

National Parks and Wildlife Service

Conservation Objectives Series

Puffin Island SPA 004003



NPWS

An tSeirbhís Páirceanna
Náisiúnta agus Fiadhúlra
National Parks and Wildlife
Service

**National Parks and Wildlife Service,
Department of Housing, Local Government and Heritage,
90 King Street North, Dublin 7, D07 N7CV, Ireland.
Web: www.npws.ie
E-mail: natureconservation@npws.gov.ie**

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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*

004003	Puffin Island SPA
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A009	Fulmar <i>Fulmarus glacialis</i>
A013	Manx Shearwater <i>Puffinus puffinus</i>
A014	Storm Petrel <i>Hydrobates pelagicus</i>
A183	Lesser Black-backed Gull <i>Larus fuscus</i>
A200	Razorbill <i>Alca torda</i>
A204	Puffin <i>Fratercula arctica</i>

Please note that this SPA adjoins Iveragh Peninsula SAC (004154). See map 2. The conservation objectives for this site should be used in conjunction with those for the adjoining site 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 :	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 :	2024
Title :	Seabird Survey and Invasive Mammal Survey of Puffin Island 2024
Author :	Dalton R.; Healy, T.; O'Connor, M.; Ambrose, J; Coffey S.
Series :	Unpublished Report

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 :	1911
Title :	The fulmar petrel breeding in Ireland
Author :	Ussher, R.J.
Series :	The Irish Naturalist, 20(9), pp.149-152
Year :	1914
Title :	Fulmars, Gannets, and Other Sea-Birds on the Skelligs
Author :	Barrington, R. M.
Series :	The Irish Naturalist
Year :	1954
Title :	The Birds of Ireland. Their Migrations and Habits. Assessed by G.R. Humphreys
Author :	Kennedy, P.G.; Ruttledge R.F.; Scroope, C.F.
Series :	London: Oliver and Boyd
Year :	1966
Title :	Ireland's Birds: their distribution and migrations
Author :	Ruttledge, R.F.
Series :	Published by HF & G Witherby, London
Year :	1977
Title :	Handbook of the Birds of Europe, the Middle East and North Africa. The birds of the Western Palearctic, Vol. 1
Author :	Cramp, S.; Simmons, K.E.L.
Series :	Oxford University Press, Oxford

Year :	1991
Title :	The status of seabirds in Britain and Ireland
Author :	Lloyd, C.; Tasker, M.L.; Partridge, K.
Series :	Poyser Monographs Volume: 50
Year :	1995
Title :	Seabird monitoring handbook for Britain and Ireland: a compilation of methods for survey and monitoring of breeding seabirds
Author :	Walsh, P.; Halley, D.J.; Harris, M.P.; del Nevo, A.; Sim, I.M.W.; Tasker, M.L.
Series :	JNCC, Peterborough
Year :	1999
Title :	Diet of the northern fulmar <i>Fulmarus glacialis</i> : reliance on commercial fisheries?
Author :	Phillips, R.A.; Petersen, M.K.; Lilliendahl, K.; Solmundsson, J.; Hamer, K.C.; Camphuysen, C.J.; Zonfrillo, B.
Series :	Marine Biology, 135 (1), pp.159-170
Year :	2003
Title :	Implications for seaward extensions to existing breeding seabird colony Special Protection Areas
Author :	McSorley, C.A.; Dean, B.J.; Webb, A.; Reid J.B.
Series :	JNCC Report No. 329
Year :	2004
Title :	Seabird populations of Britain and Ireland
Author :	Mitchell, P.I.; Newton, S.F.; Ratcliffe, N.; Dunn, T.E.
Series :	Poyser, London
Year :	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 :	2014
Title :	The Lesser Black-backed Gull <i>Larus fuscus</i> in England: how to resolve a conservation conundrum
Author :	Ross-Smith, V.H.; Robinson, R.A.; Banks, A.N.; Frayling, T.D.; Gibson, C.C.; Clark, J.A.
Series :	Seabird, 27 (October), pp.41-61
Year :	2018
Title :	Developing and assessing methods to census and monitor burrow-nesting seabirds in Ireland
Author :	Arneill, G.E.
Series :	PhD thesis, University College Cork
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 :	Lesser Black-backed Gull (<i>Larus fuscus</i>), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors)
Author :	Burger, J.; Gochfeld, M.; Kirwan, G. M.; Christie, D. A.; de Juana, E
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2020
Title :	Razorbill (<i>Alca torda</i>), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Lavers, J.; Hipfner, J. M.; G. Chapdelaine, G.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA

Year :	2020
Title :	Atlantic Puffin (<i>Fratercula arctica</i>), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Lowther, P. E.; Diamond, A. W.; Kress, S. W.; Robertson, G. J.; Russell, K.; Nettleship, D. N.; Kirwan, G. M.; Christie, D. A.; Sharpe, C. J.; Garcia, E. F. J.; Boesman, P. F. D.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2021
Title :	European Storm-Petrel (<i>Hydrobates pelagicus</i>), version 1.1. In Birds of the World (Editor not available)
Author :	Carboneras, C.; Jutglar, F.; Kirwan, G.M.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
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 :	Manx Shearwater <i>Puffinus puffinus</i>
Author :	Lee, D.S.; Haney, J.C.; Carboneras, C.; Jutglar, F.; Kirwan, G.M.
Series :	Birds of the World (N. D. Sly, Editor) Version: 1.1
Year :	2024
Title :	Atlantic Puffin (<i>Fratercula arctica</i>)
Author :	JNCC
Series :	https://jncc.gov.uk/our-work/atlantic-puffin-fratercula-arctica/
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

Conservation Objectives for : Puffin Island SPA [004003]

A009 Fulmar *Fulmarus glacialis*

To maintain the Favourable conservation condition of Fulmar in Puffin Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Apparently Occupied Sites (AOS)	Long term SPA population trend is stable or increasing	Fulmar were first recorded as a breeding bird in Ireland in 1911, and in Co. Kerry it was first recorded breeding in 1913 on the Skelligs (Ussher, 1911; Barrington, 1914). It is likely that Puffin Island was colonised shortly after, given the significant rate at which the Fulmar population and range has expanded in Ireland since. An estimated 701 pairs of Fulmar were recorded breeding on Puffin Island in 1985 (Lloyd et al., 1991). The population declined to 447 pairs in 2000 before recovering to 653 pairs in 2011 (Mitchell et al., 2004; NPWS internal files). Burnell et al. (2023) reported a population of 670 pairs in 2018. The most recent population estimate of 719 pairs in 2024 is the highest count on record for this SPA (Dalton et al., 2024) and is broadly similar to the 1985 estimate for the island. The national population estimate increased by 89% between 1985 - 1988 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. Trewby et al. (2007) reported that the average productivity from Lambay Island SPA was 0.32 (\pm 0.05 SE) chicks fledged per Apparently Occupied Sites (AOS) in 2007 (246 pairs across three 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. An analysis of the breeding success of Fulmar in the United Kingdom over a 25 year period estimated a mean breeding success of 0.39 and speculated this would result in a population decline (Cook and Robinson, 2010). They estimated that a breeding success of 0.5 would allow populations of Fulmar to stabilise and potentially increase
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 Fulmar. Typically, Fulmar nest near the tops of grassy cliffs on relatively wide ledges (Mitchell et al., 2004). Nesting Fulmar are widely distributed in this SPA but Bird Cove on the west coast of Puffin Island holds relatively large numbers (Dalton et al., 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	The colonisation of Ireland and Britain by Fulmar over the last two centuries has been largely attributed to their close association with fisheries, but contemporary dietary studies indicate that they also feed on a wide variety of prey, including sandeels, crustaceans, and squid (Phillips et al., 1999). 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 Fulmar foraging ranges from the nest site during the breeding season, which are 135km, 542km, and 2,736km 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). Work carried out in the UK found that the highest densities of Fulmar performing these behaviours occurred within 2km of the breeding colony (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. Work carried out in the UK found that the highest densities of Fulmar performing these behaviours occurred within 2km of the breeding colony (McSorley et al., 2003). 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 Fulmar foraging ranges from the nest site during the breeding season, which are 135km, 542km, and 2,736km respectively (see Power et al., 2021)

Conservation Objectives for : Puffin Island SPA [004003]

A013 Manx Shearwater *Puffinus puffinus*

To maintain the Favourable conservation condition of Manx Shearwater in Puffin Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Apparently Occupied Sites (AOS)	Long term SPA population trend is stable or increasing	Manx Shearwater are nocturnal and nest underground on islands which leads to difficulties in surveying this species and generating accurate population estimates. Survey methods and analytical methods have changed between surveys and are likely to change in the future (Burnell et al., 2023). Therefore, caution is required when comparing estimates. Ussher and Warren (1900) describe Puffin Island as one of the largest Manx Shearwater colonies in Ireland. The population of Manx Shearwater was estimated to be between 10,000 and 20,000 pairs in 1955 (Ruttledge, 1966). In 2001 an estimated 6,329 pairs of Manx Shearwater bred on Puffin Island (Mitchell et al., 2004). The population was lower in 2018 with 3,381 pairs recorded (Burnell et al., 2023). The most recent population estimate in 2024 was similar with an estimated 3,575 pairs of breeding Manx Shearwater recorded (Dalton et al., 2024)
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. An analysis of monitoring data from 2021, 2023, and 2024 from Skellig Michael, Co. Kerry produced an estimate of 0.54 presumed fledged chick per active nest (NPWS internal files). In 2023, a productivity rate of 0.60 across three UK colonies was reported (Harris et al., 2024). Invasive mammals such as Brown Rat <i>Rattus norvegicus</i> and American Mink <i>Neogale vison</i> can have deleterious impacts on Manx Shearwater breeding productivity and numbers. Recent biosecurity work indicated that this SPA is free of invasive mammals (Dalton et al., 2024). However, Mink have been recorded and controlled on the island in previous years
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	Manx Shearwater nest in burrows and under boulders. Colonies are typically found on steep grassy slopes on offshore islands where there is reduced predation risk (Lee et al., 2023). Dalton et al. (2024) identifies the slopes surrounding Pollacocka Cove on Puffin Island as a relatively important area for this species
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	Manx Shearwater feed primarily on clupeiform fish such as Sprat (<i>Sprattus sprattus</i>) and Herring (<i>Clupea harengus</i>); squid and other marine invertebrates may also form part of their diet (Lee et al., 2023). 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 foraging ranges from the nest site during the breeding season, which are 136km, 1,347km, and 2,890km 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). Manx Shearwater are known to aggregate on the water to form large rafts in the vicinity of 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 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 foraging ranges from the nest site during the breeding season, which are 136km, 1,347km, and 2,890km respectively (see Power et al., 2021)

Conservation Objectives for : Puffin Island SPA [004003]

A014 Storm Petrel *Hydrobates pelagicus*

To maintain the Favourable conservation condition of Storm Petrel in Puffin Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Apparently Occupied Sites (AOS)	Long term SPA population trend is stable or increasing	Storm Petrel are small, nocturnal and nest underground on offshore islands which leads to difficulties in surveying this species and generating accurate population estimates. Survey methods and analytical methods for this species have changed between surveys and are likely to change in the future (Burnell et al., 2023). Therefore, caution is required when comparing estimates. Ussher and Warren (1900) notes that Storm Petrel were breeding on Puffin Island in great numbers. The population of Storm Petrel in this SPA was estimated to be less than one 1,000 pairs in 1955 (Ruttledge, 1966). Based on a 2001 survey an estimated 5,177 pairs of Storm Petrel bred on Puffin Island (Mitchell et al., 2004). The most recent survey in 2024 reported an estimate of 3,343 pairs (Dalton et al., 2024)
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. There is a lack of published productivity estimates for this species. On Skellig Michael there is an ongoing programme of work to develop a method to produce robust productivity estimates for Storm Petrel at that site. In the UK there is insufficient data to produce productivity trends due to the difficulties involved in monitoring breeding success for this burrow and crevice nesting species (Harris et al., 2024). Invasive mammals such as Brown Rat <i>Rattus norvegicus</i> and American Mink <i>Neogale vison</i> can have deleterious impacts on Storm Petrel productivity and numbers. Recent biosecurity work indicated that this SPA is free of invasive mammals (Dalton et al., 2024). However, Mink have been recorded and controlled on the island in previous years
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 Storm Petrel. Storm Petrel breed on rocky ground on offshore islands and stacks, and occasionally on headlands (Carboneras et al., 2021). Storm Petrel use a range of nesting habitats, including natural crevices, under rocks and boulders, in stone walls, in self-excavated burrows, and in burrows originally excavated by other species (Cramp and Simmons, 1977). Dalton et al. (2024) identifies the boulder-fields which were free of soil and vegetation on Puffin Island as having the highest densities of Storm Petrel
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 primary diet of the Storm Petrel is small fish (<i>Sprattus sprattus</i> , <i>Ammodytes marinus</i>), squid, and crustaceans (Carboneras et al., 2021). Based on several studies, Woodward et al. (2019) estimate a mean-max foraging range of 336km for Storm Petrel from the nest site during the breeding season (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) estimate a mean-max foraging range of 336km for Storm Petrel from the nest site during the breeding season (see Power et al., 2021)

Conservation Objectives for : Puffin Island SPA [004003]

A183 Lesser Black-backed Gull *Larus fuscus*

To restore the Favourable conservation condition of Lesser Black-backed Gull in Puffin Island 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	In 1985, 55 breeding pairs of Lesser Black-backed Gull were recorded on Puffin Island (Lloyd et al., 1991). The population increased to 139 pairs in 2000 (Mitchell et al., 2004) and increased further to 308 pairs in 2011 (NPWS internal files), the peak count for this SPA. A similar population of 291 pairs was recorded in 2018 (Burnell et al., 2023). However, the most recent population estimate was significantly lower with 96 pairs recorded (Dalton et al., 2024). The natural-nesting population in Ireland has increased by 163% between 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. Trewby et al. (2007) reported that the mean productivity of Lesser Black-backed Gull from Lambay Island SPA was 1.66 (± 0.14 SE) chicks fledged per pair in 2007 (18 pairs across three 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. Ross-Smith et al. (2014) summarise Lesser Black-backed Gull productivity in some UK colonies, and colonies with productivity rates above 1.0 had increasing population trends
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. Lesser Black-backed Gull nest colonially, often with other gull species on offshore islands and coastal cliffs (Mitchell et al., 2004). The majority of the Lesser Black-backed Gull population in 2024 nested on the south-western ridge of the island (Dalton et al., 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	The diet of Lesser Black-backed Gull is diverse and opportunistic. This species can forage over both terrestrial and aquatic habitats. Frequent prey items include small fish, aquatic invertebrates, bird's eggs and chicks, trawler discards, rodents, and berries (Burger et al., 2020). 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 Lesser Black-backed Gull, which are 43km, 127km, and 533km 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 of foraging ranges from the nest site during the breeding season (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) for Lesser Black-backed Gull, which are 43km, 127km, and 533km respectively (see Power et al., 2021)

Conservation Objectives for : Puffin Island SPA [004003]

A200 Razorbill *Alca torda*

To restore the Favourable conservation condition of Razorbill in Puffin Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Individuals (IND)	Long term SPA population trend is stable or increasing	A population of 600 individual Razorbill was recorded on Puffin Island in 1985 (Lloyd, 1991), the peak count for this site. An incomplete survey conducted in 2000 recorded only 35 individuals (Mitchell et al., 2004). However, this estimate is similar to complete counts that followed with 32 individuals recorded in 2011 and 24 individuals recorded in 2015 (NPWS internal files). The population recovered somewhat to 89 individuals in 2018 (Burnell et al., 2023) but declined again to 35 individuals in 2024 (Dalton et al., 2024), an overall decrease of 94% since 1985. In contrast, the estimated national population of Razorbill has increased by 57% between surveys in 1985 - 1988 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. Trewby et al. (2007) reported that the average productivity from Lambay Island SPA was 0.65 (\pm 0.03 SE) chicks fledged per Apparently Occupied Sites (AOS) in 2007 (270 pairs across six 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. An analysis of the breeding success of Razorbill in the United Kingdom over a 25 year period determined that a breeding success of 0.55 would result in a slowly decreasing population (Cook and Robinson, 2010)
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 the species. Razorbill breed in rocky coastal regions on steep mainland cliffs and rocky offshore islands (Lavers et al., 2020). Nesting Razorbill in 2024 were concentrated primarily on the south face of the southern peninsula and in a cove on the northern tip of the SPA (Dalton et al., 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	The diet of Razorbill comprises of schooling fish including herring and sandeels. Crustaceans and polychaetes may also be important in adult diets (Lavers et al., 2020). 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 Razorbill which are 61km, 89km, and 313km 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 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). Studies in the UK found the highest densities of Razorbill performing these behaviours occurred within 1km of the breeding colony (McSorley et al., 2003)
Barriers to connectivity	Number, location, shape, 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. Studies in the UK found the highest densities of Razorbill performing these behaviours occurred within 1km of the breeding colony (McSorley et al., 2003). 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 Razorbill which are 61km, 89km, and 313km respectively

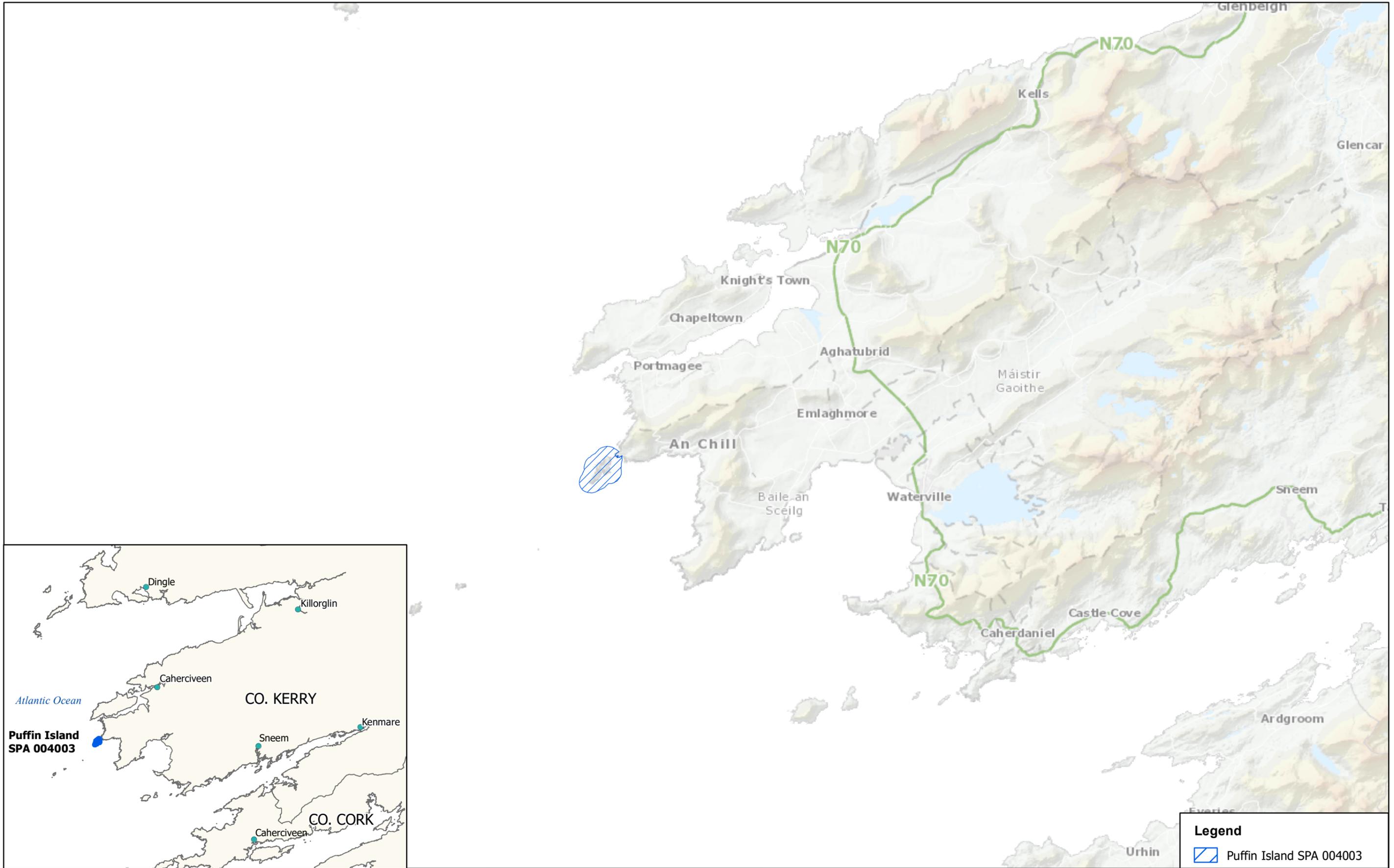
Conservation Objectives for : Puffin Island SPA [004003]

A204 Puffin *Fratercula arctica*

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

Attribute	Measure	Target	Notes
Breeding population size	Individuals (IND)	Long term SPA population trend is stable or increasing	As Puffin burrows are often sited on steeply sloping ground largely inaccessible to surveyors, counts of the number of individual birds associated with the area is a survey method often used, though it is less accurate than counting the number of occupied burrows during the breeding season (see Arneill, 2018; Walsh et al., 1995). Large numbers of breeding Puffin have been present on Puffin Island historically (Ussher and Warren, 1900; Kennedy et al., 1954; Ruttledge, 1966). A population of 7,500 individuals was recorded in 1985 (Lloyd et al., 1991). Puffin Island was surveyed in 2000 and 5,125 individuals were recorded (Mitchell et al., 2004). Subsequent counts in 2011 and 2019 yielded lower numbers of 1,360 and 2,250 individuals recorded respectively (NPWS internal files, Burnell et al., 2023). However, the most recent survey in 2024 recorded 7,438 individuals (Dalton et al., 2024)
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. 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. In Wales, an average of 0.71 chicks were fledged per apparently occupied burrow between 1986 and 2019 (JNCC, 2024). In this time period the Welsh population of Puffin increased (Burnell et al., 2023). Invasive mammals such as Brown Rat <i>Rattus norvegicus</i> and American Mink <i>Neogale vison</i> can have deleterious impacts on Puffin productivity and numbers. Recent biosecurity work indicated that this SPA is free of invasive mammals (Dalton et al., 2024). However, Mink have been recorded and controlled on the island in previous years
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 the species. Puffin are a highly colonial species with pairs typically nesting underground in burrows dug in the soil of offshore islands. If such habitat is in short supply, Puffin can nest among boulder screes, or at low densities in cracks in sheer cliffs (Mitchell et al., 2004). Dalton et al. (2024) identifies the north face of the south-western ridge to be an important area for Puffin burrows
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 Puffin predominantly consists of small to mid-sized (5 - 15cm) schooling midwater fish including Sprat (<i>Sprattus sprattus</i>), sandeel (<i>Ammodytes</i> spp.), and Herring (<i>Clupea harengus</i>) (Lowther et al., 2020). 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 Puffin, which are 62km, 137km, and 383km 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	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). Studies in the UK found that the highest densities of Puffin performing these behaviours occurred within 1km of the breeding colony (McSorley et al., 2003)
Barriers to connectivity	Number, location, shape, 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. Studies in the UK found that the highest densities of Puffin performing these behaviours occurred within 1km of the breeding colony (McSorley et al., 2003). 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 Puffin, which are 62km, 137km, and 383km respectively (see Power et al., 2021)



Legend

 Puffin Island SPA 004003



**MAP 1:
PUFFIN ISLAND SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION**

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

**SITE CODE:
SPA 004003; version 3
CO. KERRY**

0 1.25 2.5 5 Kilometres



The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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arna atáirgeadh faoin rannán mapála Náisiúnta d'uimhir cheadúnais Tailte Éireann CYAL50351092

**Map version 1
Date: July 2024**



