ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Inishkea Islands SPA 004004

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

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Citation:

NPWS (2025) Conservation Objectives: Inishkea Islands SPA 004004. 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***

004004	Inishkea Islands SPA
A018	Shag *Phalacrocorax aristotelis*
A045	Barnacle Goose *Branta leucopsis*
A137	Ringed Plover *Charadrius hiaticula*
A144	Sanderling *Calidris alba*
A148	Purple Sandpiper *Calidris maritima*
A169	Turnstone *Arenaria interpres*
A182	Common Gull *Larus canus*
A184	Herring Gull *Larus argentatus*
A194	Arctic Tern *Sterna paradisaea*
A195	Little Tern *Sterna albifrons*
A466	Dunlin *Calidris alpina schinzii*

Please note that this SPA overlaps with Inishkea Islands SAC (000507) and West Connacht Coast SAC (002998). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping sites as appropriate.

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	2007
Title :	Seabird Productivity at East and South coast colonies in Ireland in 2007: Site accounts
Author :	Trewby, M.; Burt E.; Newton, S.
Series :	Unpublished report to NPWS
Year :	2008
Title :	Research of breeding Dunlin ecology associated with machair and upland NATURA 2000 sites in N.W. Mayo
Author :	Gamero, A.; McNaghten, L.; Suddaby, D.
Series :	Unpublished report to the National Parks and Wildlife Service, Dublin, Ireland
Year :	2010
Title :	Resurvey of breeding wader populations of machair and associated wet grasslands in north-west Ireland
Author :	Suddaby, D.; Nelson, T.; Veldman, J.
Series :	Irish Wildlife Manual No. 44
Year :	2013
Title :	A review of the SPA network of sites in the Republic of Ireland
Author :	NPWS
Series :	Published Report
Year :	2019
Title :	Irish wetland bird survey: waterbird status and distribution 2009/10-2015/16
Author :	Lewis, L.J.; Burke, B.; Fitzgerald, N.; Tierney, T.D.; Kelly, S.
Series :	Irish Wildlife Manuals No. 106
Year :	2020
Title :	A survey of breeding waders on machair and other coastal grasslands in Counties Mayo and Galway
Author :	Suddaby, D., O'Brien, I., Breen, D. & Kelly, S.
Series :	Irish Wildlife Manuals No. 119
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 :	Published 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 :	Lady's Island Lake Tern Report 2022
Author :	Stubbings, E.; Büche, B.; Murray, T.; Newton, S.
Series :	BirdWatch Ireland Seabird Conservation Report to NPWS

Year :	2023
Title :	Lady's Island Lake Tern Report 2023
Author :	Stubbings, E.; Büche, B.; Murray, T.; Newton, S.
Series :	BirdWatch Ireland Seabird Conservation Report to NPWS
Year :	2023
Title :	Kilcoole Little Tern Conservation Project Report 2023
Author :	Johnson, G.C.; Stanley, J.; Doyle M.; Burke, B.
Series :	BirdWatch Ireland Seabird Conservation Report to NPWS
Year :	2023
Title :	Rockabill Tern Report 2023
Author :	Fihey, A.; Crowley, C.; Fitzgerald, M.; Newton, S.
Series :	BirdWatch Ireland Seabird Conservation Report to NPWS
Year :	2024
Title :	Lady’s Island Lake Tern Report 2024
Author :	Stubbings, E.; Büche, B.; Doyle, H.; Burke, B.; Newton, S.
Series :	BirdWatch Ireland Seabird Conservation Report to NPWS
Year :	2024
Title :	Rockabill Tern Report 2024
Author :	Coughlan, K.; Roberts, E.; Streker, R.; Newton, S.
Series :	BirdWatch Ireland Seabird Conservation Report to NPWS

Other References

Year :	1900
Title :	The Birds of Ireland: An Account of the Distribution, Migrations and Habits of Birds as Observed in Ireland, with All Additions to the Irish List
Author :	Ussher, R.J.; Warren, R.
Series :	Gurney and Jackson
Year :	1966
Title :	Ireland's Birds: their distribution and migrations
Author :	Ruttledge, R.F.
Series :	Published by HF & G Witherby, London
Year :	1973
Title :	Population Dynamics of Barnacle Geese, *Branta leucopsis*, in Ireland
Author :	Cabot, D.
Series :	Proceedings of the Royal Irish Academy. Section B: Biological, Geological, and Chemical Science, 73, 415–443
Year :	1985
Title :	Breeding waders of sand dune machair in north-west Ireland
Author :	Nairn, R.G.W.; Sheppard, J.R.
Series :	Irish Birds 3: 53-70
Year :	1985
Title :	The 1984 all Ireland tern survey
Author :	Whilde, A.
Series :	Irish Birds 3: 1-32

Year :	1995
Title :	Impacts of hunting disturbance on waterbirds - a review
Author :	Madsen, J.; Fox, A.D.
Series :	Wildlife Biology 1(4):193-207
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 :	1997
Title :	Survival and winter site-fidelity of Turnstones (*Arenaria interpres*) and Purple Sandpipers (*Calidris maritima*) in northeast England
Author :	Burton, N.H.K.; Evans, P.R.
Series :	Bird Study, 44(1), 35-44
Year :	1997
Title :	The diet of wintering waders in Cádiz Bay, southwest Spain
Author :	Perez-Hurtado, A.; Goss-Custard, J.D.; Garcia, F.
Series :	Bird Study, 44(1), pp. 45-52
Year :	1998
Title :	The Birds of the Western Palearctic Concise Edition. Vol. 1 Non-Passerines
Author :	Snow, D.W.; Perrins, C.M. (eds.)
Series :	Oxford University Press, New York
Year :	1999
Title :	Managing grassland for wild geese in Britain: a review
Author :	Vickery, J.; Gill, J.
Series :	Biological Conservation, 89(1), pp.93-106
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 :	2004
Title :	The dispersion of wintering Purple Sandpipers *Calidris maritima* in relation to the tidal cycle and shore zonation
Author :	Summers, R.W.; Nicoll, M.
Series :	BULLETIN-WADER STUDY GROUP, 103, pp. 32-35
Year :	2007
Title :	Behavioural plasticity in foraging mode of typical plovers
Author :	Masero, J.A.; Estrella, S.M.; Sánchez-Guzmán, J.M.
Series :	Ardea, 95(2), pp. 259-265
Year :	2008
Title :	Colony habitat selection by Little Terns *Sternula albifrons* in East Anglia: implications for coastal management
Author :	Ratcliffe, N.; Schmitt, S.; Mayo, A.; Tratalos, J.; Drewitt, A.
Series :	Seabird, 21: 55-63

Year :	2009
Title :	Sanderlings using African-Eurasian flyways: a review of current knowledge
Author :	Reneerkens, J.; Benhoussa, A.; Boland, H.; Collier, M.; Grond, K.; Günther, K.; Hallgrimsson, G.T.; Hansen, J.; Meissner, W.; De Meulenaer, B.; Ntiamoa-Baidu, Y.
Series :	Wader Study Group Bulletin, 116(1), pp. 2-20
Year :	2009
Title :	Low dietary importance of polychaetes in opportunistic feeding Sanderlings *Calidris alba* on Belgian beaches
Author :	Vanermen, N.; Stienen, E.W.; De Meulenaer, B.; Van Ginderdeuren, K.; Degraer, S.
Series :	Ardea, 97(1), pp. 81-87
Year :	2010
Title :	How Representative is the Current Monitoring of Breeding Seabirds in the UK?
Author :	Cook, A.S.C.P.; Robinson, R.A.
Series :	BTO Research Report No. 573
Year :	2013
Title :	The effect of group size on vigilance in Ruddy Turnstones (*Arenaria interpres*) varies with foraging habitat
Author :	Fuller, R.A.; Bearhop, S.; Metcalfe, N.B.; Piersma, T.
Series :	Ibis, 155, pp. 246-257
Year :	2015
Title :	Foraging ecology of sanderlings *Calidris alba* wintering in estuarine and non-estuarine intertidal areas
Author :	Lourenço, P.M.; Alves, J.A.; Catry, T.; Granadeiro, J.P.
Series :	Journal of Sea Research, 104, pp. 33-40
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 :	Report under Article 12 of the Birds Directive Period 2013-2018
Author :	EEA
Series :	European Environment Agency. European Topic Centre on Biological Diversity. Pp 1-9. https://cdr.eionet.europa.eu/Converters/run_conversion?file=ie/eu/art12/envxztxxq/IE_birds_reports_20191031-130157.xml&conv=612&source=remote
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 :	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 :	2020
Title :	Purple Sandpiper (*Calidris maritima*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Payne, L.X.; Pierce, E.P.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA

Year :	2020
Title :	Ruddy Turnstone (*Arenaria interpres*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Nettleship, D.N.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2020
Title :	Common Ringed Plover (*Charadrius hiaticula*), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors)
Author :	Wiersma, P.; Kirwan, G.M.; Boesman, P.F.D.
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 :	2022
Title :	Irish wetland bird survey: I-WeBS national and site trends report 1994/95 – 2019/20
Author :	Kennedy, J.; Burke, B.; Fitzgerald, N.; Kelly, S.B.A.; Walsh, A.J; Lewis, L.J.
Series :	https://birdwatchireland.ie/app/uploads/2022/04/iwebs_trends_report.html
Year :	2022
Title :	Sanderlings feed on a diverse spectrum of prey worldwide but primarily rely on brown shrimp in the Wadden Sea
Author :	Penning, E.; Verkuil, Y.I.; Klunder, L.; Reneerkens, J.
Series :	Ardea, 110(2), pp. 187-199
Year :	2023
Title :	Seabirds Count: a census of breeding seabirds in Britain and Ireland (2015-2021)
Author :	Burnell, D.; Perkins, A.J.; Newton, S.F.; Bolton, M.; Tierney, T.D.; Dunn, T.E.
Series :	Lynx Nature Books, Barcelona
Year :	2023
Title :	Home range of a long-distance migrant, the Greenland Barnacle Goose *Branta leucopsis*, throughout the annual cycle
Author :	Doyle, S.; Cabot, D.; Griffin, L.; Kane, A.; Colhoun, K.; Redmond, C.; Walsh, A.; McMahon, B.J.
Series :	Bird Study, 70(1-2), pp.37-46
Year :	2024
Title :	European Shag (*Phalacrocorax aristotelis*)
Author :	JNCC
Series :	https://jncc.gov.uk/our-work/european-shag-phalacrocorax-aristotelis/
Year :	2024
Title :	Seabird Population Trends and Causes of Change: 1986–2023, the annual report of the Seabird Monitoring Programme
Author :	Harris, S.J.; Baker, H.; Balmer, D.E.; Bolton, M.; Burton, N.H.K.; Caulfield, E.; Clarke, J.A.E.; Dunn, T.E.; Evans, T.J.; Hereward, H.R.F.; Humphreys, E.M.; Money, S.; O'Hanlon, N.J.
Series :	BTO Research Report 771

A018 Shag *Phalacrocorax aristotelis*

To maintain the Favourable conservation condition of Shag in Inishkea Islands SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number of Apparently Occupied Nests (AON)	Long term SPA population trend is stable or increasing	The Inishkea Islands SPA is made up of two large islands as well as four smaller islands of note that have all held breeding seabirds historically. As a result this SPA can be a relatively difficult site to survey in full. A complete survey of the SPA was conducted in 2000 and recorded an estimated 90 pairs of Shag (Mitchell et al., 2004). An incomplete survey in 2010 recorded 57 pairs (NPWS internal files). The most recent complete survey of the SPA occurred in 2016 and recorded 178 pairs of Shag which is the highest count on record for this SPA and represents an increase of 98% since 2000 (Burnell et al., 2023). Within the same time period the national population of Shag has increased by 40% (Burnell et al., 2023)
Productivity rate	Number of fledged young per breeding pair	Sufficient to maintain a stable or increasing population	There was no productivity data available for this species in this SPA. Trewby et al. (2007) reported that the average productivity from Lambay Island SPA was 1.69 (± 0.08 SE) chicks fledged per AON in 2007 (135 pairs across five subplots). Further monitoring and research work is required in order to identify a minimum productivity rate for this species at this site and at the national level. Shag productivity in Scotland has averaged 1.28 chicks fledged per pair between 1986 and 2019 (JNCC, 2024). In this time period the Scottish population of Shag has decreased 47% (Burnell et al., 2023). However, the cause of decline may not be related to productivity rate but rather due to significant losses of that adult population during "wrecks" in some winters during this time period (JNCC, 2024)
Distribution: extent of available nesting options within the SPA	Numbers and spatial distribution	Sufficient availability of suitable nesting sites throughout the SPA to maintain a stable or increasing population	Distribution encapsulates the number of locations and area of potentially suitable nesting habitat for the breeding population and its availability for use. The suitability and availability of habitat across the SPA may vary through time. This will affect the spatio-temporal patterns of use of the habitats by Shag. Typically this species breeds on sea cliffs, rocks and stacks (Orta et al., 2021). Within this SPA Shag have nested on Carrickawilt, Inishkea South and Inishkea North between 2000 and 2024. Carrickawilt was the most significant island for Shag in 2016
Forage spatial distribution, extent, abundance and availability	Location, 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 the sea bed or at intermediate depths, and principally of the families Ammodytidae (sandeels), Gadidae, Clupeidae, Cottidae, and Labridae, but a wide range of other species can be taken, perhaps opportunistically (Orta et al., 2021). Based on several studies, Woodward et al. (2019) provide 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 9km, 13km, and 46km respectively (see Power et al., 2021)

Disturbance at the breeding site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on birds at the breeding site	Disturbance events at the nest site/breeding colony level can result in a reduction of overall productivity and even lead to the abandonment of the breeding colony. 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
Disturbance at areas ecologically connected to the colony	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on breeding population	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, and area (ha)	Barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Seabirds, particularly during the breeding season, require regular and efficient access to marine waters ecologically connected to the colony in order to forage as well as to engage in other maintenance behaviours. Woodward et al. (2019) provide 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 9km, 13km, and 46km respectively (see Power et al., 2021)

A045 Barnacle Goose *Branta leucopsis*

To maintain the Favourable conservation condition of Barnacle Goose in Inishkea Islands SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Winter population trend	Percentage change in number of individuals	Long term winter population trend is stable or increasing	The national population of wintering Barnacle Goose in Ireland has increased by 102% from 1993 - 2018 (Lewis et al., 2019) as monitored by the International Census of Greenland Barnacle Goose. During the baseline assessments to inform SPA designation, 2,849 Barnacle Goose were estimated to be using this SPA, Duvillaun Islands SPA, Inishglora and Inishkeeragh SPA, and Termoncarragh Lake and Annagh Machair SPA (4 year mean of census counts for baseline period 1993 - 2003; see NPWS, 2013). More recent data showed a population of 2,991 Barnacle Goose used these SPAs during the period 2013 - 2023 (4 year mean of census counts from the International Census of Greenland Barnacle Goose). This represents a population increase of 5% since the baseline period, less than the national trend
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 target	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 are likely to vary throughout the season, for example, due to variation in land management practices or the abundance of resources available (due to natural variation and other factors). This will affect the spatio-temporal patterns of use of the habitats by the wintering population
Disturbance at wintering site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and distribution	The impact of any significant disturbance (direct or indirect) to the wintering population will ultimately affect the achievement of targets for population trend and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends (see, for example, Madsen and Fox, 1995). 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 trend and spatial distribution
Barriers to connectivity and site use	Number, location, shape and hectares	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 wintering population, and it may require access to other SPAs or sites for certain activities, such as foraging when preferred foraging areas are unavailable due to disturbance, extensive flooding, or other factors

Forage spatial distribution, extent and abundance	Location, hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	This species is a grazing herbivore. Historically, in Ireland, foraging habitat included salt marsh, but currently the species is typically associated with open coastal pasture, mostly improved and semi-improved agricultural grasslands. Barnacle Goose grazes on leaves, stems, rhizomes, roots and seeds, with grass and *Plantago/Bellis/Festuca* swards comprising preferred food sources (Cabot, 1973). This species selects a preferred sward height of <10cm but birds can feed on swards >15cm if preferred areas are depleted (based on birds in Islay, see Vickery and Gill, 1999). Birds are highly likely to exhibit foraging site fidelity and may be found foraging on offshore islands as well as commuting to forage on the mainland. Maximum foraging distance is approximately 7km for wintering birds (Doyle et al., 2023)
Roost spatial distribution and extent	Location and hectares of roosting habitat	Sufficient number of locations, area and availability of suitable roosting habitat to support the population target	Roosting is a critical ecological requirement for the wintering population. When roosting, this species uses open habitats (primarily pastures) that provide wide sightlines for the birds and which are typically adjacent to water bodies; thus, offshore islands are commonly used. Birds exhibit strong roost site fidelity (Doyle et al., 2023). Daytime roosting is also a common behaviour, where birds minimise activity levels to conserve energy, while benefitting from the vigilance of other flock members. A lack of sufficient and suitable roosting habitats can result in increased mortality risk, whether indirectly (e.g. via increased energy expenditure travelling to/from roost sites) or directly (e.g. via increased predation risk), or reduction in site use; this would ultimately affect the achievement of targets for population trend and/or spatial distribution
Supporting habitat: area and quality	Hectares and quality	Sufficient area of utilisable habitat available in ecologically important sites outside the SPA	The wintering population can make extensive use of suitable habitats in important areas outside the SPA for foraging and roosting. The extent, availability and quality of these supporting habitats may be of importance for the resilience of the SPA population. Suitable supporting habitats include those highlighted in the attributes for foraging and roosting habitat

A137 Ringed Plover *Charadrius hiaticula*

To maintain the Favourable conservation condition of Ringed Plover in Inishkea Islands SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Winter population trend	Percentage change in number of individuals	Long term winter population trend is stable or increasing	The national population of wintering Ringed Plover in Ireland was broadly stable between 1994/95 - 2019/20, with a noted 1% decline, as monitored via the Irish Wetland Bird Survey (I-WeBS) (Kennedy et al., 2022). During the baseline assessments to inform SPA designation, 225 Ringed Plover were estimated to be using this SPA (2 year mean of peak counts for 1996/97 and 1999/2000; see NPWS, 2013). There are insufficient data available to provide an updated population estimate for this species within the SPA and thus a population trend cannot be estimated
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 target	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 are likely to vary throughout the season, for example, due to variation in land management practices or the abundance of resources available (due to natural variation and other factors). This will affect the spatio-temporal patterns of use of the habitats by the wintering population
Disturbance at wintering site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and distribution	The impact of any significant disturbance (direct or indirect) to the wintering population will ultimately affect the achievement of targets for population trend and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends (see, for example, Madsen and Fox, 1995). 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 trend and spatial distribution
Barriers to connectivity and site use	Number, location, shape and hectares	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
Forage spatial distribution, extent and abundance	Location, hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	During the non-breeding season, Ringed Plover are widely distributed around the coast, where they forage primarily in sand and shingle beaches, sandflats, mudflats, and estuaries, and sometimes lagoons and saltmarshes. They occur less often at inland sites and in smaller numbers, foraging in short grasslands and flooded areas (Wiersma et al., 2020). The species shows a preference for foraging in moist substrates, and will forage in shallow water 0.5cm - 2cm deep (Masero et al., 2007). Diet includes a variety of invertebrates, particularly small polychaete worms, crustaceans and molluscs, as well as isopods, amphipods, and various insects and their larvae (Perez-Hurtado et al., 1997; Wiersma et al., 2020). Ringed Plover typically employ a "run-stop-search" foraging method, relying on visual cues to locate prey but have also demonstrated a "walking and pecking" method (Masero et al., 2007). Forages diurnally and nocturnally, typically in small groups

Roost spatial distribution and extent	Location and hectares of roosting habitat	Sufficient number of locations, area and availability of suitable roosting habitat to support the population target	Roosting is a critical ecological requirement for the wintering population. Ringed Plover typically roost in areas adjacent to foraging grounds, often just above the high tide line on open shoreline stretches or along the upper shores of estuaries and non-estuarine coastlines, including rocky shorelines. They are known to form communal roosts which can comprise several hundred individuals. Daytime roosting is also a common behaviour, where birds minimise activity levels to conserve energy, while benefitting from the vigilance of other flock members. A lack of sufficient and suitable roosting habitats can result in increased mortality risk, whether indirectly (e.g. via increased energy expenditure travelling to/from roost sites) or directly (e.g. via increased predation risk), or reduction in site use; this would ultimately affect the achievement of targets for population trend and/or spatial distribution

A144 Sanderling *Calidris alba*

To maintain the Favourable conservation condition of Sanderling in Inishkea Islands SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Winter population trend	Percentage change in number of individuals	Long term winter population trend is stable or increasing	The national population of wintering Sanderling in Ireland has increased by 85% from 1994/95 - 2019/20, as monitored via the Irish Wetland Bird Survey (I-WeBS) (Kennedy et al., 2022). During the baseline assessments to inform SPA designation, 140 Sanderling were estimated to be using this SPA (2 year mean of peak counts for 1995/96 and 1999/2000; see NPWS, 2013). There are insufficient data available to provide an updated population estimate for this species within the SPA and thus a population trend cannot be estimated
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 target	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 are likely to vary throughout the season, for example, due to variation in land management practices or the abundance of resources available (due to natural variation and other factors). This will affect the spatio-temporal patterns of use of the habitats by the wintering population
Disturbance at wintering site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and distribution	The impact of any significant disturbance (direct or indirect) to the wintering population will ultimately affect the achievement of targets for population trend and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends (see, for example, Madsen and Fox, 1995). 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 trend and spatial distribution
Barriers to connectivity and site use	Number, location, shape and hectares	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
Forage spatial distribution, extent and abundance	Location, hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	In the non-breeding season, Sanderlings primarily forage on sandy beaches but can also use estuarine areas, particularly muddy-sand and sandy substrates (Lourenço et al., 2015). They exhibit a characteristic "wave-chasing" behaviour, running swiftly along the shoreline to capture prey items exposed by receding waves. However they can also use probing techniques to locate sub-surface invertebrates depending on habitat and target prey species (Lourenço et al., 2015). Their diet mainly consists of small invertebrates, such as crustaceans, molluscs, and marine worms (Penning et al., 2022) but they can adapt their diet based on local prey availability (Vanermen et al., 2009)

Roost spatial distribution and extent	Location and hectares of roosting habitat	Sufficient number of locations, area and availability of suitable roosting habitat to support the population target	Roosting is a critical ecological requirement for the wintering population. During the non-breeding season, Sanderling typically roost near foraging areas for quick food access when tides allow, often communally in mixed-species flocks above the high tide line. They prefer open shores with clear visibility to detect predators (Reneerkens et al., 2009). They can show fidelity to roosting sites, returning to the same locations annually (Reneerkens et al., 2009). Daytime roosting is also a common behaviour, where birds minimise activity levels to conserve energy, while benefitting from the vigilance of other flock members. A lack of sufficient and suitable roosting habitats can result in increased mortality risk, whether indirectly (e.g. via increased energy expenditure travelling to/from roost sites) or directly (e.g. via increased predation risk), or reduction in site use; this would ultimately affect the achievement of targets for population trend and/or spatial distribution

A148 Purple Sandpiper *Calidris maritima*

To maintain the Favourable conservation condition of Purple Sandpiper in Inishkea Islands SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Winter population trend	Percentage change in number of individuals	Long term winter population trend is stable or increasing	The national population of wintering Purple Sandpiper in Ireland has increased by 24% from 1994/95 - 2019/20, as monitored via the Irish Wetland Bird Survey (I-WeBS) (Kennedy et al., 2022). During the baseline assessments to inform SPA designation, 50 Purple Sandpiper were estimated to be using this SPA (2 year mean of peak counts for 1995/96 and 1999/2000; see NPWS, 2013). There are insufficient data available to provide an updated population estimate for this species within the SPA and thus a population trend cannot be estimated
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 target	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 are likely to vary throughout the season, for example, due to variation in land management practices or the abundance of resources available (due to natural variation and other factors). This will affect the spatio-temporal patterns of use of the habitats by the wintering population
Disturbance at wintering site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and distribution	The impact of any significant disturbance (direct or indirect) to the wintering population will ultimately affect the achievement of targets for population trend and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends (see, for example, Madsen and Fox, 1995). 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 trend and spatial distribution
Barriers to connectivity and site use	Number, location, shape and hectares	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
Forage spatial distribution, extent and abundance	Location, hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	In the non-breeding season, Purple Sandpiper primarily forage in rocky (non-estuarine) shorelines, islands, peninsulas, and other coastal areas exposed to wave action, as well as man-made structures providing similar conditions (e.g. breakwaters and pier substructures) (Snow and Perrins, 1998). Less often they forage in mudflats or sandy shores. They forage primarily close to the water's edge at all stages of the tide (Summers and Nicoll, 2004). Diet is predominantly invertebrates, including gastropods (such as mussels), annelid worms, insects (adults and larvae), crustaceans, and small amounts of algae. Prey items are taken from amongst seaweed, on and under rocks, in crevices, and sometimes from the shoreline (Payne and Pierce, 2020)

Roost spatial distribution and extent	Location and hectares of roosting habitat	Sufficient number of locations, area and availability of suitable roosting habitat to support the population target	Roosting is a critical ecological requirement for the wintering population. During the non-breeding season, when roosting, Purple Sandpiper show a strong preference for tidal rocky shores and often utilise artificial structures such as piers or breakwaters. They have been found to be highly faithful to their wintering sites. Daytime roosting is also a common behaviour, where birds minimise activity levels to conserve energy, while benefitting from the vigilance of other flock members. A lack of sufficient and suitable roosting habitats can result in increased mortality risk, whether indirectly (e.g. via increased energy expenditure travelling to/from roost sites) or directly (e.g. via increased predation risk), or reduction in site use; this would ultimately affect the achievement of targets for population trend and/or spatial distribution

A169 Turnstone *Arenaria interpres*

To maintain the Favourable conservation condition of Turnstone in Inishkea Islands SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Winter population trend	Percentage change in number of individuals	Long term winter population trend is stable or increasing	The national population of wintering Turnstone in Ireland has declined by 24% from 1994/95 - 2019/20, as monitored via the Irish Wetland Bird Survey (I-WeBS) (Kennedy et al., 2022). During the baseline assessments to inform SPA designation, 275 Turnstone were estimated to be using this SPA (2 year mean of peak counts for 1995/96 and 1999/2000; see NPWS, 2013). There are insufficient data available to provide an updated population estimate for this species within the SPA and thus a population trend cannot be estimated
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 target	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 are likely to vary throughout the season, for example, due to variation in land management practices or the abundance of resources available (due to natural variation and other factors). This will affect the spatio-temporal patterns of use of the habitats by the wintering population
Disturbance at wintering site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and distribution	The impact of any significant disturbance (direct or indirect) to the wintering population will ultimately affect the achievement of targets for population trend and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends (see, for example, Madsen and Fox, 1995). 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 trend and spatial distribution
Barriers to connectivity and site use	Number, location, shape and hectares	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
Forage spatial distribution, extent and abundance	Location, hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Wintering Turnstone are almost exclusively coastal in Ireland. The species is a specialist of shorelines that are rocky/stony with seaweed/algal wrack areas, but also occurs on mudflats and sandflats (Nettleship, 2020). The species is an opportunistic feeder and scavenger, with a chiefly invertebrate diet including a diverse range of crustaceans, molluscs, annelid worms, echinoderms, small fish, and the adults and larvae of insects and arthropods. Prey is taken on or near the surface. The species is also known to consume carrion and human food discard

Roost spatial distribution and extent	Location and hectares of roosting habitat	Sufficient number of locations, area and availability of suitable roosting habitat to support the population target	Roosting is a critical ecological requirement for the wintering population. Wintering Turnstone roost in the habitats in which they forage (see above). Turnstone roost communally, often with other bird species, often close to areas first exposed after high tide for subsequent foraging, and prefer undisturbed roosts (Burton and Evans, 1997; Fuller et al., 2013; Nettleship, 2020). Daytime roosting is also a common behaviour, where birds minimise activity levels to conserve energy, while benefitting from the vigilance of other flock members. A lack of sufficient and suitable roosting habitats can result in increased mortality risk, whether indirectly (e.g. via increased energy expenditure travelling to/from roost sites) or directly (e.g. via increased predation risk), or reduction in site use; this would ultimately affect the achievement of targets for population trend and/or spatial distribution

A182 Common Gull *Larus canus*

To maintain the Favourable conservation condition of Common Gull in Inishkea Islands SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number of Apparently Occupied Nests (AON)	Long term SPA population trend is stable or increasing	Ussher and Warren (1900) highlighted Co. Mayo for having considerable Common Gull colonies and Ruttledge (1966) noted that they were breeding on several marine islands off the Mullet Peninsula. This SPA is located off the Mullet Peninsula and is made up of two large islands as well as four smaller islands of note that have all held breeding seabirds. As a result this SPA can be a relatively difficult site to survey. A complete survey of the SPA was conducted in 2000 and recorded an estimated 47 pairs of Common Gull (Mitchell et al., 2004). An incomplete survey in 2010 recorded 46 pairs (NPWS internal files). The most recent complete survey of the SPA occurred between 2016 - 2018 and recorded 45 pairs (Burnell et al., 2023). Population estimates of 47, 46 and 45 over this 20 year period indicates a stable population. Common Gull were recorded breeding within the SPA in 2024. The national population has increased by 89% between 1998 - 2002 and 2015 - 2021 (Burnell et al., 2023)
Productivity rate	Number of fledged young per breeding pair	Sufficient to maintain a stable or increasing population	There was no productivity data available for this species in this SPA. A lack of comprehensive Irish data precludes the identification of a minimum productivity rate for this species at the site and at the national level. Common Gull productivity in Scotland between 2000 and 2020 was below 0.6 chicks per breeding pair; in this time period the Scottish population of Common Gull was decreasing (Harris et al., 2024)
Distribution: extent of available nesting options within the SPA	Numbers and spatial distribution	Sufficient availability of suitable nesting sites throughout the SPA to maintain a stable or increasing population	Distribution encapsulates the number of locations and area of potentially suitable nesting habitat for the breeding 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 Gull. Common Gull breeding near marine environments typically nest on small inshore rocky stacks, islets and islands, grassy and rocky slopes, sand dunes, and the foreshore (Moskoff et al., 2021). Within this SPA Common Gull have nested on Carricknaweelion, Rusheen Island, Inishkea South and Inishkea North between 2000 and 2024. Inishkea North has been the most significant island in this time period for breeding Common Gull
Forage spatial distribution, extent, abundance and availability	Location, 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). Based on several studies, Woodward et al. (2019) estimates that the maximum foraging range of a Common Gull from the nest site during the breeding season is 50km (see Power et al., 2021)

Disturbance at the breeding site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on birds at the breeding site	Disturbance events at the nest site/breeding colony level can result in a reduction of overall productivity and even lead to the abandonment of the breeding colony. 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
Disturbance at areas ecologically connected to the colony	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on breeding population	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, and area (ha)	Barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Seabirds, particularly during the breeding season, require regular and efficient access to marine waters ecologically connected to the colony in order to forage, as well as, to engage in other maintenance behaviours. Based on several studies, Woodward et al. (2019) estimates that the maximum foraging range of a Common Gull from the nest site during the breeding season is 50km (see Power et al., 2021)

A184 Herring Gull *Larus argentatus*

To restore the Favourable conservation condition of Herring Gull in Inishkea Islands SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number of Apparently Occupied Nests (AON)	Long term SPA population trend is stable or increasing	Ussher and Warren (1900) noted that the north Mayo coast holds large Herring Gull colonies. This SPA is located off the Mullet Peninsula and is comprised of two large islands as well as four smaller islands of note that have all held breeding seabirds historically. As a result this SPA can be a relatively difficult site to survey in full. A complete survey of the SPA was conducted in 2000 and recorded an estimated 81 pairs of Herring Gull (Mitchell et al., 2004). An incomplete survey in 2010 recorded 45 pairs (NPWS internal files). The most recent complete survey of the SPA occurred between 2016 - 2018 and recorded 46 pairs (Burnell et al., 2023), a decline of 43% since 2000. In contrast, the natural-nesting (i.e. non-urban) Herring Gull population in Ireland has increased by 94% between national surveys in 1998 - 2002 and 2015 - 2021 (Burnell et al., 2023)
Productivity rate	Number of fledged young per breeding pair	Sufficient to maintain a stable or increasing population	There was no productivity data available for this species in this SPA. Cook and Robinson (2010) undertook Population Viability Analyses (PVA) of a selection of breeding populations in the UK. Over their study period, Herring Gull productivity at monitored nests was 0.75. Were this level to be maintained, Herring Gull populations would decline by 60% over 25 years. For the population to stabilise, breeding success would have to increase to 1.3 - 1.5 chicks per nest per year. A lack of comprehensive Irish data precludes the identification of a minimum productivity rate for this species at the site and at the national level
Distribution: extent of available nesting options within the SPA	Numbers and spatial distribution	Sufficient availability of suitable nesting sites throughout the SPA to maintain a stable or increasing population	Distribution encapsulates the number of locations and area of potentially suitable nesting habitat for the breeding 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 Herring Gull. Typically, coastal Herring Gull colonies are located along rocky coastlines with cliffs, islets and offshore islands (Mitchell et al., 2004). Within this SPA Herring Gull have nested on Carricknaweelion, Carrigee, Inishkea South and Inishkea North between 2000 and 2024. Carricknaweelion was the most significant island for Herring Gull in 2016
Forage spatial distribution, extent, abundance and availability	Location, 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 land birds, small mammals, terrestrial insects, earthworms, berries, carrion, and a wide variety of human refuse (Weseloh et al., 2020). Woodward et al. (2019) reviewed the foraging ranges of seabird species from over 300 studies including: direct tracking of birds; estimates based on flight speeds and time activity; survey observations; and speculative estimates. Woodward et al. (2019) provide 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 15km, 59km, and 92km respectively (see Power et al., 2021)

Disturbance at the breeding site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on birds at the breeding site	Disturbance events at the nest site/breeding colony level can result in a reduction of overall productivity and even lead to the abandonment of the breeding colony. 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
Disturbance at areas ecologically connected to the colony	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on breeding population	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, and area (ha)	Barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Seabirds, particularly during the breeding season, require regular and efficient access to marine waters ecologically connected to the colony in order to forage as well as to engage in other maintenance behaviours. Based on several studies, Woodward et al. (2019) provide 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 15km, 59km, and 92km respectively (see Power et al., 2021)

A194 Arctic Tern *Sterna paradisaea*

To restore the Favourable conservation condition of Arctic Tern in Inishkea Islands SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number of Apparently Occupied Nests (AON)	Long term SPA population trend is stable or increasing	Ruttledge (1966) noted that Arctic Tern colonies in Galway and Mayo were small, less than 10 pairs in size, with the exception of an island off the Mullet Peninsula that held approximately 50 pairs. This SPA is located off the Mullet Peninsula and is comprised of two large islands as well as four smaller islands of note that have all held breeding seabirds historically. A survey of all known tern colonies in Ireland was conducted in 1984 and identified 167 pairs of Arctic Tern within this SPA (Whilde et al., 1985). This declined to 73 pairs in 1995, the lowest on record for this SPA (Hannon et al., 1997). However the following survey in 2000 recorded a peak count of 182 pairs (Mitchell et al., 2004). Subsequent counts in 2010 and 2012 estimated 134 and 167 pairs of Arctic Tern respectively (NPWS internal files). The most recent complete survey for this SPA is from 2016 - 2018 and estimated a population of 150 pairs, a decline of 10% since 1984 (Burnell et al., 2023)
Productivity rate	Number of fledged young per breeding pair	Sufficient to maintain a stable or increasing population	There was no productivity data available for this species in this SPA. Annual productivity estimates are available from the wardened tern colonies of Rockabill and Lady's Island Lake. Over a three-year period (2022 - 2024) the average productivity estimates were 0.24 and 0.93 chicks per nest respectively (Stubbings et al., 2022, 2023 and 2024; Coughlan et al., 2024, Fihey et al., 2023; and Allbrook et al., 2022). As this species is long-lived there is a possibility that a population could be returning to a nest site annually but not fledging any chicks. Caution should be taken when interpreting the results of tern breeding numbers, especially on offshore islands, without having productivity data
Distribution: extent of available nesting options within the SPA	Numbers and spatial distribution	Sufficient availability of suitable nesting sites throughout the SPA to maintain a stable or increasing population	Distribution encapsulates the number of locations and area of potentially suitable nesting habitat for the breeding population and its availability for use. The suitability and availability of habitat across the SPA may vary through time. This will affect the spatio-temporal patterns of use of the habitats by Arctic Tern. Terns are ground nesting birds. Typically colonies are found in open areas close to the shore, frequently in areas with loose substrate or low vegetation (Hatch et al., 2020). In Ireland all known large colonies are situated on marine or inland islands of varying distances from the mainland/shore. Arctic Tern have been recorded breeding on Carricknaweelion, Carrickawilt, Carrigee, Rusheen Island, Inishkea South and Inishkea North within this SPA between 1984 and 2024. Inishkea South and Inishkea North have been the most significant islands in this time period for breeding Arctic Tern

Forage spatial distribution, extent, abundance and availability	Location, 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. The 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 from the Clupeidae (herring), Gadidae (cod, pollock) and Ammodytidae (sandeel) families (Hatch et al., 2020). Based on several studies, Woodward et al. (2019) provide estimates (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) of Arctic Tern foraging ranges from the nest site during the breeding season, which are 6km, 26km, and 46km respectively (see Power et al., 2021)
Disturbance at the breeding site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on birds at the breeding site	Disturbance events at the nest site/breeding colony level can result in a reduction of overall productivity and even lead to the abandonment of the breeding colony. 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
Disturbance at areas ecologically connected to the colony	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on breeding population	Seabird species can make extensive use of the waters adjacent to their breeding colonies for non site-specific maintenance behaviours (e.g. courtship, bathing, preening) as defined in McSorley et al. (2003). Additionally, some species may engage in maintenance behaviours outside of the breeding colony but not in the water. For example, terns may roost on rocky islets or beaches away from the breeding colony
Barriers to connectivity	Number, location, shape, and area (ha)	Barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Seabirds, particularly during the breeding season, require regular access to waters ecologically connected to the colony in order to forage, as well as to engage in other maintenance behaviours. Based on several studies, Woodward et al. (2019) provide estimates (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) of Arctic Tern foraging ranges from the nest site during the breeding season, which are 6km, 26km, and 46km respectively (see Power et al., 2021)

A195 Little Tern *Sterna albifrons*

To maintain the Favourable conservation condition of Little Tern in Inishkea Islands SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number of Apparently Occupied Nests (AON)	Long term SPA population trend is stable or increasing	Little Tern have been breeding at this site since at least the 19th century (Ussher and Warren, 1900). This SPA is located off the Mullet Peninsula and is comprised of two large islands as well as four smaller islands of note that have all held breeding seabirds historically. A survey of all known tern colonies in Ireland was conducted in 1984 and identified 33 pairs of Little Tern within this SPA (Whilde et al., 1985). This declined to 4 pairs in 1995, the lowest on record for this SPA (Hannon et al., 1997). However subsequent surveys in 2003 and 2007 recorded peak counts of 68 and 63 pairs respectively (NPWS internal files). The most recent complete survey for this SPA is from 2016 - 2018 and estimated a population of 16 pairs, a decline of 52% since 1984. However an estimated 27 pairs were recorded in 2023 during a partial survey of the SPA which indicates the population may be stable. The national population has increased since the 1980s (Burnell et al., 2023)
Productivity rate	Number of fledged young per breeding pair	Sufficient to maintain a stable or increasing population	There was no productivity data available for this species in this SPA. A productivity rate of 0.7 chicks per pair is required for population stability for Little Tern, according to an analysis of seabird population by Cook and Robinson (2010). Productivity is monitored of the conservation project at the Murrough SPA. In 2023, the productivity rate was 1.5 and since 2010 the productivity has been above 1.0 for most years, which is well above the output needed to maintain the population (Johnson et al., 2023). As this species is long-lived there is a possibility that a population could be returning to a nest site annually but not fledging any chicks. Caution should be taken when interpreting the results of tern breeding numbers, especially on offshore islands, without having productivity data
Distribution: extent of available nesting options within the SPA	Numbers and spatial distribution	Sufficient availability of suitable nesting sites throughout the SPA to maintain a stable or increasing population	Distribution encapsulates the number of locations and area of potentially suitable nesting habitat for the breeding population and its availability for use. The suitability and availability of habitat across the SPA may vary through time. This will affect the spatio-temporal patterns of use of the habitats by Little Tern. The Little Tern population have only bred on the two main islands of Inishkea South and Inishkea North between 1984 and 2024
Forage spatial distribution, extent, abundance and availability	Location, 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 an east coast 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). Based on two studies on a single colony, Woodward et al. (2019) summarises the mean foraging range and the mean-maximum foraging range as 3.5km and 5km, respectively

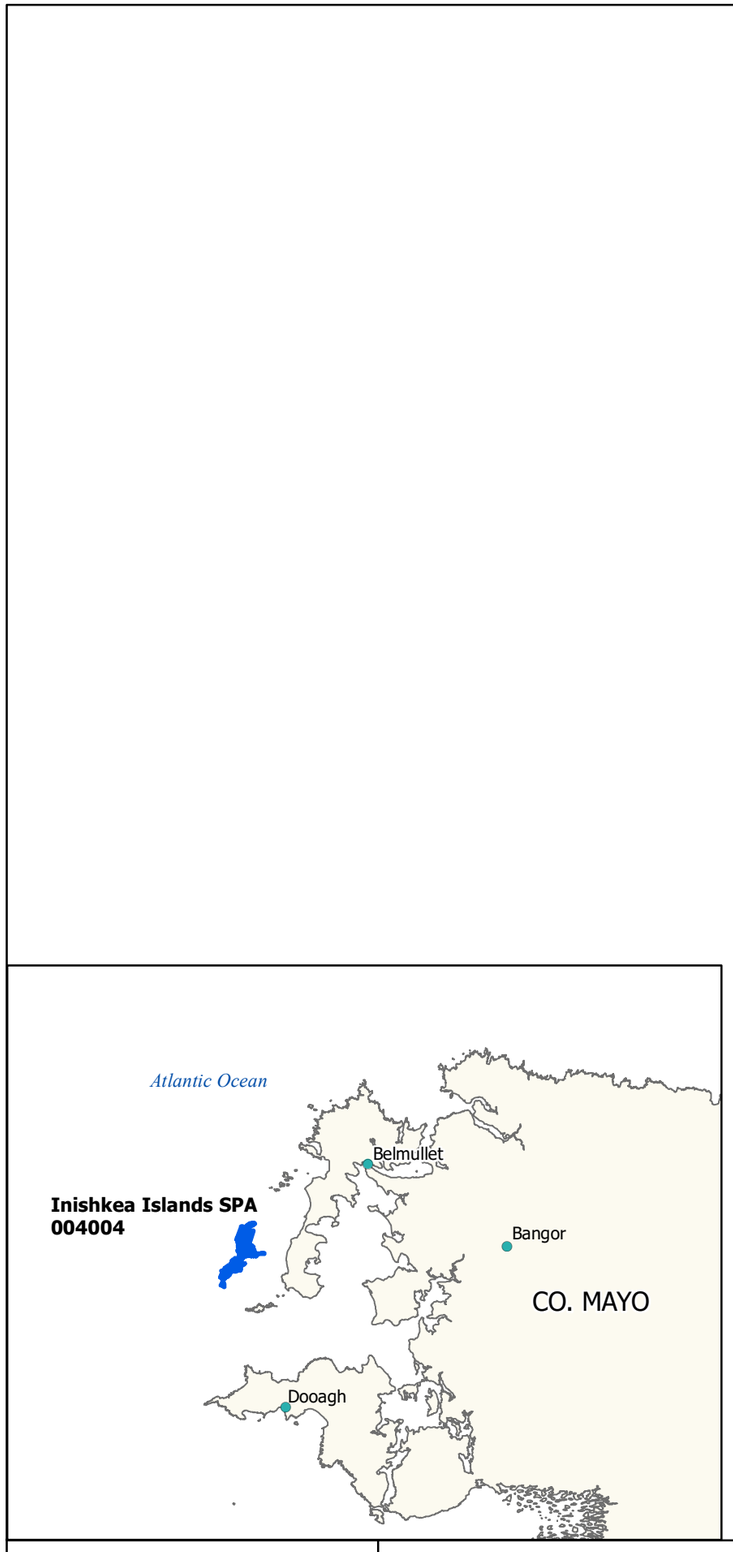
Disturbance at the breeding site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on birds at the breeding site	Disturbance events at the breeding colony can result in a reduction of overall productivity and even lead to the abandonment of the breeding colony. The impact of any significant disturbance 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. Human disturbance can impact on breeding success, as colonies are often sited on beaches used by the public (Ratcliffe et al., 2008)
Disturbance at areas ecologically connected to the colony	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on breeding population	The Little Tern has the smallest foraging range of seabirds breeding in Ireland (Woodward et al., 2019). Seabird species can make extensive use of the waters adjacent to their breeding colonies for non site-specific maintenance behaviours (e.g. courtship, bathing, preening) as defined in McSorley et al. (2003). Additionally, some species may engage in maintenance behaviours outside of the breeding colony but not in the water. For example, terns may roost on rocky islets or beaches away from the breeding colony. Exposure to both foreshore and water-based recreational activities may disrupt roosting and foraging birds associated with the colony
Barriers to connectivity	Number, location, shape, and area (ha)	Barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Seabirds, particularly during the breeding season, require regular and efficient access to marine waters ecologically connected to the colony in order to forage as well as to engage in other maintenance behaviours. Based on two studies on a single colony, Woodward et al. (2019) summarises the mean foraging range and the mean-maximum foraging range as 3.5km and 5km respectively

A466 Dunlin *Calidris alpina schinzii*

To restore the Favourable conservation condition of Dunlin in Inishkea Islands SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population trend	Percentage change in number of potential breeding pairs	Long term trend is stable or increasing	The national breeding population of Dunlin in Ireland is estimated to have declined by 93 - 94% between 1972 - 2019 (see EEA, 2019). Apparently Occupied Territory (AOT) is a standard metric used to represent breeding pairs. The breeding population of Dunlin in the Inishkea Islands SPA increased from 8 AOTs in 1985 (Nairn and Sheppard, 1985) to a peak of 47 AOTs in 2007 (see Gamero et al., 2008). The SPA population declined steadily thereafter, with 4 AOTs recorded in 2022, only a single AOT recorded in 2023, and no breeding Dunlin recorded in 2024 (NPWS internal files). The main pressures identified as likely driving the decline of breeding Dunlin on the Inishkea Islands are over-grazing by livestock and predation, primarily by Common Gull *Larus canus* (see Suddaby et al., 2010 and 2020)
Productivity rate	Number of young fledged per potential breeding pair	Sufficient productivity to maintain the population trend as stable or increasing	Productivity is a measure of breeding output and a key determinant in whether a population can maintain itself. It is defined here as the total number of young that are successfully reared to fledge (i.e. become independent of their parents) divided by the total number of potential breeding pairs (or AOTs), including failed pairs/females, in a given breeding season. A lack of comprehensive data precludes the identification of a minimum productivity rate required to maintain the breeding Dunlin population within the SPA or at national scale. However, surveys and studies of the breeding Dunlin population in this SPA recorded very low breeding productivity (for example, Gamero et al., 2008; but see also Suddaby et al., 2010 and 2020 and references therein). The evidence suggests poor productivity played a major role in the recorded population declines of breeding Dunlin. Predation, primarily by Common Gull, was recorded as a significant pressure (see Suddaby et al., 2010 and 2020)
Distribution of breeding habitat	Spatial distribution	No significant loss of distribution in the long term, other than that occurring due to natural patterns of variation	Dunlin breed in open, moist habitats, showing a preference for areas of vegetation interspersed with shallow pools or other standing or flowing water. They breed in upland and lowland blanket bog, other peatland habitats, coastal grasslands (such as machair), edges of lagoons and lakes, and other suitably open wetlands. On the Inishkea Islands, it was recorded that high grazing levels resulted in sub-optimal vegetation height for nesting Dunlin and furthermore made their nests vulnerable to predation (see Suddaby et al., 2010 and 2020 and references therein). Previously, Dunlin bred on both the North and South islands; however, in 2024, no breeding Dunlin were recorded within the SPA (NPWS internal files)

Extent and condition of breeding habitat	Hectares of high quality breeding habitat	Sufficient area of high quality habitat to support the population target	Dunlin breed in open, moist habitats, showing a preference for areas of vegetation interspersed with shallow pools or other standing or flowing water. They breed in upland and lowland blanket bog, other peatland habitats, coastal grasslands (such as machair), edges of lagoons and lakes, and other suitably open wetlands. Dunlin nest on the ground in long or tussocky vegetation in which the nest is concealed. High quality breeding habitat is considered as habitat in which Dunlin can successfully nest and rear young. On the Inishkea Islands, it was recorded that high grazing levels resulted in sub-optimal habitat conditions for nesting Dunlin and furthermore made their nests vulnerable to predation (see Suddaby et al., 2010 and 2020 and references therein). The available evidence suggests insufficient and/or poor quality breeding habitat likely contributed to the recorded declines in the breeding Dunlin population
Disturbance at breeding site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and distribution	The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population trend and/or spatial distribution. 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 trend and spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of mortality (in adults and chicks) or reduced breeding fitness of adults (if energy expenditure is greater than energy intake), and can thus negatively impact population trends. Disturbance is likely to have greatest impact at nesting sites and feeding areas for young, for example, increasing the mortality risk to eggs and young from predation, inclement weather and starvation
Barriers to connectivity and site use	Number, location, shape and hectares	Barriers do not significantly impact the breeding population's access to the SPA or other ecologically important sites outside the SPA	Barriers limiting the breeding population's access to this SPA or movement within 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
Forage spatial distribution, extent and abundance	Location, hectares, and forage biomass	Sufficient number of locations, area of suitable habitat, and available forage biomass to support the population target	Dunlin forage exclusively at ground-level and rely primarily on a wide variety of surface and sub-surface dwelling invertebrate prey. When breeding, diet is primarily adults and larvae of insects, including Diptera, craneflies, beetles, caddisflies, wasps, sawflies and mayflies. Dunlin will also feed upon spiders, mites, and earthworms. Foraging habitats include those habitats in which they breed (see Distribution of breeding habitat above)



Ceathrú Thaidhg
Ros Dumhach
Gleann na Muaidhe
MAIGH EO
Béal an Mhuirthead
Barr na Trá
An Geata Mór
Bun na hAbhna
An Clochar
An Fód Dubh
Bangor
N59
Srahnamanragh
Ballycroy
Doogort
Keem
Dooagh
Keel
Bun an Churraigh
Toin re Gaoth
Gob an Choire
Dumha Éige

Legend

Inishkea Islands SPA 004004

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

MAP 1:
INISHKEA ISLANDS SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

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

SITE CODE:
SPA 004004; version 3
CO. MAYO

0 1.25 2.5 5 Kilometres

N

Map version 1
Date: August 2024

West Connacht Coast SAC

Inishkea Islands SPA

Inishkea Islands SAC

Ceathrú Thaidhg
Cnoc an Daimh
Ros Dumhach
Béal an Mhuirthead
MAIGHEO
Barr na Trá
An Geata Mór
Bun na hAbhna
Bangor
An Clochar
N59
Cnoc an Tearmainn
An Fód Dubh
Cnoc na gCnámh
N59

Legend

- Inishkea Islands SPA 004004
- Inishkea Islands SAC 000507
- West Connacht Coast SAC 002998

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

MAP 2:
INISHKEA ISLANDS SPA
CONSERVATION OBJECTIVES
OVERLAPPING AND ADJACENT SITES

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

SITE CODE:
SPA 004004; version 3
CO. MAYO

0 1.25 2.5 5 Kilometres

N

Map version 1
Date: August 2024