Lindisfarne Special Protection Area and Ramsar

Evidence Pack

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Further information

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Contents

1. Site Details

From Lindisfarne Special Protection Area citation:

Lindisfarne, or Holy Island, is a large island off the north east coast of Northumberland. The Special Protection Area (SPA), designated in 1990, is also a Ramsar site and a National Nature Reserve.

Lindisfarne has a road connecting the island to the mainland, which is only accessible at low tide. There are a wide range of coastal habitats within the SPA, which support a large assemblage of birds. Large intertidal mud and sandflats provide an important food source for wading birds, such as the grey plover, bar-tailed godwit, redshank and dunlin. The mudflats host an important number of invertebrate prey, including polychaete worms and bivalves. The light-bellied brent geese and wigeon also feed upon the *Zostera* spp. and *Ulva* spp. which grow upon the mudflats and are some of the largest areas in the north-east of England. This provides a food source for some of the geese and the wigeon, as well as a refuge for roosting birds when the tide is high. Rafts of sea ducks overwinter in the shallow waters surrounding the island, including long-tailed duck, eider and common scoter.

These waters also provide an important foraging area for tern species during the breeding season. The island also has other habitats which support the bird population, including large sand dune habitats and a rocky shore.

The designated features of the SPA include the breeding little tern (*Sternula albifrons*) and roseate tern (*Sterna dougallii*), although the roseate has not bred on the reserve in recent years. The non-breeding SPA features are: bar-tailed godwit (*Limosa lapponica*), light-bellied brent goose (*Branta bernicla hrota*), common scoter (*Melanitta nigra*), dunlin (*Calidris alpina*), eider (*Somateria mollissima*), golden plover (*Pluvialis apricaria*), grey plover (*Pluvialis squatarola*), greylag goose (*Anser anser*), long-tailed duck (*Clangula hyemalis*), red-breasted merganser (*Mergus serrator*), redshank (*Tringa totanus*), ringed plover (*Charadrius hiaticula*), sanderling (*Calidris alba*), shelduck (*Tadorna tadorna*), whooper swan (*Cygnus cygnus*) and wigeon (*Mareca penelope*).

Lindisfarne SPA also supports an internationally important assemblage of non-breeding waterbirds.

2. Reasons for European Site Designation

The SPA is designated for the following features:

- Bar-tailed godwit, *Limosa lapponica* - A157, nb
- Common scoter, *Melanitta nigra* - A065, nb
- Dunlin, Calidris *alpina alpina* - A672, nb
- Eider, *Somateria mollissima* - A063, nb

- Golden plover, *Pluvialis apricaria* - A140, nb
- Grey plover, *Pluvialis squatarola* - A141, nb
- Greylag goose, *Anser anser* - A043, nb
- Light-bellied brent goose, *Branta bernicla hrota* - A674-B, nb
- Little tern, *Sterna albifrons* - A195, b
- Long-tailed duck, *Clangula hyemalis* - A064, nb
- Red-breasted merganser, *Mergus serrator* - A069, nb
- Redshank, *Tringa totanus* - A162, nb
- Ringed plover, *Charadrius hiaticula* - A137, nb
- Roseate tern, *Sterna dougallii* - A192, b
- Sanderling, *Calidris alba* - A144, nb
- Shelduck, *Tadorna tadorna* - A048, nb
- Waterbird assemblage
- Whooper swan, *Cygnus cygnus* - A038-B, nb
- Wigeon, *Mareca penelope* - A050, nb

The Ramsar is designated for the following features:

- Bar-tailed godwit, *Limosa lapponica* - Wintering
- Greylag goose, *Anser anser* - Wintering
- Light-bellied brent goose, *Branta bernicla horta* - Wintering
- Redshank, *Tringa totanus* - Wintering
- Ringed plover, *Charadrius hiaticula* - Wintering
- Waterbird assemblage - Wintering
- Wigeon, *Mareca penelope* - Wintering

Links to Conservation Advice:

- Conservation Objectives
- JNCC Ramsar Information Sheet

3. Nutrient Pressures and Water Quality Evidence

Nutrient pressure(s) for which this site is unfavourable:

- Nitrogen

In the Conservation Objectives Supplementary advice for Lindisfarne SPA the target for the site related to nutrients is **to 'restore water quality to mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features.**'

The Water Framework Directive (WFD) Dissolved Inorganic Nitrogen (DIN), Phytoplankton and Opportunistic Macroalgae 'weight of evidence' assessment criteria are currently used to assess the condition for Lindisfarne SPA/Ramsar site. Failure to achieve Good Ecological Status for these elements would mean the site is in unfavourable condition in relation to nutrients.

Classification status Holy Island & Budle Bay (HIBB) under the Water Framework Directive is currently failing for Dissolved Inorganic Nitrogen (DIN), and Opportunistic Macroalgae. The overall waterbody classification is classed as moderate in 2016, the 2019 draft classification is moderate. Source: Northumbria River Basin District 2019 – 2020 WFD Investigation, Environment Agency.

Table 1 – Summary of WFD status (UC – Uncertain, QC – Quite certain)

	Classification year					
WFD Element	2012	2013	2014	2015	2016	2019
Opportunistic Macroalgae	Good	Moderate (QC)	Moderate (UC)	Moderate (UC)	Moderate (UC)	Moderate (UC)
Dissolved Inorganic Nitrogen (DIN)	Good	Good	Moderate (UC)	Moderate (QC)	Moderate (QC)	Moderate (QC)

Water quality data and flow was collected/gauged from 10 freshwater sites twice a month (Nov 2016 – Nov 2017). This was combined with additional water quality data collected and spanned years 2016 to 2020.

Opportunistic macroalgae forms dense mats upon mudflats and sandflats and become entrained in the sediment. During the ebb and flood of the tide these mats can become dislodged and drift to form even denser mats. As a result of these characteristics, the opportunistic macroalgae can smother other intertidal habitats such as seagrass and saltmarsh (figures 2a-c). In addition, the smothering nature of the mats creates anoxic sediment below it, which prevents colonisation of sediment by invertebrates. This in turn can lead to impacting the birds which depend on the intertidal muds for food. So it is clear that the extensive growth of opportunistic macroalgae can lead to a deterioration of multiple other elements within the coastal ecosystem. There is evidence that secondary impacts of smothering has been observed, including deterioration of seagrass and erosion of saltmarsh within Holy Island and Budle Bay.

Therefore, the Lindisfarne SPA/Ramsar has been assessed as at risk of eutrophication, using the Environment Agency's Weight of Evidence approach. This takes into account assessments of the Water Framework Directive Dissolved inorganic nitrogen levels which are high within the site, combined with opportunistic macroalgae and phytoplankton quality

elements using the respective assessment tools. Adverse effects to integrity should be avoided.

Therefore opportunistic macroalgae levels should be restored so there is no adverse effect to the feature through limited algal cover (<15%) and low biomass (< 500 g m2) of macroalgal blooms in the available intertidal habitat, with affected area of available intertidal habitat affected by opportunistic macroalgae less than 15 %. There should also be limited (<5%) entrainment of algae in the underlying sediment (all accounting for seasonal variations and fluctuations in growth). Phytoplankton levels should be restored to above a WFD assessment tool score of 0.6, where there is only a minor (a) decline in species richness, and (b) disturbance to the diatom- dinoflagellate succession in the spring bloom compared to reference conditions.

High concentrations of nutrients in the water column can cause phytoplankton and opportunistic macroalgae blooms, leading to reduced dissolved oxygen availability. This can impact sensitive fish, epifauna and infauna communities, and hence adversely affect the availability and suitability of bird breeding, rearing, feeding and roosting habitats. The aim is to seek no further deterioration and improve water quality.

Any nutrients entering the catchment upstream of the locations which are exceeding their nutrient targets, will make their way downstream and have the potential to further add to the current exceedance. Therefore, the entire catchment upstream of Lindisfarne is included in the catchment map.

4. Additional Information

Habitat type impacted by nutrients – Estuarine/Coastal.

Lindisfarne SPA is legally underpinned by Lindisfarne Site of Special Scientific Interest (SSSI), and Lindisfarne Ramsar is legally underpinned by Lindisfarne SSSI and Northumberland Shore SSSI.

Interest features of these SSSIs include:

Lindisfarne SSSI

- Aggregations of breeding birds - Little tern, *Sterna albifrons*
- Aggregations of breeding birds - Roseate tern, *Sterna dougallii*
- Aggregations of non-breeding birds - Bar-tailed godwit, *Limosa lapponica*
- Aggregations of non-breeding birds - Brent goose (light-bellied), *Branta bernicla hrota*
- Aggregations of non-breeding birds - Common scoter, *Melanitta nigra*
- Aggregations of non-breeding birds - Curlew, *Numenius arquata*
- Aggregations of non-breeding birds - Dunlin, *Calidris alpina alpina*
- Aggregations of non-breeding birds - Golden plover, *Pluvialis apricaria*
- Aggregations of non-breeding birds - Grey plover, *Pluvialis squatarola*

- Aggregations of non-breeding birds - Greylag goose, *Anser anser*
- Aggregations of non-breeding birds - Redshank, *Tringa totanus*
- Aggregations of non-breeding birds - Ringed plover, *Charadrius hiaticula*
- Aggregations of non-breeding birds - Sanderling, *Calidris alba*
- Aggregations of non-breeding birds - Shelduck, *Tadorna tadorna*
- Aggregations of non-breeding birds - Whooper swan, *Cygnus cygnus*
- Aggregations of non-breeding birds - Wigeon, *Mareca penelope*
- EC - Carboniferous - Permian Igneous
- EC - Dinantian
- FB - Quaternary of NE England
- Fixed dune grassland
- Humid dune slacks
- IA - Coastal Geomorphology
- Invert. assemblage F111 bare sand & chalk
- Invert. assemblage F112 open short sward
- Invert. assemblage W221 undisturbed fluctuating marsh
- Littoral sediment
- Lowland calcareous grassland (CG7)
- Lowland dry heath
- Sand dune; strandline, embryo and mobile dunes (SD1-6)
- Vascular plant assemblage

Northumberland Shore SSSI

- Aggregations of non-breeding birds - Golden plover, *Pluvialis apricaria*
- Aggregations of non-breeding birds - Purple sandpiper, *Calidris maritima*
- Aggregations of non-breeding birds - Redshank, *Tringa totanus*
- Aggregations of non-breeding birds - Ringed plover, *Charadrius hiaticula*
- Aggregations of non-breeding birds - Sanderling, *Calidris alba*
- Aggregations of non-breeding birds - Turnstone, *Arenaria interpres*

Appendix

Component SSSIs Map

Map of component SSSIs of Lindisfarne SPA and Ramsar

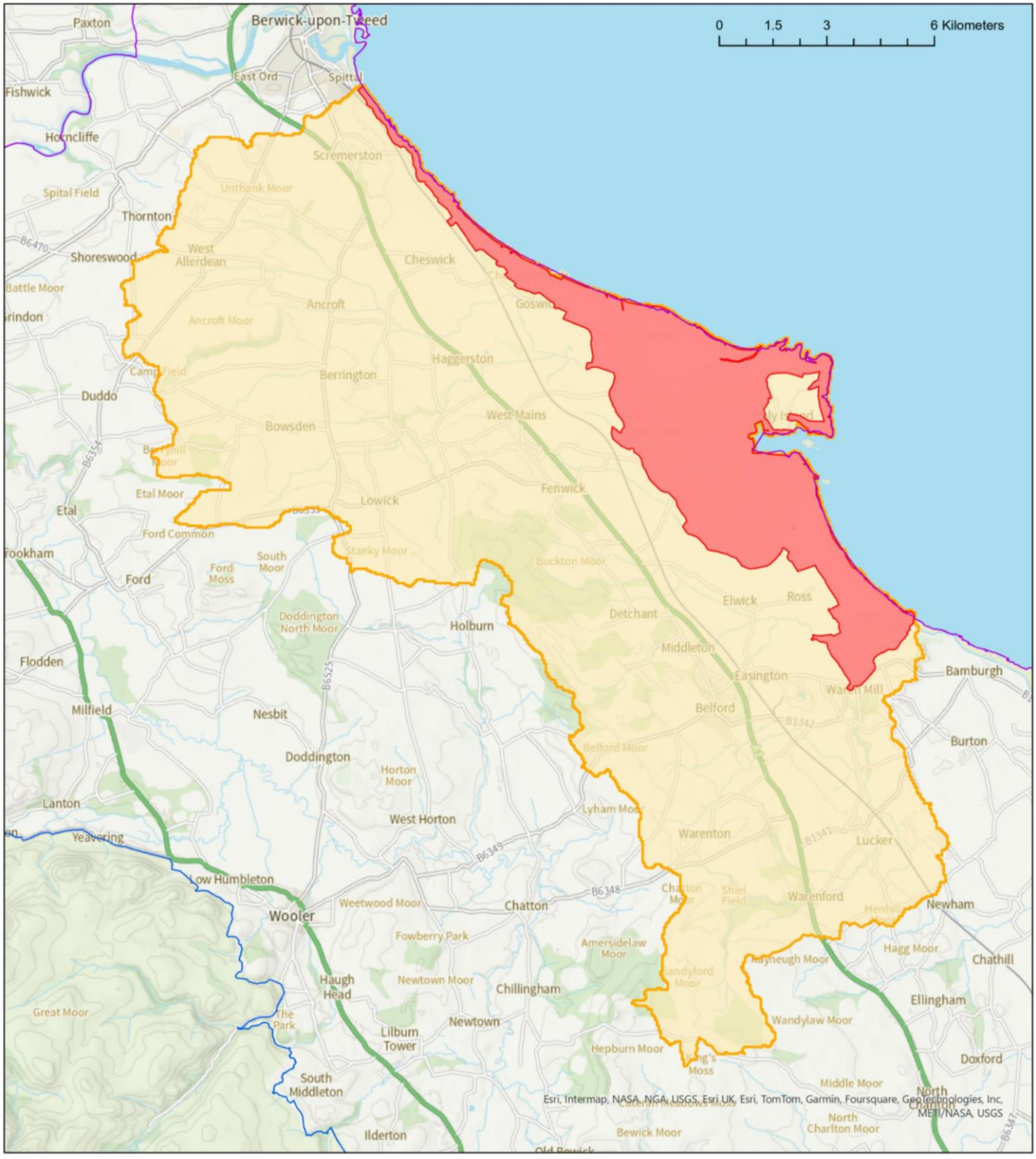
Catchment Area Update (2024)

Natural England has undertaken a review of all the Nutrient Neutrality catchment areas. This review has considered updated surface water catchment data and evidence held by both Natural England and the Environment Agency. Consideration has also been given to data and evidence provided by other parties such as Local Planning Authorities. The information below summarises changes.

The update has made a minor change to the southern part of the catchment, where the extent has been slightly reduced. This change has been made in order to remove a small area that Environment Agency data shows to drain to a different river catchment.

Publishing of catchment area data

The Geographic Information Systems (GIS) data is available on Defra Data Services Platform.



Area where Natural England's Nutrient Neutrality advice applies for Lindisfarne SPA / Ramsar

European protected sites requiring nutrient neutrality strategic solutions

- Local Authorities
- National Parks
- Component SSSIs of impacted designated site
- Surface water catchment area of relevant designated site due to nutrient pollution

Produced by Nutrient Mitigation Scheme Team

NATURAL ENGLAND

List of abbreviations

DIN – Dissolved Inorganic Nitrogen

HIBB – Holy Island & Budle Bay

SPA – Special Area for Conservation

SSSI – Site of Special Scientific Interest

UNESCO – United Nations Educational, Scientific and Cultural Organisation

WFD – Water Framework Directive

Glossary

Ramsar – A Ramsar site is a wetland site designated to be of international importance under the Ramsar Convention, also known as the 'The Convention on Wetlands', an intergovernmental environmental treaty established in 1971 by UNESCO.

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