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Conservation Objectives Series

Lough Derg (Shannon) SPA 004058

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

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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***

004058	Lough Derg (Shannon) SPA
A017	Cormorant *Phalacrocorax carbo*
A061	Tufted Duck *Aythya fuligula*
A067	Goldeneye *Bucephala clangula*
A193	Common Tern *Sterna hirundo*
A999	Wetlands

Please note that this SPA overlaps with Lough Derg, North-east Shore SAC (002241), and is adjacent to Barroughter Bog SAC (000231), River Shannon Callows SAC (000216) and Middle Shannon Callows SPA (004096). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping and adjacent 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 :	1987
Title :	Cormorants and Game Fisheries in Ireland
Author :	MacDonald, R.A.
Series :	Report commissioned by the Forest & Wildlife Service
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 :	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 :	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

Other References

Year :	1926
Title :	A Natural History of the Ducks
Author :	Phillips, J.C.
Series :	Mineola, NY: Houghton Mifflin Co., Boston and New York. Reprinted (1986) as 2 vol., Dover Publications, Inc.
Year :	1978
Title :	Ducks, Geese and Swans of the World
Author :	Johnsgard, P.A.
Series :	University of Nebraska Press, Lincoln, NE, USA
Year :	1978
Title :	Population models for common terns in Massachusetts
Author :	Nisbet, I.C.T.
Series :	Bird-banding, 49(1), 50-58

Year :	1980
Title :	Population dynamics of a Common Tern colony
Author :	DiCostanzo, J.
Series :	Journal of Field Ornithology, 51(3), pp.229-243
Year :	1985
Title :	The 1984 all Ireland tern survey
Author :	Whilde, A.
Series :	Irish Birds 3: 1-32
Year :	1995
Title :	Seabird monitoring handbook for Britain and Ireland: a compilation of methods for survey and monitoring of breeding seabirds
Author :	Walsh, P.M., Halley, D.J., Harris, M.P., Del Nevo, A., Sim, I.M.W. and Tasker, M.L.
Series :	JNCC / RSPB / ITE / Seabird Group, Peterborough ISBN 1 873701 73 X
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 :	1996
Title :	Birds in Central Ireland, Mid-Shannon Bird Report 1992-1995
Author :	Heery, S.
Series :	Irish Wildbird Conservancy
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 :	2002
Title :	Impacts of vegetative manipulations on Common Tern nest success at Lime Island, Michigan
Author :	Cook-Haley, B.S.; Millenbah, K.F.
Series :	Journal of Field Ornithology, 73(2), 174-179
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 :	2005
Title :	Breeding performance and timing of breeding of inland and coastal breeding Cormorants *Phalacrocorax carbo* in England and Wales
Author :	Newson, S.E.; Hughes, B.; Hearn, R.; Bregnballe, T.
Series :	Bird Study, 52:1, 10-17, DOI: 10.1080/00063650509461369

Year :	2011
Title :	A preliminary assessment of the potential impacts of Cormorant (*Phalacrocorax carbo*) predation on Salmonids in four selected river systems
Author :	Tierney, N.; Lusby, J.; Lauder, A.
Series :	Report Commissioned by Inland Fisheries Ireland and funded by the Salmon Conservation Fund
Year :	2013
Title :	Seabird Monitoring Programme: Goat Island, Co. Tipperary - Visit Report for 3rd June 2013
Author :	Copland, A.; Jones, S.; Collins, K.; Williams, H.; Carrol, D.
Series :	Unpublished note
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 :	2020
Title :	Common tern (*Sterna hirundo*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Arnold, J.M.; Oswald, S.A.; Nisbet, I.C.T.; Pyle, P.; Patten, M.A.
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 :	Common Goldeneye (*Bucephala clangula*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Eadie, J.M.; Mallory, M.L.; Lumsden, H.G.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2021
Title :	Definition of Favourable Conservation Status for Great Cormorant, *Phalacrocorax carbo*
Author :	Newson, S.E.; Austin, G.
Series :	Natural England, pp.25. ISBN: 978-1-78354-723-4
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 :	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 :	2024
Title :	Seabird Monitoring Programme (SMP) Database
Author :	JNCC
Series :	http://jncc.defra.gov.uk/smp/Default.aspx

A017 Cormorant *Phalacrocorax carbo*

To restore the Favourable conservation condition of Cormorant in Lough Derg (Shannon) 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 division of the SPA between three counties and multiple islands has resulted in difficulties in the derivation of a total population estimate. A near complete survey in 2024 recorded 121 pairs, all in the Galway section (NPWS internal files). This represents a 56% decline from a 2017 estimate of 272 pairs from the Galway and Clare sections of the lough (Burnell et al., 2023) and a longer term decline of 25% since 1985 which had breeding Cormorant in all three county sections of the lough (MacDonald, 1987; NPWS internal files). This trend is dissimilar to the national trend where the current estimate of 4,124 pairs (2015-2021), represents a long term increase of 4% from 1985-1988 but a decrease of 8% from 1998-2002 (Burnell et al., 2023)
Productivity rate	Number of fledged young per AON	Sufficient to maintain a stable or increasing population	Five subspecies of Great Cormorant are recognised with the nominate and Atlantic subspecies *P. c. carbo* breeding in both coastal and inland resorts in Ireland (Burnell et al., 2023). In the United Kingdom the continental race *P. c. sinensis* also breeds at inland sites largely in England and differences in their productivity rates and overall population trends have been noted (Newson and Austin, 2021; Newson et al., 2005; Burnell et al., 2023). A lack of comprehensive Irish data precludes the identification of a minimum productivity rate for this species at this site and at the national level. Cormorant colonies in the UK fledged approximately 1.84 chicks per nest per year between 1989 and 2019 (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	Typically, inland Cormorant colonies are located in trees surrounded by or close to freshwater bodies (Newson and Austin, 2021). The SPA is spread across counties Tipperary, Clare and Galway. Cormorant have bred on different small islands, across all county sections, since at least 1985. However, Galway has held the most significant colonies in this time. A near complete survey in 2024 recorded 121 pairs, all in Galway (NPWS internal files). In a complete survey in 2018 all colonies were in Galway except for a small colony in Clare (Burnell et al., 2023). 133 pairs were recorded in a complete survey in 2016, all in Galway (NPWS internal files). 122 and 167 pairs were recorded breeding near Portumna, Co. Galway in 1999 and 1995 respectively but these surveys were limited to this area (Heery, 1996; and NPWS, 2013). 161 pairs were recorded across counties Galway and Tipperary in a complete survey in 1985 (MacDonald, 1987)

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	Cormorant diet consists predominantly of small benthic and pelagic fish which are captured by pursuit diving, typically over shallow (<10m) freshwater, estuarine and marine environments (Grémillet et al., 1998; Hatch et al., 2020). Perch, roach, pike, salmonids and trout were determined to be the main diet of Cormorant at the Silver Island colony in the SPA (Tierney et al., 2011) through an analysis of Cormorant pellets (regurgitated prey items). 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) 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 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 or on the water. Cormorant, after long periods in the water, may stand in areas away from the colony and engage in a behaviour known as wing-spreading. The main purpose of this behaviour is to dry plumage (Hatch et al., 2020) and may occur on sandbanks and small rocks and islets
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	Seabirds, particularly during the breeding season, require regular access to the 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) 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)

A061 Tufted Duck *Aythya fuligula*

To maintain the Favourable conservation condition of Tufted Duck at Lough Derg (Shannon) 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 Tufted Duck in Ireland has decreased by 18% 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, 776 Tufted Duck were estimated to be using this SPA (4 year mean of peak counts for baseline period 1995/96 - 1999/00; see NPWS, 2013). There is 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 is 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 spatial 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), which can 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	This species is omnivorous and forages primarily in open freshwater or brackish waterbodies. Molluscs are the main food source, and hence the species prefers shallow areas (to c.15m depth), but will also consume fish, insects, amphibians and various plant materials (leaves, shoots, tubers, seeds). Tufted Duck feed primarily by diving, but to a lesser extent will also feed at the surface of waterbodies, wade in shallows, and forage onshore (e.g. for cereal grain). Utilised habitats include lakes, rivers, ponds, reservoirs, marshes, estuaries, lagoons, and (less so) coastal areas. In winter, individuals can forage alone or as part of large aggregations

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	When roosting overnight, the species uses a range of waterbodies, as noted for foraging habitat. Roosting is a critical ecological requirement for the wintering population. 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

A067 Goldeneye *Bucephala clangula*

To maintain the Favourable conservation condition of Goldeneye at Lough Derg (Shannon) 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 Goldeneye in Ireland has decreased by 67% 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, 157 Goldeneye were estimated to be using this SPA (4 year mean of peak counts for baseline period 1995/96 - 1999/00; see NPWS, 2013). There is 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 is 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 spatial 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), which can 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	This species is primarily found on coastal estuaries and inland lakes with substrate that supports the main prey species (e.g. sand, gravel, rock, and boulder substrates supporting molluscs and crustaceans). Birds forage in the shallower waters along shorelines (typically <4m deep) but may feed occasionally in deeper water (6-7m) (Phillips, 1926), and rarely up to 9m (Johnsgard, 1978). Goldeneye prefer open water without emergent or dense submerged vegetation, with good visibility. Goldeneye are a diving duck and feed on invertebrates, mostly crustaceans, molluscs and insects, but also small fish, seeds and other plant materials (see Eadie et al., 2020). In winter, birds can forage alone or or as part of a flock

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	When roosting overnight, the species uses a range of waterbodies, as noted for foraging habitat. Roosting is a critical ecological requirement for the wintering population. Goldeneye tend to roost communally. 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

A193 Common Tern *Sterna hirundo*

To restore the Favourable conservation condition of Common Tern in Lough Derg (Shannon) 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	Lough Derg SPA is situated in counties Tipperary, Clare and Galway. A breeding seabird survey of this SPA was conducted in May 2024 and no Common Tern were recorded which indicates a complete population collapse (NPWS internal files). Common Tern has historically bred at this lough since at least the 1980s with 28-37 pairs recorded then (Whilde, 1985 and NPWS internal files). In 1995 a peak count of 55 pairs was recorded (Hannon et al., 1997). Since then the population has declined to 30 pairs in 2013, 13 in 2014, 17 in 2016 and eventually to the apparent extirpation in 2024 (Copland et al., 2013; Burnell et al., 2023; NPWS internal files). Further survey work is required to establish if the 2024 zero count was an exception. The collapse of the population in this SPA runs contrary to the national population trend. The national population of natural-nesting Common Tern has increased by 91% from 2,469 pairs in 1998-2002 to 4,728 pairs in 2015-2021 (Burnell et al., 2023)
Productivity rate	Number of fledged young per AON	Sufficient to maintain a stable or increasing population	A lack of comprehensive Irish data precludes the identification of a minimum productivity rate for this species at site level. Walsh et al. (1995) sets out methods to estimate the productivity rate for this species. A productivity rate of 1.1 young per pair is needed to maintain a colony according to DiCostanzo (1980) and Nisbet (1978). However, it has been noted that colonies with productivity rates of 0.6 and above can have stable or growing tern populations. Colonies such as Rockabill Island have supported a stable/growing Common Tern population with a productivity rate between 0.6 and 1.1 (Allbrook et al., 2022)
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	Common Tern are ground nesting birds. Typically colonies are found in open areas with loose substrate, such as sand or shingle, with some scattered vegetation to provide cover for chicks (Arnold et al., 2020). Common Tern in this SPA have bred almost entirely on Goat Island. Vegetation growth may have made the island unsuitable for breeding Common Tern. Vegetation cover was manipulated at a Common Tern colony in Lake Michigan and it was shown that breeding birds preferred areas with scattered vegetation to more vegetated sites (Cook-Haley and Millenbah, 2002). Vegetation is managed at tern colonies such as Rockabill Island and Lady's Island Lake to maximise habitat available for breeding seabirds present (Allbrook et al., 2022 and Stubbings et al., 2023). The extent of vegetation management may vary depending on the physical characteristics of the colony and breeding species present but may be required on Goat Island in order to ensure suitable habitat is present for Common Tern

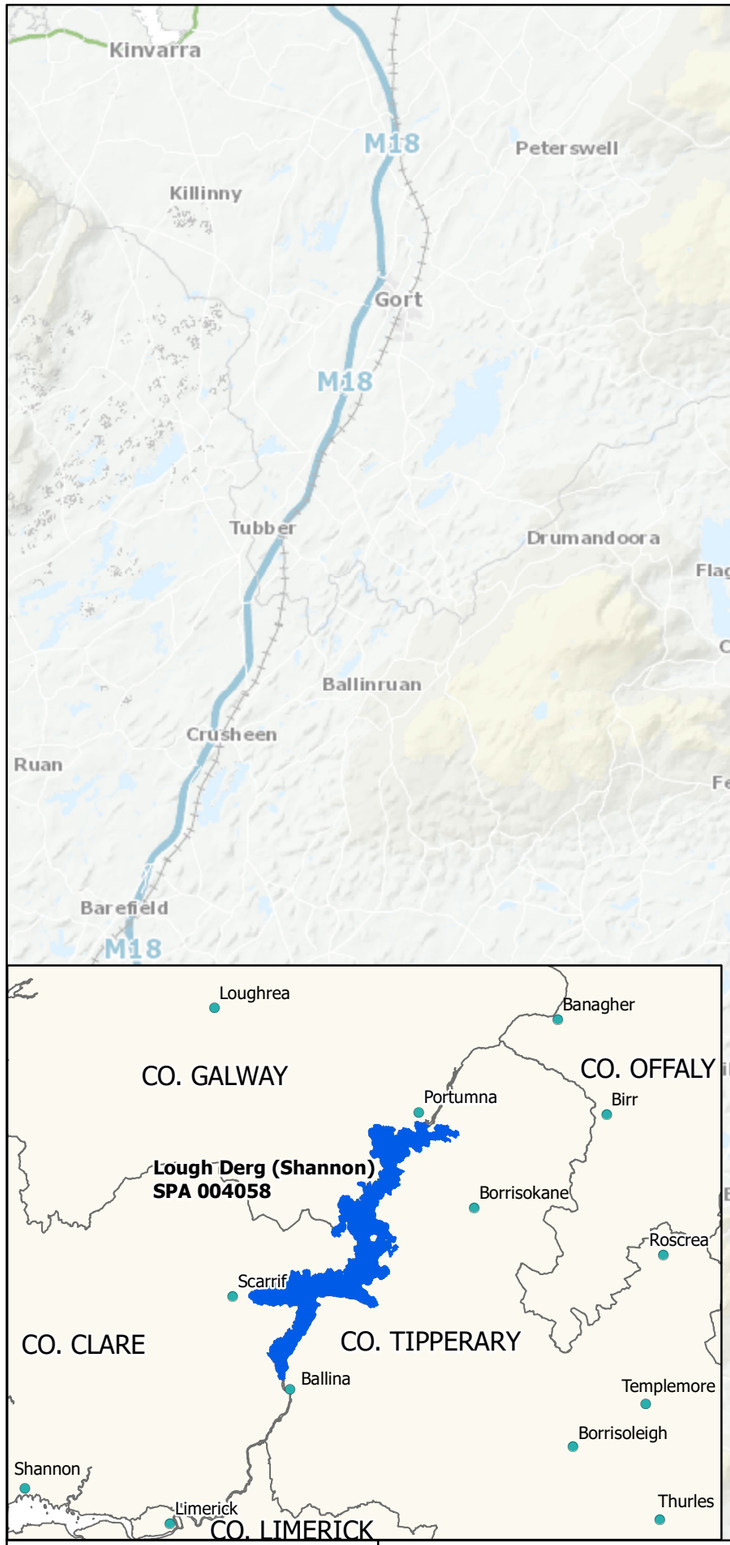
Forage spatial distribution, extent, abundance and availability	Location and hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Common Tern are largely piscivorous, feeding on small fish up to 150mm in length (Arnold et al., 2020). Common Tern feed almost entirely on live, aquatic prey (Arnold et al., 2020) so are dependent on Lough Derg and adjacent freshwater habitats for food. 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 Common Tern foraging ranges from the nest site during the breeding season, which are 6.4, 18, and 30km 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; area (hectares)	No significant increase	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) provides estimates (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) of Common Tern foraging ranges from the nest site during the breeding season, which are 6.4, 18, and 30km respectively (see Power et al., 2021)

Conservation Objectives for : Lough Derg (Shannon) SPA [004058]

A999 Wetlands

To maintain the Favourable conservation condition of Wetland habitats in Lough Derg (Shannon) SPA as a resource for the regularly-occurring migratory waterbirds that utilise these areas. This is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Wetland habitat area	Hectares	No significant loss to wetland habitat within the SPA, other than that occurring from natural patterns of variation	Any significant loss to the wetland habitat within the SPA would likely negatively impact the regularly-occurring migratory waterbirds that utilise this wetland habitat. Such loss of wetland habitat would likely reduce the diversity and abundance of waterbird species that the wetland can support. This, in turn, could negatively impact the Conservation Objectives for waterbird species listed as Special Conservation Interests in the SPA or other regularly-occurring migratory waterbird species
Wetland habitat quality and functioning	Quality and function of the wetland habitat	No significant impact on the quality or functioning of the wetland habitat within the SPA, other than that occurring from natural patterns of variation	Any significant impact on the quality, functioning and accessibility of the wetland habitat within the SPA would likely negatively impact the regularly-occurring migratory waterbirds that utilise this wetland habitat. Impacts on wetland quality, functioning and accessibility would likely reduce the diversity and abundance of waterbird species that the wetland can support. This, in turn, could negatively impact the Conservation Objectives for waterbird species listed as Special Conservation Interests in the SPA or other regularly-occurring migratory waterbird species



MAP 1:
LOUGH DERG (SHANNON) SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

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

SITE CODE:
SPA 004058; version 3
CO. CLARE, GALWAY, TIPPERARY

0 1.5 3 6 Kilometres

Legend

Lough Derg (Shannon) SPA 004058

N

Map version 1
Date: May 2024

River Shannon Callows SAC

Middle Shannon Callows SPA

Barroughter Bog SAC

Lough Derg, North-east Shore SAC

Lough Derg (Shannon) SPA

Legend

- Lough Derg (Shannon) SPA 004058
- Middle Shannon Callows SPA 004096
- River Shannon Callows SAC 000216
- Barroughter Bog SAC 000231
- Lough Derg, North-east Shore SAC 002241

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

MAP 2:
LOUGH DERG (SHANNON) SPA
CONSERVATION OBJECTIVES
OVERLAPPING AND ADJACENT SITES

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

SITE CODE:
SPA 004058; version 3
CO. CLARE, GALWAY, TIPPERARY

0 3 6 12 Kilometres

N

Map version 1
Date: May 2024