



National
Trust

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23rd March 2023

Online submission: Planning Inspectorate

Your Ref: EN010109

Our Ref: 20033322

Dear Sir/Madam

Application by Equinor for an Order Granting Development Consent for the Sheringham and Dudgeon Extension Project (EN010109)

Submission in lieu of attendance at Issue Specific Hearing 5 (Offshore Matters)

Thank you for the invitation from the Examining Authority (ExA) to speak at Issue Specific Hearing 5. We note that the National Trust is listed as an Interested Party that the ExA would like to hear from at the Hearing. Unfortunately, due to annual leave and resource constraints we are unable to attend this Hearing. However, we have reviewed the detailed agenda and would like to offer our comments in writing on agenda item 5 (i) and (ii). We will review the recording of the Hearing and address any further points in our response at Deadline 3 if necessary.

Agenda Item 5: The extent, suitability and security of Habitats Regulation Assessment compensation for offshore ornithology.

5 (i) The Statement of Common Ground with the National Trust [REP2- 046] suggests that there need not be any further discussion on the Farne Islands compensation

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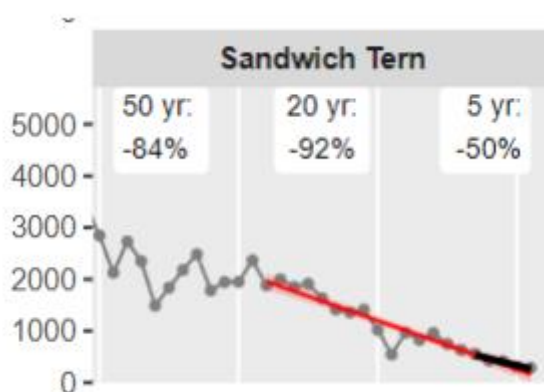
measures. However, before discounting this and moving on, the Examining Authority request that the National Trust:

a) provide a copy of the Farne Islands Management Plan to the Examination and

b) explain why the proposed measures do not represent additionality?

- a) A copy of the National Trust's National Trust 'Delivering for Nature at Farne Islands NNR, Site Management Plan 2022-26 (draft)' is included as an attachment to this letter. This is still being edited and has not yet been signed off by Natural England.
- b) Compensation measures to improve breeding success for Sandwich terns are proposed by the developer for the Farne Islands. However, the National Trust is not confident that these will be effective or demonstrate additionality over the management measures required to restore and maintain favourable status.

The National Trust actively manages the Farne Islands for Sandwich tern and other species in line with the NNR Site Management Plan. However, numbers of Sandwich tern are steeply declining in the short and long term on the islands, despite active site management to attempt to reverse declining population trends and restore their favourable condition.



Source: National Trust Delivering for Nature at Farne Islands NNR, Site Management Plan 2022-26 (Draft), Table 1

Habitat change and predation are likely to be a factor. There is a strong indication that predation by large gulls is an issue. Herring and Lesser Black Backed Gull numbers have increased in the Farnes, but it should be noted that these are Red and Amber listed species of conservation concern themselves. There is a history of movement of Sandwich terns between Brownsman, Knoxes and Inner Farne (although Knoxes has only had breeding birds on one occasion and so potential there does not seem high). We are not completely sure of the factors that influence tern movement between islands. When we understand more about the reasons, there may be scope to expand Sandwich tern management and attraction to those historical areas. It is important, also, to recognise that there are wider pressures on seabirds through climate change and overfishing in particular, and these could be occurring in a wide range of locations, including outside the breeding season, and having impacts on population trends.

The Farne Islands and other seabird colonies have also been badly by Avian Influenza in 2022. This presents serious concern for Sandwich tern and other seabirds conservation status. We do not expect numbers to increase in 2023 given the impact of Avian Influenza, and so do not think we will be able to demonstrate the recovery of bird numbers to favourable status for a number of years, let alone additionality to compensate the proposed development.

The compensation measures proposed by the applicant must be above and beyond normal site management, and features should be in favourable condition to demonstrate any additionality.

The draft Site Management Plan 2020-2026 states “it is imperative that we carry out interventions known to boost common and Sandwich tern, roseate tern, eider and cormorant family species on the islands”. Management measures set out in the Plan include:

- Vegetation management
- Provision of more chick shelters
- Creation of nesting plots
- Appropriate attraction lures in areas where Sandwich terns formerly nested
- Gull control

- Annual monitoring and monitoring through the use of cameras
- Biosecurity measures
- Ranger presence
- Managing visitor access

The project led measures proposed by the applicant, including deployment of tern nest boxes and shelters and monitoring by camera are already included in the draft Site Management Plan and are not above and beyond normal management. Therefore, they do not represent additionality.

We are aware that Natural England did not consider the proposed interventions at Farne Islands to provide meaningful compensation in their Relevant Representation RR-063.

5 (ii) Views from Natural England, National Trust and the Applicant about the appropriateness to pursue bamboo canes as a compensation measure for the Farne Islands?

The National Trust hosted a student project trialling the use of canes to deter gulls on the Farne Islands. The resulting study published in Ibis International Journal of Avian Science (Boothby, Redfern & Schroeder 2019) showed that while the canes reduced the number of attempts, they did not significantly reduce the success of those predation attempts. Accordingly, the use of canes is not a measure which the National Trust proposes in the draft Site Management Plan.

Canes were also used around a Sandwich tern colony on adjacent Coquet Island by Natural England but discontinued because it was not thought to be effective, and additional chick shelters were provided instead. The use of chick shelters is included as a management measure in the draft Farne Islands Management Plan.

I am sorry that the National Trust is unable to attend this hearing but hope the above information is of assistance.

Yours faithfully

Nina Crabb

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Regional Planning Adviser (Midlands and East of England)



National
Trust



Photos (clockwise, from top left): Ritchie Southerton; Gwen Potter; Gwen Potter; Ritchie Southerton

Delivering for Nature at Farne Islands NNR

Site Management Plan 2022-26

18.09.2020

Prepared by: Gwen Potter,
Harriet Reid, Tom Hendry

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Plan summary: delivering for nature at Farne Islands NNR

1. This plan sets out how the future management of the land and intertidal environments at Farne Islands NNR can deliver for nature and contribute to our Land, Outdoors and Nature (LON) KPI targets for 2025.
2. The objectives define how future management can deliver 'better' and 'bigger/more' habitats and express the High Nature Status (HNS) for the land ('Joined Up'), as well as providing a reasonable evidence base for future land condition assessments.
3. The objectives define favourable conservation management for important species populations.
4. The objectives also define management required to achieve 'good condition' for soils, water, archaeology/historic environment, landscape and visitor experience.
5. The important LON features at Farne Islands NNR are the seabird assemblage, the habitats supporting seabirds, grey seals, the soil cap, and the archaeological features, particularly those of Inner Farne.
6. In terms of delivering for nature under LON, the implementation of this plan will:
 - Better: Maintain/improve 34.5Ha of maritime cliff and slope supporting internationally significant populations of seabirds
 - Bigger: We will ensure our habitats are linked to a wider network of high-quality habitats for both seabird and marine species, and advocate measures which protect the marine environment
 - Joined up: The land will meet HNS standards where this supports the seabird assemblage
7. In order to achieve these aims we will appropriately manage habitats and species for the benefit of seabirds and seals, all of which is on in-hand land apart from the lighthouses which are maintained by Trinity House.

1. Property description

Area (Ha): 96.7Ha (inc. intertidal lease from Crown Estate)

Area Ranger: Harriet Reid

Ranger: Rosie Parsons (Inner Group); Tom Hendry (Outer Group)

Status: National Trust property and National Nature Reserve

Farne Islands SPA

The Farne Islands SSSI

Farne Islands NNR

Part of Berwickshire & Northumberland Coast SAC (MPA)

Part of Northumberland Coast AONB and Northumberland Coast Heritage Coast Scheduled Ancient Monument (Inner Farne, with exception of lighthouse enclosure)

Grade I Listed Building (Prior Castell's Tower)

Grade II* Listed Building (St. Cuthbert's Chapel, including 17C interiors from Durham Cathedral)

Grade II Listed Buildings (seven in total, on Inner Farne, Brownsman and Longstone)

Details of designations are listed in the appendix. All land-based nature designations cover all islands

The Farne Islands NNR forms a rugged, rocky archipelago of whin sill outcrops off the Northumberland Coast around one nautical mile from the core of the Northumberland Coast, comprising of 15 key islands that are rarely overtopped by the tide. The islands are internationally important for nature and nationally important for their landscape, archaeology and buildings. National Trust has a legal responsibility to ensure the islands are managed in a way that will conserve and enhance the special features here, including the seabird assemblage and associated habitats, grey seals and associated habitats, the soils (particularly the soil cap's ability to provide a habitat for burrowing seabirds), and the archaeology and buildings, with their significant association with St. Cuthbert and evidence of the development of small, marginal island communities. There is a responsibility to and keep these features accessible where this does not conflict with conservation.

The Islands have a truly unique place within the historic and cultural landscape of England. Like other islands in the British Isles, they hold internationally significant assemblages of seabirds and a nationally significant number of pupping grey seals [Atlantic subspecies] *Halichoerus*

grypus. At the start of the year, stormy seas become calmer and a sense of anticipation descends as we await the bird's return before May to July, when the air is filled with the blazing cacophony of seabirds. The seas are packed with dolphins and curious grey seals rest on the rockier islands, while shags and cormorants stand with their wings outstretched. As we reach peak season, a visitor to Inner Farne can have a visceral experience, as Arctic terns swoop to attack intruders and defend their precious nests. Perfectly formed eggs of many species may cover the ground and cliffs, fluffy chicks seek shelter beneath their parents or juveniles take their first steps into the wide world – whether jumping from high cliffs, following their parents to the sea or simply leaving, alone, in the dead of night. A lull then descends over the islands, as the sun shines over sweeping views of coastal castles and the Cheviots behind – a time for contemplation and a good time to understand the histories and people of the islands and the buildings and archaeology they have left behind, from Celtic Christian saints to protectors of Pele Towers and from lighthouse keepers performing daring rescues to our long history of Rangers. The islands are also a great place to truly understand our impact on the environment, from overfishing to climate change, and how we can help resolve these crises. From October to February, the islands belong to the grey seals – haunting mermaid cries fill the air and fluffy white-coated pups learn to swim in peace. What makes these islands different from others in the British Isles is their accessibility, welcoming up to 50,000 visitors a year in 2019, and their 182 year history of rangers, perhaps having the first people in the world employed solely to care for 'wild' nature.

2. Policy and strategy

Our Land, Outdoors and Nature (LON) strategy used the Lawton Report as a lens for assessing how we can create better, bigger, more and joined-up habitats on our land holdings. We have specific and challenging targets (KPIs) that must be met by 2025.

Our vision for the Farne Islands NNR will therefore be built around and understood in the context of our Land Outdoors and Nature (LON) policy framework, which aims to produce... 'a landscape that is healthy, beautiful, rich in culture and nature, enjoyable and productive'. This means focussing in on habitats and species, water resources, soils and carbon, archaeology, historic buildings and visitor experience in the context of a thriving, economically and environmentally sustainable productive landscape.

This plan marks a shift towards increased habitat management, focussed surveillance monitoring and increased seabird research and away from peripheral monitoring and lengthy reporting. There is also a shift towards improved visitor experience, boosting our fundraising, and away from membership recruitment and island-based retail.

3. Background and Vision for the Farne Islands NNR

It is important to cover activities carried out in the latest plan period, since many of these were not included in the previous management plan.

Summary of past work and resulting plans for the 2022-26 period

Our previous five-year plan (2016 – 2020) mainly involved continuing long-standing monitoring of seabirds on behalf of Natural England, and an ambitious goal of monitoring disturbance impacts at sea. We also:

1. Trialled roseate tern *Sterna dougallii* nest boxes & shingle patches above the dock bank & near common terns in 2016 & 2018-19.
2. Attempted to examine the effect of disturbance from visitors on the productivity of Arctic tern *Sterna paradisaea* and eider *Somateria mollissima*
3. Implemented a (mostly) successful boat licence to ensure disturbance to the birds was minimised – however visitor numbers remained very high some of the time.
4. In our final year (2020), we intended to measure hour-by-hour impacts as we knew there were still times when the islands were too busy on Inner Farne and Staple particularly when there were over 200 people in one hour on Inner Farne, resulting in increased risk to nests and a poorer quality visit. However, this will need to be delayed until such time as visitors return to the islands in the forthcoming plan year.
5. Covid and storms have impacted the birds and seals in both 2020 and 2021. Covid restrictions meant the Ranger team were not resident in 2020 or 2021 as they could not be reliably evacuated – this meant that the large gull numbers increased dramatically and predation will have increased, with ground nesting birds such as eiders and terns being particularly vulnerable to predation⁵³. The ‘exception which proves the rule’ is the moderate increase in fulmars in this time – these birds likely benefitted from decreased disturbance from visitors coupled with a powerful ability for the protective adults and feisty chicks to repel predators. Arctic terns moved from Inner Farne, most likely to Staple, Brownsman, Beadnell Bay, Lindisfarne or Coquet, and overall numbers on the islands decreased steeply – likely in response to lack of people presence⁸⁴. After no visitors in 2020 and few visitors in 2021, it will be important to ensure any return of visitors to the islands is cautious and that moderate footfall and short dwell times occur, to reduce disturbance length times for terns, eiders and shags in particular. Storm Arwen in December 2021 threw pups and their Mums onto the top of the Inner Farne and increased soil erosion – extensive erosion has occurred in the past but on this occasion it was exacerbated by wind energy – this means that the plans to deter seals from the fragile soil cap and associated habitat for burrowing seabirds will need to cover the Inner Farne as well as Brownsman
6. 2022 – Baseline rapid assessments on Inner Farne were carried out⁹⁵. Implemented some of veg man plan (4 experiments from 10) – intention in 2023 would be to repeat successful experiments & 6 of the experiments outstanding, as well as carrying out the same work on Brownsman in any problem vegetation areas. The only experiment not to be repeated will be the solarisation, which caused further growth rather than killing the seed bank within the experimental plots
 - a. Only 100 eggs from herring gulls and 100 from lesser black-backed gulls were licensed by Natural England, and this was coupled with the use of deterrents such as sound deterrents, scarecrows, spinning deterrents and human presence. We found that, in proportion to nesting numbers, great black-backed gulls were the most impactful on ground-nesting birds, followed by herring

gulls, with lesser black-backed gulls impacting to a lesser degree⁹⁶. We do expect that, regardless of avian influenza, numbers of nesting gulls did increase in 2022⁹⁷

- b. Decoy common terns and Sandwich terns were used on Inner Farne – these appear to have contributed to an increase in nesting numbers from the year before – however this is only part of the equation. We will need to couple tern attraction with strong gull management to allow these populations to recover, with a focus on ground nesting bird islands, to avoid attraction and then subsequent predation of terns.
 - c. Avian influenza had a devastating impact on both adults and chicks, and around 6,000 carcasses were collected and incinerated off island by a licensed contractor, to reduce transmission. Fencing around discrete colonies, such as Sandwich and common terns, to reduce transmission between chicks, should be considered for 2023
 - d. It was not possible to carry out bird productivity monitoring consistently for Arctic Terns, therefore monitoring results should be treated with a degree of caution, this was due to changes in methodology due to avian influenza.
 - e. A full suite of islands were monitored using the drone, thus we have data from 2019 to 2022 to help build a seal pup production model
7. Artificial gravel patches were added to Arctic tern, Sandwich tern and Common tern nesting areas. These proved successful for Common terns and Arctic terns with both species nesting on the patches however Sandwich terns nested beside them and showing a preference for their normal breeding area.
 8. Seeding took place on some of the bare patches on the Inner Farne, sea campion and common saltmarsh grass were used.

Out with the plan, we also:

1. Attempted to rationalise our gull control and ‘egging’ by trialling paint marking of ‘problem’ gulls and looking at the number of gull eggs taken as a proportion of the total breeding pairs. This became impossible with gull egg control in 2019 as, licensing of gull control went through some changes and is subject to a new process. With covid restricting our ability to manage gulls in 2020 and 2021 and a subsequent rapid increase in large gull numbers on ground nesting bird islands, intensive efforts to manage the gulls on the islands will need to take place if the islands are to maintain a diverse seabird assemblage.
2. Hosted a student trialling the use of canes to deter gulls – the resulting study published in Ibis (Boothby, Redfern & Schroeder 2019) showed that while the canes reduced the number of attempts, they did not significantly reduce the success of those predation attempts.
3. Successfully trialled the use of drones to count seal pups, reducing disturbance to seals in the process. We are currently unable to measure mortality in this way, but did question the necessity of annual pup mortality surveillance given the thriving grey seal population and the fact that no organisation utilises this data. Should the population decline steeply, this could be reinstated using the previous method¹¹.

4. Considered that quinquennial assessments of puffin populations were not useful given puffins are a key species on the islands in terms of numbers and conservation status, and therefore initiated an annual puffin census which started to prove successful and was fully implemented in 2018 & 2019 and partially implemented in 2020 & 2021. In 2022 the three largest islands were included in the puffin census however due to avian flu and weather restraints as well as boat equipment issues the smaller islands were not included.
5. Introduced a 'closure protocol'³ for visitors in 2018 to ensure island closures to visitors were consistent, and protected the birds at vulnerable stages in their development during poor weather without unnecessarily closing the islands.
6. Trialled the use of seawater to control nettles with some success in reducing the density and height of vegetation.
7. Attempted to implement electric fencing to deter seals from the fragile soil cap on Brownsman with limited success in 2019 and in 2021, keeping pathways clear of seals meant an increase in the risk of staying on the island to maintain the electric fence. We are looking into ways of how to maintain pathways for electric fence use.
8. In 2022 the use of scarecrows, presence of rangers and sound callers were used to try and maintain a line above the beach where the puffin burrows started. The intention was to keep the pupping seals on the beach away from the delicate soil, this process was successful, with very few pups and mothers going further than the beach.

Regarding archaeology, buildings and the historic environment, some progress was made – a project is being initiated in 2023v to assess and improve the buildings

Within the plan period, we:

1. Initiated an archive project with a group of volunteers, sorting through the hundreds of folders of natural environment and cultural heritage information in relation to the Farne Islands NNR
2. In late 2019, we also had a visit from the Whole Trust specialist teams to the islands, who produced an initial buildings report² and suggestions for future improvements.

Buildings have been under-prioritised historically. Basic issues, including storage, reliable water, sewerage and electricity capacity for staff and visitors, remain to varying degrees on both Brownsman and Inner Farne. In this plan, hygiene and housing, post-covid, will also require resolution as well as improving our knowledge of the significance and condition of the built heritage and reversing its continuing deterioration. The condition of the Chapel & Pele Tower in particular are of concern.

Nesting bird trends

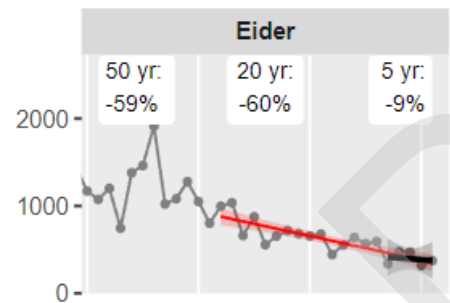
Over the previous plan period (short term trend†), the following birds have seen a decline:

Sandwich tern *Thalasseus sandvicensis*; common tern *Sterna hirundo*; Arctic tern *S. paradisaea*; shag *Gulosus aristotelis*; eider *S. mollissima*; cormorant *Phalacrocorax carbo*; fulmar *Fulmarus glacialis*; razorbill *Alca torda*.

Roseate tern *S. dougallii* have not nested on the islands since 2015.

The following species have seen a positive trend:

Grey seal *H. grypus*; herring gull *Larus argentatus*; lesser black-backed gull *Larus fuscus*; guillemot *Uria aalge*; black headed gull *Chroicocephalus ridibundus*; kittiwake *Rissa tridactyla*; puffin *Fratercula arctica*.

Species	Farnes LT trend (20 yrs)	Farnes LT trend (3 gens)	UK 20 yr trend	Europe LT trend (3 gens)	Farnes 5 yr trend, 2017 - 2021	UK ST trend	UK status (2020)	European status (2020) ³	Long term trends	Short term trends
Eider			?	>-40% ³⁴	-9%	?		Near threatened	Eider are experiencing steeper declines on the Farnes than the European trends, however the rate of decline is slowing. Disturbance and predation are likely to be the biggest factors affecting these birds on the islands but a background decline is also	

									contributing to these figures as demonstrated by steep declines on Coquet.
Sandwich tern	<p>Sandwich Tern</p> <p>50 yr: -84% 20 yr: -92% 5 yr: -50%</p>		5% ³³	? ³⁷	-50%	?		Least concern	<p>Sandwich tern numbers are steeply declining in the short and long term on the islands. Habitat change and predators are likely to be a factor but there is a history of movement in this species between Brownsman, Knoxes and Inner Farne. An approach focussing on creating new habitats, managing predators and managing non-native species (rabbits) will be important</p>

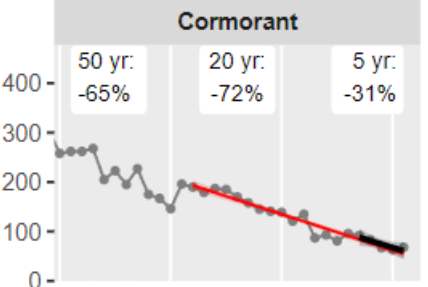
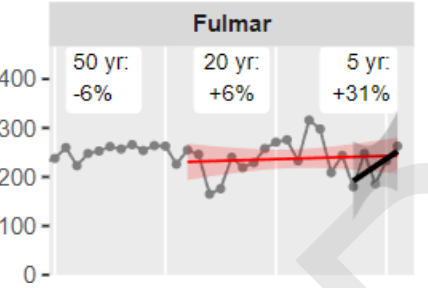
									to reverse recent trends.
Common tern			-3% ³³	? ³⁸	-63%	?		Least concern	<p>Like Sandwich terns, common tern numbers are steeply declining in the short and long term on the islands, however unlike Sandwich terns the recent decline is more steep. Habitat change and predation are likely to be a factor but there is a history of movement in this species between Inner Farne, Brownsman, Northern Hares and Longstone End. An approach focussing on creating new habitats,</p>

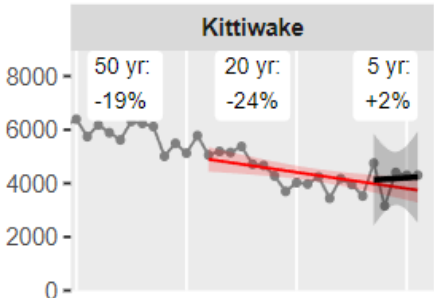
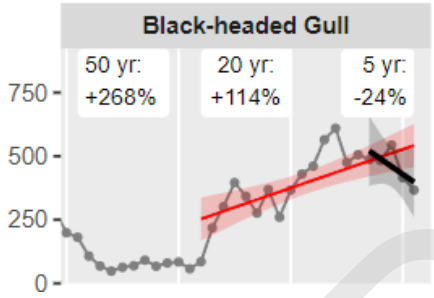
									managing predators and managing non-native species (rabbits) will be important to reverse recent trends.
Arctic tern			-5% ³³	>-25%	-67%	?		Least concern	Arctic tern numbers have been in long and short term decline on the islands and, as these birds appear to be heavily associated with people on Inner Farne & Brownsman (people keeping predatory gulls away to a degree), covid has meant Arctic tern numbers on Inner Farne have declined particularly steeply. It is crucial to ensure

									visitors are carefully reintroduced after two years absence and that we monitor intervention impacts on these birds.
Roseate tern			125% ³³	+? ⁴⁰	N/A	?	Least concern	Coquet and Rockabill are the only UK colonies of these birds – this raises the possibility of looking into ways to bring roseate terns to the islands. It will be crucial, however, to ensure that the birds are productive and to recognise that these birds only appear to thrive on this part of the coast with intensive interventions	

Guillemot			60% ³³	-25 - >- 50% ⁴¹	35%	?		Near threatened	<p>Guillemots are doing better in the UK than in Europe, increasing the importance of the Farnes population. The Farnes population are not doing as well as the UK trend, but appear to be doing well.</p>	
Razorbill			37% ³³	+? ⁴²	-7%	?		Least concern	<p>Razorbills are doing better in the UK than in Europe, increasing the importance of the Farnes population, particularly given the Farnes population is increasing faster in the long term than the UK population. There has, however, been a recent decline in</p>	

								razorbill on the islands
Puffin		?	? ⁴³	TBC	?	Vulnerable	<p>Puffin numbers on the islands are stable, in contrast to international declines, particularly in the more northerly colonies. 2020 & 21 figures are not yet included as not all islands could be covered</p>	
Shag		-40% ³³	<- 25% ⁴⁴	-33%	?	Least concern	<p>Significant declines on the Farne islands are faster than UK-wide long term trends, which are around twice the declines in the international population.</p>	

Cormorant			16% ³³	+? ⁴⁵	-31%	?		Least concern	Significant declines on the Farne islands contrast with UK-wide trends. This marine sub-population is important as it has different habitat requirements from other cormorants in the UK.	
Fulmar			-33% ³³	>-40% one gen ⁴⁶	+31%	?		Least concern	Fulmar populations remain stable on the Farnes and have experienced a marked increase in the short term, while the UK and international populations are experiencing a steep decline	

Kittiwake			-29% ³³	-40% ⁴⁷	2%	?		Vulnerable	The kittiwake population on the Farnes is in strong decline, but is declining at half the speed of the UK population and slightly slower than the European population. In recent years the numbers appear more stable.	
BH Gull			-? ⁴⁸	-24%		?		Least concern	Black-headed gull numbers are significantly increasing in the long term on the Farne Islands, however this trend has reversed in the short term	

LBB gull			+	+% ²⁴⁹	45%	?		Least concern	Lesser black-backed gull numbers are significantly increasing on the Farne Islands, in both the short and long term
Herring gull			-37% ³³	-37% ⁵⁰	40%	?		Least concern	Herring gull numbers are very significantly increasing on the Farne Islands, in contrast to steep declines the UK and Europe
GBB gull			23% ³³	-24% ⁵¹	20%	?		Least concern	Great black-backed gull numbers are significantly increasing on the Farne Islands, in contrast to steep declines in Europe and a much slower UK-wide increase

Table 1: Breeding bird trends in long & short term on the Farnes, UK & in Europe

¹ From DEFRA (2020) report 'Wild bird populations in the UK' unless otherwise indicated

² From BTO (2019) WeBS summary report

³ From Birdlife International (2020) IUCN Red data list for birds

Note: long term trends calculated using 3 gen length using birdlife International (2020) IUCN red data list for birds

The long-term trends for many species present a concerning picture. If current trends continue, Sandwich terns & common terns will be extinct on the Farnes within the coming plan period (2024); eiders by 2026/27; cormorants by 2031; shag by 2043 and kittiwake by 2053. With no new species other than Canada geese nesting on the islands (but an expectation that Mediterranean gull, *Ichthyaetus melanocephalus*, may start to nest), it is imperative that we carry out interventions known to boost common and Sandwich tern, roseate tern, eider and cormorant family species on the islands. This will include new vegetation management for common and Sandwich terns; continuing expanded vegetation management for eiders and Arctic terns; the provision of more chick shelters for terns; the use of appropriate attraction lures in areas where common and Sandwich terns formerly nested and the provision of predator (large gull) control under license. This work would need to occur in tandem with the current vegetation management for puffins and Arctic tern plot management to ensure a transfer of effort to different species doesn't contribute to accelerated declines for Arctic terns or impacts on stable and increasing populations of non-predatory seabirds. It is also important to agree an acceptable number of each gull species, since these will impact on the productivity of other species and are included as a feature impacting the breeding success of other species in the Habitats Regulations Assessments²⁵. It is important, also, to recognise that there are wider pressures on seabirds through climate change and overfishing in particular, and these could be occurring in a wide range of locations, including outside the breeding season. Species seemingly stable on the Farne Islands NNR, particularly puffin and kittiwake, are in steep decline internationally.

We began a long-term vision process for the Farne Islands NNR with some stakeholder involvement in 2017. While some progress has been made in identifying key areas for action, over 2022-26 a whole Farne Islands NNR project would hugely benefit the islands – this could include, but may not be limited to: a significant and comprehensive progression of necessary habitat and species management; a brief review of 'visitor experience' both on and off island leading to an Interpretation Plan; a brief review of research need leading to a Research Plan; progression of an archive project to record and make accessible items of historical, cultural and biological significance; a review of monitoring need; progress on buildings conservation; an updated Statement of Significance according to Historic England's accepted format; a Spirit of Place statement as an agreed Articulation of the sense of the unique, distinctive and cherished aspects of the islands; completion of the 'Knowledge Review' for the islands with a plan to fill any urgent gaps; a Conservation Management Plan which builds on the existing Historic Environment Survey (Archaeo-Environment, 2010) and includes detailed, useful reports on the condition of key buildings; a Collections Development Policy for the islands and a Collections Documentation Plan. The need for a transition to avoid over-reliance on visitor footfall both for funding our work and communicating our messages should be explored, to enhance both conservation management and visitor experience. This should be coupled

with a Fundraising Plan and a plan to couple visitor needs with nature connection and engagement with visitors both on and off-island' which focuses on natural and cultural heritage at the relevant times. [Farnes project info here](#)

2022 RESULTS AND BIRD FLU RESULTS TO BE ADDED HERE

Key challenges

1. Predation & displacement

	Ground-nesting birds				Large gulls		Cliff-nesting birds		
	Eider	S Tern	C Tern	A Tern	L B-b Gull*	H Gull†	Kittiwake	Guillemot	Razorbill
Percentage change - short term	-9%	-65%	-12%	-336%	62%	71%	25%	2870%	-8%
Percentage change - long term	-31%	-88%	-4%	-16%	19%	26%	-77%	747%	15%

*long-term trend from 2000

†long-term trend from 2001

Table 31: Table showing trends in short and long term across all islands for ground-nesting birds, large gulls and cliff-nesting birds

The impacts of large gulls on ground nesting birds will remain a key focus in the forthcoming plan period. Large gull numbers have increased across the islands and it is an established conservation principle that gulls impact ground nesting birds through both predation^{31,56,58} and competition for nesting habitat³¹. In table 31, the decline in ground-nesting birds on the islands is compared to a range of cliff nesting species. Cliff-nesting birds such as kittiwakes feed in a similar way to the terns at the surface of the water, as opposed to guillemots and razorbills which forage deeper in the water column. While the long-term trends indicate declines for all of the surface-feeding species, and the impact of this background decline will be ongoing, the short-term trends indicate a large increase in the number of large gulls and a steep, worrying decline in all tern species as well as eiders, which are the key ground-nesting species on the islands. In contrast to the ground-nesting bird

trends, while gulls can predate cliff-nesting birds, the cliff nesting bird populations are not in significant short-term decline. The last large-scale egg destruction occurred in 2015 & 2016, when gull eggs were targeted across all islands. Since then, the number of eggs removed has been limited by the ability to obtain licenses and in 2019, the ability of Natural England to issue such licenses. We plan to focus comprehensive gull egg smothering activity on the islands where ground nesting birds such as terns and eiders are most numerous on Inner Farne, Brownsman, Staple and the Wideopens, however if this is not successful in reducing the total number of nesting birds the following year, then some flex will be required to allow us to expand the egg destruction programme whilst keeping the numbers to a figure around the five-year mean. It is clear that weather conditions, as well as staff resource, limited our ability to develop consistent deterrence in 2022. Part of our management for the gulls was the use of deterrents such as lasers, scarecrows, electronic callers and roost disturbance through active ranger presence. This was accompanied by licenced egg destruction; the table of destroyed eggs is in the appendix. In 2023 we will continue to carry out deterrents which we found effective in 2022, we will also attempt to deconstruct nests before eggs are laid in areas close to ground nesting species. Large gull impacts will be closely monitored through timed predator watches, as well as the impacts of any deterrents or egg removal interventions. We will attempt to remove persistent predatory individual gulls which feed on ground nesting birds through shooting. Further detail on gull control and rationale can be found in the gull management section in the objectives tables. Black-headed gulls *Chroiocephalus ridibundus* can predate young chicks but appear to exhibit a unique kleptoparasitic behaviour on the Farne Islands, focussed on the puffins. They are therefore not considered to have the same impact on other ground-nesting birds as the other large gulls.

Crows *Corvus corone* generally attempt nesting early in the season and the nests are destroyed before any impact can occur – the crows then leave the islands.

2. People presenceq

Covid has impacted some species on the islands, perhaps Arctic terns most drastically. All terns show a low degree of faithfulness from one site to the next³⁰ and sometimes move from one location to another as shown in historic records. Rangers were not able to live on the islands in 2020 or 2021 as we were unable to be certain that the rangers could be evacuated should they become ill on the islands. There were no visitors in 2020 or 2021 until June 21st, 2021, well after the breeding season was established. The lack of people on the islands is considered to be the driver of the Arctic terns movements to other islands⁸⁴. Visitor and crucially, Ranger, movements on the islands have a predator deterrent function, as demonstrated at other colonies during the covid pandemic^{85,86} and it has been established that terns nesting nearer to people are more productive. It is important to consider a range of efforts to ensure Arctic terns and other terns are successful on the islands in the coming years – including attracting terns to productive areas. The declines in common terns and Sandwich terns could be reversed but it is important to be certain that common and Sandwich terns are productive if they are attracted to nest – hence establishing consistent, low-disturbance monitoring of common and Sandwich terns through the use of cameras will be required. Notwithstanding the fact that Arctic terns

have nested relatively consistently on Inner Farne and Brownsman for the last 80 years, the overall population of Arctic terns in the region will be the most important measure for conservation success.

3. Disturbance on islands

From a visitor perspective, the volume of people, how they behave and the length of time they stay will influence the Arctic terns in particular. In recent years, the opening hours have increased from historic levels and the volume of people has been relatively high for a small (9Ha) island (around 30-35,000 people on Inner Farne each year for six months of the year). Photography groups in particular have spent a large amount of dwell time in one place as well as overlapping with other trips, which can impact on bird welfare^{60,61} and visitor enjoyment. Eiders are influenced by the number, distribution and frequency of visitors – while some individuals tolerate people this is certainly not the case for all individuals and when the parents abandon, eggs can chill or predators can take an immediate opportunity. Following the large changes covid has brought, a precautionary principle will be applied to inviting visitors back, particularly to Inner Farne, as we plan how to cater to the wide range of people who visit the islands. Should numbers increase, the results of a study of kittiwakes and guillemots at St Abbs⁶⁰ suggests that set-back distances for kittiwakes, razorbills and guillemots will need to be considered.

4. Soil

Soil erosion occurs across the islands due to seals, poor weather and as-yet unknown factors.

On Brownsman, seals impact the soil cap in pupping and moulting seasons, creating small wallows which can destroy small areas of burrows. Vegetation recovers between seasons with the exception of small areas of cliff opposite Staple Sound, where the guillemot colony is expanding onto the meadow – however, the range of *Atriplex* is expanding while the range of *Silene* and other perennials is contracting⁶². This presents a problem due to the annual cycle of *Atriplex* as opposed to the perennial cycle of *Silene*, which means the former will not bind the soil together in the winter months.

In 2021, storm Arwen caused a large amount of erosion in bare soil areas on Inner Farne, with the wind getting into burrows and then flinging the soil into the air – this expanded existing eroded areas as well as creating new ones.

A re-seeding programme in bare-soil and managed areas, with the exception of existing common and Sandwich tern habitat, is proposed.

5. Vegetation management

While many cycles of change in vegetation have been observed on the islands over decades, suggesting a habitat in constant flux⁶², a more robust monitoring and constant review and adaptation will be required if soil erosion is to be reduced.

On Inner Farne, the vegetation is generally managed as nesting bird habitat on the islands (particularly for terns and eiders), and early interventions occur before the birds return. Once the full nesting season is underway in May, the vegetation management is more targeted and limited to reduce disturbance to the nesting birds, which means that later in the season the vegetation can grow long, particularly following a wet year such as 2020. The range of *Conium*, an invasive, non-native species, has expanded, while species unfavourable to chicks,

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such as *Arctium*, has also expanded. While the vegetation was prepared for Arctic terns early in the season as much as possible in 2020 and fully in the relevant areas in 2021, the vegetation terns showed a preference for Brownsman, an island which was less managed early in the season, in 2021. *Silene*, *Puccinellia* and *Armeria* are perennial as well as being native to the Inner Farne. These three plants provide a range of heights and are likely to be good plants for binding the soil, reducing erosion and providing cover for nesting seabirds and chicks without soaking them or hindering movement. This management will be set to continue in the coming years, with specific interventions to reduce the distribution and density of plants which are less favourable to nesting birds, such as *Conium*, *Urtica*, *Cirsium* and *Atriplex*, and increase the range of more favourable species, such as *Silene*, *Puccinellia* and *Armeria*.

It has been recommended that grazing animals can provide a vegetation management function, however it is not possible to control rabbit numbers in any meaningful way and the vegetation after seven years of rabbits is gradually becoming less favourable. Grazing in highly diverse habitats is generally more favourable than mechanical control – however, on this island where seabirds are the priority and the vegetation is highly nutrient rich due to past cultivation and guano, mechanical control or grazing which can be easily adjusted is felt to be the most appropriate.

6. Threats including the wider environment (inc. climate change, disease & foraging)

The Coastal Adaptation Strategy¹⁷ shows expected long-term climate change impacts on the Farnes.

Species & European IUCN threat level as of 2021	Climate					Invasive and other problematic species, genes & diseases			Natural systems modifications		Pollution		Biological resource use		Human intrusions & disturbance		Agriculture & aquaculture		Energy production & mining		Transport & service corridors	Residential & commercial			
	Habitat shifting & alteration	Droughts	Temperature extremes	Storms & flooding	Other impacts	Viral/prion-induced diseases	Problematic native species/diseases	Invasive non-native/alien species/diseases	Problematic species/disease of unknown origin	Dams & water management/use	Other ecosystem modifications	Industrial & military effluents	Agricultural & forestry effluents	Garbage & solid waste	Hunting & trapping terrestrial animals	Fishing & harvesting aquatic resources	Recreational activities	Work & other activities	Marine & freshwater aquaculture	Annual & perennial non-timber crops	Renewable energy	Oil & gas drilling	Mining & quarrying	Shipping lanes	Commercial & industrial areas
Fulmar ^{LC}							X				X		X	X	X					X			X		
Shag ^{LC}			X						X	X	X		X	X	X	X				X					X
Eider ^{NT}	X										X			X	X	X	X	X			X	X			

Black-headed gull ^{LC}		x				x	x	x	x		x	x		x	x	x	x		x	x	x					x
Kittiwake ^{VU}	x				x	x		x	x			x			x	x					x					
Sandwich tern ^{LC}	x	x		X				x			x	x	x	x	x	x		x			x				x	
Roseate tern ^{LC}	x						x	x			x	x			x	x	x	x		x						
Common tern ^{LC}	x	x	x	X		x	x	x			x	x	x			x	x		x						x	
Arctic tern ^{LC}	x			X	x		x	x			x	x	x			x	x								x	
Guillemot ^{LC}	x		x		x			x	x			x			x	x									x	x
Razorbill ^{LC}			x	X	x			x				x			x	x	x								x	x
Puffin ^{VU}	x		x	X	x			x				x			x	x									x	

	<i>European threats</i>	<i>Threats within wider environment</i>
Fulmar ^{VU}	<p>The species was subject to intensive exploitation for food in the past, and hunting remains in Greenland, Svalbard and the Faroe Islands (Thorup et al. 2014). In some breeding colonies the species is susceptible to predation from invasive mammals, such as foxes, rats, mice etc. It is vulnerable to oil spills, particularly in the North East Atlantic, but increasingly in its Northern range (Mendel et al. 2008). It is highly susceptible to ingesting marine litter and plastics (Van Franeker et al. 2011). Bycatch in fisheries is also a significant threat, with large numbers recorded as caught in longline fisheries in the North East Atlantic and in trawl fisheries (Dunn et al. 2001, Anderson et al. 2011) as well as in gillnet fisheries (Žydelis et al. 2013) . It is susceptible to collision and displacement from offshore wind farms, although this is currently considered to be a very low risk (Bradbury et al. 2014). It may also be disturbed and displaced by shipping lanes. Large wrecks of this species in North Sea in Feb 2004 thought to be caused by multiple factors, namely low food abundance, persistent bad weather, higher levels of pollutants, and secondary diseases (Van Franeker 2004).</p>	<p>Large foraging range towards the mid-Atlantic ridge means oil spills, bycatch, windfarms and shipping lanes remain a risk to this species on the islands including within the breeding season. Invasive mammals remain a threat and a combination of factors can cause large mortality events. It is not certain that these factors are impacting the existing population on the islands as the population remains stable, however these threats could increase in the future</p>

Shag ^{LC}	<p>The species is persecuted (e.g., shot, intentionally drowned or poisoned) at commercial fisheries and fish farms as it is perceived to be a threat to fish stocks (Carss 1994, Wanless and Harris 1997). It also suffers predation at nesting colonies by introduced American Mink (<i>Neovison vison</i>) (Wanless and Harris 1997), is vulnerable to coastal oil pollution (Wanless and Harris 1997, Velando et al. 2005), locally suffers from accidental entanglement and subsequent drowning in gill-nets (fishing nets) (Wanless and Harris 1997, Velando and Freire 2002), and is susceptible to the Newcastle disease so may be threatened by future outbreaks of the virus (Kuiken 1999). Eggs, chicks and adults are taken from colonies for food (Wanless and Harris 1997).</p>	<p>Invasive non-native predatory mammals remain a threat though it is not thought they have contributed to past declines on the islands. The threat of coastal oil pollution appears low and so long as gill netting is over 7km from the islands it is likely that it will not directly impact foraging shags⁶⁴ in the breeding season. Shags show a very high degree of fidelity to their natal area⁶⁷ and in the winter they will be in relatively local coastal areas. Increased climate change impacts may increase the frequency or shift the range of diseases in the future⁶⁵, including Newcastle disease. One study suggests that shags can be impacted by the number of recreational boats on the water⁵⁹ but the impact on Farnes birds is unknown.</p>
Eider ^{EN}	<p>The species is vulnerable to chronic coastal oil pollution (Nikolaeva et al. 2006), especially oil spills (Kear 2005, Nikolaeva et al. 2006, Carboneras et al. 2017), in areas where large moulting and wintering concentrations occur (Carboneras et al. 2017). It also comes into conflict with the shellfish aquaculture industry which depletes the species's food resources (Kear 2005, Ens 2006, Nikolaeva et al. 2006,) and has previously lead to mass starvation events due to the over-fishing of benthic molluscs (e.g. in the Dutch Wadden Sea) (Camphuysen et al. 2002, Ens 2006). On the breeding grounds, disturbance from the development of mineral resources along the coast (Nikolaeva et al. 2006) and from local shore-based activities (e.g. angling, dog-walking (Keller 1991) and scientific research (Bolduc and Guillemette 2003)) increases the likelihood of predation on young (Keller 1991). Unregulated tourism and shipping also cause disturbance to the species on its wintering grounds (Nikolaeva et al. 2006). The species commonly becomes</p>	<p>Female eiders are thought to be highly faithful to their natal islands, while males can disperse much further following breeding (up to 1,700km)⁶⁶, which could include coasts from southern Norway to northern France. This means that both local and regional factors could impact Farnes birds. Regional threats include shellfish aquaculture and oil spills. One study suggests that recreational activities in the water can give opportunities to predators³², and, in combination with disturbance on islands, the steeper decline on the Inner Group compared to Brownsman may reflect this. In common with many other birds, eiders have very few opportunities to breed on the Northumberland Coast, which is subject to increasing recreational pressure. Wider declines are likely to be impacting this bird as Coquet declines are also severe.</p>

	<p>entangled and drowned in monofilament nets (Kear 2005), and it is hunted unsustainably (Nikolaeva et al. 2006).</p>	
<p>Black-headed gull^{LC}</p>	<p>The species is susceptible to avian influenza (Melville and Shortridge 2006) and avian botulism so may be threatened by future outbreaks of these diseases (Hubalek et al. 2005). It may also be threatened by future coastal oil spills (Gorski et al. 1977) and has suffered local population declines in the past as a result of egg collecting (del Hoyo et al. 1996). In some areas of its breeding range the species may also suffer from reduced reproductive successes due to contamination with chemical pollutants (del Hoyo et al. 1996).</p>	<p>Disease is likely to impact these birds in the region – there has been an outbreak of avian botulism in 2019 and avian influenza in 2021 – however, these are not known to have impacted the black-headed gull colony. Some limited egg collecting may have occurred prior to 2016, but this is unconfirmed. Oil spills and pollutants may impact these birds and as these birds disperse from their natal colony⁶⁸, wider factors may impact them. In the breeding season, however, they are likely to feed locally⁶⁹ and therefore threats will be likely to be local. The population is increasing at the moment.</p>

Kittiwake ^{VU}	<p>The species is threatened by the depletion of food resources (e.g. through over-fishing) (Frederiksen et al. 2004, Nikolaeva et al. 2006), marine oil spills (Nikolaeva et al. 2006, Burger et al. 2016) and chronic oil pollution (Nikolaeva et al. 2006). It is also susceptible to avian influenza so may be threatened by future outbreaks of the virus (Melville and Shortridge 2006). The species is potentially threatened by climate change because it has a geographically bounded distribution: its global distribution is restricted to within c. 10° latitude from the polar edge of continent and within which 20–50% of current vegetation type is projected to disappear under doubling of CO2 levels (BirdLife International, unpublished data). It is caught as bycatch in longline fisheries, with significant numbers estimated to be caught off the western coast of Ireland and the U.K. The species is considered a high risk for collision with offshore wind farms (Bradbury et al. 2014). The species is hunted in the Faroe Islands and in Greenland (Labansen et al. 2010, Burger et al. 2016, Thorup et al. 2014).</p>	<p>Avian influenza can impact this bird and indeed did so in 2022, since these birds tend to disperse in winter. This species is highly pelagic in winter⁷⁰ and therefore both the north sea and north Atlantic are important for this bird. Over-fishing, bycatch, oil spills and collision with windfarms are therefore major threats. While the population on the islands appears stable at the moment, climate change is expected to have a large impact in future as this species is restricted to its northern range, and to feeding at the surface of the water.</p>
Sandwich tern ^{LC}	<p>The species is particularly vulnerable to human disturbance (Gochfeld and Burger 1996) (e.g. from tourists) especially near breeding colonies on beaches early in the breeding season (Bourne and Smith 1974). It is also sensitive to disturbance from coastal wind farms (wind turbines) (Garthe and Huppopp 2004). It is threatened by the loss or degradation of its favoured breeding habitats through inundation, wind-blown sand and erosion (Gochfeld and Burger 1996), and has suffered previous local declines from exposure to bioaccumulated organochlorine pollutants in marine fish (Koeman et al. 1967, Gochfeld and Burger 1996). Other serious threats include recreational disturbance, coastal</p>	<p>Birds sometimes move north before heading to central Africa in the winter⁷¹, therefore the range outside the breeding season is large. Windfarms and pollutants are likely to impact this species and the influence of disturbance on this species is unknown as the birds nest on the busiest island, Inner Farne. Maintaining and expanding available habitat and deterring and managing predators on-island will likely reverse the downward trend.</p> <p>Avian influenza impacted this bird in 2022⁹⁸</p>

	developments, pollution, land-use affecting vegetation and predation (Garthe and Flore 2007).	
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<p>Roseate tern^{LC}</p>	<p>The species is threatened by a number of agents, of which hunting in the wintering quarters may be the most significant (Brown and Nettleship 1984, Buckley and Buckley 1984, Cooper et al. 1984, Avery et al. 1995). At the northern European breeding grounds, the most significant threats are human disturbance (e.g., from habitat development, off-road vehicles and recreation (Buckley and Buckley 1984, van Halewyn and Norton 1984)) and predation from both natural and introduced avian and ground predators (Brown and Nettleship 1984, Buckley and Buckley 1984, Cooper et al. 1984, van Halewyn and Norton 1984, Avery et al. 1995, Snow and Perrins 1998). Disturbance and egg-collecting have been stopped in most areas by the use of wardens, but disturbance still threatens some major colonies in the Azores (van Halewyn and Norton 1984, Gochfeld and Burger 1996). Predation by rats, ferrets, red foxes and Peregrine Falcon (<i>Falco peregrinus</i>) occurs locally, and can have significant effects, including complete breeding failure at some Azores colonies (Avery et al. 1995). Natural predators can often take a great toll on localised colonies, particularly when terns are disturbed from the nest by other birds and humans (Buckley and Buckley 1984, Cooper et al. 1984). Habitat loss in Northern Europe is not a major problem but has caused the local extinction of some colonies, as have extreme weather events (Avery et al. 1995). Climate change may negatively affect the species, but the exact mechanisms are not known (Newbery 1999). The species is also vulnerable to pollution and disease (Brown and Nettleship 1984, Avery et al. 1995).</p>	<p>It is possible that disturbance has already caused Roseate terns to abandon the islands, and any attempted reintroduction will need to be preceded by and then coupled with low disturbance and interventions to ensure there are far fewer predators nesting on the same islands – indeed, the best years for this species are correlated with large gull numbers in the 10s or less. Habitat loss may have contributed to abandonment in 2007 and the two British Isles locations at Rockabill at Coquet and Rockabill in Ireland as well as on the northeast seabird of the USA have intensive ongoing management and installation of tern terraces to attract and retain these birds and in common with the Farnes, natural shelter such as burrows is not available due to occupation by puffins in some of these locations. Biosecurity measures will need to be maintained to ensure rat predation does not become a threat. Extreme weather events, climate change, food supply issues, pollution and disease can also contribute to declines in this species, particularly at their wintering grounds in southwest Europe, northwest and west African coasts.</p>
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<p>Common tern^{LC}</p>	<p>During the breeding season the species is vulnerable to human disturbance at nesting colonies (Buckley and Buckley 1984, Blokpoel and Scharf 1991) (e.g. from off-road vehicles, recreation, motor-boats, personal watercraft and dogs) (van Halewyn and Norton 1984, Hyde 1997, Burger 1998, Gochfeld et al. 2013), and to the flooding of nest sites as a result of naturally fluctuating water levels (Buckley and Buckley 1984, Hyde 1997, Gochfeld et al. 2013). On its breeding grounds the species is also threatened by habitat loss as a result of coastal development (Buckley and Buckley 1984, Blokpoel and Scharf 1991, Hyde 1997, Gochfeld et al. 2013), erosion (Hyde 1997), vegetation overgrowth (rapid vegetation succession encroaching upon nesting habitats) (Blokpoel and Scharf 1991, Hyde 1997, Gochfeld et al. 2013), and chemical pollution (which may also result in eggshell thinning) (Blokpoel and Scharf 1991, Hyde 1997, Gochfeld et al. 2013). It suffers predation at nesting colonies from rats (especially on islands) (Buckley and Buckley 1984, Gochfeld et al. 2013) and from expanding populations of large gull species (Brown and Nettleship 1984, Gochfeld et al. 2013) such as Herring Gulls (<i>Larus argentatus</i>) (Buckley and Buckley 1984) (gulls may also prevent the species from nesting in the area by colonising it first) (Blokpoel and Scharf 1991, Gochfeld et al. 2013). The species is susceptible to avian influenza so may be threatened by future outbreaks of the virus (Melville and Shortridge 2006). Other threats include organochlorine pollution, over-fishing by man (Hagemeijer and Blair 1997) and fatalities from wind turbine collisions (Everaert and Stienen 2007).</p>	<p>An avian influenza outbreak has occurred in wild bird populations as recently as 2021 and so this species may be threatened by future outbreaks. Given that this species winters at the central and southern African coast it is also susceptible to organochlorine pollution, over-fishing and fatalities from wind turbine collisions. Biosecurity measures will need to be maintained to ensure rat predation does not become a threat. Vegetation overgrowth and the rapid increase in large gull numbers⁷² are already impacting this species on the islands, therefore maintaining and expanding available habitat and deterring and managing predators on-island will likely reverse the downward trend.</p> <p>Avian influenza impacted this species in 2022, both on the islands and on neighbouring Coquet⁹⁸.</p>
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<p>Arctic tern^{LC}</p>	<p>The species is potentially threatened by climate change because it has a geographically bounded distribution: its global distribution is restricted to within c.10° latitude from the polar edge of continent within 20–50% of current vegetation type is projected to disappear under a doubling of CO² levels (Birdlife International, unpublished data). In some areas predation by starlings (<i>Sturnus vulgaris</i>) (Horobin 1971) and American mink (<i>Mustela vison</i>) can be a problem (Hagemeijer and Blair 1997) and mortality has been recorded as a result of red tide (Horobin 1971). In northern Britain the collapse of sand eel stocks have caused a crash in the population and in Svalbard the population may be vulnerable to oil, particularly in the post-breeding period (Gochfeld et al. 2014). Pollution is likely a major factor in the species' decline and yachting and other leisure activities have led to an increase in disturbance. Declines have also been correlated with gull abundance (Hagemeijer and Blair 1997)</p>	<p>Similar to kittiwakes, this species is limited to breeding within 10° latitude from the polar edge of continent, meaning the Farne Islands is at the very south of this species' range. Red tides periodically occur and could impact the population, and disease impacted a large proportion of the population at the Beadnell Bay nesting site in 2019⁷³. Collapses in the sandeel stocks and pollution can also impact – however, given the exceptionally long migration distance of this bird, any issues in the circumpolar regions could impact these birds. Biosecurity measures will need to be maintained to ensure rat predation does not become a threat. At locations such as the Beadnell Bay nesting site, flooding during extreme tides/floods in breeding season can impact breeding success, and in common with Arctic terns in general^{30,74,75,76} there is intra-island movement in the region between the Farne Islands, Coquet, Beadnell Bay and Lindisfarne.</p> <p>A rapid increase in large gull numbers⁶³ can influence breeding success and are already impacting this species on the islands and both predators and changes to vegetation can impact Arctic tern can impact choice of nesting location⁷⁵, therefore maintaining and expanding available habitat and deterring and managing predators on-island will likely reverse the downward trend. On the islands it is also likely that the presence of people is becoming crucial to the success of Arctic terns on the islands⁵¹, therefore a visitor and ranger presence in limited numbers and within limited time frames should be resumed where it is safe to do so.</p>
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<p>Guillemot^{LC}</p>	<p>This species is highly vulnerable to human disturbance as it is found in high concentrations outside the breeding season, in contrast with puffins. Throughout the 19th and early 20th centuries, egg collection and shooting at colonies, as well as introduced alien predators caused severe declines in the world population and unregulated hunting in Greenland is still a major threat. As human populations increased and expanded the species was extirpated in many regions, particularly in the south of its range. Other important threats are overfishing of important forage species (e.g. capelin, herring, cod and sandeels) in the North Atlantic (Barents Sea, Iceland), uncontrolled gill-net fisheries in the north-east Atlantic and oil pollution and offshore petroleum developments in areas such as the Barents and North Seas and Greenland (Nettleship et al. 2018). The species is susceptible to avian cholera (Österblom et al. 2004) so is threatened by future outbreaks of this disease. Wind farm development has a negative impact on this species as well (Vanermen et al. 2014). The species is also likely threatened by future climate change (Sandvik 2005, Frederiksen et al. 2013).</p>	<p>The guillemot's tendency to remain in high concentrations outside the breeding season may have contributed to the large number of guillemots in wrecks in late 2021 – population-level impacts on this and other species remain to be seen, and may not be fully observed in terms of breeding numbers for five years if, as is likely the juvenile population was impacted. Winter mortality impacts auk populations but the severity of the winter 2021 event is yet to be seen. The wintering range of British birds is thought to be predominantly on the Icelandic, Norwegian and British coasts and therefore wind farm development, pollution and gill-net fishing will impact this species, but does not currently appear to be driving a decline on the Farne Islands. It is likely that climate change will impact this species in the future⁷⁷, particularly food availability and sea surface temperatures⁷⁸, though the population currently appears to be doing well. Avian cholera may be a threat in future. Generally guillemots will winter around the UK coast, well offshore.</p> <p>Avian influenza impacted this species on the islands in 2022⁹⁸.</p>
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Razorbill ^{LC}	<p>This species is threatened by the current and future impacts of climate change, including temperature extremes, sea temperature rises and shifts and reductions in prey availability (Sandvik et al. 2005). The species is vulnerable to extreme weather, with severe winter storms causing large scale mortality across north-western Europe in the past (Underwood and Stowe 1984). As a pursuit diver the species is at risk from being caught in gillnets and driftnets, with gillnet fisheries in the North and Baltic Seas known to catch significant numbers (Zydalis et al. 2013; Skov et al. 2011). As the species spends much of its life at sea, including at and below the sea surface, it is vulnerable to both chronic oil pollution and oil spill events. Offshore renewable energy, such as wind farms are also likely to pose a threat to this species, including through habitat displacement (Furness et al. 2013) and collision, although collision risk is currently considered low (Bradbury et al. 2014). Disturbance from shipping lanes and marine constructions occurs in coastal and offshore areas with high human presence, and habitat degradation at sea from mining and aggregate extraction also threatens this species. On land during its breeding season this species is exposed to invasive mammalian predators (e.g. rats, cats, mink), which could increase in severity as climate change allows their northward movement. The species is also vulnerable to disturbance from recreational and tourism activities. It is hunted in the Faroe Islands (Thorup et al. 2014).</p>	<p>Gillnet & driftnet fishing, oil pollution, wind farms, shipping lanes and mining could impact this species in its wintering range, though specific impacts on Farne Islands birds are unknown. These birds may winter throughout European seas Europe from southwest Norway to Iberia and North Africa, and into the western Mediterranean⁷⁹. Biosecurity measures will need to be maintained to ensure rat predation does not become a threat. Winter mortality impacts auk populations but the severity of the winter 2021 event is yet to be seen – the number of razorbills impacted may have been masked by the much larger number of guillemots found on the coast. It is likely that climate change will impact this species in the future⁷⁷, particularly food availability and sea surface temperatures⁷⁸, though sea surface temperatures are thought to impact guillemot survival the most⁷⁸, the razorbill population is relatively stable while the guillemot population is increasing. The impact on razorbills of vessels on the water on is unknown but recreation could threaten this species^{80,32}. Razorbills will generally winter around the UK, off the coast of Norway, or south the the Mediterranean.</p>
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Puffin ^{EN}	<p>This species is highly susceptible to the impacts of climate change, such as sea temperature rise and shifts in prey distribution and abundance (Durant et al. 2003, Sandvik et al. 2005). This is a particularly important threat when prey species are exploited unsustainably, leading to prey reductions and subsequent unsuccessful breeding. The species is vulnerable to oil spills and other marine pollution. The species is also vulnerable to extreme weather events and storms, with large wrecks recorded following severe winter storms at sea. At the breeding colonies the species is vulnerable to invasive predators, such as rats, cats, and American Mink <i>Neovison vison</i>. The species is susceptible to being caught in gillnets, although other fishing gears may also catch significant numbers. Increasing numbers of offshore wind farms may result in displacement from habitat, although the risk of collision is considered very low (Bradbury et al. 2014). The species is hunted for human consumption in Iceland, and in the Faroe Islands (Thorup et al. 2014).</p>	<p>Farnes birds are likely to winter across the North Sea and towards the Atlantic⁸², so oil spills, gillnets and other marine pollution are a risk and wider declines due to foraging ranges⁸³ seen in north Scotland, Norway and Iceland may impact Farnes birds in the future. Winter mortality impacts auk populations but the severity of the winter 2021 event is yet to be seen. It is likely that climate change will impact this species in the future⁷⁷, the puffin population is relatively stable rather than increasing as the guillemot population is doing.</p> <p>Birds are more likely to leave from a saturated colony and move to other colonies nearby⁸¹ – the population appears stable at the moment but it is difficult to compare to wider trends year-on-year as so few colonies monitor on an annual basis. Biosecurity measures will need to be maintained to ensure rat predation does not become a threat. Each puffin has its own consistent wintering route which can be well north and west of the breeding colony, so there is a possibility that shooting may impact on some individuals but it is expected that this would be a small number.</p> <p>Avian influenza impacted this species in 2022, both on the islands and on neighbouring Coquet⁹⁸.</p>
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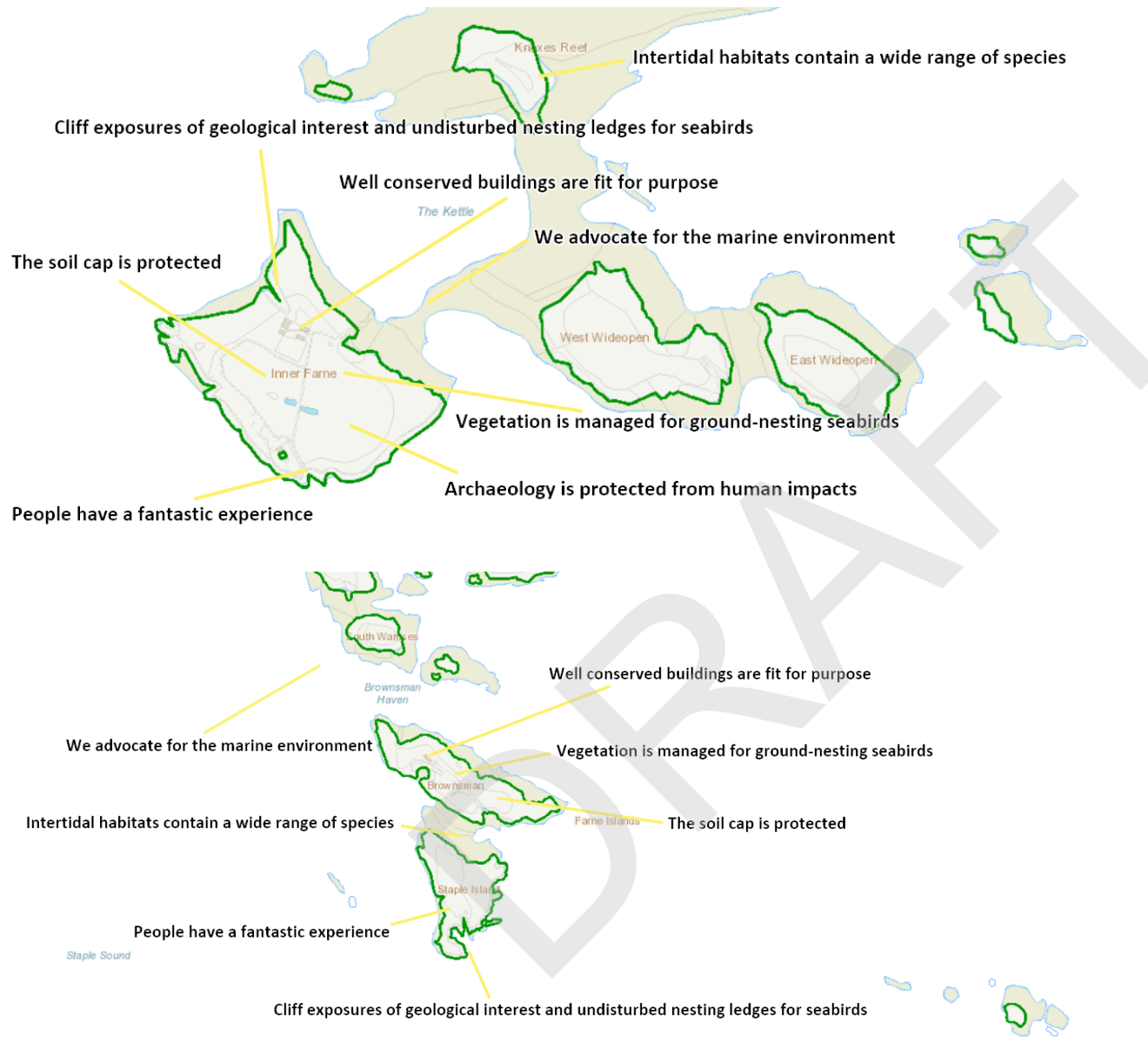
4. What are the important features and where are they?

Land Outdoors and Nature features	
Healthy	Soils (particularly the soil cap, providing a habitat for burrowing seabirds) Water resources

Rich in wildlife	Globally important seabird colony (SSSI/SPA feature) ⁵ Seabird habitats including sea cliffs & rocky shores (SAC) ⁶ Grey seals & associated habitats (SAC) ⁶
Rich in culture	The historic environment including grade 1, 2 and 2* listed buildings ⁷ Archaeology including Scheduled Monument on Inner Farne ⁸
Beautiful	The landscape quality is very high and the views of, and from, the property are beautiful
Enjoyed	Important visitor destination for seabirds in particular
Productive	The wildlife, landscape, archaeology and historic environment are enjoyed, loved and protected by visitors

The designations cover the whole of the islands, therefore only the specific archaeological and soil features are mapped below

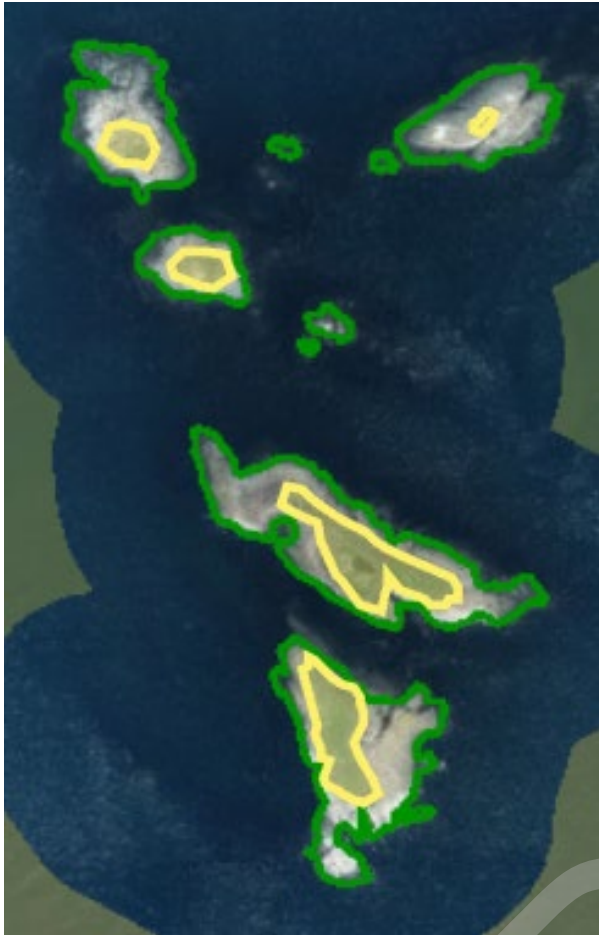
Map 1: Location of the main features & planned actions on the Inner Group of islands



Map 2: Location of the main features & actions on the Outer Group of islands



Map 3: Location of the important soil cap areas on the Inner Group of islands



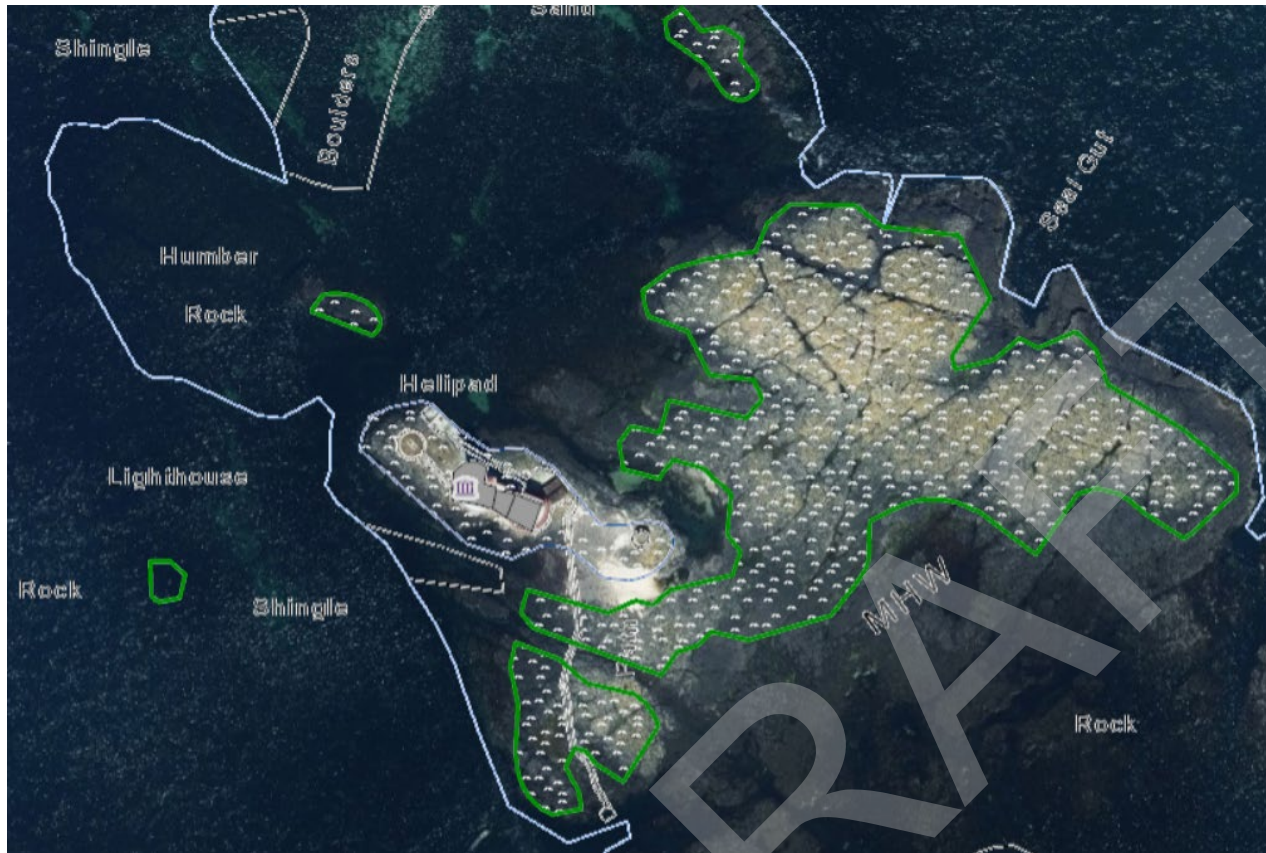
Map 4: Location of the important soil cap areas on the Outer Group of islands



Map 5: Location of the scheduled monument and listed buildings on the Inner Farne



Map 6: Location of listed building on Brownsman



Map 7: Location of listed building on Longstone

5. Objectives for the LON features: description, vision, factors, attributes, status, current condition and action

Nature and Wildlife: seabirds, seals and the marine environment

CPI feature/attribute: Seabird assemblage

LON KPI: Nature and wildlife



description:

Nesting Arctic tern, common tern, Sandwich tern, roseate tern and guillemot³; Atlantic puffin, great cormorant, European shag, black-legged kittiwake, eider, fulmar, razorbill and ringed plover⁷. Around 200,000 seabirds breed on the islands in a given season

What do we want?

A thriving seabird colony, with effective biosecurity plan and relevant research and monitoring activity.

What we can influence:

Impacts of gull predation and displacement of other species on Staple, Brownsman & Inner Farne; human disturbance (nesting birds); biosecurity issues (from visiting boats & visitors); high quality research. We can also influence vegetation, grazing and chick shelters (covered in habitat section)

Harder to influence but still have an impact:

Human disturbance (rafting, feeding birds); overfishing; marine pollution; climate change¹⁷; biosecurity issues (from marine environment, kayakers/non-landing vessels or animals 'swimming' to islands); global impacts on wintering birds; disease eg avian flu & avian botulism

What are the attributes we want to protect, what factors do we need to manage and how do we measure progress?	Current rationale & status	Action and monitoring – focussed on Brownsman, Staple & Inner Farne (see annual work programme for detail actions, timings & costings)
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<p>Factor: Gull & crow impacts on ground nesting birds [e.g tern spp. eiders], particularly terns and eiders (NEWLS)</p> <p>Upper limit: Numbers of individual large gull (lesser black-backed gull, herring gull and great black-backed gull) pairs should be within thresholds described for individual species below</p> <p>Lower limit: Numbers of individual large gull (lesser black-backed gull, herring gull and great black-backed gull) pairs should be within thresholds described for individual species below</p>	<p><u>Poor</u> - Gull numbers have risen hugely on the islands in recent years, and large gulls will be having an impact on other nesting birds in terms of competition for habitat, predation and disturbance. We are not seeing a steep decline in cliff nesting birds but are seeing declines in ground nesting birds and eider.</p> <p>Gull control is required as ground nesting birds, aside from burrowing species, are in steep decline to the point where Sandwich terns may disappear from the islands within the plan period, while eiders and common terns may not be present within the following plan period. Roseate terns are unlikely to be able to successfully return to breed on the islands should large gull numbers continue to increase.</p> <p>While wider factors in the environment will impact all seabirds to a greater or lesser degree, both terns and eiders in particular have steeply declined</p>	<p>Monitor & record gull predation impacts through timed observations</p> <p>Use a combination of agrilaser; sound recordings; human presence and terror eyes across islands coupled with assessment of deterrent success:</p> <ul style="list-style-type: none"> - Focussing on Inner Farne & Brownsman, use sound recordings combined with ranger & hi-viz or agrilaser to regularly scare gulls from strategic points from October to April, prior to the arrival of terns. Note: laser is ineffective in sunny weather and sound recordings affected by wind - Focussing on Inner Farne & Brownsman, regularly scare gulls from roosts (at least daily), where large populations of other birds will not be disturbed, particularly during late March and April before black-headed gulls, terns and puffins arrive¹⁰ <p>Focussing on Inner Farne & Brownsman, trial scarecrows and terror eyes by moving these to strategic positions from October to April, ensuring these do not negatively impact fulmars, shags or eiders</p> <p>2023: Destroy a proportion of nests according to 2023 gull license⁹⁷ application & assess results with Natural England in Oct 2023</p> <p>2024: Destroy a proportion of nests according to 2024 gull license⁹⁷ which will be determined by an increase or decrease in the number of breeding pairs of large gulls. Assess results with Natural England in Oct 2024</p> <p>Where necessary, subject to license, use gamekeeper to remove adult or subadult birds which persistently predate terns, eiders or shags</p>
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	<p>on the islands. Nearby Coquet island, around 25 miles south, has seen more favourable trends than the Farne Islands in recent years and so wider factors are unlikely to be impacting only on Farnes birds.</p> <p>It is also important to note that any issues with food availability in the wider environment are likely to impact gulls the least. Among seabirds, gulls (genus <i>Larus</i>) are the most generalized group and are capable of changing diets both between and within breeding seasons.⁵⁵ An example of a relevant study while controlled for feeding conditions and disease showed that gulling culls in consecutive years increased common tern productivity⁵⁶. Another study showed that coloniality did not protect tern colonies overall from predation⁵⁸. It is therefore expected that we will need to reduce the number of gulls, particularly on and near to islands where both gulls and terns nest, alongside monitoring</p>	<p>Should crows start to nest on the islands, the bird's nests will be destroyed under the general license in order to encourage them to nest elsewhere</p> <p>Focussing on Inner Farne & Brownsman, scare gulls including subadults from roost areas at least daily from July to September, after the terns including subadults and fledglings have left the islands</p> <p>Use shooting under license with gamekeeper to manage 'problem' gulls after paint marking where possible, as a last resort, focussing only on those predating terns and eiders & recording & reporting results annually¹¹⁶¹¹</p> <p>Continue to carry out annual monitoring of all nesting seabirds, including gulls, to ensure the gull population does not decrease below lower thresholds</p> <p>Consider (subject to Natural England consent) colour ringing scheme for any gull chicks found to record inter-island movements</p> <p>Continue (subject to Natural England consent) working with gamekeeper to create plan to remove rabbits in 2022 and 2023 (further info in following section) to reduce food available for gulls over the winter months</p> <p>Review all methods on annual basis with Natural England, examining effectiveness of deterrence & egging methodologies</p> <p>Remove any crow nests to deter carrion crows from the islands</p>
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	<p>of predation impact and annual review.</p> <p>While all tern species are highly mobile³⁰, it is likely that gulls, human presence/ disturbance and habitat quality in combination will be impacting ground nesting birds. Human presence and habitat quality impacts appear mixed and species dependent – for example, Arctic terns favoured Brownsman island in 2021 which was uninhabited, and vegetation was not managed that year on Brownsman but Arctic terns are generally thought to favour and be more successful in relatively managed areas with regular human presence on the islands. For eiders and Arctic terns, the individual behaviour of the birds is also key, with some individuals choosing to nest very close to visitor areas and not being disturbed when visitors are extremely close to them.</p> <p>One factor affecting terns which is in our control and has the clearest trend correlating with</p>	
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ground-nesting bird declines, is the nesting gull numbers. Large gulls including herring gulls, and lesser black-backed gulls can impact tern productivity⁵⁴ and Arctic tern numbers have been correlated with gull abundance in specific studies.⁶³

It is also clear that some individual gulls can specialise in terns, having a larger impact than an average gull⁵⁶. It is therefore expected that we will attempt to identify and remove problem gulls within the plan period.

Intertidal specialist gulls tend to lay eggs earlier, produce heavier and larger clutches and have higher rates of hatching than more generalist individuals and other specialists⁵⁷. Ideally, if we were to leave any eggs on larger islands these earlier nests would be the ones to leave, however this is a risky strategy which could result in a second brood and a switch in diet of the parent bird from intertidal areas to the later eggs of prey species.

	<p>Attempts to remove a proportion of gull eggs in 2019 (10% of the population) did not result in a reduction in the number of nesting gulls the following year. Therefore, removing a higher quota of eggs that is proportionate to the increase in breeding pairs on Inner Farne, Brownsman, Staple and the Wide opens seems like the most appropriate approach. This will reduce the overall number of gulls and consequent predation.</p> <p>Finally, while pressures on eiders are high with a strong regional decline, gulls could be contributing to this decline as they can hugely influence eider fledging success³².</p> <p>Crows occasionally nest on the islands (1/2 pairs) – the nests are removed and the adult birds then generally move off the islands.</p>	
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<p>Factor: Gull impacts on puffin fitness and productivity (NEWLS)</p> <p>Upper limit: Gulls should not impact on the fitness or productivity of puffins to a level which causes significant impact</p> <p>Lower limit: Not required</p>	<p><u>Good</u> – The puffin population on the Farne Islands appears stable for the moment. We are not aware of any gull impacts on puffin productivity but black-headed gulls do display kleptoparasitic behaviour on Inner Farne.</p> <p>It is likely that lesser black-backed gull colonies in particular exacerbate soil erosion through vegetation removal⁹²</p>	<p>Consider ongoing study of the impact of gulls (including including black-headed gulls) on puffin productivity and fitness, so action can be taken on the island should the puffin population steeply decline</p> <p>Consider feasibility of examining black headed gull nesting areas and puffin nesting areas to see if there is an overlap</p> <p>Monitor & record gull predation impacts through timed observations</p>
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<p>Factor: Bird productivity monitoring, annual counts & research of SPA and SSSI protected birds</p> <p>Upper limit: Productivity 'monitoring' (surveillance) should be achievable and focussed on the correct proportion of the population in accordance with the previous year's results where feasible</p> <p>Lower limit: Annual counts to BTO standards should be carried out each year</p>	<p><u>Good</u> – There is a high level of monitoring carried out on the islands for all nesting species, with a few minor changes to timings to account for staff and visitors. Productivity of kittiwake, shag, Arctic tern, eider and fulmar is monitored annually but there is potential to monitor more species, particularly declining terns.</p>	<p>Ensure monitoring methodologies remain consistent, according to those listed in the annual workplan/management plan through annual review</p> <p>Review data & spreadsheets to ensure data capture is efficient as possible, including exploring the use of similar equipment to tree safety surveys to capture data in the field (excluding cliff counts)</p> <p>Alongside camera/drone trials, trial power analysis of productivity data, potentially focussing on a different species each year, beginning with Sandwich tern, common tern, fulmar; eider; puffin; shag; Arctic tern; kittiwake; razorbill – to give a recommended proportion of population monitored each year</p> <p>Consider use of remote cameras or observations from Pele Tower to monitor Sandwich tern & common tern productivity predation & provisioning</p> <p>Explore the potential use of cameras and drones and citizen science/AI to perform annual counts & productivity monitoring with less invasive methods</p> <p>Examine productivity figures for eider, Arctic tern, Sandwich tern & common tern (latter two require new methods) to help determine cause of decline</p> <p>Share migratory bird & monitoring bird data annually with BTO & request copy for NT records</p> <p>Implement annual review of management plan every January</p>
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		<p>Complete & annually update conservation questions¹⁹ list to drive high quality research on islands</p> <p>Ensure archive of studies carried out on islands is updated & maintained</p> <p>Continue digitisation of past data whilst keeping originals</p> <p>Complete Farnes Vision document to guide our agreed future along with stakeholders</p>
<p>Factor: Biosecurity</p> <p>Upper limit: There should be no mammals on the islands. Ongoing monitoring should be carried out on all islands.</p> <p>Lower limit: Ongoing monitoring should be carried out throughout the year on the key ground-nesting bird islands of Inner Farnes, Brownsman and Staple Islands</p>	<p><u>Good</u> – Biosecurity monitoring is being carried out and will be enhanced as the final plan¹⁵ is developed along with Biosecurity4Life. There is some work to do to ensure staff, stakeholders and visitors understand biosecurity and good biosecurity practices.</p> <p>Pirri-pirri bur has been brought to the islands in the past and has been immediately removed and burnt where found. A dead rat was found on the island in 2020 and</p> <p>Rabbits are present on the islands.</p>	<p>Continue implementation of biosecurity plan¹⁵ & keep records of checks, location of bait stations using GIS & record any incursions</p> <p>Ensure any food kept on islands is rodent proof</p> <p>Ensure licence contains biosecurity information and work with partners to ensure that this is understood by visitors, boat owners, skippers and key stakeholders – including biosecurity measures and prompt reporting to National Trust team</p> <p>Biosecurity signage in harbour and refresher training for all Farnes staff including retail & visitor teams for March/April</p> <p>Add further information to biosecurity plan to help identify potentially invasive species & next steps should they be discovered</p>

<p>Factor: Drones/UAVs</p> <p>Upper limit: No aircraft, including drones, over islands</p> <p>Lower limit: Drones used only for monitoring purposes for seals or cliff-nesting bird trials</p>	<p><u>Moderate</u> – The islands do not currently have a CAA no-fly-zone in place, and there are no extant byelaws. There is a National Trust rule that drones must not fly over NT land without NT permission.</p> <p>Note: no filming with drones for commercial purposes (see ‘Visitor Experience’ section)</p> <p>Some disturbance has occurred due to drones flown from a boat – the law in this case appears rather woolly.</p>	<p>Record & report any incidents on incident reporting system and send to CAA & Natural England</p> <p>Encourage any measures which prevent flying over Farne Islands</p> <p>Continue drone monitoring for seals, ensuring messaging on any use of drones includes ‘no drones’</p> <p>Request Natural England permission should any cliff-nesting bird drone trials occur</p> <p>Clarify how WiSE³⁵ scheme can assist with any rules around drones flown from a boat</p>
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<p>Factor: Disturbance to terns, cliff-nesting birds, fulmars, puffins, eiders and cormorants from people</p> <p>Upper limit: Disturbance should not impact the productivity or fitness of these seabirds</p> <p>Lower limit: N/A</p>	<p><u>Unknown</u> – There is generally some disturbance likely to be impacting black-headed gulls on Inner Farne, but people presence on Inner Farne appears to positively impact Arctic terns and also attracts some eiders, likely due to reduced gull predation. There is a lack of information regarding impacts on rafting and cliff nesting birds. Knowledge of disturbance from boats is scant – proximity is relatively close and many cliff nesting birds are doing well. The biggest concern may be eiders, where both disturbance and predation combined can impact fledgling success³²</p>	<p>Ensure closure protocol³ is followed and updated annually to ensure extreme weather (consistent heavy rain or wind) combined with visitors is not causing eggs and chicks up to one week old to chill and die</p> <p>Explore options for protecting nests at periphery of paths – visible chicken wire, weighted fencing.</p> <p>Where eggs are present on the path on Inner Farne or in unavoidable areas in the courtyard, trial and monitor gradual movement of no more than ten nests in 2021 & ten nests in 2022, gradually moving these to the nearest edge of the path c. 5cm at a time in order to protect them from visitors’ feet – success or failure of this approach will be closely monitored & reported against average productivity of the birds</p> <p>Where eggs are present in the courtyard on Inner Farne and a clear alternative route can be found, a clear path is created around them without nests being on the visitor route. Trial & record results of incremental movement of nests which cannot be avoided where there is a high likelihood the eggs will be crushed</p> <p>Encourage boat companies to join WiSE scheme³⁵</p> <p>Support engagement of owners of private vessels with an updated Berwickshire & Northumberland Marine Nature Partnership Code of Conduct²⁴ based on responding to animal behaviours and harbour with Code of Conduct poster</p> <p>Record activities of recreational boats at cliff to monitor impact of recreational boats on cliff nesting birds & juvenile eiders³² to</p>
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		<p>inform Code of Conduct. Record any observed impacts elsewhere (from island)</p> <p>Encourage high quality studies which monitor the impacts of visitors on Arctic tern and eider productivity and fitness²¹</p> <p>Station Rangers at Lighthouse Cliff, top of west face jetty & SW cliffs on Staple to ensure disturbance from visitors on islands and in private vessels is minimised. Include max. of 5 timed observations with camera or Seasonal Ranger</p> <p>Monitor visitor boat proximity to cliff through 5-10 timelapses on Brownsman , redeploying security cameras during visits.</p> <p>Provide data to Natural England, BNMNP & County Ecologist</p> <p>Collect data on visitor numbers on hourly basis to inform maximum visitor numbers in given hour on Inner Farne</p> <p>Keep the following opening times: April, August & September: Inner Farne only, 10am – 5pm May – July: Staple 10am (earliest) – 1.30pm (latest); Inner Farne 1.00pm (earliest) – 5.00pm (latest)</p>
<p>Factor: Nesting Canada geese Upper limit: These birds should not impact on nesting native seabirds Lower limit: N/A</p>	<p><u>Moderate</u> Canada geese have nested 2018-21 and the impacts should be monitored.</p>	<p>Seek advice from partners on potential opportunities/benefits of nesting Canada geese on different islands</p> <p>Monitor positive/negative impacts of Canada geese – grazing; nest displacement; disturbance; aggression; protection of other nesting birds</p>

<p>Attribute: Maintain numbers of breeding eider <i>S. mollissima</i> pairs at or above KNF threshold^{15*}</p> <p>Upper limit: N/A</p> <p>Lower limit: threshold figure 1081 nests⁴</p> <p>Note: 25 yr mean – 648; 5 yr mean - 394</p>	<p><u>Poor</u></p> <p>372 pairs 2021</p> <p>25 yr trend: -64%</p> <p>ST trend: -10%</p> <p>Under threat internationally and under threat in the UK³⁴.</p> <p>Farnes is significant for this species in a UK population context. 2020 figures are used as 2021 data is partial.</p> <p>Please see ‘key challenges’ section above for further information on the recent history of this bird on the islands.</p> <p>Productivity has remained steady from 1996 to 2019.</p>	<p>Create eider piles with nettle, dock, thistle & Yorkshire fog arisings from current & previous years in favoured areas (Inner Farne: green & yellow, periphery of green area & near walls in lighthouse compound; Brownsman: green & purple areas)</p> <p>Implement eider runs to west of Inner Farne to allow swift and safe passage for chicks</p> <p>Encourage studies which investigate causes of eider declines as part of ‘conservation questions’</p> <p>Continue to monitor numbers on annual basis using onl nest count day, 21 days after first Arctic tern egg laid</p> <p>Monitor productivity using principles of WWT sea duck nest monitoring scheme</p> <p>Liaise with BTO to estimate proportion of population necessary to study productivity</p>
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<p>Attribute: Maintain numbers of breeding Sandwich tern <i>T. sandveicensis</i> pairs at or above KNF threshold¹⁵¹⁵</p> <p>Upper limit: N/A</p> <p>Lower limit: threshold figure 2250 breeding pairs</p> <p>Note: 25 yr mean - 978</p>	<p><u>Poor</u></p> <p>285 pairs 2021</p> <p>25 yr trend: -89%</p> <p>ST trend: -48%</p> <p>Under threat in the UK³⁷</p> <p>Please see 'key challenges' section above for further information on the recent history of this bird.</p> <p>There is no long term productivity data for Sandwich terns at the current time, and across the UK productivity fluctuates hugely between years and between colonies in a given year.</p> <p>We have strimmed the periphery of the colonies before the birds arrive on an annual basis, however the vegetation encroaches and becomes taller as the Sandwich tern numbers decrease, with Sandwich terns creating their own bare soil areas and open landscapes and preferring vegetation at 30-100% cover below 20cm height³⁷</p>	<p>Continue to ensure disturbance to breeding colonies is minimised</p> <p>Deploy 50 chick shelters around edge of existing colony</p> <p>Create 25 large (2m²) nesting plots immediately adjacent to periphery of current colony with bare soil to create 'scalloped edge' effect at periphery of colony & seed with sea campion between plots⁸⁸. Ensure puffin burrow access is not impacted</p> <p>Deploy 50 decoys & Sandwich tern sound lures on Inner Farne in April to encourage nesting alongside gull interventions</p> <p>Assess results of vegetation management and gull work in winter 2022, then, if successful, use lures and decoys in 2024 to encourage terns to nest in appropriate locations on Brownsman</p> <p>Consider (subject to Natural England consent) similar interventions on Staple, Knoxes, W. Wides, N. Hares & Longstone should removal of gull eggs and the above lures, decoys & shelters prove successful</p> <p>Encourage studies which investigate causes of Sandwich tern declines as part of 'conservation questions'</p> <p>Continue to monitor numbers on annual basis using BTO census method 2 (21 days after first Arctic tern chick)</p> <p>Consider monitoring chick provisioning</p> <p>Investigate options to monitor productivity using remote cameras as part of 'conservation questions'</p>
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	<p>As climate change means that wind is likely to become more frequent and intense, it will be important to ensure that any areas which Sandwich terns breed are relatively sheltered, as wind speed severely affects energy intake of chicks⁹⁰</p>	
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<p>Attribute: Maintain numbers of breeding common tern <i>S. hirundo</i> pairs at or above KNF threshold¹⁵</p> <p>Upper limit: N/A</p> <p>Lower limit: threshold figure 120 breeding pairs</p> <p>Note: 25 yr mean - 75</p>	<p><u>Poor</u></p> <p>15 pairs 2021 25 yr trend: -74% ST trend: -80% Under threat in the UK³⁸.</p> <p>Please see 'key challenges' section above for further information on the recent history of this bird.</p> <p>There is no long term productivity data for common terns at the current time, and across the UK productivity fluctuates hugely between years and between colonies in a given year.</p> <p>Some vegetation management at the start of the breeding season has occurred, and chick shelters have been used within the colony at least 1.5 feet apart but quickly become swamped by vegetation, therefore further habitat management and maintenance options need to be explored – the results of vegetation management experiments from 2022 on Inner Farne⁹⁵ should help with this. A</p>	<p>Continue to ensure disturbance to breeding colonies is minimised</p> <p>Continue to monitor common tern numbers on annual basis using BTO census method 2 (21 days after first Arctic tern chick)</p> <p>Deploy 50 decoys & sound lures on Inner Farne in April to encourage nesting IF gull interventions are accepted by Natural England & licenses in place by start of season</p> <p>Consider sound lures for common terns on Brownsman in yr 4</p> <p>Trim & create shingle patches in existing colony in combination with chick shelters & seed areas between with maritime herbs to provide optimum habitat⁹¹</p> <p>Should lures and decoys prove successful, consider (subject to Natural England consent) use of lures, decoys, shingle patches and chick shelters or a larger scale to encourage terns to nest on Brownsman and Inner Farne, Cuthbert Cove, top meadow & central meadow in appropriate areas</p> <p>Encourage studies which investigate drivers of common tern declines as part of 'conservation questions'</p>
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	study ⁹¹ has shown weed barriers are more effective than burning for common terns so this will be what we put in place after early strimming	
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DRAFT

<p>Attribute: Maintain numbers of breeding pairs of Arctic tern <i>S. paradisaea</i> pairs at or above KNF threshold¹⁵</p> <p>Upper limit: N/A</p> <p>Lower limit: threshold figure 1,846 breeding pairs</p> <p>Note: 25 yr mean – also 1100</p>	<p><u>Poor</u></p> <p>502 2021 (1135 pairs 2020)</p> <p>25 yr trend: -80%</p> <p>ST trend: -73%</p> <p>Under threat in the UK³⁹. Farnes is significant for this species in a UK population context.</p> <p>Please see ‘key challenges’ section above for further information on the recent history of this bird.</p> <p>As with terns in general, productivity varies wildly between years. Productivity in recent years has recently ranged between 0.2 and 0.5, which is lower than the long-term English average of 0.67³⁰ and appears to be consistent across islands – that is, a poor year on Inner Farne is often reflected in poor productivity on Brownsman. The consistently higher productivity on Inner Farne is thought to be due to the presence of visitors on Inner Farne deterring predatory gulls during afternoons.</p>	<p>Raise Arctic tern nests vulnerable to inundation on beach</p> <p>Create the following, ensuring gaps between plots strimmed & seeded with common saltmarsh grass, sea campion, common daisy, bird’s foot trefoil & buck’s horn plantain [Inner Farne] & common saltmarsh grass & sea campion [Brownsman] prior to season along with chick shelters:</p> <ul style="list-style-type: none"> ▪ 30 1mx1m & 10 1mx5m Arctic tern plots in green areas ex. the veg garden on Brownsman ▪ 10 1mx1m & 5 1mx5m Arctic tern plots in green areas & lighthouse compound ex. veg garden on Inner Farne ▪ 15 1mx1m & 10 1mx5m Arctic tern plots in yellow area on Inner Farne ▪ 5 1mx1m & 2 1mx5m Arctic tern plots in lighthouse compound on Inner Farne <p>Explore options to create new nesting areas where there are few large gulls nesting at Staple, Knoxes, W. Wides, N. Hares & Longstone</p> <p>Continue to monitor numbers on annual basis using BTO census method 2 (21 days after first Arctic tern chick)</p> <p>Continue to monitor population annually using BTO productivity monitoring method 1</p> <p>Liaise with BTO to estimate proportion of population necessary to study productivity</p> <p>Encourage studies which investigate causes of Arctic tern declines as part of ‘conservation questions’</p>
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	<p>The vegetation on the islands changes over time without management and monitoring, and the taller vegetation can be unfavourable for terns generally. For both Inner Farne and Brownsman, a suite of perennial, low-growing plants native to the islands have been selected to be seeded in the locations between the plots after strimming and raking, to reduce soil erosion, bind the soil and provide favourable habitat for terns generally, with glabrous leaves and low-growing nature which would still provide some protection and shelter for chicks</p>	<p>Use decoys to pull Arctic terns to highly productive areas if Arctic terns do not return to Inner Farne in significant numbers in 2023</p>
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<p>Attribute: Maintain numbers of breeding pairs of Roseate tern <i>S. dougalli</i> at or above KNF threshold¹⁵</p> <p>Upper limit: N/A</p> <p>Lower limit: baseline figure from citation 13 breeding pairs^{4,5}</p> <p>Note: 25 yr mean – 0.72</p>	<p><u>Poor</u></p> <p>0 pairs 2021. This species has not bred on the islands since 2015.</p> <p>LT trend: -100%</p> <p>ST trend: 0%</p> <p>Under threat in the UK⁴⁰.</p> <p>Please see ‘key challenges’ section above for further information on the recent history of this bird.</p> <p>Productivity figures are not available and numbers breeding on the Farne Islands historically have been relatively low in the last 25 years.</p>	<p>Liasise with RSPB to implement lures, chick shelters, shingle & terraces to Inner Farne and Brownsman</p> <p>Should Roseate terns nest on the islands, monitor numbers on annual basis as part of annual nest count day, 21 days after first Arctic tern egg laid</p>
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<p>Attribute: Maintain numbers of breeding guillemot <i>U. aalge</i> at or above KNF threshold¹⁵</p> <p>Upper limit: N/A</p> <p>Lower limit: threshold figure 3,184 breeding birds¹⁵</p> <p>Note: 20 yr mean: 49,800</p>	<p><u>Good</u></p> <p>62,936 individuals 2021</p> <p>26 yr trend: +194%</p> <p>ST trend: +30%</p> <p>Under threat in the UK⁴¹</p> <p>Farnes is significant for this species in a UK population context.</p> <p>Please see 'key challenges' section above for further information on the recent history of this bird.</p> <p>There is a historic productivity decline, particularly in the north and east of the UK, thought to be driven by prey availability. On the Farnes, however, for years where we have the data, it appears that the productivity is marginally higher than the UK average.</p>	<p>Continue to monitor numbers on annual basis using JNCC whole colony census method, counting in groups of 10 in the densest colonies</p> <p>Liaise with BTO to estimate proportion of population necessary to study productivity, & consider options for use of remote cameras to measure this</p>
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<p>Attribute: Maintain razorbill <i>A. torda</i> numbers at or above 5 year mean</p> <p>Upper limit: N/A</p> <p>Lower limit: Five year mean: 432 breeding pairs</p> <p>25 yr mean – 232 breeding pairs</p>	<p><u>Stable-Poor</u></p> <p>440 breeding pairs 2021</p> <p>25 yr trend: +193%</p> <p>ST trend: -4%</p> <p>Under threat in the UK⁴².</p> <p>Please see ‘key challenges’ section above for further information on the recent history of this bird.</p> <p>Productivity has declined on the islands in the long term but has been similar to the UK average, aside from a concerning dip between 2016 and 2019, which appears steeper than the slight dip UK-wide.</p>	<p>Continue to monitor numbers on annual basis using JNCC whole colony census method</p> <p>Continue to monitor productivity on annual basis using SMP productivity monitoring method 1</p> <p>Liaise with BTO to estimate proportion of population necessary to study productivity, & consider options for use of remote cameras to measure this</p>
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<p>Attribute: Maintain numbers of breeding pairs of puffin <i>F. arctica</i> at or above KNF threshold¹⁵</p> <p>Upper limit:</p> <p>Lower limit: baseline figure from citation 14,000⁴</p> <p>Note - 25 yr mean cannot be calculated as annual counts started in 2002</p>	<p><u>Stable</u> 43,752 breeding pairs 2019 LT trend (26 yrs): +26% ST trend (6 yrs): +9%</p> <p>Under threat internationally¹⁷ and under threat in the UK⁴³ but this species appears to be doing well on the islands. Farnes is significant for this species in a UK population context.</p> <p>Please see 'key challenges' section above for further information on the recent history of this bird.</p> <p>Puffin productivity has remained consistent in the long term, with birds on the islands being slightly more productive than the UK average.</p> <p>A puffling run is created each year to allow easy access to sea for pufflings, reducing entanglement and predation. Previous attempts at preventing soil erosion through netting can cause entanglement and death of adult puffins.</p>	<p>Continue to monitor numbers annually using BTO census method 1b²⁷, starting as soon as puffins appear settled in late April – early May</p> <p>Continue to monitor productivity on annual basis using BTO productivity monitoring method 1²⁷</p> <p>Liaise with BTO to estimate proportion of population necessary to study productivity</p> <p>Remove any netting from previous attempts to prevent erosion.</p> <p>Strim annual puffling run to Inner Farne beach in April & follow-up if necessary in June, avoiding nesting birds & allowing puffling access to beach</p> <p>As of 2023, initiate 5-yearly assessment of high and low density puffin areas for re-mapping of puffin census areas</p> <p>Consider examining impacts of visitors on puffin productivity</p> <p>Consider studies tracking puffin movements between islands</p>
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<p>Attribute: Maintain shag <i>G. aristolelis</i> numbers at or above KNF threshold^{4,15}</p> <p>Upper limit: N/A</p> <p>Lower limit: threshold figure 443 breeding pairs¹⁵</p> <p>Note – 25 yr mean 880 breeding pairs</p>	<p><u>Poor</u></p> <p>425 breeding pairs 2021 25 yr trend: -60% ST trend: -40% Under threat in the UK⁴⁴.</p> <p>Please see ‘key challenges’ section above for further information on the recent history of this bird.</p> <p>Shag productivity has improved in the long term, while the national picture is one of fluctuating productivity but relatively stable figures over time.</p>	<p>Continue to monitor numbers annually a combination of BTO census method 1²⁷ and JNCC whole colony count method</p> <p>Continue to monitor productivity on annual basis using BTO productivity monitoring method 1²⁷</p> <p>Liaise with BTO to estimate proportion of population necessary to study productivity</p>
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<p>Attribute: Maintain cormorant <i>P. carbo</i> numbers at or above KNF threshold⁴threshold⁴⁴</p> <p>Upper limit: N/A</p> <p>Lower limit: threshold figure 238 breeding pairs¹⁵</p> <p>Note – 25 yr mean 100 breeding pairs</p>	<p><u>Poor</u></p> <p>68 pairs 2021 25 yr trend: -70% ST trend: -26%</p> <p>Please see ‘key challenges’ section above for further information on the recent history of this bird.</p> <p>There is no recent data on cormorant productivity on the islands, though inland populations nationally are more productive than coastal ones, due to food availability. The population on the islands is important – coastal breeding cormorants of subspecies <i>P. carbo carbo</i> have declined by about 11% since 1986, with some larger declines of up to 60% in northern Scotland.</p>	<p>Continue to monitor numbers on annual basis using a BTO census method 1²⁷</p> <p>If successful for other species, in 2025 consider use of remote cameras to remotely monitor productivity.</p> <p>Continue to ensure disturbance to breeding and resting birds is minimised.</p>
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<p>Attribute: Maintain fulmar <i>F. glacialis</i> numbers at or above 5 year mean</p> <p>Upper limit: N/A</p> <p>Lower limit: Five year mean: 222 breeding pairs</p>	<p><u>Stable</u> 263 pairs 2021 25 yr trend: -1% ST: +46% Under threat in the UK⁴⁶.</p> <p>Please see 'key challenges' section above for further information on the recent history of this bird.</p> <p>Fulmar productivity appears steady, mirroring UK trends, and remains at a similar level to UK trends.</p>	<p>Continue to ensure disturbance to breeding & resting individuals is minimised</p> <p>Monitor population using BTO population monitoring method 1 (21 days after first Arctic tern egg)</p> <p>Continue to monitor productivity on annual basis using BTO productivity monitoring method 2²⁷</p> <p>Liaise with BTO to estimate proportion of population necessary to study productivity</p> <p>Always keep at least 20m from nesting fulmars</p>
<p>Attribute: Maintain ringed plover <i>Charadrius hiaticula</i> numbers at or above 5 year mean</p> <p>Upper limit: N/A</p> <p>Lower limit: Five year mean: 2 breeding pairs</p>	<p><u>Poor</u> 3 pairs 2021 25 yr trend: -73% ST -25% Under threat in the UK.</p> <p>Regionally, ringed plovers are faring very badly, due to disturbance, predation and tides.</p> <p>There is not enough Farne Islands data on ringed plover to give an idea of productivity trends.</p>	<p>Cage ringed plover nests, and raise any nests vulnerable to tides^{25*}</p> <p>Include ringed plover nesting habitat in gull patrols</p> <p>Continue to monitor numbers on annual basis as part of annual nest count day, 21 days after first Arctic tern egg laid</p>

<p>Attribute: Maintain kittiwake <i>R. tridactyla</i> numbers at or above KNF threshold^{4,15}</p> <p>Upper limit: N/A</p> <p>Lower limit: threshold figure 3,976 breeding pairs¹⁵</p> <p>Note – 25 yr mean 2,944 breeding pairs</p>	<p><u>Stable - Poor</u></p> <p>4304 pairs 2021</p> <p>25 yr trend: -30%</p> <p>ST trend: -9%</p> <p>Under threat internationally¹⁷ and under threat in the UK⁴⁷.</p> <p>Please see ‘key challenges’ section above for further information on the recent history of this bird.</p> <p>Kittiwake productivity remains steady on the islands, while UK wide a historic decline appears to be resersing in the short term. Productivity on the islands is slightly higher than the UK average.</p>	<p>Continue to monitor numbers annually BTO whole colony census method</p> <p>Continue to monitor productivity on annual basis using BTO productivity monitoring method 1</p> <p>Liaise with BTO to estimate proportion of population necessary to study productivity</p>
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<p>Attribute: Black-headed gull <i>C. ribibundus</i> (NEWLS)</p> <p>Upper limit: 5 yr mean 459 breeding pairs</p> <p>Lower limit: 25 year mean 289 breeding pairs</p>	<p><u>Good</u></p> <p>367 pairs 2021</p> <p>25 yr trend: +303%</p> <p>ST: -24%</p> <p>Under threat in the UK⁴⁸</p> <p>Please see 'key challenges' section above for further information on the recent history of this bird.</p> <p>There has been considerable regional variation in black-headed gull productivity trends and information UK-wide is fairly sparse. Black-headed gull productivity is not currently monitored.</p>	<p>Remove vegetation from walls to prevent BHGs nesting in areas with good vantage point over tern & eider nests</p> <p>Continue to monitor numbers on annual basis on nest count day, 21 days after first Arctic tern egg laid</p> <p>Monitor & record gull predation impacts through timed observations</p>
<p>Attribute: Lesser black-backed gull <i>L. fuscus</i> (NEWLS)</p> <p>Upper limit: 5 yr mean 678 pairs</p> <p>Lower limit: 22 yr mean 558 pairs</p>	<p><u>Good</u></p> <p>839 pairs 2021</p> <p>LT (22 years): +185%</p> <p>ST: +23%</p> <p>Under threat in the UK⁴⁹</p> <p>Note: 3 generations = 42 years</p> <p>There is insufficient UK-wide and on-island data to generate meaningful productivity trends</p>	<p>Manage large gulls according to principles above to reduce predation impacts on terns and eiders</p> <p>Continue to monitor numbers on annual basis with a combination of nest count day, 21 days after first Arctic tern egg laid, and either Seabird Monitoring Programme census method 1²⁷ (Inner Farne, Brownsman & Staple) or 4²⁷ (other islands) depending on the island to be surveyed</p> <p>Monitor & record gull predation impacts through timed observations</p>

<p>Attribute: Herring gull <i>L. argentatus</i> Upper limit: 5 yr mean 853 pairs (NEWLS) Lower limit: 20 yr mean 662 pairs</p>	<p><u>Good</u> 1219 pairs 2021 20 yr trend: +960% ST: +43% Under threat in the UK⁵⁰.</p> <p>Note: 3 generations – 39 years</p> <p>The UK-wide productivity trend is declining but there is insufficient data on the islands for a comparison to be made.</p>	<p>Manage large gulls according to principles above to reduce predation impacts on terns and eiders</p> <p>Continue to monitor numbers on annual basis with a combination of annual nest count day, 21 days after first Arctic tern egg laid, and either Seabird Monitoring Programme census method 1 or 4 depending on the island to be surveyed</p> <p>Monitor & record gull predation impacts through timed observations</p>
<p>Attribute: Great black-backed gull <i>Larus marinus</i> (NEWLS) Upper limit: 5 yr mean 18 pairs Lower limit: 25 yr mean 8 pairs</p>	<p><u>Good</u> 19 pairs 2021 25 yr trend: +850% ST: +27% Under threat in the UK⁵¹</p> <p>Note: 3 generations – 36 years</p> <p>There is a historic productivity decline across the UK for this species, but there are recent increases. Productivity of this species is not currently monitored on the islands.</p>	<p>Manage large gulls according to principles above to reduce predation impacts on terns and eiders</p> <p>Continue to monitor numbers on annual basis with a combination of annual nest count day, 21 days after first Arctic tern egg laid, and either Seabird Monitoring Programme census method 1 or 4 depending on the island to be surveyed</p> <p>Monitor & record gull predation impacts through timed observations</p>

<p>Factor: Understanding of impacts of external factors on seabird assemblage</p>	<p><u>Moderate</u> Our knowledge of species wintering locations and consequent impacts of external factors on our birds is limited</p>	<p>'Horizon-scan' for factors external to Farnes which may impact on seabirds – policy changes in particular</p> <p>Work with partners such as RSPB to co-ordinate our 'voice' as a conservation charity in the marine landscape</p> <p>Continue to remain abreast of current research relevant to Farnes species</p>
<p>Current condition</p>		<p>Land condition score: Longstone & Staple: 1; Inner Farne: 4; Brownsman: 4</p>

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FAF

CPI feature/attribute: Seabird habitats including sea cliffs and rocky shores

LON KPI: Nature and wildlife



Brief description: Seabird habitats including sea cliffs, rocky shore, beaches, ground nesting bird habitat mosaic

What do we want?

Habitat mosaic in vegetated areas benefitting terns and eiders, including interventions; vegetation on Inner Farne cut to ensure pufflings can leave; elimination of hemlock, Yorkshire fog & nettle in medium term; intertidal areas free of plastic and other human debris as much as possible; driftwood left in situ

What we can influence:

Rabbits; habitats for ground nesting birds; intertidal debris

Harder to influence but still have an impact:

Disturbance (rafting, feeding birds); overfishing; marine pollution; climate change

What are the attributes we want to protect, what factors do we need to manage and how do we measure progress?

Current status

Action and monitoring

<p>Attribute: Sea cliffs, inlets, marine areas & sea inlets & marine habitats inc. submerged or partially submerged sea caves and reefs</p> <p>Upper limit: Not required</p> <p>Lower limit: Maintain these habitats insofar as is possible</p>	<p><u>Good</u> – We are not aware of any immediate impacts on these habitats which we can control</p>	<p>Natural England to maintain monitoring of temperature, non-native invasive marine species, sea level rise & damage through anchoring. NT to assist where possible.</p> <p>NIFCA to maintain checks on fishing vessels</p> <p>Natural England to carry out condition monitoring of associated SAC reef marine habitats as part of Condition Assessment reporting</p> <p>Review provision of toilets inc. raw sewage as part of marine pollution contingency plan¹⁶</p>
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<p>Factor: Grazing management</p> <p>Upper limit: No damage from livestock or rabbits</p> <p>Lower limit: Stocking rates, livestock type and grazing periods should maintain the habitat mosaic in good condition as defined below</p>	<p><u>Poor</u> - We are unable to control when and where grazing occurs on Inner Farne, so vegetation that is benign, such as daisy, sea campion and thrift does not do well while species such as hemlock, nettle, scurvy grass and Yorkshire fog, which can retain moisture or become dense, causing young chicks to chill and die, can be tricky to reduce in density and extent. Rabbits are not compatible with our vegetation management goals and are not native to the islands.</p>	<p>Discuss feasibility of rabbit management with RSPB & NE in 2022 (would need separate consent)</p> <p>Consider removing rabbits from the islands in autumn and winter 2023 using a combination of gassing, trapping and shooting¹⁰ to reduce uncontrolled grazing of beneficial plants Inc. thrift and sea campion</p> <p>Starting 2023, consider trialling use of temporary grazing animals such as goat(s) on less fragile areas eg veg garden, cemetery & courtyard at start of season on Inner Farne and Brownsman, and less fragile areas for aftermath grazing</p> <p>Consider (subject to Natural England consent) whether male geese would be able to perform a grazing function outside breeding season</p>
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<p>Factor: Bare soil on Inner Farne & Brownsman (pale blue on Inner Farne & red on Brownsman)</p> <p>Upper limit: No bare soil outside common tern/Sandwich tern colony. Vegetation no higher than 15cm</p> <p>Lower limit: No more than 5% bare soil outside common tern/Sandwich tern colony. No 'wallows' or bare soil comprising more than one quadrat size. Vegetation heights forming a mosaic between 1cm and 15cm height. No continuous vegetation stands over 10cm height</p>	<p>Poor – Generally there are longer, denser more continuous patches of vegetation on both Inner Farne and Brownsman. Otherwise, the other islands, which rarely have nesting terns, have better vegetation. There is a large amount of erosion from pupping and moulting seals on Brownsman in particular (covered in soil section), and there is increased erosion in the areas marked 'blue' on Inner Farne, but some bare soil on Inner Farne is utilised by breeding Sandwich & common terns. The replacement of sea campion with orache on Brownsman in some areas is of concern as the sea campion will bind the soil together.</p>	<p>Embed annual review of soil & vegetation management</p> <p>Seed bare soil areas by hand, mixing sand with appropriate species in spring and again in autumn if spring sowing unsuccessful.</p> <p>Trial sowing other spp in 2023.</p> <p>See vegetation management plan below & management & monitoring plan for further information.</p>
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<p>Factor: Extent and density of Yorkshire fog, nettle, dock, sow thistle and burdock on Brownsman</p> <p>Upper limit: No hemlock, burdock or Yorkshire fog present; sow thistle, nettle and dock should not occupy more than 20% of the soil cap and should be scattered and 'mosaic like' in nature. There should be <40% overall vegetation cover, predominantly maritime plants with sea campion, & common saltmarsh grass dominant and orache frequent, with occasional - frequent common daisy, bird's foot trefoil & buck's horn plantain on Inner Farne</p> <p>Lower limit: No more than 5% of the current extent of Yorkshire fog, nettle, sow thistle and dock should be present in 2025, and burdock should not be present.</p>	<p>Poor – Chicks can get chilled to death in the long, rank vegetation at present, while other areas are so dense that ground nesting is not possible. Burdock and Yorkshire fog are a particular risk, with the former producing burrs which birds find it difficult to escape from and the latter's hairiness meaning it gets very wet, causing chicks to chill and die.</p> <p>In the purple area some sea campion and scurvy grass and orache <i>A. glabriuscula</i> is present so any management should be selective. Orache will be less likely to hold the soil together than sea campion. Puffin burrows in some areas are extremely fragile which makes achieving strimming of whole island pre-season more challenging.</p>	<p>Continue National Plant Monitoring Scheme monad annually</p> <p>Avoid strimming/managing sea campion, common saltmarsh grass, or maritime herbs where possible</p> <p>Continue annual vegetation surveillance – fixed point photography, DAFOR & mapping habitats to detect change</p> <p>No inorganic fertilisers, herbicides or pest killing agents including insecticides, fungicides and molluscides will be used on any of the islands</p> <p>Manage plants on Brownsman according to appended monitoring & management work programme</p> <p>Where puffin burrows are too fragile to manage vegetation using trimmers, explore options for creating a weed barrier and then using dredgings to create wider-scale tern patches along with chick shelters⁸⁷</p>
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<p>Factor: Extent and density of Yorkshire fog, hemlock, nettle, scurvygrass, dock, small bugloss, burdock, spear thistle and scarce fiddleneck on Inner Farne & Wides</p> <p>Upper limit: No hemlock, burdock, fiddleneck, scurvygrass or Yorkshire fog present; small bugloss, nettle, spear thistle/other thistles. and dock should not occupy more than 20% of the soil cap and should be scattered and 'mosaic like' in nature. There should be <40% overall vegetation cover, predominantly maritime plants with sea campion, & common saltmarsh grass dominant and orache <i>A. glabruscula</i> frequent.</p> <p>Lower limit: No more than 5% of the current extent of hemlock, Yorkshire fog, nettle, thistle, scurvygrass, small bugloss and dock should be present in 2025, and scarce fiddleneck and burdock should not be present.</p>	<p>Poor – Chicks can get chilled to death in the long, rank vegetation at present, while other areas are so dense that ground nesting is not possible. Hemlock, burdock, Yorkshire fog and scurvygrass are a particular risk while scarce fiddleneck is an American plant which can stick to chicks. there is some hemlock and burdock on the West Wides and solutions to limit their spread should be explored and implemented</p> <p>In the purple area some sea campion and common saltmarsh grass is present so any management should be selective. Puffin burrows in some areas are extremely fragile which makes achieving strimming of whole island pre-season more challenging.</p>	<p>Avoid strimming/managing sea campion, common saltmarsh grass, or maritime herbs where possible</p> <p>Continue annual vegetation surveillance – fixed point photography & mapping / DAFOR on annual basis to detect change</p> <p>Manage plants on Inner Farne & Wides according to appended monitoring & management work programme</p> <p>No inorganic fertilisers, herbicides or pest killing agents including insecticides, fungicides and molluscides will be used on any of the islands</p> <p>Where puffin burrows are too fragile to manage vegetation using trimmers, explore options for creating a weed barrier and then using dredgings to create wider-scale tern patches along with chick shelters⁸⁷</p>
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<p>Factor: Invasive plant species Upper limit: Not required Lower limit: Non-native species including pirri-pirri bur are not present</p>	<p><u>Good</u> – Pirri-pirri bur along boardwalks is generally removed and burnt promptly, while invasive mammals are included in our biosecurity plan¹⁵.</p>	<p>Ensure harbour team alert to seed on shoes/boots & correct online messaging. Ensure rangers aware of plant & boots thoroughly cleaned prior to visting island. Immediately remove whole of plant, inc. fine roots, and burn in enclosed area, should this plant be seen on the islands</p> <p>Continue to remove pirri-pirri bur from alongside areas people can visit and immediately burn the arisings in an enclosed drum to avoid seed spread</p>
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<p>Attribute: Extent & density of native maritime plants on Inner Farne (orange, red)</p> <p>Upper limit: Not required</p> <p>Lower limit: Common saltmarsh-grass, thrift, lesser sea-spurrey, sea milkwort, sea campion and silverweed have increased in extent</p>	<p><u>Poor</u> – Maritime species, if present at all, are limited to the peripheries of the islands and are frequently nibbled away by rabbits. The coming plan period may be the last opportunity to collect seed from some of these plants for potential future restoration.</p>	<p>Protect thrift from rabbits using wire cages & monitor results in orange areas in associated map</p> <p>From 2023, map & monitor locations of maritime plants across islands using DAFOR & regular fixed point photography</p> <p>In 2024, continue annual monitoring & initiate study to examine feasibility of reintroducing native maritime plants to islands</p> <p>In 2025, should previous year’s work identify appropriate areas for reintroduction of native maritime plants, attempt collection, seeding and protection of appropriate maritime plant seeds into new areas, with a focus on thrift</p>
<p>Current condition</p>	<p>Land condition score: Longstone & Staple: 1; Inner Farne: 3; Brownsman: 4</p>	

<p>CPI feature/attribute: Grey seals & associated habitats (littoral rock: submerged or partially submerged sea caves, reefs⁶⁶)</p>
<p>LON KPI: Nature and wildlife</p>



Brief description: Thriving grey seal pupping site with a stable population of grey seals

What do we want?
Thriving grey seal population pups on the islands with minimal disturbance, & intertidal habitats are protected

What we can influence:
Disturbance to pupping site; removal of material from intertidal habitats

Harder to influence but still have an impact:
Overfishing; marine pollution; climate change; persecution or disturbance to seals off-island

<p>What are the attributes we want to protect, what factors do we need to manage and how do we measure progress?</p>	<p>Current status</p>	<p>Action and monitoring</p>
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<p>Attribute: Annual pup production</p> <p>Upper limit: Not required</p> <p>Lower limit: Maintain pup production above baseline figure – 1133¹⁵</p> <p>Ensure no decline of >7% in 6yrs, which would bring the islands into unfavourable condition²⁴</p>	<ul style="list-style-type: none"> • <u>Good</u> - LT trend: +164%; ST trend: +50% <p>Disturbance to the seals is minimal and their population is expanding into new pupping areas on the islands.</p>	<p>Continue to develop less invasive monitoring methods for annual seal monitoring involving the use of drones and/or cameras/sampling</p> <p>Consider developing accurate remote methods for pup mortality monitoring</p> <p>Develop methods to count number of adult grey seals during moult</p> <p>Create summary document outline mortality monitoring methods and data analysis, in case this becomes necessary in future</p> <p>Continue to ensure minimum disturbance to seals throughout year through support of updated Code of Conduct & WiSE scheme, with the exception of Brownsman & Inner Farne where damage to the soil cap may occur (see section relating to birds & soil)</p> <p>Pup production should be measured at least every three years. Mortality rate should not rise above average of 60% over 6 years¹⁵</p>
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<p>Attribute: Strandline habitats & beach⁶</p> <p>Upper limit: No plastic or human debris on strandline and no removal of untreated driftwood</p> <p>Lower limit: Regular checks and removal of litter on accessible islands</p>	<p><u>Good</u> – Litter picks do occur, but driftwood is occasionally removed for firewood from strandlines.</p> <p>Generally, sand is taken in small quantities from bare sand areas for tern nesting patches at a time of year when there are few birds or seals present.</p> <p>It is less possible to regularly check unvisited islands but the options for regular or annual litter picking here should be explored</p>	<p>Regular litter picks on strandline on visited islands where this does not disturb non-gull species</p> <p>Consider feasibility of removal of litter from uninhabited islands at least once per year or more</p> <p>No removal of ‘natural’ (untreated) driftwood to benefit strandline communities including <i>Broscus cephalotes</i>, talitrids, archaeognatha and kelp flies</p> <p>Sand can be removed in limited quantities for tern nesting habitat creation but will be returned to the beach at the end of each nesting season if the tern plots do not last during the winter months</p>
<p>Current condition</p>	<p>Favourable (seal population element)</p>	

Natural Resources

CPI feature/attribute: Soils

LON KPI: Healthy



Brief description: Soil cap on Inner Farne, Brownsman, Staple & Wideopens, consisting of boulder clay and peaty soils⁴⁴

What do we want?

Minimal damage to seabird burrowing habitat

What we can influence:

Impacts of seals (to a degree); impacts of visitors and rangers

Harder to influence but still have an impact:


Soil chemistry, guano, climate change (esp. rainfall intensity)

What are the attributes we want to protect, what factors do we need to manage and how do we measure progress?	Current status	Action and monitoring
<p>Factor: Erosion of soil cap by pupping and moulting seals on all islands Upper limit: Soil cap recovering from seal damage Lower limit: No further damage to soil cap on Brownsman or Inner Farne</p>	<p><u>Poor</u> - the increasing numbers of seals are damaging puffin burrows – particularly on Brownsman Additionally Storm Arwen in 2021 threw seal pups onto the top of the islands so that there were six adults on the top – this did not result in the seals moulting on the top. This seal impact pressure is marginally easier to manage on Inner Farne and Brownsman than more remote</p>	<p>Electric fencing and dog bark sounds deployed on Inner Farne & monitored Oct - Dec & seal numbers & distribution checked Jan - Feb to minimise damage to the soil cap, encouraging seals to beach where needed Jan - Feb. Consider options to deter seals from Brownsman during pupping & moulting season</p>

	<p>islands, where it is difficult to visit and maintain interventions, due to the logistics of accessing those islands due to time, weather and tide. Seals can create wallows which destroy puffin burrows and puffin numbers appear to have steeply declined on Brownsman within the past ten years. When the soil is compacted or the vegetation is changing from perennials such as sea campion to annuals such as orache, even in areas which are vegetated, and increasing frequency of summer storms with compacted soil can drown puffins in their burrows, particularly in more low-lying areas</p> <p>Seal activity is more realistically managed on Inner Farne and Brownsman than more remote islands, where it is impractical. In winter 2021-22, pups were thrown onto the top of Inner Farne</p>	<p>Repair & maintain wall to east of Pele Tower to prevent access to meadows from west of jetty</p> <ol style="list-style-type: none"> 1. Consider options for monitoring seals and preventing soil cap damage on Brownsman 2. Trial use of electric scarer playing loud dog barking sounds, to deter seals from using the soil cap both as a breeding ground in autumn, and as moulting ground in winter. 3. Regular (at least weely) patrolling of Brownsman island to retain a human presence to deter seals from puffin-nesting areas of soil cap Oct - Feb." Investigate past surveys of soil depth, and/or initiate new soil depth/compaction monitoring on Inner Farne & Brownsman, taking into account Scheduled Mionument & puffin burrows <p>Test seal responses to automated human voice, dog & gas gun sounds combined with human presence</p> <p>Develop plans to map vegetation work against moulting/pupping seals</p>
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		<p>Seed eroded areas on Inner Farne [excepting Sandwich tern nesting area] on Inner Farne with thrift, common saltmarsh grass, sea campion, common daisy, bird's foot trefoil & buck's horn plantain along with sand should deterrence methods be successful</p> <p>Seed eroded areas on Brownsman with common saltmarsh grass & sea campion along with sand should deterrence methods be successful</p> <p>Explore options to create new habitat through the use of dredged material in order to build soil cap (2024)</p>
<p>FactorFactor: Visitor & ranger damage to soil cap Upper limit: Not required Lower limit: Ensure visitor access remains as is currently in place, and that ranger damage to soil cap is minimised</p>	<p><u>Good</u> – On Inner Farne, Boardwalks are regularly repaired though more work is needed on Brownsman</p> <p>Damage to soil cap from rangers is minimal and where this does occur, burrows are repaired with boards made from untreated wood</p>	<p>Ensure visitor access continues to be limited to existing areas</p> <p>Replace boardwalk with like-for like structure (60m per year on Inner Farne, 25m per year on Brownsman) according to HMA⁹³. Add non-slip strips where possible.</p> <p>Explore options to mark safe passage through the puffin burrows for monitoring purposes, to minimise damage to said burrows</p>

		Ensure enough untreated wood and slates for burrow repairs is available at start of season
Current condition of soils?	Unfavourable declining ²⁰²⁰ Land Condition Score: Brownsman 4; Staple 3; Inner Farne 2; Longstone 1	

CPI feature/attribute: Geology		
LON KPI: Healthy		
	<p>Brief description: Resistant quartz dolerite, the most easterly outcropping of the Great Whin Sill, and soils indicating changes in the Flandrian period</p> <p>What do we want? A geodiverse archipelago, providing habitats for a wide variety of bird and marine species</p> <p>What we can influence: Soil cap (see soil section directly above)</p> <p>Harder to influence but still have an impact: Climate change</p>	
	<p>What are the attributes we want to protect, what factors do we need to manage and how do we measure progress?</p> <p>Factor: Damage to geological features Upper limit: Not required Lower limit: No damage/disturbance to geological features caused by people. Damage caused by natural processes such as erosion and rock fall will be accepted</p>	<p>Current status</p> <p><u>Unknown</u> - there is no evidence of disturbance/damage caused by people or public access and supralittoral rock is in good condition, but features last assessed</p>

	in 2014 and classed as 'unfavourable recovering' – this is due to the damage to soil cap covered in the soil section rather than impacts on the Whin Sill	
Attribute: Accessibility and visibility Upper limit: Not required Lower limit: All important exposures should be open and visible and, where possible, accessible	<u>Good</u> – the geological features are currently visible and accessible.	See above
Current condition of geology?	Supralittoral rock vegetation unfavourable recovering (2014) Supralittoral rock resistant quartz dolerite – good condition Land Condition Score: 1	

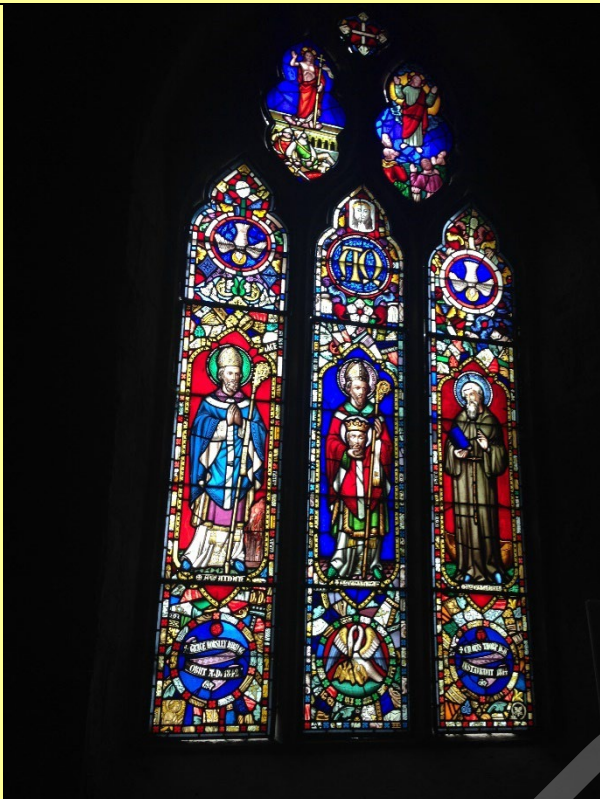
CPI feature/attribute: Water resources
LON KPI: Healthy
<p><i>*Pic of mallard ponds*</i></p> <p>Brief description: Two areas of eutrophic standing water on Inner Farne</p> <p>What do we want? Open standing water on Inner Farne to be maintained</p> <p>What we can influence: Works affecting standing open water</p> <p>Harder to influence but still have an impact: Climate change; water quality</p>

What are the attributes we want to protect, what factors do we need to manage and how do we measure progress?	Current status	Action and monitoring
<p>Attribute: Eutrophic standing water (semi-saline pools)</p> <p>Upper limit: No more than current extent (aerial maps)</p> <p>Lower limit: No less than current extent (aerial maps)</p>	<p>These rarely dry out, and are key for swallows building nests in spring and used by eiders. When they do dry out, swallows, eiders and common terns have usually already made use of them</p>	<p>Monitor any changes to extent of water using aerial maps</p>
<p>Current condition of water resources?</p>	<p>Unfavourable declining LCA score: 4</p>	

D

AAE

Objective for archaeology, landscape and setting & buildings,

CPI feature: Archaeology and the historic environment		
LON KPI: Rich in culture		
	<p>Brief description: A range of grade I, 2* and 2 listed⁷ buildings on Inner Farne, Staple and Brownsman; archaeology across islands including Scheduled Ancient Monument⁸ on Inner Farne including a pre-Viking monastic cell. There are a good range of buildings on the islands showing the history of lighthouse engineering in Britain, with Longstone having been home to one of our most famous lighthouse inhabitants, Grace Darling.</p> <p>What do we want? Well maintained buildings and archaeology, with well recorded archaeology and no deterioration of buildings</p> <p>What we can influence: Visitor impacts; boardwalk repairs; managing conflicting conservation aims, eg seals vs archeology/puffins & birds vs chapel</p> <p>Harder to influence but still have an impact: Climate change; management of lighthouses (in care of Trinity House)</p>	
What are the attributes we want to protect, what factors do we need to manage and how do we measure progress?	Current status	Action and monitoring
<p>Attribute: Pre-Conquest monastic cell and post-Conquest monastic settlement on Inner Farne²¹</p> <p>Upper limit: No loss of visibility of and accessibility to archaeological features</p> <p>Lower limit: Not required</p>	<p><u>Good</u> - the archaeological deposits remain in situ subject to burrowing animals and the associated field system is visible. Specific buildings are included in individual listings</p>	<p>Develop plans for survey recommendations</p> <p>Scope archaeological site monitoring programme</p>

		<p>Ensure boardwalk repairs remain in same location and so do not further compromise existing archaeology</p> <p>Complete Farnes Vision document to guide our agreed future along with stakeholders</p>
<p>Attribute: Historic interiors & chattels</p> <p>Upper limit: No loss of integrity of walls and no loss of visibility of or accessibility to features</p> <p>Lower limit: Not required</p>	<p><u>Poor</u> – While many of these features are in reasonable condition, there is some deterioration of these features and little maintenance, particularly in the chapel. CMS accessioning has taken place and all objects in the chapel now have records (63 in total).</p>	<p>Complete Collections Development Policy</p> <p>Complete CPP bid</p> <p>Scoping survey of historic elements on islands inc. fixtures & fittings</p> <p>Collections Documentation Plan, based on findings of scoping</p> <p>Work through Documentation Plan. A priority action should include completing inventory marking for Chapel collections</p> <p>Complete accessioning on non-chapel historic objects, i.e. Lighthouse Cottage, Pele Tower etc</p> <p>Develop monitoring and maintenance programme for historic interiors & chattels</p>

		<p>Plan for maintenance of the building “envelope” to improve protection of interiors (see earlier note on need for fit-for-purpose CMP)</p> <p>Consider removal of modern cupboards in Pele Tower kitchen & replace or use existing historic cupboards</p> <p>Complete Farnes Vision document to guide our agreed future along with stakeholders</p>
<p>Attribute: Prior Castell’s Tower (grade I listed) Upper limit: features maintained, protected and enhanced Lower limit: no further deterioration of Tower</p>	<p><u>Poor</u> – these features are not adequately maintained and despite this being staff accommodation, there is damp, water ingress and poor maintenance of features. Electricity/heating is not reliable & no reliable running water. Raw sewage from c. 40k visitors flows into sea each year</p>	<p>Regularly record & report deterioration of fireplace & other stonework in Pele Tower</p> <p>Identify funding for LTC repairs</p> <p>Plan future accommodation & visit needs, using prior appraisals of buildings to progress substantial repairs & upgrades</p> <p>Carry out ST & LT repairs</p> <p>Consider options to make this feature accessible in long term</p>
<p>Attribute: Chapel of St Cuthbert (grade II* listed) Upper limit: features maintained and protected Lower limit: no further deterioration of Chapel</p>	<p><u>Poor</u> – these features are deteriorating, due to environmental conditions and guano</p>	<p>Regularly record / monitor condition of chapel interiors</p>

		<p>Feed into planning for LTC building repairs to improve environmental conditions inside the chapel insofar as they do not compromise nesting birds, and identify funding for LTC repairs</p> <p>Carry out LT repairs</p> <p>Ensure this feature remains accessible</p> <p>Implement swallow nest boxes in courtyard prior to April should it become necessary to shut chapel to prevent further deterioration of 17th Century interiors due to bird guano</p> <p>Consider options for local volunteer groups to participate in maintenance of the chapel</p>
<p>Attribute: Remains of Chapel to south east of Chapel of St Cuthbert (grade II listed)</p> <p>Upper limit: features maintained and protected</p> <p>Lower limit: no deterioration of remains</p>	<p><u>Good</u> – these features are visible and do not appear to be in decline</p>	<p>Ensure this feature is fully recorded and maintained</p> <p>Ensure this feature remains accessible</p>
<p>Attribute: Font & stone coffin (latter excluded from scheduling) in chapel courtyard (grade II listed)</p> <p>Upper limit: features maintained and protected</p> <p>Lower limit: no deterioration of remains</p>	<p><u>Good</u> – these features are visible and do not appear to be in decline. Oth objects are now on CMS.</p>	<p>Ensure these features are fully recorded and maintained</p> <p>Ensure these features remain accessible</p>
<p>Attribute: Inner Farne lighthouse & Keeper’s Cottage (grade II listed; building excluded from scheduling)</p> <p>Upper limit: features maintained, protected and enhanced</p>	<p><u>Poor</u> – these features are not adequately maintained and despite the Keeper’s Cottage being staff</p>	<p>Identify funding for LTC repairs (cottage)</p>

<p>Lower limit: no further deterioration of cottage</p>	<p>accommodation, there is damp present and no electricity, heating or running water. Accessioning of historic objects in the cottage & lighthouse compound on Inner Farne onto CMS has begun. Lighthouse upgrades are being performed by Trinity House in early 2022.</p>	<p>Plan future accommodation & visit needs, using prior appraisals of buildings to progress substantial repairs & upgrades</p> <p>Consider options to make this feature accessible in long term</p>
<p>Attribute: Longstone Lighthouse (grade II listed) Upper limit: features maintained and protected Lower limit: no further deterioration of cottage</p>	<p><u>Good</u> – this feature is well maintained by Trinity House</p>	<p>Ensure any issues raised with Trinity House</p>
<p>Attribute: Cottage & Beacon on Brownsman (grade II listed) Upper limit: features maintained, protected and enhanced Lower limit: no further deterioration of cottage</p>	<p><u>Poor</u> – these features are not adequately maintained and despite this being staff accommodation, there is damp, deteriorating decoration and inadequate office/storage facilities. No reliable running water in accommodation & electricity does not always meet capacity.</p>	<p>Identify funding for LTC repairs</p> <p>Plan future accommodation & visit needs, using prior appraisals of buildings to progress substantial repairs & upgrades</p> <p>Carry out ST & LT repairs</p> <p>Add any historic objects to CMS as necessary</p>
<p>Attribute: Jetties & associated structures Upper limit: features maintained and protected Lower limit: no further deterioration of jetties & regular repair & maintenance regime in place</p>	<p><u>Poor</u> – Jetties not checked & upgraded</p>	<p>Maintain jetties on annual basis using Patio Magic</p> <p>Survey & upgrade/repair ladders (Inner Farne, Staple, Brownsman & Longstone) & lifting equipment (Inner Farne & Brownsman)</p>

		<p>Inspect annual checks of jetty structures</p> <p>Ensure options for marine habitat creation considered in any jetty works</p>
<p>Factor: Footpath repairs on Inner Farne, Staple & Brownsman</p> <p>Upper limit: maintained and protected</p> <p>Lower limit: regular maintenance and protection of footpaths</p>	<p><u>Moderate</u> – Permission has been granted from Historic England for repairs but will need updating in 2022</p> <p>Extensive repairs required on Brownsman</p>	<p>Replace boardwalk with like-for like structure (60m per year on Inner Farne, 25m per year on Brownsman) according to plan & Heritage Management Agreement, ensuring repairs reported to Historic England on annual basis</p> <p>Add non-slip paint or strips.</p>
<p>Current condition of the archaeological and the historic environment</p>	<p>LCA score: 2 (Longstone); 3 (Inner Farne, Staple & Brownsman)</p>	

<p>CPI feature: Landscape & Setting</p>
<p>LON KPI: Rich in culture</p>



Brief description: The landscape gives uninterrupted views of the coast north and south of Seahouses, including Lindisfarne, Bamburgh and Dunstanburgh castles and a backdrop of the Cheviot Hills. There are uninterrupted views to the seaward aspects, and there are a variety of views around the islands from a vessel.²²

What do we want?

Protect current open views 360° around islands, and complete settings study to flag any views at risk

What we can influence:

Planning near to, or on, NT property

Harder to influence but still have an impact:

Climate change; development on land/buildings outside of NT care, particularly in the marine environment; wind farms

What are the attributes we want to protect, what factors do we need to manage and how do we measure progress?

Current status

Action and monitoring

Factor: Development on & around islands NT or external interests
 Upper limit:
 Lower limit:

Good – there is no known development planned that will impact views

Revise Spirit of Place statement

Continue to consider Spirit of Place and landscape in any work & continue formal monitoring of planning applications


Complete Setting Study

		Continue to consider Spirit of Place , landscape & planning in any development work
Factor: Development of offshore windfarms or other structures Upper limit: Lower limit:	<u>Poor</u> – local understanding of the impact of this issue on our birds is poor	Engage with internal consultants & external partners and examine reports to understand potential impacts of windfarms on Farnes species
Current condition of the landscape and setting	Land Condition Assessment score: 1	

D

DAFE

Visitor experience & people – enjoying and understanding seabirds, seals and history of small islands

Feature: Visitor experience & people		
LON KPI: Enjoyable		
	<p>Brief description: Around 50,000 visitors visit per year (weather permitting)</p> <p>What do we want? Visitors should have the ability to visit islands safely, without them feeling too busy; we should be able to engage with visitors and offer them a unique and exceptional experience prior to visit, during their boat trip, on island and at end of visit. We actively advocate for marine environment and raise awareness of the National Nature Reserve.</p> <p>What we can influence: Website content (to a degree); ranger engagement; interpretation; ‘visitor journey’; opening times; service standards</p> <p>Harder to influence but still have an impact: Journey to and from islands; Seahouses visitor flow; harbour visitor flow; visits from kayaks/canoes</p>	
	<p>What are the attributes we want to protect, what factors do we need to manage and how do we measure progress?</p> <p>Attribute: Provision of good quality visitor infrastructure</p> <p>Upper limit: Access should allow access for as wide a range of people as possible but should not significantly interfere with nesting seabirds and breeding seals (see also ‘seabird assemblage’ section and ‘grey seals and associated habitats’ section)</p> <p>Lower limit: The footpath network should enable a high level of access to as wide a range of users as possible on Inner Farne and Staple within the capacity of the land</p>	<p>Current status</p> <p><u>Moderate</u> – Access on Inner Farne is generally good. Moderate inclines and boardwalk provide access to those with slightly poorer mobility. Access to Staple is problematic if visitors are not informed of the terrain in advance, and is not suitable for those with limited mobility. Jetties require regular repair & maintenance</p>

		<p>See 'archaeology' section for boardwalk maintenance</p> <p>Complete Farnes Vision document to guide our agreed future along with stakeholders, including in relation to visitor landing points²³</p> <p>Alongside safety incidents, create incident report within 48 hours should any visitor not be informed of terrain in advance of visit to ensure safety follow-up with boat companies</p> <p>Regularly review Emergency Plans</p>
<p>Attribute: Provision of signage and interpretation materials which meet NT brand & interpretation standards</p> <p>Upper limit: All signage should be succinct & necessary (consider alternatives to signage where possible). Interpretation should be engaging, take into account nature connection, learning styles & appropriate 'segments' & work as part of holistic experience</p> <p>Lower limit: There should be clean & well maintained good quality welcome signage and way marking/access signs.</p>	<p><u>Moderate</u> – Waymarking includes a number of interpretation points but could be clearer. Signage does not overwhelm the landscape. Visitor Centre location, interpretation & offer requires review</p>	<p>Ensure interpretation is not dug into the ground, impacting Scheduled Monument or nesting burrows</p> <p>Ensure accessible annual summary of monitoring or research included in interpretation each year</p> <p>Ensure islands remain as tidy as possible so that mess does not detract</p> <p>Implement Visitor Journey Framework to ensure a high quality visit which meets a good standard and to ensure negatives do not detract from the visit</p> <p>Regular signage cleaning</p>

<p>Factor: Visitor numbers within hour in peak season & during seal season</p> <p>Upper limit: Maximum of 6 boats to Inner Farne per day, May – July (Inner Farne); 1.15pm – 4.35pm (5.00pm on low tide days); 10.15 – 3.35 Apr, Aug, Sep</p> <p>Lower limit: Not required if rangers replicate visitor movements and/or gulls are managed</p>	<p><u>Good</u> – Generally OK but there are occasions when busyness on Inner Farne leads to crushed eggs/chicks, high dwell time around Arctic terns and eiders, an inability for visitors to visit cliff and complaints that islands are too busy, typically if visitor numbers in a given hour are above 200 on Inner Farne or 100 on Staple, and dwell time around the birds is higher when there are a large number of boats arriving and leaving. Numbers of visitors have been around 50,000 between 2016 and 2019, with lower numbers of visitors in 2021 due to the coronavirus pandemic.</p> <p>Visitor numbers were significantly lower in the early 2000s and limits to length of stay and island visited were initiated in 2016. Generally visits have been limited to 4.5 hours on Staple from 10am and 4 – 4.5 hours on Inner Farne from 1.15pm in the afternoon. A reduction in length of time open on Inner Farne in particular would reduce staff fatigue and ensure conservation work can continue. The number of staff on the islands cannot be unlimited due to limits to</p>	<p>Explore ways to ensure visitors have clear preliminary information and are spread throughout the day during peak season</p> <p>Closely monitor & record visitor numbers on daily basis using boat log</p> <p>Monitor feedback from visitors</p> <p>Consider potential for seal visits to Inner Farne from jetty in autumn for photography</p>
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accommodation availability. It is important to carefully reintroduce visitors to the islands given that some birds such as fulmars, did better in the absence of visitors to Staple while other birds, particularly terns, eiders and shags, continue their long-term decline

Individual behaviours of visitors can have a disproportionate effect on the birds – photography groups tend to prefer longer dwell times and favour getting extremely close to the birds, increasing disturbance length times and overall dwell time, and therefore numbers in a given hour. These groups will require further consideration. It is possible these groups could come to Staple and be carefully monitored.

Education groups should be permitted to the islands, but this will push numbers to around 200 on an occasional basis. Given that NT are able to closely monitor numbers with the new model due to the pattern and number of boats, we would like to trial the addition of education group boats. These groups are generally closely

	<p>supervised with a 1:6 ratio requested, and are generally up to 20 pupils. The alternative would be to have around three boats to Inner Farne in the afternoon with the occasional education group layered on top of this</p> <p>Multiple boat landings increase disturbance on the water as well as at entry points and in and around jetties but spreading visitors around popular locations is thought to be more beneficial to seabirds than hotspots⁶¹, therefore less frequent boats at regular intervals will be more likely to spread the visitors around the islands.</p> <p>It is likely that in the absence of a ranger presence, predators are afforded more opportunities as demonstrated on the islands in 2020 and 2021 during the covid pandemic as well as at other colonies⁸⁵. Therefore, visitors can have a beneficial impact when carefully managed in lower numbers, on shorter days with less regular frequency.</p>	
<p>Factor: Visitor Journey Upper limit: N/A</p>	<p><u>Moderate</u> – Outside Visitor Journey Framework, which covers basic</p>	<p>Complete & apply Visitor Journey Framework to islands</p>

<p>Lower limit: N/A</p>	<p>provision, there is no agreed medium or long-term plan for the islands in regard to visitors</p>	<p>Complete visitor elements of Farnes Vision document to guide our agreed future along with key stakeholders</p> <p>Explore ways to clearly articulate the threat to seabirds in a compelling way which galvanises action – on & off island</p> <p>Regularly sense-check our work for visitors & their experience – does it engage people in nature and/or our work</p> <p>Explore ways to engage people unable to visit the islands in person</p> <p>Collect 100 pieces of appropriate feedback per month from visitors in 2021 to help inform our future, using engaging methods to gather data</p>
<p>Factor: Annual report Upper limit: Accessible & engaging visitor report and NHSN report each year Lower limit: N/A</p>	<p><u>Moderate</u> – the current report has a limited audience and is published by NNHS</p>	<p>Create annual report template alongside NNHS and complete bird report by end of September; seal report by end of January</p> <p>Produce an accessible annual bird & seal report (c. 10 pages) in order to widen the audience</p>

		Ensure data is sent to JNCC, NE, BTO (birds) & SMRU seals on annual basis
<p>Factor: Visitor awareness of protected status of islands</p> <p>Upper limit: N/A</p> <p>Lower limit: N/A</p>	<p><u>Poor</u> – Visitors appear frequently unaware of the islands’ NNR status & reasons for its importance, biosecurity or the marine code²⁴ skippers should be following</p>	<p>Ensure information about biosecurity & photography code is given to every visitor at the appropriate time (pre-visit/booking system), with storage available at harbour where necessary</p> <p>Ensure visitors are aware that they will be pecked by terns and eggs may be present on both islands</p> <p>Ensure ‘Farne Islands National Nature Reserve/Farne Islands NNR’ is used in all communications to align ourselves with other NT & NE NNRs, embed this information with visitors & including further context on the meaning of NNR where necessary</p> <p>Work with partners to ensure the updated marine code is displayed at harbour, included in licence alongside WiSE scheme³⁵ and on boats (annual check)</p>
<p>Factor: Quality of visit</p> <p>Upper limit:</p> <p>Lower limit:</p>	<p><u>Moderate:</u> People generally seem to enjoy their visit but there are a lot of competing ‘asks’ on their time within the hour visit - arrival information; shop; fundraising. We currently struggle to engage with photographers</p>	<p>During their visit, the limited time visitors have is used facilitate connection to nature, history, the marine environment (‘under the waves’) depending on the season or involve people in action to help</p>

		<p>wildlife (including citizen science) depending on the time of year</p> <p>Ensure Ranger training includes visitor engagement & storytelling</p> <p>Explore ways to measure visitor enjoyment and needs, particularly photographers and families (current core audience)</p> <p>Explore options for clarifying photo rules, photo sharing & collecting feedback</p>
<p>Factor: Media visits</p> <p>Upper limit: Media activity can occur in the following circumstances:</p> <ul style="list-style-type: none"> - Apr-July: up to four people within visitor areas for up to four hours per island between 9am and 5pm on Inner Farne and Staple Island - Aug, Sep: up to eight people for up to eight hours 9am – 5pm - No drones - Only filming from visitor areas - Accompanied by Trust staff at all times - No filming of breeding annex 1 species - Time around Arctic terns or eiders that elicits response limited to five minutes - No overnight stays - Up to four standard media visits in first year, subject to annual review thereafter - Numbers of media under this man plan consent reported annually - Anything outside the above will require separate consent <p>Lower limit: Not required</p>	<p><u>Moderate</u> – Not always clear to media (as opposed to filming book through film office) what is and isn't allowed in advance of their visit</p>	<p>All consented activity to take place in accordance with upper limit.</p> <p>Use media form to gather information on consented activity²⁹</p> <p>Report media visits on an annual basis and review & adjust media policy annually</p>

<p>Factor: Access to islands online (interpretation & digital)</p> <p>Upper limit: Information for a range of audiences and ages, also including links to partner sites, live camera links and citizen science</p> <p>Lower limit: Basic information regarding islands & landings; information on safety; biosecurity; wildlife disturbance; copy of brief report. Weekly tweet & weekly instagram from islands</p>	<p><u>Moderate</u> – There is some information on the islands but this is limited</p>	<p>Audit website for current content</p> <p>Include new content as information builds</p> <p>Include Farnes in social media regularly</p>
<p>Current condition of the visitor experience</p>	<p>LCA score: Longstone 2; Inner Farne 3; Staple 4</p>	

6. Management summary -- vegetation

6.1 Inner Farne

Overall, across the islands, management options are limited by the presence of a Scheduled Monument across Inner Farne, which limits any digging to the first two inches of soil; the fragility of the soil cap that contains multiple burrows; extremely improved soil due to guano across most of the islands; the presence of rabbits *Oryctolagus cuniculus* which eat herbs and benefit from the presence of breeding birds, which limits possible management activities from May to July. The fragility of the soil cap in some areas prevents the resumption of previous strimming, which had been done across the whole island pre-season in the 1980s⁹⁴

Map 8 shows the Inner Farne Island split into habitat sections. The corresponding vegetation work programme is colour coded to emphasise which actions will take place in the given sections of the island in the tables below.



Map 8: Location of colour-coded habitat locations on Inner Farne (2021)

6.2 Inner Farne vegetation communities (visual 'rapid assessment' updated in 2021)

Ruderal (Buildings, historically managed ground, encroachment) – Green shading

This area is heavily characterised by ruderal species including docks *Rumex spp.*, nettle spp. *Urtica spp.*, hemlock *Conium maculatum*, scarce fiddleneck *Amsinckia lycopoides*, ragwort *Senecio jacobaea*, Lesser burdock *Arctium minus* and thistles *Cirsium spp.* along with maritime and grassland species such as Yorkshire fog *Holcus lanatus* and common saltmarsh grass *Puccinellia maritima*. This area is the most interfered with and disturbed by people, with sections of land historically used for vegetable farming and human burials.

This area is where the majority of Arctic terns *S. paradisaea* nest, along with at least half of the eiders *S. mollissima* on Inner Farne. It is essential that this area is managed in a way that maximises the success of both species. Nettle spp. *Urtica spp.* and hemlock *C. maculatum* are particularly prolific and are targeted in a range of management techniques. Large amounts of guano contribute to a dynamic and fast changing landscape. Difficulties in managing this area include historical site protection, which restricts the depth to which the soil can be dug, and breeding bird presence that can limit access and management methods. Whilst we do not want an abundance of thistles (*Cirsium sp.*), they are good for bees and butterflies which visit in the summer months, keeping a reasonable number of thistles *Cirsium spp.*, will be beneficial in this respect.

Ruderal (

3. Visual 'rapid assessment' results & actions tables 2021

† = aim to eradicate

* = manage

Dominant Nettle areas) – Yellow shading

Vegetation species composition as above, though nettles *Urtica spp.* growth in these zones are particularly dense, with intense management performed to thin out, eliminate and prevent encroachment.



Map 9: Marked ruderal and meadow part of Inner Farne which impacts the Sandwich and common tern breeding areas.

Maritime (St. Cuthberts Cove) - Maritime Aqua shading

The top of the beach and the lower bank leading down to it are characterised by maritime species which are tolerant to salt to sand and salt. Such species include sea rocket *Cakile maritima*, sea campion *Silene uniflora*, lesser sea-spurrey *Spergularia marina* and some larger more exotic species. A future survey to determine the unknown species in this area would be beneficial.

Maritime Grassland (Meadow)- Red shading

The thick soil cap on the higher parts of the island are characterised typical maritime species such orache *Atriplex sp.*, sea campion *S. uniflora*, and common saltmarsh grass *P. maritima*, some ruderal presence represented by broad-leaved dock *Rumex obtusifolius*. This area is the main breeding area for Puffins *F. arctica* on the island. Plants such as sea campion (*S. uniflora*), broad-leaved dock *R. obtusifolius* and oraches *Atriplex sp.* are desirable in this area, as the roots of such species hold the soil together and are good foliage for providing cover for puffin burrows. These plants will also act as good nesting habitat for eiders *S. mollissima* in the meadow. Should thrift *Armeria maritima* be found in the meadow, then attempts will be made to protect it from grazing rabbits *O. cuniculus*.

Maritime Ruderal (Meadow) – Purple shading

This area is characterised by a mixture of Maritime species including oraches *Atriplex sp.*, sea campion *S. uniflora*, and common saltmarsh grass *P. maritima*. There is a heavy ruderal influence of nettle spp. *Urtica spp.*, docks *Rumex spp.*, Yorkshire fog *H. lanatus*, hemlock *C. maculatum* and thistles *Cirsium sp.*, among other plants, with some grassland species including Silverweed *Potentilla anserina*. These areas require similar management to the Red and Green shaded areas in order to maximise the habitat potential for eiders *S. mollissima* and puffins *F. arctica*, along with the Arctic terns *S. paradisaea* nest that nest in the Lighthouse Compound.

Maritime (Rocky areas)- Orange shading

Rocky areas characterised by sparse soil and salt tolerant maritime plants. Such species include lesser sea-spurrey *S. marina*, sea milkwort *Lysimachia maritima* and scurvygrass sp. *Cochlearia sp.* These areas require no management and are best left with as little disturbance as possible as there are nesting birds such as fulmars *F. glacialis* and shags *G. aristotelis*.

Maritime (Eroded meadow) – Blue shading

These patches of meadow are heavily eroded and characterised by bare soil where puffin burrows occur. These areas are very fragile, prone to collapse, and best avoided. However, management to try and re-establish plants such as sea campion *S. uniflora*, and oraches *Atriplex sp.* should be pursued if possible. Ideally these areas would slowly regain a meadow status.

Aquatic (Ponds)

There are three small ponds in the centre of the island, two of which usually dry up during the warmest months of the year. Aquatic species such as yellow flag *Iris pseudacorus* and celery-leaved buttercup *Ranunculus sceleratus* can be found around the small ponds. Other more generalist species found on the banks of the ponds include Yorkshire fog *H. lanatus*, Annual meadow grass *Poa annua* and spear thistle *Cirsium vulgare*.

6.3 Vegetation management interventions – Inner Farne



Map 10: Figure indicating minimum annual management on Inner Farne linked to the five-year table and work programme spreadsheet

Section 1 in map 10 is the top priority as it covers the Arctic tern *S. paradisaea* nesting areas and the edge of the Sandwich tern *T. sandvicensis* nesting area. In this section we would strim at the beginning of the season, pull in the mid-season and use saltwater treatment at the beginning and end of the season. The management of this section would be continuous although hopefully will become easier over time.

Section 2 covers the dense nettles, these will be strimmed at the beginning and end of the season, time and resources allowing. They are second priority to section 1 however if the whole section can't be managed in 2021, smaller chunks of the section will be managed and hopefully over the next five years full management of these sections can take place.

Section 3 includes hemlock *C. maculatum* as well as nettles *Urtica spp.* If experiments in management methods do not produce the desired result after three years, in these areas stem injection could be considered as well as strimming between dense areas of hemlock *C. maculatum*. We will plan to split the area into sections and hopefully treat 10-20% of the blue areas in the every year for the next five years and be at least at the lower limit of our management plan of at least 50% eliminated.

Section 4 should be will be managed every year as it is where the puffin runs must be strimmed to allow pufflings from the top meadow to travel down to the sea.

6.4 Inner Farne summary - principles of management

Hemlock *C. maculatum* and scarce fiddleneck *A. lycopoides* grow tall and densely, reducing opportunities for nesting, while Yorkshire fog's hairy leaves can soak and chill vulnerable young chicks, and burdock *A. minus* can produce burrs which may stick to chick's feathers.

Plants we aim to eliminate: hemlock *C. maculatum*, scarce fiddleneck *A. lycopoides*, Yorkshire fog *H. lanatus*, burdock *A. minus*, piri-piri- bur *Acaena novae-zelandiae*

Plants we will tolerate at low density: docks *Rumex spp.*; nettles *Urtica spp.*; thistles *Cirsium spp.*

Plants we will encourage and protect: common saltmarsh grass *P. maritima*, sea spurrey *S. marina*, sea milkwort; scruey grass; sea rocket *S. marina*; silverweed *P. anserina*; oraches (*Atriplex spp.*), sea campion *S. uniflora*, thrift *A. maritima*, yellow flag iris *I. pseudacorus*, celery-leaved buttercup *R. sceleratus*

We aim to eliminate hemlock *C. maculatum* through stem injection, fiddleneck *A. lycopoides* through digging, piri-piri bur *Acaena novae-zelandiae* through digging out roots and Yorkshire fog *H. lanatus* and burdock *A. minus* through hand pulling, starting at the margins and working inward

Thistles *Cirsium spp.* and docks *Rumex spp.* will be hand pulled early in the season should they grow densely, while seawater trials will be used to reduce the density of the nettle beds. Should the seawater trial be unsuccessful, attempts will be made to cut the nettles with scythes pre and post season and using hand tools where necessary/possible within the season.

Five Year Plan

Dominant	Abundant	Frequent	Occasional	Rare
Dock <i>Rumex spp.*</i>	Yorkshire fog <i>Holcus lanatus†</i>	Ragwort <i>Jacobaea vulgaris</i>	Spear/creeping thistle <i>Cirsium vulgare/arvense*</i>	Lesser burdock <i>Arctium minus†</i>
Nettle <i>Urtica dioica*</i>		Common saltmarsh grass <i>Puccinellia maritima</i>		Scarce fiddleneck <i>Amsinckia lycopsoides†</i>

Hemlock <i>Conium maculatum</i>		Spiny sow thistle <i>Sonchus asper</i>		Pirri-pirri bur <i>Acaena novae-zelandiae</i>
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Table 2: Plant composition in pale green area on Inner Farne

Dominant	Abundant	Frequent	Occasional	Rare
Scarce fiddleneck A. <i>lycopsoides</i> †				
	Small bugloss <i>Anchusa arvensis</i>			

Table 3: Plant composition in dark green area on Inner Farne

Dominant	Abundant	Frequent	Occasional	Rare
Dock <i>Rumex spp.*</i>	Sea rocket <i>Cakile maritima</i>			
Nettle <i>U. dioica*</i>	Sea campion <i>S. uniflora</i>			
Hemlock <i>C. maculatum</i> †	Lesser sea- spurrey			

	<i>Cochlearia spp.</i>			
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Table 4: Plant composition in dark blue area on Inner Farne

Dominant	Abundant	Frequent	Occasional	Rare
Nettle <i>U. dioica</i> *			Spear/creeping thistle <i>C. vulgare/arvense</i> *	Pirri-pirri bur <i>A. novae-zelandiae</i> †
Hemlock <i>C. maculatum</i> †			Sea mayweed <i>T. maritimum</i>	

Table 5: Plant composition in yellow area on Inner Farne

Dominant	Abundant	Frequent	Occasional	Rare
	Orache <i>A. glabriuscula</i>	Dock <i>Rumex spp.*</i>		Thrift <i>A. maritima</i>
Sea campion <i>S. uniflora</i>				
	Common saltmarsh-grass <i>P. maritima</i>			

Table 6: Plant composition in red area on Inner Farne

Dominant	Abundant	Frequent	Occasional	Rare
	Dock <i>Rumex spp.*</i>		Spear/creeping thistle <i>C. vulgare/arvense*</i>	Silverweed <i>A. anserina</i>
Sea campion <i>S. uniflora</i>	Nettle <i>U. dioica*</i>			
	Hemlock <i>C. maculatum†</i>			
	Common saltmarsh-grass <i>P. maritima</i>			
	Orache <i>A. glabriuscula</i>			
	Yorkshire fog <i>H. lanatus†</i>			

Table 7: Plant composition in purple area on Inner Farne

Dominant	Abundant	Frequent	Occasional	Rare
Scurvey grass <i>Cochlearia spp.</i>	Lesser sea-spurrey <i>Spergularia marina</i>			Thrift <i>A. maritima</i>
	Sea milkwort			

	<i>Lysmachia maritima</i>			
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Table 8: Plant composition in orange area on Inner Farne

Dominant	Abundant	Frequent	Occasional	Rare
Bare soil				

Table 9: Plant composition in pale blue area on Inner Farne

Table X? -- West Wideopens

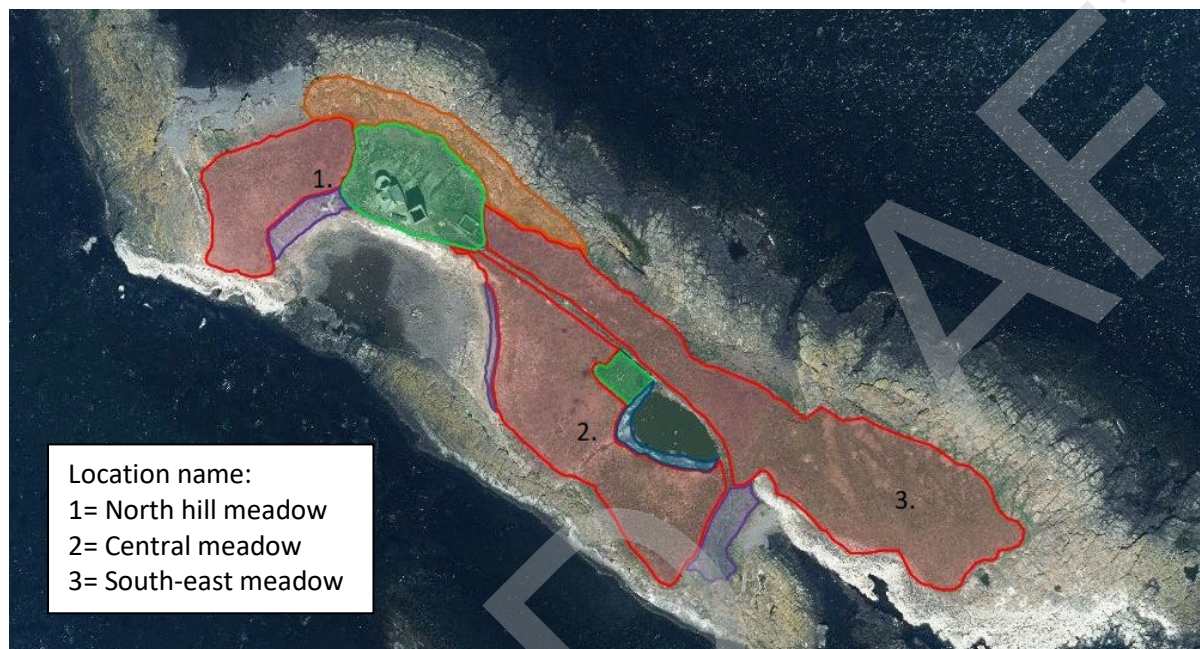
Dominant	Abundant	Frequent	Occasional	Rare
Hemlock <i>C. maculatum</i> [†]				
Lesser burdock <i>A. minus</i> [†]				

Table 10: Plant composition on West Wideopens

6.5 Brownsman

Overall, across the island management options are limited by the presence of the soil cap, which can be fragile in certain places; the presence of grey seals (*Halichoerus grypus*) which utilise the island from October- February as a breeding/moulting ground and disturb the soil; and the presence of breeding birds, which limits possible management activities from May to July.

Map 11 shows Brownsman split into habitat sections. The corresponding vegetation work programme is colour coded to emphasise which actions will take place in the given sections of the island.



Map 11: Habitats on Brownsman indicated by coloured areas

6.6 Brownsman vegetation communities – 2020 rapid assessment

Maritime Grassland (Meadows)- Red shading

Thick soil cap dominated by maritime species such as Oraches *Atriplex sp.*, Sea campion *S. uniflora* and Common scurvy grass *Cochlearia officinalis*), interspersed with bare soil patches. Yorkshire fog *H. lanatus* is also present, though percentage cover has decreased markedly from 2016-2019 on the South-east meadow.

This habitat is utilised by ground nesting birds; with eider *S. mollissima*, Herring gull *L. argentatus*, Lesser black-backed gull *L. fuscus* and great black-back gull *L. marinus* nesting on the meadow. Puffins *F. arctica* breed in underground nest chambers and can damage the roots of chamerophytes such as sea campion *S. uniflora*, when digging and lining burrows. The above bird species pluck the vegetation for nest-lining material, as do shags *G. aristotelis* and Kittiwakes *R. tridactyla*.

Grey seals *H. grypus* utilise the meadows in autumn for pupping, and to a lesser extent in winter for moulting. The impact of large seal numbers on the habitat is perhaps the most visible sign of erosion. Compacted soil, extensive bare ground, and the formation of large 'wallows' are circumstantial evidence of this, though targeted vegetation surveys will enable us to better understand the dynamic between flora and fauna, which in turn may help answer some of our conservation questions.

Our current meadow management plans involve protecting patches of meadow with electric fencing, in order to prevent such impacts by seals. This specifically to reduce bare soil, soil compaction, and allow Sea Campion *S. uniflora*, oraches *Atriplex sp.* and scurvy grass *C. officinalis* to spread. This is to be trialled on one half of the Central Meadow, with the other half offering a control to monitor its effects. The fencing will be installed using 200m of horse tape type electric fence and approximately 60-70 polyposts connected to a solar panel. See figure 2 below for location. Pending outcomes from this experiment, the fence could be trialled in different locations.

Ruderal (Cottage and Vegetable gardens)- Green shading

As a result of continuous human disturbance, these compact areas are dominated by ruderal flora such as nettles *Urtica sp.*, docks *Rumex sp.*, sow thistles *Sonchus sp.* and lesser burdock *A. minus*. Typical maritime species such as common scurvy grass *C. officinalis* and oraches *Atriplex spp.* also occur sparsely. The latter is known to initially colonise disturbed ground. Nesting Arctic terns *S. paradisaea* heavily utilise this habitat, as do eiders *S. mollissima*. The disturbed ground, along with the guano deposited by terns, has resulted in a dynamic and fast-changing changing vegetation community, and is heavily managed specifically of Arctic terns *S. paradisaea*.

Stinging nettle *Urtica dioica* is the most prolific species and can form dense uniform stands. These can encroach on suitable breeding areas for Arctic terns *S. paradisaea*, which require a mosaic habitat of thinned out nettles *Urtica spp.* and dock *Rumex spp.* for shelter, and bare ground/

short turf for nesting. Several management techniques are utilised to achieve this. This includes the strimming of nettles in the marked area (see figure 3), which is subsequently sprayed with saltwater via knapsack sprayer in order to suppress growth. Nettles *Urtica sp.* and dock *Rumex sp.* are also hand-pulled at regular intervals throughout May, June and July so that they do not infringe or swamp the tern nests. Artificial 'tern plots' are constructed to provide suitable clear ground for nesting; consisting of tarpaulin squares / strips lined with a mix of sand and shingle. These patches are moved around each season, which helps to suppress nettle *Urtica spp.* growth in different areas. Lesser burdock *A. minus* and Sow thistles *Sonchus sp.* occur less frequently and are therefore tolerated. Management of this area using the above techniques was extremely successful in achieving the desired result.

As the Nettle *Urtica spp.* communities on Brownsman are relatively small and dense, efforts are made to prevent their spread into the maritime grasslands. Though no formal vegetation monitoring takes place in this area, such surveys would be beneficial in quantifying the change of ruderal species over time. Such results can be correlated with bird nesting success, and by extension, the success of our management techniques.

Little management currently takes place in the large Vegetable garden area, though the historically disturbed ground contains thick swathes of nettle *Urtica sp.* and dock *Rumex sp.*, along with a small patch of garden rhubarb *Rheum rhabarbarum* that provides sheltered habitat for nesting eiders *S. mollissima*. Singles pairs of mallard *Anas platyrhynchos* and Canada goose *Branta canadensis* also utilise the area, as do a few pairs of puffins *F. arctica*.

Maritime Ruderal (Banks and shingle)- Purple shading

Distinctive transitional zones in which the maritime meadow merges into shingle beach, accompanied by a topographic change. In these areas, steep banks taper down from the meadow and merge into shingle and rocky areas. Maritime species such as oraches *Atriplex sp.*, sea campion *S. uniflora* and common scurvy grass *C. officinalis* are present. They are supplemented by curled dock *Rumex crispus* which holds a moderate presence on the bank and shingle.

It is likely that the disturbed banks, under intense pressure from breeding puffins *F. arctica*, grey seal *H. grypus* trampling and abiotic factors such as rain and wind, are easily colonised by docks. Aside from Puffins that burrow into the banks, the habitat also supports nesting eider *S. mollissima* which shelter beneath the dock leaves, along with oystercatcher *Haematopus ostralegus* and fulmar *F. glacialis*. In some years, the shingle habitats support large numbers of Arctic terns *S. paradisaea* which benefit from the vegetation for shelter, particularly in the south east of the islands.

There are no nettles *Urtica spp.* in this habitat, though some form of monitoring may be beneficial to ensure this remains the case. Likewise, although the presence of dock *Rumex spp.* can be beneficial in stabilising banks and providing shelter for birds, intervention may be required should it encroach onto the maritime grassland meadows.

Maritime Aquatic- Blue shading

The pond edge has the greatest species diversity of all Brownsman habitats with a mix maritime, ruderal and aquatic species present. Common chickweed *Stellaria media* and sea mayweed *Tripleurospermum maritimum* are the most abundant species in Summer, whilst Charlock (*Sinapis arvensis* and the aquatic specialist yellow iris *I. pseudacorus* are also present. Oraches *Atriplex sp.* is the dominant species in autumn, with Lesser Sea-spurry *S. marina* and common wild oat *Avena fatua*, also present.

A monitoring plot covering this habitat is surveyed as part of the National Plant Monitoring Survey (NPMS), which although part of a national scheme, will enable us to track changes over time and intervene if warranted. A dramatic increase of Common chickweed *S. media* was noted from 2016-2019. This fast-growing plant can smother the seeds of other species. Aside from the odd eider *S. mollissima* and mallard *A. platyrhynchos* nest, this habitat holds little value to the breeding bird assemblage, so habitat management is a low priority.

Maritime (Rocky areas)- Orange shading

This is a transitional habitat where the vegetation line meets the rocks. It is characterised by patches of clay soil, tidal pools and regular sea spray. Common saltmarsh grass *P. maritima* is the most abundant species present, followed by oraches, atriplex sp. and knotgrass *Polygononum aviculare*. Sea mayweed *T. maritimum*, common scurvy grass *C. officinalis* and sea campion *S. uniflora* also occur among others.

This area is monitored as part of the NPMS which will enable us to track changes over time, though there is little scope for active management or intervention. The habitat hosts nesting pairs of eider *S. mollissima* and oystercatcher *H. ostralegus*. The Arctic tern *S. paradisaea* colony around the cottage often spills out into this area, though the exposed nature of the habitat results in very poor productivity. Twenty-four pairs of Sandwich terns *T. sandvicensis* nested in this area in 2016 without success.

Dominant	Abundant	Frequent	Occasional	Rare
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Orache <i>A. glabriuscula</i>			Bare soil	
Sea campion <i>S. uniflora</i>			Yorkshire fog <i>H. lanatus</i>	
Scurvey grass <i>Cochlearia spp.</i>				

Table 11: Plant composition in red area on Brownsman

Dominant	Abundant	Frequent	Occasional	Rare
Nettle <i>U. dioica</i>	Dock <i>Rumex spp.</i>	Spiny sow thistle <i>S. asper</i>	Orache <i>A. glabriuscula</i>	
		Common sorrel <i>Rumex acetosa</i>		
		Scurvey grass <i>Cochlearia spp.</i>		

Table 12: Plant composition in dark green area on Brownsman

Dominant	Abundant	Frequent	Occasional	Rare

Nettle <i>U. dioica</i>	Dock <i>Rumex spp.</i>		Garden rhubarb <i>Rheum x hybridum</i>	
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Table 13: Plant composition in veg garden on Brownsman

Dominant	Abundant	Frequent	Occasional	Rare
Orache <i>A. glabriuscula</i>		Dock <i>Rumex spp.</i>		
Sea campion <i>S. uniflora</i>				
Scurvey grass <i>Cochlearia spp.</i>				

Table 14: Plant composition in purple area on Brownsman

Dominant	Abundant	Frequent	Occasional	Rare
Comon chickweed <i>Stellaria media</i>		Charlock <i>Sinapis arvensis</i>	Yellow flag iris <i>Iris pseudacorus</i>	

Sea mayweed <i>T.</i> <i>maritimum</i>		Orache <i>A.</i> <i>glabriuscula</i>	Lesser sea- spurrey <i>S.</i> <i>marina</i>	
			Wild oat <i>Avena fatua</i>	

Table 15: Plant composition in dark blue area on Brownsman

Dominant	Abundant	Frequent	Occasional	Rare
Common saltmarsh grass <i>P.</i> <i>maritima</i>	Orache <i>A.</i> <i>glabriuscula</i>	Scurvey grass <i>Cochlearia</i> <i>spp.</i>	Sea milkwort <i>L.</i> <i>maritima</i>	
	Knotgrass <i>Polygonum</i> <i>aviculare</i>		Sea mayweed <i>T.</i> <i>maritimum</i>	
			Sea campion <i>S. uniflora</i>	

Table 16: Plant composition in orange area on Brownsman

6.7 Seal interventions – Brownsman

Seals can impact soils by increasing erosion and compaction. NT plan to trial electric fencing in winter 2022 & 23 and monitor impacts and recovery of the vegetation.



Blue: proposed seal fence area
Yellow: control area (for vegetation comparison)

Map 12: Electric fence location on Brownsman Central Meadow

6.8 Nettle management experimental areas on Brownsman



Map 13: Location marked in blue for experimental strimming and saltwater treatment for nettles on Brownsman as detailed in management & monitoring work programme.

6.8 Brownsman summary – principles of management

Nettles *Urtica spp.* grow tall and thick in the Arctic tern *S. paradisaea* nesting area by the cottage and can reduce opportunities for nesting. Hemlock *C. maculatum* has been reported in past years and has the potential to do the same if unchecked. Burdock *A. minus* can also produce burrs which may stick to chick's feathers, though the species occurs in small numbers.

Plants we aim to eliminate: Hemlock *C. maculatum* (should it be discovered).

Plants we aim to tolerate at low density: Docks *Rumex spp.*, nettle *spp.*, sow thistles *Sonchus spp.*, lesser burdock *A. minus*, Yorkshire fog *H. lanatus*.

Plants we aim to encourage and protect: sea campion *S. uniflora*, common scurvy grass *C. officinalis*, oraches *Atriplex sp.*, common saltmarsh grass *P. maritima*, lesser sea-spurrey *S. marina*, celery-leaved buttercup *Ranunculus sceleratus*, yellow flag iris *Iris pseudacorus*, sea mayweed.

Nettles *Urtica spp.* and docks *Rumex spp.* will be tolerated in low density only within the present ruderal areas and should not be permitted to encroach onto the maritime grassland. Nettle spp. *Urtica spp.* and docks *Rumex spp.* will be strimmed early in the breeding season, while seawater shall be applied to the treated areas. Handpulling of nettles *Urtica spp.*, docks *Rumex spp.* and sow thistles *Sonchus sp.* will be performed during the breeding season.

Deterrence of grey seals *Halichoerus grypus* using electric fence, ranger patrols and electronic scarers will be the only management techniques utilised to protect the maritime meadows.

DRAFT

7. Appendices

***Unless otherwise stated within the tables in section 4, long term trends cover three generations; short-term (five year) trends cover the period 2016 - 2020**

1. Morrison P. & Allcorn R.I. (2006) The effectiveness of different methods to deter large gulls *Larus* spp. from competing with nesting terns *Sterna* spp. on Coquet Island RSPB reserve, Northumberland, England. *Conservation Evidence*, 3, 84-87*
2. Summary of current seal mortality monitoring methods (TBC)
3. Farne Islands closure protocol (2019)
4. Booth V. & Morrison P. (2010) Effectiveness of disturbance methods and egg removal to deter large gulls *Larus* spp. from competing with nesting terns *Sterna* spp. on Coquet Island RSPB reserve, Northumberland, England. *Conservation Evidence*, 7, 39-43 9*
5. Conservation Evidence Action – four supporting papers: Physically protect nests with individual enclosures/barriers or provide shelters for chicks of ground nesting seabirds
6. Berwickshire and North Northumberland Coast SAC citation
7. Farne Islands SPA citation
8. Booth, V. (RSPB, 2020) – Notes on rabbit eradications on islands
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