSPAs species-season represented	6 pSPAs with 4 pSPAs in OSPAR Region II (Northern Isles) and 2 pSPAs in OSPAR Region III (west coast).		
Consideration of threats and pressures	There is evidence of activities in UK waters generating pressures or threats likely to have medium impacts on relevant populations of red-throated diver (breeding) (Furness, 2016). Documented threats and pressures occurring at the individual level include visual disturbance associated with shipping or recreational craft, displacement and impacts on prey availability and foraging behaviour associated with aggregate extraction, removal of prey and entanglement in fishing nets and bycatch in surface gears.		
Proposed SPAs	UK SPA Selection Guideline: Stage 1	% GB population supported by pSPA	Functional links with existing SPAs
Scapa Flow	1.1	7.6%	Birds foraging in Scapa Flow are within foraging range of the nesting territories at Hoy SPA and Orkney Mainland Moors SPA.
North Orkney	1.1	4.4%	Birds foraging in North Orkney are within foraging range of the nesting territories at Orkney Mainland Moors SPA.
Bluemull and Colgrave Sounds	1.1	15.4%	Birds foraging in the Bluemull and Colgrave Sounds are within foraging range of the nesting territories at Otterswick and Graveland SPA
East Mainland Coast, Shetland	1.1	16.6%	Birds foraging in East Mainland Coast, Shetland are within foraging range of some nesting territories within the Otterswick and Graveland SPA
West Coast of the Outer Hebrides	1.1	4.5%	Birds foraging in the West Coast of the Outer Hebrides are within foraging range of the nesting territories at Mointeach Scadabhaigh SPA
Rum	1.1	1.4%	Birds foraging in the marine extension to Rum SPA are within foraging range of the nesting territories on Rum SPA.
Advisory Panel recommendation	The inclusion of red-throated diver (breeding) as a qualifying feature of Scapa Flow pSPA, Bluemull and Colgrave Sounds pSPA, East Mainland Coast, Shetland pSPA, West Coast of the Outer Hebrides pSPA and Rum SPA is supported to provide the best geographic coverage of the species range (Shetland, Orkney and Hebrides (no sites located off northern mainland) and match the minimum level of representation expected for this species based on the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe.		

Some local geographic replication is supported because the entire GB population of breeding red-throated diver is confined to Scotland. Red-throated divers are represented at four proposed SPAs in the Northern Isles. Inclusion of both pSPAs in the Shetlands is supported because together they support up to 32% of the GB population and are double the population size of any other pSPA. All pSPAs are functionally linked to nesting territories on existing SPAs.

Red-throated diver (breeding) present a weaker case at North Orkney pSPA – Of the four Northern Isles pSPAs, North Orkney pSPA supports the lowest % of the GB population. It is however functionally linked to nesting territories on an existing SPA.

10. European shag (non-breeding)

European shag (non-breeding) – regularly occurring migratory species			
Relative value of protected areas to the conservation of that species in Europe.	Very High: Expectation of the species being included in all pSPAs where it has been identified as a qualifying feature and of being represented more than twice in each OSPAR region overlapping its Scottish distribution, ensuring full geographic coverage of the species range in Scotland; replication of representation in regions is considered necessary to enhance species resilience.		
Number of pSPAs species-season represented	4 pSPA in OSPAR Region II (east coast) and none in OSPAR Region III.		
Consideration of threats and pressures	There is evidence of activities in UK waters generating pressures or threats likely to have medium impacts on relevant populations of European shag (non-breeding) (Furness, 2016). Documented threats and pressures occurring at the individual level include entanglement in static fishing gear, depletion of prey, exposure to pollutants, disturbance associated with vessel movements and potential collision with tidal-stream energy generating devices.		
Proposed SPAs	UK SPA Selection Guideline: Stage 1	% GB population supported by pSPA	Functional links with existing SPAs
Outer Firth of Forth and St Andrews Bay Complex	1.3	2.2%	European shag (non-breeding) is a feature of the Forth Islands SPA and St Abbs Head to Fast Castle SPA, both of which are contiguous with this proposed marine SPA.
Moray Firth	1.2	5.9%	European shag (non-breeding) is a feature of the East Caithness Cliffs SPA which overlaps with this proposed marine SPA.
Scapa Flow	1.2	2.9%	European shag (breeding) is a feature of the East Caithness Cliffs SPA, which is within foraging range of this proposed marine SPA.
North Orkney	1.4	1.6%	No known linkages.
Advisory Panel recommendation	<p>The inclusion of European shag (non-breeding) as a qualifying feature of Outer Firth of Forth and St Andrews Bay Complex pSPA, Moray Firth pSPA and Scapa Flow pSPA is supported to provide the best geographic coverage of the species range in OSPAR Region II and match the minimum level of representation expected for this species based on the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe.</p> <p>European shag (non-breeding) present a weaker case at North Orkney pSPA – There is local geographic replication with European shag being represented at two proposed SPAs in the Northern Isles. Of the two Orkney pSPAs, Scapa Flow supports more than 1% of the relevant biogeographic population qualifying under Stage 1.2. North Orkney pSPA does not meet the Stage 1.2 threshold and supports a low % of the GB population qualifying under Stage 1.4. There are</p>		

	no known linkages with existing SPAs.
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11. Common guillemot (non-breeding)

Common guillemot (breeding) – regularly occurring migratory species			
Relative value of protected areas to the conservation of that species in Europe.	High: Expectation of the species being represented at least twice in each OSPAR region overlapping its Scottish distribution, ensuring full geographic coverage of the species range in Scotland; replication of representation in regions is considered necessary to enhance species resilience.		
Number of pSPAs species-season represented	4 pSPAs with 3 pSPA in OSPAR Region II (east coast) and one in OSPAR Region III (part in OSPAR Region V).		
Consideration of threats and pressures	There is evidence of activities in UK waters generating pressures or threats likely to have medium impacts on relevant populations of common guillemot (breeding) (Furness, 2016). Documented threats and pressures occurring at the individual level include entanglement in set net fisheries and fisheries bycatch in both surface gears and at depth near the seabed.		
Proposed SPAs	UK SPA Selection Guideline: Stage 1	GB population supported by pSPA (individuals)¹⁶	Functional links with existing SPAs
Outer Firth of Forth and St Andrews Bay Complex	1.3	28,123	Birds foraging in the Outer Firth of Forth and St Andrews Bay Complex are within mean foraging range (37.8km, Thaxter <i>et al</i> , 2012) of breeding colonies at Forth Islands SPA and St Abb's Head to Fast Castle SPA and additionally within mean maximum foraging range.
Pentland Firth	1.3	34,410	Birds foraging in the Pentland Firth are within mean foraging range of breeding colonies at North Caithness Cliffs SPA, East Caithness Cliffs SPA, Hoy SPA, Copinsay SPA, Marwick Head SPA and Rousay SPA and within mean maximum foraging range of 3 additional colony SPAs in Orkney.
Seas off Foula	1.3	11,142	Birds foraging in the Seas off Foula are within mean foraging range of breeding colonies at Foula SPA, Sumburgh Head SPA, Fair Isle SPA and Noss SPA and within mean maximum foraging range of four additional SPA colonies in the Northern Isles.

¹⁶ This is an average number of birds within a site, derived from analysis of densities using the ESAS dataset to identify areas of sea that on average held higher and more aggregated densities of birds than other areas (Kober et al, 2010). Essentially the average figure gives an indication of the relative importance of sites; it represents a snapshot of usage because the entire population of the relevant breeding colonies are not at sea at any one time and are not solely confined to those areas identified as pSPAs. The total number of individuals using the site over the breeding season will be well in excess of the estimate used for site selection purposes and will reflect the breeding populations at colonies within foraging range of the site and turnover within the site.

Seas off St Kilda	1.3	3,147	Birds foraging in the Seas off St Kilda are within mean foraging range of breeding colonies at St Kilda SPA and Flannan isles SPA and additionally within mean maximum foraging range of Shiant Isles SPA.
Advisory Panel recommendation	<p>Inclusion of common guillemot (breeding) in all pSPAs is supported to provide best geographic coverage of the species range and match the minimum level of representation expected for this species based on the relative value of protected areas in Scotland's marine environment to the conservation of the species in Europe.</p> <p>Within the Northern Isles, there are two pSPAs for common guillemot (breeding); Pentland Firth and Seas off Foula. The Panel also supports the inclusion of both Pentland Firth pSPA and Seas off Foula pSPA as both are functionally linked (within foraging range) to different breeding colonies at existing SPAs. At both pSPAs common guillemot is a main component of the breeding seabird assemblages which are composed of different species at each site.</p>		