ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

North-west Irish Sea SPA 004236

National Parks and Wildlife Service,
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Citation:

NPWS (2023) Conservation Objectives: North-west Irish Sea SPA 004236. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

Series Editors: Maria Long and Colin Heaslip
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

004236 North-west Irish Sea SPA

A001	Red-throated Diver *Gavia stellata*
A003	Great Northern Diver *Gavia immer*
A009	Fulmar *Fulmarus glacialis*
A013	Manx Shearwater *Puffinus puffinus*
A017	Cormorant *Phalacrocorax carbo*
A018	Shag *Phalacrocorax aristotelis*
A065	Common Scoter *Melanitta nigra*
A179	Black-headed Gull *Chroicocephalus ridibundus*
A182	Common Gull *Larus canus*
A183	Lesser Black-backed Gull *Larus fuscus*
A184	Herring Gull *Larus argentatus*
A187	Great Black-backed Gull *Larus marinus*
A188	Kittiwake *Rissa tridactyla*
A192	Roseate Tern *Sterna dougallii*
A193	Common Tern *Sterna hirundo*
A194	Arctic Tern *Sterna paradisaea*
A195	Little Tern *Sterna albifrons*
A199	Guillemot *Uria aalge*
A200	Razorbill *Alca torda*
A204	Puffin *Fratercula arctica*
A862	Little Gull *Hydrocoloeus minutus*

For all overlapping or adjoining SPA and SACs, see map 2

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	2018
Title :	The seasonal distribution and abundance of seabirds in the western Irish Sea 2016
Author :	Jessopp, M.; Mackey, M.; Luck, C.; Critchley, E.; Bennison, A.; Rogan, E.
Series :	Report to Department of Communications, Climate Action and Environment, and National Parks & Wildlife Service, Department of Culture, Heritage & the Gaeltacht, Ireland
Year :	2019
Title :	The status of Ireland's breeding seabirds: Birds Directive article 12 reporting 2013 – 2018
Author :	Cummins, S.; Lauder, C.; Lauder, A.; Tierney, T. D.
Series :	Irish Wildlife Manual No. 114
Year :	2021
Title :	Estimated foraging ranges of the breeding seabirds of Ireland's marine special protected area network
Author :	Power, A.; McDonnell, P; Tierney, T.D.
Series :	Unpublished NPWS report
Year :	2022
Title :	Rockabill Tern Report, 2022
Author :	Allbrook, D.; Dunne, S.; Fink, A.; Newton, S.
Series :	BirdWatch Ireland Seabird Conservation Report to NPWS
Year :	2022
Title :	Kilcoole Little Tern Conservation Project Report, 2022
Author :	Johnson, G.C.; Kavanagh, P.; Burke, B.
Series :	BirdWatch Ireland Seabird Conservation Report to NPWS
Year :	2022
Title :	Spatial utilisation of marine areas as foraging resources for Roseate and Common Terns at Rockabill SPA
Author :	Power, A.; O'Connor, I.; Tierney, T.D.
Series :	Unpublished report by NPWS and ATU
Year :	2022
Title :	Determining the use of coastal waters by breeding Little Terns in Kilcoole through boat-based visual tracking and line transects
Author :	Power, A.; O'Connor, I.; Berrow, S.; O'Meara, S.; Acampora, H.; Monaghan, J.; Clarke, D.; Tierney, T.D.
Series :	Unpublished report by NPWS and ATU
Year :	2022
Title :	Baltray Little Tern Colony Report, 2022
Author :	Louth Nature Trust
Series :	Unpublished report to NPWS

Other References

Year :	1990
Title :	The Manx Shearwater
Author :	Brooke, M.
Series :	Poyser, London

Year :	1997
Title :	The status and distribution of breeding sandwich, roseate, common, arctic and little terns in Ireland in 1995
Author :	Hannon, C.; Berrow, S.D.; Newton, S.F.
Series :	Irish Birds, 6: 1-22
Year :	1998
Title :	Flexible foraging techniques in breeding cormorants *Phalacrocorax carbo* and shags *Phalacrocorax aristotelis*: benthic or pelagic feeding?
Author :	Grémillet, D.; Argentin, G.; Schulte, B.; Culik, B.M.
Series :	Ibis, 140(1), pp.113-119
Year :	1999
Title :	Diet of the northern fulmar *Fulmarus glacialis*: reliance on commercial fisheries?
Author :	Phillips, R.A.; Petersen, M.K.; Lilliendahl, K.; Solmundsson, J.; Hamer, K.C.; Camphuysen, C.J.; Zonfrillo, B.
Series :	Marine Biology, 135 (1), pp.159-170
Year :	2003
Title :	Implications for seaward extensions to existing breeding seabird colony Special Protection Areas
Author :	McSorley, C.A.; Dean, B.J.; Webb, A.; Reid J.B.
Series :	JNCC Report No. 329
Year :	2004
Title :	Seabird populations of Britain and Ireland
Author :	Mitchell, P.I.; Newton, S.F.; Ratcliffe, N.; Dunn, T.E.
Series :	Poyser, London
Year :	2005
Title :	Generic guidelines for seaward extensions to existing breeding northern fulmar *Fulmarus glacialis* colony Special Protection Areas
Author :	McSorley, C.A.; Webb, A.; Dean, B.J.; Reid J.B.
Series :	JNCC Report No. 358
Year :	2006
Title :	Distribution and behaviour of Common Scoter *Melanitta nigra* relative to prey resources and environmental parameters
Author :	Kaiser, M.J.; Galanidi, M.; Showler, D.A.; Elliott, A.J.; Caldow, R.W.; Rees, E.I.S.; Stillman, R.A.; Sutherland, W.J.
Series :	Ibis, 148, pp.110-128
Year :	2012
Title :	Integrating Irish Marine Protected Areas: the FAME Seabird Tracking Project
Author :	Baer, J.; Newton, S.
Series :	Unpublished BirdWatch Ireland report
Year :	2015
Title :	Simultaneous multi-colony tracking of a pelagic seabird reveals cross-colony utilization of a shared foraging area
Author :	Dean, B.; Kirk, H.; Fayet, A.; Shoji, A.; Freeman, R.; Leonard, K.; Perrins, C.M.; Guilford, T.
Series :	Marine Ecology Progress Series, 538, pp.239-248
Year :	2016
Title :	Assessing the Movements and Usage of Irish Sea Birds using Innovative Technology: A report on phase 1, Seabirds
Author :	Moss, E.; Tierney, N.; Crowe, O.
Series :	Unpublished report by BirdWatch Ireland to the Sustainable Energy Authority of Ireland

Year :	2019
Title :	Desk-based revision of seabird foraging ranges used for HRA screening
Author :	Woodward, I.; Thaxter, C. B.; Owen, E.; Cook, A. S. C. P.
Series :	BTO Research Report No. 724.
Year :	2019
Title :	Visual tracking of Roseate Tern *Sterna dougallii* from Rockabill: area utilisation and sample size
Author :	Harwood, A.; Perrow, M.; Berridge R.
Series :	ECON report for RSPB
Year :	2019
Title :	Digital video aerial surveys of Common Scoter at Gormanstown: Final report for December 2018 to March 2019
Author :	Hi-Def
Series :	Report produced for Marine Institute
Year :	2019
Title :	The diet of red-throated divers (*Gavia stellata*) overwintering in the German Bight (North Sea) analysed using molecular diagnostics
Author :	Kleinschmidt, B.; Burger, C.; Dorsch, M.; Nehls, G.; Heinänen, S.; Morkūnas, J.; Žydelis, R.; Moorhouse-Gann, R.J.; Hipperson, H.; Symondson, W.O.; Quillfeldt, P.
Series :	Marine Biology, 166, pp.1-18
Year :	2020
Title :	Arctic tern (*Sterna paradisaea*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Hatch, J. J.; Gochfeld, M.; Burger, J.; Garcia, E. F. J.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2020
Title :	Great Cormorant (*Phalacrocorax carbo*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Hatch, J.J.; Brown, K.M.; Hogan, G.G.; Morris, R.D.; Orta, J.; Garcia, E.F.J.; Jutglar, F.; Kirwan, G.M.; Boesman, P.F.D.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2020
Title :	Black-headed Gull (*Chroicocephalus ridibundus*), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors)
Author :	Burger, J.; Gochfeld, M.; Kirwan, G. M.; Christie, D. A; Garcia, E. F. J.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2020
Title :	Lesser Black-backed Gull (*Larus fuscus*), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors)
Author :	Burger, J.; Gochfeld, M.; Kirwan, G. M.; Christie,D. A.; de Juana, E
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2020
Title :	Results from the first three years of monitoring post-breeding tern aggregations in Ireland
Author :	Burke, B.; Fitzgerald, N.; Boland, H.; Murray, T.; Gittings, T.; Tierney, T.D
Series :	Irish Birds 42: 35-44
Year :	2020
Title :	Great Black-backed Gull (*Larus marinus*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Good, T. P.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA

Year :	2020
Title :	Little Gull (*Hydrocoloeus minutus*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Ewins, P. J.; Weseloh, D. V.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2020
Title :	Black-legged Kittiwake (*Rissa tridactyla*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Hatch, S. A.; Robertson, G. J.; Baird, P. H.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2020
Title :	Razorbill (*Alca torda*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Lavers, J.; Hipfner, J. M.; G. Chapdelaine, G.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2020
Title :	Atlantic Puffin (*Fratercula arctica*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Lowther, P. E.; Diamond, A. W.; Kress, S. W.; Robertson, G. J.; Russell, K.; Nettleship, D. N.; Kirwan, G. M.; Christie, D. A.; Sharpe, C. J.; Garcia, E. F. J.; Boesman, P. F. D.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2020
Title :	Herring Gull (*Larus argentatus*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Weseloh, D. V.; Hebert, C. E.; Mallory, M. L.; Poole, A. F.; Ellis, J. C.; Pyle, P.; Patten, M. A.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2021
Title :	Common Murre (*Uria aalge*), version 2.0. In Birds of the World (S. M. Billerman, P. G. Rodewald, and B. K. Keeney, Editors)
Author :	Ainley, D. G.; Nettleship, D. N.; Storey, A. E.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2021
Title :	Common Gull (*Larus canus*), version 1.1. In Birds of the World (S. M. Billerman, Editor)
Author :	Moskoff, W., Bevier, L. R.; Rasmussen, P. C.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2021
Title :	European Shag (*Gulosus aristotelis*), version 1.2. In Birds of the World (B. K. Keeney, Editor)
Author :	Orta, J., Garcia, E. F. J.; Jutglar, F.; Kirwan, G. M.; Boesman, P. F. D.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2021
Title :	Common Loon (*Gavia immer*), version 2.0. In Birds of the World (P. G. Rodewald and B. K. Keeney, Editors)
Author :	Paruk, J. D., Evers, D. C.; McIntyre, J. W.; Barr, J. F.; Mager, J.; Piper, W. H.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2022
Title :	Dublin Bay Birds Project: Dublin Port Tern Conservation Project
Author :	Boland, H.; Adcock, T.; Burke, B
Series :	Unpublished Birdwatch Ireland report

A001 Red-throated Diver *Gavia stellata*

To maintain the favourable conservation condition of red-throated diver at North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Non-breeding population size	Number	No significant decline	North-west Irish Sea SPA provides essential resources for adjacent seabird colonies. Red-throated diver is a Special Conservation Interest (SCI) for this site. During the non-breeding period divers (primarily great northern and red-throated divers) in the western Irish Sea are known to concentrate in the shallower coastal areas, with a clear preference for waters of 5-20m (Jessopp et al., 2018). One series of surveys focused on waters off Gormanstown, which overlaps with this SPA, found that the numbers of red-throated diver peaked in the February survey and estimated the population to be 2,140 (±95% confidence interval of 1,429 – 2,957) individuals (HiDef, 2019); the North-west Irish Sea SPA overlaps with this area. A population of 827 individuals was estimated based on December 29th 2019 HiDef data (NPWS unpublished data analysis). Red-throated diver can be quite mobile and it is likely that there is interchange between the designated (e.g. Dundalk Bay SPA) and undesignated waters
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the wintering population and its availability for use. The suitability and availability of habitat areas may vary throughout the season. This will affect the spatio-temporal patterns of use of the habitats by the non-breeding population
Forage spatial distribution, extent and abundance	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	The diet of this piscivorous diver is poorly known outside of the breeding season but one study from the German Bight indicates that red-throated diver is a generalist opportunistic feeder but pelagic schooling fish that have a high energetic value might be favoured (Kleinschmidt et al., 2019)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the non-breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of over-winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution
Barriers to connectivity and site use	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the non-breeding population, and it may require access to other SPAs or undesignated sites for certain activities, such as additional foraging when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A003 Great Northern Diver *Gavia immer*

To maintain the favourable conservation condition of great northern diver at North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Non-breeding population size	Number	No significant decline	During the non-breeding period divers (primarily great northern diver and red-throated diver (*Gavia stellata*)) in the western Irish Sea are known to concentrate in the shallower coastal areas, with a clear preference for waters of 5-20m (Jessopp et al., 2018). One series of surveys focused on waters off Gormanstown, which overlaps with this SPA, found that the numbers of great northern diver peaked in the March survey and estimated the population to be 1,279 (±95% confidence interval of 676 – 2,084) individuals (HiDef, 2019); the North-west Irish Sea SPA overlaps with this area. A population of 176 individuals was estimated based on December 29th 2019 HiDef data (NPWS unpublished data analysis). Great northern diver can be quite mobile and it is likely that there is interchange between the designated (e.g. Dundalk Bay SPA) and undesignated waters
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the wintering population and its availability for use. The suitability and availability of habitat areas may vary throughout the season. This will affect the spatio-temporal patterns of use of the habitats by the non-breeding population
Forage spatial distribution, extent and abundance	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Largely piscivorous, foraging over the benthos as well as throughout the water column, but will also frequently eat marine invertebrates (Paruk et al., 2021)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the non-breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of over-winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution
Barriers to connectivity and site use	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the non-breeding population, and it may require access to other SPAs or undesignated sites for certain activities, such as additional foraging when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A009 Fulmar *Fulmarus glacialis*

To restore the favourable conservation condition of fulmar in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population Size	Number	Long term SPA population trend is stable or increasing	Fulmar is present within the SPA throughout the year. Breeding fulmar is a SCI of Lambay Island SPA (004069), which declined by 36% over the period 1999-2015 to 375 pairs (Mitchell et al., 2000; and Cummins et al., 2019). These birds exploit the marine waters of the North-west Irish Sea SPA during the breeding season. As fulmar can range large distances from their nest sites during the breeding season it is likely that the North-west Irish Sea SPA does not contain all relevant foraging resources for the Lambay Island SPA breeding population (Power et al., 2021). Fulmar breeding at other colonies and non-breeding individuals may also use the North-west Irish Sea SPA during the breeding period. Fulmar winter at sea and Jessopp et al. (2018) showed a broad distribution in the winter survey. Based on Jessopp et al. (2018) data for summer, autumn and winter surveys of the western Irish Sea an estimated 214, 11,260 and 506 individuals occurred in the SPA respectively
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by fulmar. Jessopp et al. (2018) recorded fulmar throughout the western Irish Sea survey area showing a clear preference for deeper waters; a high aggregation was noted in the eastern half of the North-west Irish Sea SPA during the autumn survey. Based on several studies, Woodward et al. (2019) estimates (i.e. overall mean; mean of maximum distances across all studies; and maximum distance recorded) of fulmar foraging ranges from the nest site during the breeding season, which are 135; 542; and 2,736km respectively (see Power et al., 2021)
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	The colonisation of Ireland and Britain by fulmar over the last two centuries has been largely attributed to their close association with fisheries, but contemporary dietary studies indicate they also feed on a wide variety of prey including sandeels, crustaceans and squid (Philips et al., 1999)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours as defined in McSorley et al. (2003). Studies in the UK found the highest densities of fulmar performing these behaviours occurred within 2km of the breeding colony (McSorley et al., 2005)

Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Fulmar require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A013 Manx Shearwater *Puffinus puffinus*

To maintain the favourable conservation condition of manx shearwater in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number	No significant decline	Dean et al. (2015) identifies an area of marine waters near the Irish Sea front and the stratified waters of the western Irish Sea as being an important foraging resource for manx shearwater breeding in several colonies located around the periphery of the Irish Sea; the North-west Irish Sea SPA overlaps with this area. One summer aerial survey, conducted in 2016, estimated 13,010 individual manx shearwater within the SPA (Jessopp et al., 2018, NPWS unpublished data analysis). A follow up survey in September 2016 provides an estimate of 457 individuals occurring in the SPA
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by manx shearwater. Jessopp et al. (2018) noted that particularly during the summer survey manx shearwater were sighted throughout the survey area, but were not observed in the nearshore waters, instead generally being recorded at least 4km from the shore. Manx shearwaters had a clear preference for deeper waters in the survey area, with a marked absence of this species over shallow areas and sandbars with less than 20m water depth
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Primarily clupeiform fish, during the chick rearing period; outside of this period squid and other marine invertebrates may form a larger part of the manx shearwater's diet (Brooke, 1990)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non sites-specific maintenance behaviours (e.g. courtship, bathing, preening) as defined in McSorley et al. (2003)

Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Manx shearwater require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A017 Cormorant *Phalacrocorax carbo*

To restore the favourable conservation condition of cormorant in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding Population Size	Number	Long term population trend within theSPA is stable or increasing	Breeding cormorant is a SCI of Lambay Island SPA (004069), Ireland's Eye SPA (004117) and Skerries Islands SPA (004122). These breeding populations exploit the North-west Irish Sea SPA to varying degrees. Trend analysis over the period 1999-2015 show that the estimated population of Lambay Island decreased by 58% to 282 and the Ireland's Eye population is estimated to have increased by 39% to 424. Limited recent data exists for the Skerries Island SPA population but a minimum count of 125 in 2022 indicated that the population has decreased by 78% since 1999 (NPWS unpublished data). As cormorant can range some distance from their nest sites during the breeding season it is likely that the North-west Irish Sea SPA does not contain all relevant foraging resources for the populations of the aforementioned SPAs (Power et al., 2021). Conversely, cormorant breeding at other colonies and non-breeding individuals may also use the North-west Irish Sea SPA during the breeding period
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by cormorant. Aerial surveys of the western Irish Sea (Jessopp et al., 2018) did not differentiate shag (*Phalacrocorax aristotelis*) and cormorant by eye and they were grouped together. There was a clear peak in the distribution of sightings over water depths around 10m indicating a preference for shallow waters, with very few observations occurring over water depths in excess of 20m
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	The cormorant's diet consists predominantly of small benthic and pelagic fish which are captured by pursuit diving, typically over shallow (<10m) freshwater, estuarine and marine environments (Gremillet et al., 1998; Hatch et al., 2020). Based on several studies, Woodward et al. (2019) provides estimates (i.e. overall mean; mean of maximum distances across all studies; and maximum distance recorded) of cormorant foraging ranges from the nest site during the breeding season, which are 7, 26, and 35km respectively (see Power et al., 2021)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours (e.g. display, bathing, preening) as defined in McSorley et al. (2003)

Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Cormorant require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A018 Shag *Phalacrocorax aristotelis*

To restore the favourable conservation condition of shag in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number	Long term SPA population trend is stable or increasing	Breeding shag is a SCI of Lambay Island SPA (004069) and Skerries Islands SPA (004122). These breeding populations exploit, to varying degrees, the adjacent marine waters of this SPA. 2015 survey results show that the estimated population of Lambay Island decreased by 58% to 469 pairs since 1999 (Cummins et al., 2019). Limited recent data exists for the Skerries Island SPA population but it is estimated that only a small number (<5 pairs) may persist from an estimated population of 100 pairs in 1999 (Mitchell et al., 2000; Cummins et al., 2019). As shag can range some distances from their nest sites during the breeding season it is likely that the North-west Irish Sea does not contain all relevant foraging resources for the populations of the aforementioned SPAs (Baer and Newton, 2012; Moss et al., 2016; Woodward et al., 2019). Conversely shag, breeding at other colonies and non-breeding individuals will use the North-west Irish Sea SPA during the breeding period
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by shag. Aerial surveys of the western Irish Sea (Jessopp et al., 2018) did not differentiate shag and cormorant by eye and they were grouped together. There was a clear peak in the distribution of sightings over water depths around 10m indicating a preference for shallow waters, with very few observations occurring over water depths in excess of 20m. Baer and Newton (2012) and Moss et al. (2016) provide telemetry based foraging information of this species relevant to this particular area
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	The diet of shag is almost exclusively fish, taken chiefly near sea bed or at intermediate depths, and principally of the families Ammodytidae (sandeels), Gadidae, Clupeidae, Cottidae and Labridae, but a wide range of species taken, perhaps opportunistically (Orta et al., 2021). Based on several studies, Woodward et al. (2019) provides provides estimates of foraging ranges from the nest site during the breeding season (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) for shag, which are 9, 13, and 46km respectively (see Power et al., 2021). Baer and Newton (2012) and Moss et al. (2016) provide telemetry based foraging information of this species relevant to this particular area

Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours (e.g. courtship, bathing, preening) as defined in McSorley et al. (2003)
Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Shag require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A065 Common Scoter *Melanitta nigra*

To maintain the favourable conservation condition of common scoter at North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Non-breeding population size	Number	No significant decline	Common scoter utilise the shallow nearshore coastal waters of the wider North-west Irish sea region across the non-breeding period (Jessopp et al., 2018). One series of surveys focused on waters off Gormanstown, which overlaps with this SPA, found that the numbers of common scoter peaked in the second part of December and estimated the population to be 14,612 (±95% confidence interval of 1,038 – 39,694) individuals (HiDef, 2019); the North-west Irish Sea SPA overlaps with this area. A population of 14,567 individuals was estimated based on December 29th 2019 HiDef data (NPWS unpublished data analysis). Common scoter flocks can be quite mobile and it is likely the that there is interchange between the designated (e.g. Dundalk Bay SPA (004026)) and undesignated waters
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the wintering population and its availability for use. The suitability and availability of habitat areas may vary throughout the season. This will affect the spatio-temporal patterns of use of the habitats by the non-breeding population
Forage spatial distribution, extent and abundance	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Common scoter is a diving duck that feed on prey species that live upon or within the upper few centimetres of the substratum. Common scoter diet primarily comprises of bivalve molluscs with other species (e.g. crabs, small fishes and gastropods) incorporated less frequently (Kaiser et al., 2006)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the non-breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of over-winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution
Barriers to connectivity and site use	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the non-breeding population, and it may require access to other SPAs or undesignated sites for certain activities, such as additional foraging when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A179 Black-headed Gull *Chroicocephalus ridibundus*

To maintain the favourable conservation condition of black-headed gull at North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Non-breeding population size	Number	No significant decline	Jessopp et al. (2018) undertook surveys across the western Irish Sea during summer, autumn and winter with black-headed gull occurring in all three seasons. Jessopp et al. (2018) noted that there was no association between black-headed gull and ocean depth profile. Based on Jessopp et al. (2018) it is estimated that 508 individuals occurred in the SPA in winter (NPWS unpublished data analysis). Non-breeding black-headed gull are a SCI for Dundalk Bay SPA (004026) and North Bull Island SPA (004006)
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the wintering population and its availability for use. The suitability and availability of habitat areas may vary throughout the season. This will affect the spatio-temporal patterns of use of the habitats by the non-breeding population. HiDef aerial surveys (2018, 2019) were conducted from December to March and the survey area overlaps with the SPA. Peak observations of this species were recorded in the second December survey and distribution patterns were coastal in all surveys, always south of Dundalk Bay
Forage spatial distribution, extent and abundance	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Diet varies by location and season. Birds foraging in marine environments feed on fish and marine invertebrates (Moskoff et al., 2021).The diet of black-headed gull is extremely broad and opportunistic. Coastal birds may feed on marine invertebrates and to lesser extent on fish, sometimes following fishing vessels (Burger et al., 2020). HiDef aerial surveys showed the distribution patterns were coastal in all surveys, always south of Dundalk Bay
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the non-breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of over-winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution
Barriers to connectivity and site use	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the non-breeding population, and it may require access to other SPAs or undesignated sites for certain activities, such as additional foraging when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A182 Common Gull *Larus canus*

To maintain the favourable conservation condition of common gull at North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Non-breeding population size	Number	No signifcant decline	Jessopp et al. (2018) undertook aerial surveys during summer, autumn and winter of the western Irish Sea in 2016. Common and herring gulls could not be differentiated and were grouped together for the purposes of analysis. However, winter aerial surveys conducted by HiDef in a similar area did differentiate between species and indicates that while common gull numbers are significant in the winter herring gull (*Larus argentatus*) is the more abundant species. Based on Jessopp et al. (2018) and using HiDef to approximate the proportion of individual species populations it is estimated that 2,866 common gull individuals occurred in the SPA in the winter (NPWS unpublished data analysis). Non-breeding common gull is a SCI for Dundalk Bay SPA (004026)
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the wintering population and its availability for use. The suitability and availability of habitat areas may vary throughout the season. This will affect the spatio-temporal patterns of use of the habitats by the non-breeding population. HiDef aerial surveys (2018, 2019) were conducted from December to March and the survey area overlaps with the SPA. Peak observations of this species were recorded in the second December survey and concentrations were mainly in coastal habitats
Forage spatial distribution, extent and abundance	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Diet varies by location and season. Birds foraging in marine environments feed on fish and marine invertebrates (Moskoff et al., 2021).The diet of black-headed gull is extremely broad and opportunistic. Coastal birds may feed on marine invertebrates and to lesser extent on fish, sometimes following fishing vessels (Burger et al., 2020). HiDef surveys showed that concentrations of this species were mainly in coastal habitats
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the non-breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of over-winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution

Barriers to connectivity and site use	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the non-breeding population, and it may require access to other SPAs or undesignated sites for certain activities, such as additional foraging when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A183 Lesser Black-backed Gull *Larus fuscus*

To maintain the favourable conservation condition of lesser black-backed gull in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number	No significant decline	Breeding lesser black-backed gull is a SCI of Lambay Island SPA. This population exploits the surrounding marine waters of North-west Irish Sea SPA during the breeding season. The breeding lesser black-backed gull population is estimated to have increased by 12% over the period 1999-2015 from 309 to 345 pairs (Mitchell et al., 2000; NPWS unpublished data). As lesser black-backed gull can range large distances from their nest sites during the breeding season it is likely that the North-west Irish Sea SPA does not contain all relevant foraging resources for the Lambay Island SPA breeding population (Moss et al., 2016; Power et al., 2021; Woodward et al., 2019). Conversely lesser black-backed gull, breeding at other colonies and non-breeding individuals will use the North-west Irish Sea SPA during the breeding period
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by lesser black-backed gull. Sightings of black-backed gulls by Jessopp et al. (2018) were normally of single individuals with some larger groups observed. Black-backed gulls showed no clear water depth preference although relatively more observations of lesser black-backed gulls occurred over shallower depths
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	The diet of lesser black-backed gull is diverse and opportunistic. This species can forage over both terrestrial and aquatic habitats. Frequent prey items include small fish, aquatic invertebrates, birds' eggs and chicks, trawler discards, rodents and berries (Burger et al., 2020). Based on several studies, Woodward et al. (2019) provides provides estimates of foraging ranges from the nest site during the breeding season (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) for lesser black-backed gull, which are 43km, 127km, and 533km respectively (see Power et al., 2021)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours (e.g. courtship, bathing, preening) as defined in McSorley et al. (2003)

Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Lesser black-backed gull require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A184 Herring Gull *Larus argentatus*

To restore the favourable conservation condition of herring gull in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population size	Number	Long term SPA population trend is stable or increasing	Herring gull is present within the North-west Irish Sea SPA throughout the year. Breeding herring gull is a SCI for Lambay Island, Ireland's Eye and Skerries Islands SPAs. Over the period 1999-2015, the herring gull breeding population are estimated to have decreased by 50% to 906 pairs at Lambay and increased by 29% to 318 pairs on Ireland's Eye (Cummins et al., 2019). The population was estimated to be 300 pairs in 1999. As herring gull can range large distances from their nest sites during the breeding season it is likely that this SPA does not contain all relevant foraging resources for the aforementioned SPAs' breeding populations (Power et al., 2021). Herring gull, breeding at other colonies and non-breeding individuals will use the North-west Irish Sea SPA during the breeding period. Based on survey data of Jessopp et al. (2018) and by HiDef (2019) it is estimated that 6,893 herring gull individuals occurred in the SPA in the winter
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary throughout the season. This will affect the spatio-temporal patterns of use of the habitats by herring gull. Jessopp et al. (2018) survey of the western Irish Sea did not distinguish between common gull and herring gull – these gulls occurred across the range of available water depths in the survey area but more observations were noted in depths less than 50m. Winter HiDef aerial surveys (2018, 2019) were conducted from December to March and the survey area overlaps with the SPA. This survey showed that herring gull was mainly concentrated along the coast south of Dundalk Bay
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Herring gull is a generalist and opportunistic feeder and can forage over both terrestrial and aquatic habitats. Its diet includes fish, fish offal, bivalves, gastropods, crustaceans, squid, insects, other seabirds, small landbirds, small mammals, terrestrial insects, earthworms, berries, carrion, and a wide variety of human refuse (Weseloh et al., 2020). Based on several studies, Woodward et al. (2019) provides estimates (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) of herring gull foraging ranges from the nest site during the breeding season, which are 15, 59, and 92km respectively (see Power et al., 2021)

Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours (e.g. courtship, bathing, preening) as defined in McSorley et al. (2003)
Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Herring gull require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the non-breeding population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A187 Great Black-backed Gull *Larus marinus*

To maintain the favourable conservation condition of great black-backed gull at North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Non-breeding population size	Number	No significant decline	Jessopp et al. (2018) undertook an aerial survey of the western Irish Sea in 2016. Not all sightings of great black-backed gulls and lesser black-backed gulls (*Larus fuscus*) could be differentiated and were grouped together for the purposes of analysis. However, winter aerial surveys conducted by HiDef (2019) in a similar area did differentiate between species and indicates that great black-backed gull was significantly more abundant than lesser black-backed gull in the winter. Based on Jessopp et al. (2018) and using HiDef to approximate the proportion of individual species populations it is estimated that 2,096 great black-backed gull individuals occurred in the SPA in the winter (NPWS unpublished analysis)
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the wintering population and its availability for use. The suitability and availability of habitat areas may vary throughout the season. This will affect the spatio-temporal patterns of use of the habitats by the non-breeding population. Sightings of black-backed gulls by Jessopp et al. (2018) were normally of single individuals with some larger groups observed. HiDef aerial surveys (2018, 2019) were conducted from December to March and the survey area overlaps with the SPA. Peak observations for great black-backed gull were recorded in early December, the spatial distribution was varied in surveys in December and January but more concentrated in the north of the survey area in February and March
Forage spatial distribution, extent and abundance	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	The great black-backed gull is a generalist predator that feeds on fish, both pelagic and intertidal marine invertebrates, mammals, insects, seabirds and waterfowl as well as their eggs and chicks. Great black-backed gulls also scavenge on fish, carrion, human refuse and will follow fishing vessels in search of fisheries discard. Great black-backed gulls will forage in widely scattered groups at sea and join other groups when concentrations of prey are located (Good, 2020). HiDef surveys detected more concentrated numbers of this species the north of the survey area in February and March
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the non-breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of over-winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution

Barriers to connectivity and site use	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA	Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the non-breeding population, and it may require access to other SPAs or undesignated sites for certain activities, such as additional foraging when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A188 Kittiwake *Rissa tridactyla*

To restore the favourable conservation condition of kittiwake in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population size	Number	Long term SPA population trend is stable or increasing	Kittiwake is present within the North-west Irish Sea SPA throughout the year. Breeding kittiwake is a SCI for Lambay Island (004069), Howth Head (004113) and Ireland's Eye (004117) SPAs; all of which declined over the period 1999-2015 (19% to 3,320 pairs; 22% to 1,773 pairs; 52% to 455 pairs respectively) (Cummins et al., 2019). It is likely that this SPA does not contain all relevant foraging resources for all of the aforementioned SPAs (Baer and Newton, 2012; Moss et al., 2016; Power et al., 2021). Conversely kittiwake, breeding at other colonies and non-breeding individuals may use the North-west Irish Sea SPA during the breeding period. Based on Jessopp et al. (2018) data for summer, autumn and winter surveys of the western Irish Sea 1,632, 2,858, and 944 individuals are estimated to have occurred in the SPA, respectively
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by kittiwake. Jessopp et al. (2018) noted that sightings occurred throughout the western Irish Sea survey area, however, there was a distinct change in the distribution of sightings between the summer breeding season and the subsequent autumn and winter periods. In contrast to other gull species, and in all three seasons, areas of high sightings density occurred some distance from the coast. Based on several studies, Woodward et al. (2019) provides estimates of foraging ranges from the nest site during the breeding season (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) for kittiwake, which are 55km, 156km, and 770km respectively (see Power et al., 2021)
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Kittiwake is a surface feeding seabird and primarily piscivorous (e.g. sandeels, herring, gadoids) with some invertebrates (e.g. euphausids, amphipods) in the diet also recorded (Hatch et al., 2020)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours (e.g. courtship, bathing, preening) as defined in McSorley et al. (2003)

Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Kittiwake require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the non-breeding population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A192 Roseate Tern *Sterna dougallii*

To maintain the favourable conservation condition of roseate tern in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number	No significant decline	Breeding roseate tern is also a SCI of Rockabill SPA. Since 1995 the Rockabill population has increased by 231% to 1,834 pairs (Allbrook et al., 2022; Hannon et al., 1997). Studies indicate that the waters of Rockabill SPA and the North-west Irish Sea SPA contain the majority of the foraging habitat for the Rockabill population (Power et al., 2022; Harwood et al., 2019; Power et al., 2021). At the latter stages of breeding season, and prior to migration, tern species can form large aggregations at terrestrial and intertidal roost sites along the coast (Burke et al., 2020). Notable concentrations have been recorded at South Dublin Bay and River Tolka Estuary SPA (004024) and Dalkey Islands SPA (004172) and are a SCI for these SPAs. More recent work has identified further areas along the east coast (Burke et al., 2020)
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by roseate tern. Boat based, visual tracking of roseate terns nesting on Rockabill showed terns feeding immediately around Rockabill Island, along coastal areas of north County Dublin, Louth and Meath as well as coastal areas from Skerries (immediately west of Rockabill Island) south to Donabate. Additionally, during the fledging period roseate terns foraged in deeper water offshore, immediately east of the colony (Harwood et al., 2019; Power et al., 2022)
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Roseate Tern is largely piscivorous; studies from Rockabill SPA show that sandeels (*Ammodytes* spp) along with clupeids and, to a lesser extent, gadoids can form important prey bases (e.g. Allbrook et al., 2022). Breeding birds forage over marine waters often some distance from the colony (see Harwood et al., 2019; Power et al., 2021; Power et al., 2022)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours as defined in McSorley et al. (2003). At latter stages of the breeding season tern species form large aggregations at terrestrial and intertidal roost sites along the coast (Burke et al., 2020)

Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Roseate tern require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A193 Common Tern *Sterna hirundo*

To maintain the favourable conservation condition of common tern in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number	No significant decline	Breeding common tern is also a SCI of two other SPAs. Between 1995-2022 the populations has increased by 328% to 1,503 pairs at Rockabill SPA (004014) and by 45% to 138 on the ESB Dolphin nesting platform (part of South Dublin and River Tolka Estuary SPA (004024)) by 45% to 138 pairs with a further 417 pairs located nearby on two structures outside of the SPA (Boland et al., 2022). Common tern can range up to 30km from nest sites it is likely that Rockabill SPA and the North-west Irish Sea SPA contain the majority of foraging habitat for the Rockabill population but a significantly lesser proportion for the Dublin Port colony (Power et al., 2021). Towards the end of the breeding season, and prior to migration, tern species form large aggregations at roost sites along the coast (Burke et al., 2020). Notable concentrations have been recorded at South Dublin Bay and River Tolka Estuary SPA and Dalkey Islands SPA (004172) and common tern is listed as an SCI for these SPAs
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by common tern. Aerial surveys of the western Irish Sea (Jessopp et al., 2018) did not differentiate common and Arctic tern by eye and they were grouped together. While sightings occurred across a large range of sea depths, they occurred more frequently over shallow areas of sea in the central transects of the survey area during the summer breeding season, with some sightings also concentrated further south
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Common tern are largely piscivorous. Studies from Rockabill SPA show that sandeels (*Ammodytes* spp) along with Clupeidae (herrings) and, to a lesser extent, Gadidae (cods, pollocks) can form important prey bases (e.g. Allbrook et al., 2022). Breeding birds forage over marine waters often some distance from the colony (see Power et al., 2021, Power et al., 2022)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours as defined in McSorley et al. (2003). At latter stages of the breeding season tern species form large aggregations at terrestrial and intertidal roost sites along the coast (Burke et al., 2020)

Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Common tern require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A194 Arctic Tern *Sterna paradisaea*

To maintain the favourable conservation condition of Arctic tern in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number	No significant decline	Breeding Arctic tern is a SCI for Rockabill SPA (004014). Population size at Rockabill has fluctuated over the years. However, the population size in 2022 (estimate of 49 - 60 pairs), was similar to that in 1995 (49 pairs) (Allbrook et al., 2022; Hannon et al., 1997). Arctic tern can range up to 46km from their nest sites during the breeding season, so it is likely that Rockabill SPA and the North-west Irish Sea SPA contain the majority of the foraging habitat for this population (Power et al., 2021; Woodward et al., 2019). Towards the end of the breeding season, and prior to migration, tern species form large aggregations at roost sites along the coast (Burke et al., 2020). Notable concentrations have been recorded at South Dublin Bay and River Tolka Estuary SPA (004024) and Dalkey Islands SPA (004172) and Arctic tern is listed as an SCI for these SPAs
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by Arctic tern. Aerial surveys of the western Irish Sea (Jessopp et al., 2018) did not differentiate common and Arctic tern by eye and so they were grouped together. While sightings occurred across a large range of sea depths, they occurred more frequently over shallow areas of sea in the central transects of the survey area during the summer breeding season, with some sightings also concentrated further south
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Arctic tern are largely piscivorous. Most frequent fish prey are small, schooling species commonly caught in open water, at tide rips, and over predators (e.g. jellyfish and marine mammals). These are usually 1- or 2-year-old fish, including from the Clupeidae (herrings), Gadidae (cods, pollocks) and Ammodytidae (sandeels) families (Hatch et al., 2020). Based on several studies, Woodward et al. (2019) provides estimates of foraging ranges from the nest site during the breeding season (i.e. overall mean; mean of maximum distances across all studies; and maximum distance recorded) for Arctic tern, which are 6, 26, and 46km respectively (see Power et al., 2021)

Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours as defined in McSorley et al. (2003). At latter stages of the breeding season tern species form large aggregations at terrestrial and intertidal roost sites along the coast (Burke et al., 2020)
Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Arctic tern require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A195 Little Tern *Sterna albifrons*

To maintain the favourable conservation condition of little tern in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number	No significant decline	Breeding little tern is a SCI of Boyne Estuary SPA (004080). Population size at Baltray, Co. Louth has fluctuated over the years but the 2022 estimate of 84 pairs represents an increase of some 500% from the 1995 All-Ireland Tern Survey (Moënner and Hartigan, 2022; Hannon et al., 1997). The foraging range of breeding little tern from the colony is relatively small and therefore it is likely that all feeding resources for this colony during the breeding season are included within the Boyne Estuary SPA and North-west Irish Sea SPA (Woodward et al., 2019; Power et al., 2021; Power et al., 2022). However there is likely to be interchange of birds from other colonies around the Irish Sea during the breeding season and on passage
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by little tern. Breeding birds forage over marine and brackish waters quite close (<5km) to the colony (see Power et al., 2021; Power et al., 2022)
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Little tern are largely piscivorous. Studies from a more southerly Irish colony show that sandeels (*Ammodytes* spp.) along with clupeids and, to a lesser extent, gadoids can form important prey bases (Johnson et al., 2022). Breeding birds forage over marine and brackish waters quite close (<5km) to the colony (see Power et al., 2021; Power et al., 2022)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours as defined in McSorley et al. (2003). At latter stages of the breeding season tern species form large aggregations at terrestrial and intertidal roost sites along the coast (Burke et al., 2020)

Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Little tern require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A199 Guillemot *Uria aalge*

To maintain the favourable conservation condition of guillemot in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population size	Number	No significant decline	Guillemot occur in the SPA throughout the year. Breeding guillemot is a SCI of Lambay Island and Ireland's Eye SPAs. From 1999-2015, individual population estimates at Lambay of 59,983 remained stable (-1%), and Ireland's Eye increased by 101% to 4,410 (Cummins et al., 2019). These birds exploit this SPA during the breeding season. As birds can range large distances from the colony during the breeding season it is likely that this SPA does not contain all relevant foraging resources for these populations (Baer and Newton, 2012; Power et al., 2021). Guillemot from other colonies and non-breeding individuals may also use this SPA during the breeding period. Jessopp et al. (2018) undertook summer, autumn and winter surveys of the western Irish Sea; razorbill (*Alca torda*) and guillemot were categorised together. Based on this 18,621, 93,191, and 18,553 individuals are estimated to have occurred in the SPA respectively; it is likely that guillemot formed the majority of these
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat may vary through time. This will affect the spatio-temporal patterns of use of the habitats by the guillemot. Jessopp et al. (2018) noted that during the summer, guillemot/razorbill sightings concentrated around the central transect lines, while during autumn surveys, large numbers of sightings occurred in the northernmost transects. There was no obvious association between the occurrence of razorbills/guillemots and bathymetric features. HiDef (2019) undertook surveys off Gormanstown and noted that most areas were used regularly by guillemot, but were present at the highest density in the east of the study area. Woodward et al. (2019) provides estimates (i.e. mean, mean of max distances across all studies, and max distance) of guillemot movements from the colony, which are 33, 73, and 338km respectively
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	The diet of guillemot consists of micronektonic prey, 2–25cm in length (mainly 6–10cm), including fish, euphausiids, large copepods, and squid. In summer mainly fish, especially when feeding chicks, in contrast to a more diverse diet during non-breeding period, with euphausiids in particular more important (Ainley et al., 2021). Based on several studies, Woodward et al. (2019) provides estimates of foraging ranges from the nest site during the breeding season (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) for guillemot, which are 33, 72, and 338km respectively (see Power et al., 2021)

Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours as defined in McSorley et al. (2003). Studies in the UK found the highest densities of guillemot performing these behaviours occurred within 1km of the breeding colony (McSorley et al., 2003)
Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Guillemot require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A200 Razorbill *Alca torda*

To maintain the favourable conservation condition of razorbill in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population size	Number	No significant decline	Razorbill occur in the SPA throughout the year. Breeding razorbill is a SCI of Lambay Island and Ireland's Eye SPAs. From 1999-2015, individual population estimates at Lambay of 7,353 increased by 70%, and Ireland's Eye increased by 207% to 1,600 (Cummins et al., 2019). These birds exploit this SPA during the breeding season. As birds can range large distances from the colony during the breeding season it is likely that this SPA does not contain all relevant foraging resources for these populations (Baer and Newton, 2012; Power et al., 2021). Razorbill from other colonies and non-breeding individuals may use this SPA during the breeding period. Jessopp et al. (2018) undertook summer, autumn and winter surveys of the western Irish Sea; razorbill and guillemot were categorised together. Based on this 18,621, 93,191, and 18,553 individuals are estimated to have occurred in the SPA respectively; it is likely that razorbill formed a significant minority of these
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat may vary through time. This will affect the spatio-temporal patterns of use of the habitats by razorbill. Jessopp et al. (2018) noted that during the summer, guillemot/razorbill sightings were concentrated around the central transect lines, while during autumn surveys, large numbers of sightings occurred in the northernmost transects. There was no obvious association between the occurrence of razorbills/guillemots and bathymetric features. HiDef (2019) undertook surveys off Gormanstown and noted that razorbill varied across the survey area, with most areas being used, except the most coastal of habitats. Woodward et al. (2019) provides estimates (i.e. mean, mean of max distances across all studies, and max distance) of razorbill movements from the colony, which are 61km, 89km, and 313km respectively
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	The diet of razorbill comprises schooling fish including herring and sandeel. Crustaceans and polychaetes may also be important in adult diets (Lavers et al., 2020). Based on several studies, Woodward et al. (2019) provides estimates of foraging ranges from the nest site during the breeding season (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) for razorbill, which are 61km, 89km, and 313km respectively (see Power et al., 2021)

Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours as defined in McSorley et al. (2003). Studies in the UK found the highest densities of razorbill performing these behaviours occurred within 1km of the breeding colony (McSorley et al., 2003)
Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Razorbill require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the breeding population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A204 Puffin *Fratercula arctica*

To restore the favourable conservation condition of puffin in North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

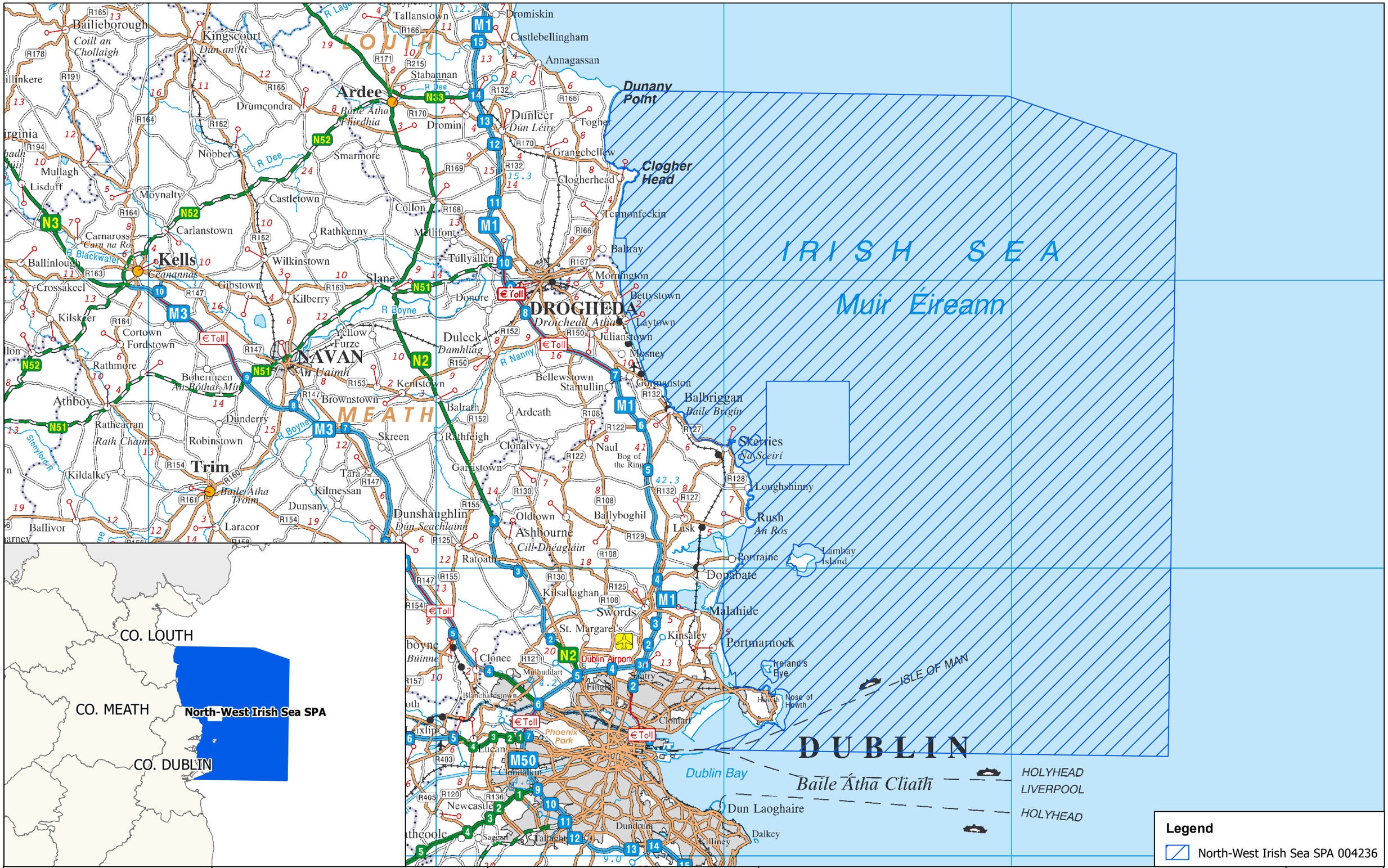
Attribute	Measure	Target	Notes
Breeding population size	Number	Long term SPA population trend is stable or increasing	Breeding puffin is also a SCI of Lambay Island SPA (004069). This breeding population exploits the surrounding marine waters of North-west Irish Sea SPA during the breeding season. The breeding puffin population is estimated to have declined by 68% over the period 1999-2015 from 265 to 158 individuals (Mitchell et al., 2000; NPWS unpublished data). As puffin can range large distances from their nest sites during the breeding season it is likely that the North-west Irish Sea does not contain all relevant foraging resources for the Lambay Island SPA breeding population (Power et al., 2021). Also conversely non-breeding individuals will use the North-west Irish Sea SPA during the breeding period
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by puffin
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	The diet of puffin predominately consists of small to mid-sized (5 – 15cm) schooling midwater fish including sprat (*Sprattus sprattus*) sandeel (*Ammodytes* spp) and herring (*Clupea harengus*) (Lowther et al., 2020). Based on several studies, Woodward et al. (2019) provides estimates of foraging ranges from the nest site during the breeding season (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) for puffin, which are 62km, 137km, and 383km respectively (see Power et al., 2021)
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution. Seabird species can make extensive use of the marine waters adjacent to their breeding colonies for non site-specific maintenance behaviours as defined in McSorley et al. (2003). Studies in the UK found that the highest densities of puffin performing these behaviours occurred within 1km of the breeding colony (McSorley et al., 2003)

Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Puffin require regular access to marine waters ecologically connected to their colonies during the breeding season and on migration. Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the population, and it may require access to other SPAs or undesignated sites for certain activities, such as breeding and additional foraging locations when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors

A862 Little Gull *Hydrocoloeus minutus*

To maintain the favourable conservation condition of little gull at North-west Irish Sea SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Non-breeding population size	Number	No significant decline	Jessopp et al. (2018) noted that little gull occurred over a wide range of depths across the western Irish Sea, although there were no sightings over waters deeper than 80m. Based on Jessopp et al. (2018) it is estimated that 391 individuals occurred in the SPA area in winter (NPWS unpublished data analysis)
Spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	Distribution encapsulates the number of locations and area of potentially suitable habitat for the non-breeding population and its availability for use. The suitability and availability of habitat areas may vary throughout the season. This will affect the spatio-temporal patterns of use of the habitats by the non-breeding population
Forage spatial distribution, extent and abundance	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	A primarily aquatic forager that feed on flying insects, small fish and aquatic invertebrates typically at the water surface (Ewins and Weseloh, 2020). Little is known of the winter diet of this species
Disturbance across the site	Intensity, frequency, timing and duration	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population size and spatial distribution	The impact of any significant disturbance (direct or indirect) to the non-breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of over-winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution
Barriers to connectivity	Number; location; shape; area (hectares)	The number, location, shape and area of barriers do not significantly impact the site population's access to the SPA or other ecologically important sites outside the SPA	Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the non-breeding population, and it may require access to other SPAs or undesignated sites for certain activities, such as additional foraging when preferred foraging areas are unavailable due to disturbance, prey availability, or other factors



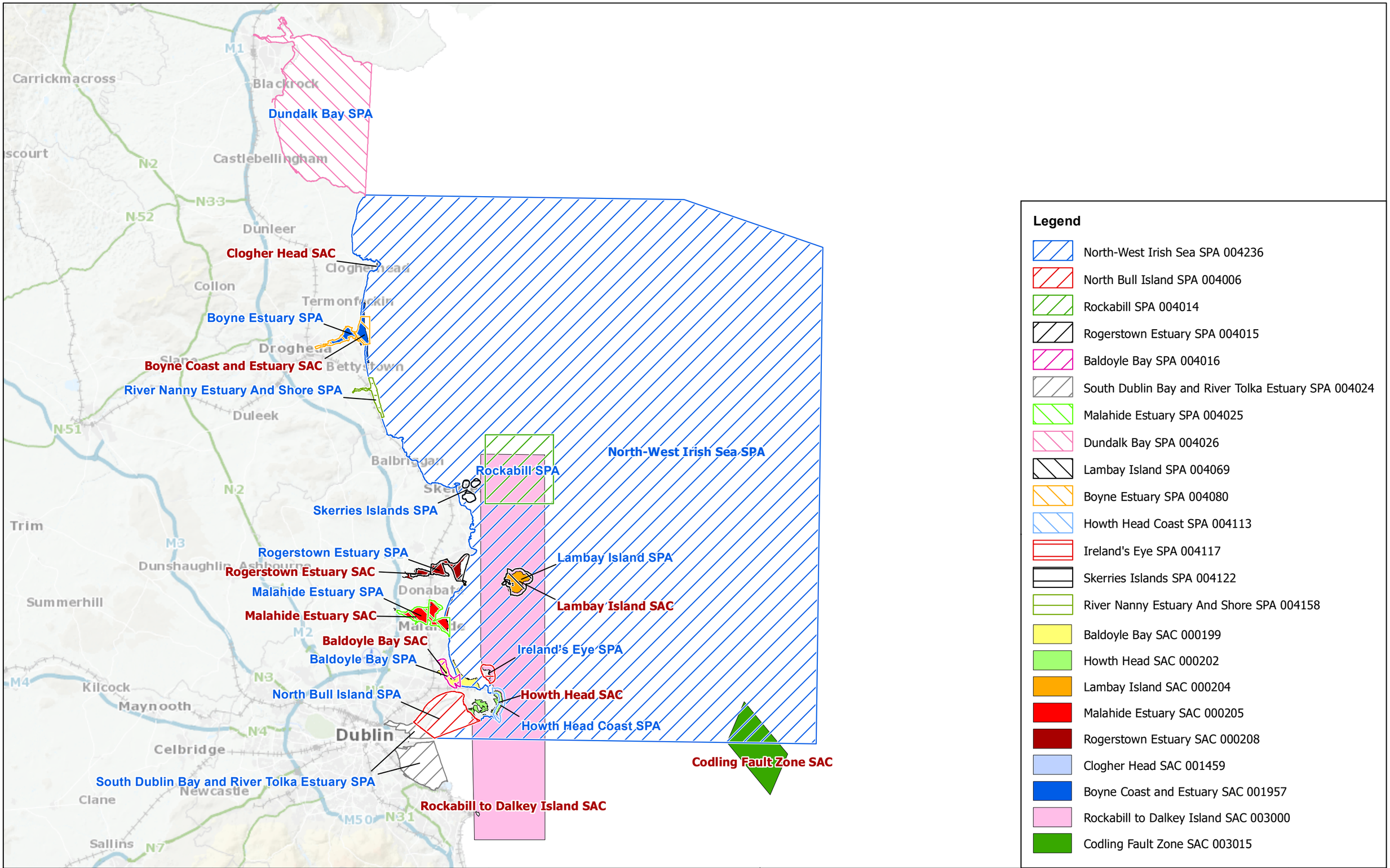
NPWS An tSeirbhís Páirceanna Náisiúnta agus Fiadhúlra National Parks and Wildlife Service

MAP 1:
NORTH-WEST IRISH SEA SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SPA 004236; version 3

Map version 1
Date: September 2023



Legend

- North-West Irish Sea SPA 004236
- North Bull Island SPA 004006
- Rockabill SPA 004014
- Rogerstown Estuary SPA 004015
- Baldoyle Bay SPA 004016
- South Dublin Bay and River Tolka Estuary SPA 004024
- Malahide Estuary SPA 004025
- Dundalk Bay SPA 004026
- Lambay Island SPA 004069
- Boyne Estuary SPA 004080
- Howth Head Coast SPA 004113
- Ireland's Eye SPA 004117
- Skerries Islands SPA 004122
- River Nanny Estuary And Shore SPA 004158
- Baldoyle Bay SAC 000199
- Howth Head SAC 000202
- Lambay Island SAC 000204
- Malahide Estuary SAC 000205
- Rogerstown Estuary SAC 000208
- Clogher Head SAC 001459
- Boyne Coast and Estuary SAC 001957
- Rockabill to Dalkey Island SAC 003000
- Codling Fault Zone SAC 003015

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MAP 2:
NORTH-WEST IRISH SEA SPA
CONSERVATION OBJECTIVES
OVERLAPPING AND ADJACENT SITES

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SPA 004236; version 3

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Map version 1
Date: September 2023