Definition of Favourable Conservation Status for Little Tern *Sternula albifrons*

Defining Favourable Conservation Status Project

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About the DFCS project

Natural England's Defining Favourable Conservation Status (DFCS) project is defining the minimum threshold for thriving habitats and species in England.

We are doing this so we can say what good looks like, recommend actions to get them there and keep them that way.

Using Natural England's expert evidence and specialist knowledge, our DFCS definitions will set out our aspirations for these species and habitats in England.

We are publishing these tools so that you, our partners and decision-makers can do your bit for nature, better.

As we publish more of our work, the format of our definitions may evolve, however the content will remain largely the same.

This definition has been prepared using current data and evidence. It represents Natural England's view of FCS based on the best available information at the time of production.

All blocks of evidence within the definition should be given one of three confidence levels [High, Moderate, Low], based on the quality of the evidence, its applicability and the level of agreement.

Quality of evidence is defined as follows:

- Robust evidence is that which has been reported in peer-reviewed literature, or other reputable literature, from well-designed experiments, surveys or inventories that shows signs of being applicable generally.
- Medium evidence is that reported from well-designed experiments, surveys or inventories but from only one or a small number of sites, with uncertainty over its more general applicability, or is correlational or circumstantial evidence.
- Limited evidence includes 'expert opinion', based on knowledge of ecological factors that plausibly suggest an effect, but there is no circumstantial or direct evidence available.

Confidence levels are assigned as shown in the following matrix (after IPCC 2010):

High agreement Limited evidence	High agreement Medium evidence	High agreement Robust evidence
Medium agreement Limited evidence	Medium agreement Medium evidence	Medium agreement Robust evidence
Low agreement Limited evidence	Low agreement Medium evidence	Low agreement Robust evidence

Introduction

This document sets out Natural England's view on the contribution England needs to make to achieve Favourable Conservation Status (FCS) for **Little Tern *Sternula albifrons***. It is the aim of the Habitats Directive to achieve and maintain FCS. The England contribution is defined in terms of the natural range and population of the species and the extent of habitat necessary for long-term maintenance of populations.

This section contains the summary statement of the England contribution. Sections 2 – 5 describe the evidence considered when defining FCS for each of the three parameters. Annex 1 sets out the UK and England position in the 3rd Habitats Directive report.

This document does not include any action planning, or describe actions, to achieve FCS where the species is not considered to be in FCS. These will be presented separately, for example within restoration strategies.

England contribution to FCS

Little terns of the subspecies *albifrons* are widely distributed, breeding throughout the western Palearctic, and in south-west Asia. At the time of the last complete census of the little tern breeding population in Britain and Ireland (Seabird 2000), the English breeding population comprised some 72% of the total Britain and Ireland population and 8% of the Eastern Atlantic breeding population.

The little tern is now considered globally of Least Concern but is Vulnerable in GB and an amber-listed Bird of Conservation Concern in the UK. An exclusively coastal species in England, little terns breed on beaches of sand or shingle and spits or inshore islands, widely scattered along the coastline but with notable concentrations in East Anglia and the south-east. In recent decades, there has been a reduction in the number of colonies, a loss of range and, in general, there are poor levels of productivity and the species is considered to have unfavourable conservation status in England. The decline has been attributed to reductions in breeding success rather than to emigration or changes in adult survival. A primary factor contributing to the low breeding success is human disturbance, largely through recreational activity, although many sites are now wardened or fenced off, which has greatly helped manage disturbance. Other contributing factors include loss of nests due to bad weather, habitat loss/change (natural and due to man-influenced coastal squeeze), predation of chicks and eggs, and food shortage.

Achievement of favourable conservation status requires: i) range restoration ii) an increase in the number of colonies within the current and restored range and iii) an increase in the size of the population as a whole.

The range should be restored to that at the time of the 1968-72 Breeding Atlas (Sharrock 1976), requiring the re-colonisation of former sites and/or the colonisation of new sites in Cumbria, Lincolnshire, East Sussex, Kent and Essex and Northumberland. This work will require habitat creation and enhanced management of existing breeding sites to address issues of predation, recreational disturbance and habitat loss caused by coastal squeeze.

The population size should be increased to that in the mid to late 1980s (around 2,000 pairs, representing the highest figure for England based on reliable census information in the 1980s).

Definitions and ecosystem context

Species definition

Little Tern *Sternula albifrons*
Sub species: *Sternula albifrons albifrons*
Only birds of the nominate race occur in England

Sources: *Stroud and others. 2001, Wetlands International 2012*
Confidence: *Moderate*

Threat status

Red list status:

- **Global: IUCN red list:** Least Concern, http://www.iucnredlist.org/details/22694656/0
- **European:** Least Concern, The IUCN Red List of Threatened Species. Version 2016-3
- **GB:** Vulnerable; Birds of Conservation Concern 4: Amber list, Stanbury and others. 2017; Eaton and others. 2015 https://www.bto.org/sites/default/files/shared_documents/publications/birds-conservation-concern/birds-of-conservation-concern-4-leaflet.pdf

Habitat for the species definition

This species nests exclusively on the coast in well-camouflaged shallow scrapes on bare or sparsely vegetated sand and shingle beaches and spits or inshore islets. The height, cover, variation and composition of vegetation are often important characteristics of habitats supporting this species which enable successful nesting/rearing/roosting. Little terns have a particular propensity for nesting close to the high water mark making nests especially vulnerable to flooding by high tides and burial by 'sea-foam'.

The physical topography of a site and of adjacent intertidal and near-shore areas strongly influence the quality and extent of supporting habitats used by the terns for nesting, chick-rearing, feeding and/or roosting.

The availability of an abundant food supply (a variety of small fish and marine invertebrates) is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. Of all the species of tern which breed in England, little terns have the shortest foraging range (mean maximum of 6.3 km, Thaxter and others. 2012), with terns feeding close to the colony (i.e. <1 km) tending to be the most successful. Little terns thus select breeding sites close to shallow, sheltered feeding areas where they can easily locate their prey. Factors which have direct or indirect impacts on their prey tend to have a considerable effect on the distribution and abundance of the terns themselves.

Little terns are highly vulnerable to human disturbance at their breeding colonies and the nature, scale, timing and duration of some human activities can (and does) result in the disturbance of birds at a level that substantially affects their behaviour and both the short- and long-term use of the colony. Colony abandonment and breeding failure as a direct or indirect effect of anthropogenic disturbance is a very significant issue. For example, disturbance at two little tern colonies (in Teeside and Suffolk) during the 2017 breeding season greatly reduced the hatching success and numbers fledged from the two colonies. At a national scale, it is evident that little terns tend now to use only sites which are relatively undisturbed either through inaccessibility (as on Scolt Head Island) or by fencing and 24 hour wardening. Disturbance associated with human activity may take a variety of forms including various recreational activities, malicious activities (e.g. egg collection, vandalism) and predation during disturbance events.

Following the breeding season, little terns migrate to waters off West Africa.

Sources: *Terrestrial SPA species feature framework file://samnedfsn1/common/Exception%20-%20Frequent%20Access%20Spreadsheets/Conservation/Conservation%20Objectives/Feature%2*

0Frameworks%20for%20supp%20advice/Final%20Draft_SPA%20Birds%20Feature%20Framework.xlsx

JNCC Marine Biodiversity Monitoring http://jncc.defra.gov.uk/page-2897

Sources: *del Hoyo and others. (1996), Mitchell and others. (2004), Thaxter and others. (2012)*
Confidence: *Moderate*

International context

Little terns breed widely across Europe and Asia, and also in Africa and Australia. There are three subspecies of which only the nominate race *S. a. albifrons* breeds in Great Britain. England lies very close to the north-western edge of the species' range in the Palaearctic. England makes a very important contribution to the UK and European populations of breeding little terns.
The little tern is the smallest species of tern breeding in the UK and has a wide but scattered distribution along the UK coastline with the southern-most colony in Dorset and the northern-most in the Outer Hebrides. The majority of birds nest in England with notable concentrations in East Anglia and south-east England from Dorset to Norfolk. The only significant parts of the English coast from which the species is totally or nearly totally absent are the south-west coast and, recently, much of the north-east coast. The species' preference for beaches also favoured by people makes it vulnerable to disturbance, with levels of recreation in many areas now excluding the species altogether. Birds frequently shift colony location within and between breeding seasons, often in response to adverse weather or tidal conditions or disturbance.
Little terns are long-distance migrants, arriving in the UK from April onwards and departing from August onwards. Although relatively little is known about the wintering grounds of UK little terns compared to other tern species, they appear to spend the northern winter in the coastal waters of west Africa and they are recorded moving through Gambia and Senegal on their southern migration.

Source: *JNCC Marine Biodiversity Monitoring http://jncc.defra.gov.uk/page-2897*
Sources: *del Hoyo and others. 1996, Mitchell and others. 2004*
Confidence: *Moderate*

Natural range and distribution

Metric

10 km square is the best available metric for measuring distribution, as there are good data showing numbers of 10 km squares used by breeding little terns (including confirmed/probable/possible breeding) across the UK from the first Breeding Bird Atlas in 1968-72 and subsequent Breeding Bird Atlases. Therefore, changes can be linked to the Atlases.

The distribution of counties supporting breeding birds, along with the main colonies (known to have supported 100 pairs or more) within those counties, will give a useful measure of natural range.

Historical range

The Breeding Bird Atlas 1968-72 shows little tern breeding colonies in England were then distributed along the south and south-east coast from Dorset, Hampshire and the Isle of Wight eastwards through West and East Sussex, Kent and Essex to Suffolk and Norfolk and up the English east coast from Lincolnshire to Humberside. Little terns were also present in the north-west (Cumbria) and north-east (Durham and Northumberland). Around 80 10 km squares in England supported breeding birds (probable/confirmed breeding only), with a further 10 10 km squares where possible breeding was confirmed during the 1968-72 Breeding Bird Atlas survey. The distribution at the time of the 1988-91 Breeding Atlas was relatively unchanged. See maps at: http://app.bto.org/mapstore/StoreServlet?id=256

Table 1 below shows the numbers of nesting little terns in England by county in 1969-70, 1985-88 and 1998-2002, along with the colonies known to have supported 100 pairs or more.

Table 1 Historical and recent status of little terns in England, from Brown & Grice 2005

County*	**Number pairs 1969-70**	**Number pairs 1985-88**	**Number pairs 1998-2003**	**Colonies know to have supported 100 pairs or more (max count in pairs and year)**	**Notes**
Northumberland	20	71	50		
Durham	2	0	0		
Yorkshire	4	48	68		A colony at Spurn may have approached 100 pairs between 1900-1940
Lincolnshire	63	156	46	Tetney: 120 (1977)	
Norfolk	416	508	600	Blakeney Point: 215 (1996) Yarmouth: 277 (1991) Scolt: approx. 200 (1937) Holkham: 120 (1988)	
Suffolk	80	378	148	Orfordness: 115 (1986)	
Essex	163	370	262	Foulness: 360 (1983)	

				Horsey Island: 102 (1998-2002)	
Kent	55	135	38	Dungeness: 110 (1962)	Regular breeding ceased in 1979
Sussex	132	85	12	Chichester Harbour: 102 (1975)	
Hampshire	82	245	151	Needs Ore Point: 100 (1977) Lymington/Hurst: 105 (1981) Langstone Harbour: 171 (1989)	
Isle of Wight	5	1	0		No evidence that there have every been more than approx. 10 pairs in county
Dorset	120	30	81	Chesil Beach: approx. 200 (1967)	Chesil Beach remains the sole nesting site in south-west England
Cumbria	105	60	65		Bred Ravenglass and Walney in 1890s (Macpherson 1892), though both sites had probably been in use for many years, between Allonby and Skinburness at similar time and bred Foulney, Walney, Hodbarrow, Borwick Rails, Siddick and in very small numbers at 5 other sites in county since 1985, since when county total has not exceeded the 77 pairs present in 1988
England total	*1,247*	*2,087*	*1,521*		

* Zero pairs of little terns have been recorded in Lancashire, Cheshire, Somerset, Devon, Cornwall and the Isle of Scilly since 1969-70

Sources: *Sharrock 1976, Gibbons and others. 1993, Brown & Grice 2005, Balmer and others. 2013*
Confidence: *Moderate*

Current range

Table 1 above shows the counties in England where little terns bred between 1998 and 2002 (during the most recent national seabird census). Together with the most recent atlas of little tern distribution in the breeding season (2008-11) and the map of breeding range change since 1968-

1972, significant colony loss from England is evident, particularly from East Sussex, Kent and parts of Essex, from the north-west (Cumbria) and very far north-east of England, with around 40 10 km squares losing breeding birds between 1968-72 and 2008-11 (Breeding Atlases).

The most significant gains in England since the 1988-91 Breeding Atlas have been a cluster of new colonies towards the north-east (Teesside). Offshore sandbars, e.g. Scroby Sands, Norfolk, are also now being occupied when conditions allow (Balmer and others. 2013).
Current (2008 to 2011) distribution and distribution change maps can be seen at:
http://app.bto.org/mapstore/StoreServlet?id=256

Source: *Balmer and others. 2013, Brown & Grice 2005*
Confidence: *Moderate*

Range required for future maintenance of populations and diversity

The principal non-natural threat to this shore-nesting species is from human disturbance. Habitat is likely to be further limited as a result of coastal flood management and rising sea levels/increased storminess, which result in 'coastal squeeze' where beaches and spits are not permitted to migrate landwards and develop naturally.

Many mainland beaches are increasingly disturbed by human recreational activities and are frequented by a wide range of potential ground and aerial predators which take advantage of the disturbance to predate eggs, young and adults (Balmer and others. 2013). As little terns habitually nest very close to the high water mark, tidal inundation during storm surges is a frequent cause of nest loss as is burial in 'sea-foam' during spring and summer storms. Given predictions of future sea level rise and increases in storminess, these threats may be expected to become increasingly prevalent, though managed realignment of coastal defences (especially landward habitat creation options) may create new opportunities for nesting if managed with the species' needs in mind.

One problem with reduced range and fewer (but sometimes very large) colonies is that chance effects such as local weather or tidal conditions, reduced food availability, or heavy predation by a few local generalist predators that happen to specialise in tern predation can have a disproportionate effect at the population level (e.g. loss of c. 300 nests at one site in one season). A much higher number of smaller colonies over a wider area might be more resilient to such stochastic events, although this potentially renders a greater proportion of the population vulnerable to recreational disturbance unless protection efforts are increased according to need. It may also be the case that smaller colonies are less able to mount effective anti-predator defences than larger (especially mixed species) tern colonies. Measures which encourage terns to nest in a small number of relatively well-protected colonies (by fencing, predator control, wardening) have also been rather at odds with such a strategy. In recognition of this, there is a move to put such measures in place early in the season, wherever little terns choose to nest.

The attainment of FCS requires the re-establishment of birds in around 40 10 km squares, although it should be noted that this is about range, so for example, adding more 10 km squares holding breeding birds in the south-east of England would not rectify losses in Cumbria. Therefore, maintenance of the current range to include all the counties where we know this species has bred since the Seabird 2000 census (1998 to 2002) (see Table 1) is required, along with the re-establishment of breeding little terns in counties where colonies have declined or been lost since the late 1960s, e.g. in the north-west (Cumbria), north-east (Northumberland), Lincolnshire and around much of Essex, Kent and East Sussex. Additionally, populations at the key colonies identified in Table 1 should also be recovered.

Sources: *Balmer and others. 2013, Brown & Grice 2005, Info on little tern EU Life project: http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4755&docType=pdf*

Confidence: *Moderate*

Potential for restoration of the natural range

Range restoration requires the maintenance of current colonies, and the re-establishment of colonies throughout the species' former range. Enhanced management at breeding sites will need to address habitat loss, caused variously by coastal squeeze (as a result of man-made flood defences and rising sea levels), coastal stability, and breeding season storms. Enhanced wardening can help address issues of predation and disturbance. Most little tern breeding sites experience heavy visitor pressure, and where suitable habitat is present, management of recreational users is key to the long-term viability of colonies. Where public access is to be restricted in the breeding season, securing public support is a key action. Restoration of breeding habitat involves the creation of largely bare expanses of sand and/or shingle in areas free from disturbance and above the reach of storm tides. There is potential for the creation of suitable breeding habitat (e.g. creation of new islands, and early successional communities) at new sites and recently abandoned sites and as an enhancement of current sites.

Beach re-charge along parts of the south-east coast of England as an aid to sea defences has, in the process, created suitable nesting habitat for little terns and although unproven as beneficial for the species in England, other species of tern have benefited elsewhere from the approach (Charlton 2003). For example, common terns (*Sterna hirundo*) have successfully bred on nesting rafts and man-made islands at Shotton stealworks in Flintshire, Wales (Coffey 2016). Additionally, common, Caspian (*S. caspia*) and Forster's (*S. fosteri*) terns have also successfully bred on nesting rafts and man-made islands in Canada and the USA, whilst least terns *Sternula antillarum* have been encouraged onto artificial islands and even gravel covered rooftops, out of reach of predator populations in the USA (Dunlop and others. 1991, Lampman and others. 1996, Quinn & Sirvedan 1998, Krogh & Schweitzer 1999, Powell & Collier 2000, Kress & Hall 2002). Whilst not an artificial island, one little tern colony in Cumbria is well-established on an artificial substrate. Little terns have also nested on an old concrete causeway at a site in Lincolnshire and at an old airfield base in Scotland (S. Rendell-Read *pers. comm.*). Roseate terns have nested on a stone breakwater in Sunderland and common and Sandwich terns, as well as gulls, have nested on dumped dredge spoil at Wells in Norfolk.

Many of these requirements are being addressed at the most important remaining colonies in Britain by a five-year EU LIFE+ Nature Little Tern Recovery Project, which is an 11-organisation partnership working together to ensure the long-term future of the little tern. The project started in September 2013 and involves enhanced management and habitat restoration/creation work at over 20 sites (all located within Special Protection Areas). As part of the project, trials are being undertaken to attempt to attract little terns to artificial areas, e.g. rafts at Spurn and platforms at Langstone Harbour (Rendell-Read 2016). While this project is largely focussed on existing important colonies, the fact that appropriate management measures are well established and often successful, suggests that (with the exception of stochastic events and poor prey supply) there is good potential for the restoration of the natural range of the species. Habitat creation strategies have been drawn up by the project for several regions (Rendell-Read 2016), examining opportunities for restoration and the creation of new sites.

Source: *Charlton 2003, Rendell-Read 2016, Coffey 20161, Info on little tern EU Life project from: http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4755&docType=pdf*

Date: *2003 to 2016*

Confidence: *Moderate*

Favourable range

FCS will be a distribution of at least 80 10 km squares with proven or probable breeding little terns (equal to or exceeding that recorded in the 1968-72 Breeding Bird Atlas, Sharrock 1976) and the range will be for little terns to breed regularly in the colonies and counties indicated in Table 1.

Whilst 10 km square occupancy can be measured as part of a repeat of the BTO national Breeding Bird Atlas (normally repeated at around twenty year intervals and next due around 2027), information at a colony level is available via the Seabird Monitoring Programme (SMP) and a table-top examination of county bird reports.

Comparison with situation in 1981

The range of this species has decreased since the time of the Birds Directive being implemented, see Table 1 and http://app.bto.org/mapstore/StoreServlet?id=256, and is thus unfavourable compared to the situation in 1981.

Population

Population metric

Breeding pairs as described in Musgrove and others. (2013). This is the appropriate metric because current and historical data are available nationally for this metric and it is employed in monitoring population trends.

Historical populations

Although no England-wide population estimates are available for little terns for any period prior to 1969, it is known that little terns declined at many individual colonies during the latter part of the 19th century due to persecution, disturbance and habitat destruction (Holloway 1996), but then recovered to reach a 'modern-day' peak in the 1920s or early 1930s. Thereafter, a renewed decline set in which, while not quantified, was nevertheless regarded as very serious and prompted a special inquiry during the summer of 1967. Coverage in 1967 was considered to be generally good, although some of the more isolated colonies in the west of Ireland and north-west Scotland were not visited, precluding a national population figure being derived for that year.

Breeding little terns in the UK have been counted in three national censuses, Operation Seafarer (1969 to 1970; Cramp and others. 1974), the Seabird Colony Register (SCR, 1985 to 1988; Lloyd and others. 1991) and Seabird 2000 (1998 to 2002; Mitchell and others. 2004). Complete coverage of UK little tern colonies was achieved in each national census. As noted above, site fidelity can be low from year to year as a response to predation, disturbance or habitat change. Therefore, in order to gain an accurate national population estimate, a simultaneous census was planned to cover all British colonies within a single year. During Seabird 2000, 93% of the population were counted in 2000, compared to the SCR where counts were spread over four years (13% counted in 1985, 21% in 1986, 63% in 1987, and 3% in 1988).

The first national census (Operation Seafarer 1969-70) estimated the population of little terns in the UK to be 1,589 apparently occupied nests (AONs – the unit of measurement treated as equivalent to the number of breeding pairs), with the population in England estimated to be 1,247 AONs (Mitchell and others. 2004; JNCC 2016). The second national census (the SCR 1985-88) recorded the UK little tern population to have increased to 2,517 AONs, an increase of 58% since the last census. The population in England was estimated to be 2,087 AONs, an increase of 67% since the previous census (Mitchell and others. 2004; JNCC 2016). The last national census (Seabird 2000) recorded a decline in little tern numbers in the UK with an estimated 1,927 AONs (decline of 23% since the SCR), with an estimated 1,521 little tern AONs in England (a decline of 27% since the SCR) (Mitchell and others. 2004; JNCC 2016). Annual monitoring of many of the more important little tern colonies has been conducted in Britain since 1969 as part of the JNCC's Seabird Monitoring Programme (SMP), with the colonies monitored currently holding about two thirds of the national population (JNCC 2016): changes here provide strong corroboration of a significant decline – of some 31% over the last three generations.

Sources: *Cramp and others. 1974, Lloyd and others. 1991, Mitchell and others. 2004, JNCC 2016*
Confidence: *Moderate*

Current population

The current UK population is not known precisely, as the last national census was conducted as part of Seabird 2000. The most recent census (Seabird 2000) estimate for breeding little terns in the UK is 1,927 pairs (Mitchell and others. 2004), with an estimated 1,521 pairs nesting in England at this time. A summary of trends since Seabird 2000 up to and including 2015 at selected colonies indicates a decline of 18% in the UK population since Seabird 2000 (Hayhow and others. 2017; JNCC 2016, see: http://jncc.defra.gov.uk/page-3201). If this trend is true throughout the UK (and this is at least very likely), then the current UK population may now be in the region of 1,600 pairs. Currently the total England population of little terns is below that recorded at the time of Seabird 2000 (1,541 AON in England); with at least 1,154, 1,100 and 959 AON recorded in England in

2013, 2014 and 2015 respectively, although data are not submitted annually to the SMP for all colonies (JNCC 2016).

***Sources**: Mitchell and others. 2004, JNCC 2016, Hayhow and others. 2017*

***Confidence:** Poor/Moderate*

Population required for future maintenance of populations and diversity

As noted above, the current UK population is not known precisely, as the last national census was conducted as part of Seabird 2000. A full national census is urgently required.
The trend between 1998-2002 and 2015 at the colonies that have been monitored over that period is a decline of 18% (JNCC 2016). As noted above, the current total England population of little terns is below that recorded at the time of Seabird 2000.
In order to achieve FCS the species numbers must be restored across the favourable range to a target of approximately 2,000 pairs (i.e. approximately the highest contemporary figure for England based on reliable census information in the 1980s).

***Sources:** Mitchell and others. 2004, Balmer and others. 2013, JNCC 2016*

***Confidence:** Poor/Moderate*

Potential for restoration of populations

Population restoration depends on securing high levels of productivity at the remaining nesting colonies. Key threats to breeding productivity are colony abandonment due to disturbance; colony loss to storm events and high tides; and predation of eggs, chicks and adults by avian and mammalian predators. Coastal change can also limit nesting opportunities.
Measures to address disturbance, predation and risk from storms and tides are well established and include public engagement and management, wardening, protection of colonies from ground and avian predators and habitat restoration to secure areas above the reach of storms and tides (or in situations such as islands in coastal lagoons). All of these measures are technically achievable but require considerable resourcing and active management. Coastal change, be it natural or anthropogenic may be harder to manage but is not the limiting factor in most areas and in fact coastal processes can lead to as much habitat creation as loss.

As mentioned above, there is potential to enhance numbers and productivity at existing colonies through enhanced management to protect little terns, their nests and eggs from threats such as disturbance and predation. This can be done through wardening to reduce human disturbance and fencing. With regard to fencing, site managers are advised, as a minimum, to erect a rope perimeter fence to reduce human disturbance and to use an electric fence or barrier within the rope fence to reduce mammalian predation and the risk of dogs entering established colonies (S. Rendell-Read *pers. comm.*). Individual nest cages have also proved useful at sites where ground predation is high. On Lindisfarne, for example, oystercatchers were the primary predators but nest cages have been used successfully to protect little tern nests there (A. Craggs *pers. comm*.; Smart 2003).

There is also potential (see above) for the creation of new sites (e.g. islands) or the restoration of recently abandoned sites and opportunities are being identified by region as part of the EU LIFE + Nature Little Tern Recovery Project (Rendell-Read 2016).
Population models indicate that observed annual productivity is insufficient to maintain the UK or GB breeding population, and that the low productivity recorded can alone account for the observed national population decline. Restoring the breeding population therefore requires increasing annual breeding success. An analysis of the Seabird Monitoring Programme (SMP) UK breeding little tern dataset by Cook & Robinson (2010) indicated that breeding success remained relatively stable between 1986 and 2008 at around 0.51 chicks per nest per year, which, if continued, suggests that the UK population will decline by 41% over 25 years.

If breeding success were to increase to 0.70 fledged chicks/breeding pair, population decline would cease (JNCC 2016). The attainment of at least this level of productivity is considered

achievable given sufficient resources. The EU LIFE+ Nature Little Tern Recovery Project is working to create a set of 'conservation evidence best practice' notes and case studies to facilitate achievement.

For the population to recover to its previous peak, management at colonies would need to deliver an average annual breeding productivity in excess of this value. A current ringing and re-sighting programme under the EU LIFE+ Nature Little Tern Recovery Project (now covering 14 sites across the UK) will be running model demography to get a better understanding of the target productivity required to recover the population. In addition, as little tern is a long-lived seabird; adult survival is also an important factor in increasing productivity and hence population recovery.

More effective management of existing little tern colonies, and establishment and management of new colonies to achieve the restoration target may have knock on benefits for other breeding bird species, including other terns; for example, ringed plover and oystercatchers have greater breeding success within areas fenced for little terns. Predator exclusion/control necessary to ensure the high level of productivity needed would have limited impact on populations of potential predators of little terns which are generally opportunist, generalist species that are relatively common and widespread e.g. foxes, mustelids, corvids, kestrels etc. The EU LIFE+ Nature Little Tern Recovery Project is trialling non-lethal measures of predator control, such as fox diversionary feeding and laser-hazing of avian predators.

Any creation of new nesting habitat would have to be carried out in such a way as not to damage other coastal habitats that may be of national or European importance. A 'theme' of the EU LIFE+ Nature Little Tern Recovery Project is to establish principles for dune/vegetated shingle habitat and little tern management.

Source: *Cook & Robinson 2010, JNCC 2016, Rendell-Read 2016*

Confidence: *Moderate*

Favourable population

The little tern will be considered to have a favourable population when the population in England is at or above 2,000 pairs.

This approximates to the highest contemporary figure for England based on reliable census information in the 1980s. This figure recognises that range expansion, additional colonies within the current range and more birds are required to increase resilience.

The size of the breeding population should be monitored at all established colonies, and any newly restored colonies, on an annual basis. As almost all little tern colonies are subject to some degree of management and any newly restored colonies will be too, data on colony sizes at all or nearly all colonies should be gathered as a matter of course. Periodic national censuses such as Seabird 2000 take place too infrequently (the current gap is 15 years with no plan or resources in place to deliver a repeat census) to inform effective monitoring of progress towards meeting the FCS target for this species.

Habitat for the species

Metric

The area of sand/shingle habitat present in those 10 km squares in England in which little terns were recorded in the national Breeding Bird Atlases.
Given that the nesting habitat of little terns in the UK is well-known, this metric is considered to capable of providing the best indication of the area of potentially suitable habitat in the vicinity of Little Tern colonies.
However, it should be noted that such an approach will exaggerate any estimate of habitat availability as within any given coastal 10 km square the area of habitat actually available to nesting little terns is likely to be much more limited – by disturbance, food availability, vegetation cover, predators and other factors - even in areas with extensive areas of suitable habitat such as at Dungeness. Whilst it may be technically feasible to approximate the area available, this would be extremely difficult, costly and time-consuming. Arguably, a better indicator of the availability of suitable habitat is the area around successfully reproducing Little Tern colonies.

Historical area

Breeding habitat - as for range. See maps at: http://app.bto.org/mapstore/StoreServlet?id=256
Within the 10 km squares where little terns were recorded breeding in England in the 1968-72 Breeding Bird Atlas a total of 242 km^2 of sand/shingle habitat (calculated from Land Cover 2007 data) was present. In the 1988-91 Breeding Bird Atlas a total of 230 km^2 of sand/shingle habitat (again calculated from Land Cover 2007 data) was present in the 10 km squares in which little tern were recorded breeding in England. However, it should be noted that these areas are the sum total of sand/shingle at the 10 km square level across all known breeding sites for these time periods and hence these figures are likely to represent a massive overestimate of the area both available to birds and actually used by them. Large areas of sand/shingle habitat are unsuitable because of a range of factors, including the nature of vegetation cover, quality of the inshore waters for foraging, amount of disturbance and, most importantly, because they are regularly inundated at high tide, for which it would be extremely difficult to quantify the effects. Furthermore, each colony in any one year normally occupies only a very modest proportion of the available habitat.

Sources: *Sharrock 1976, Gibbons and others. 1993, Balmer and others. 2013*

Confidence: *Moderate*

Current area

Breeding habitat – as for range. See map at http://app.bto.org/mapstore/StoreServlet?id=256
Within the 10 km squares where little terns were recorded breeding in England in the 2008-11 Breeding Bird Atlas a total of 133 km^2 of sand/shingle habitat (calculated from Land Cover 2007 data) was present. This implies that breeding little terns currently occupy roughly 55% of the area occupied in the first (1968-72) Breeding Bird Atlas, which is almost certainly the result of many factors including changes in physical habitat extent/suitability of habitat, interspecific competition, recreational disturbance and food availability. Although an estimated area of habitat used by nesting birds is greatly exaggerated, as explained above the comparison of habitat extent between years does indicate a decline in the area of nesting habitat used.
Given that the 2007 Land Cover data have been used for the calculations of sand/shingle habitat availability for both the earlier and later figures (Land Cover 2007 being the most recent data set accessible at the time of writing), there may have been changes since in habitat extent due to coastal processes. As a result of flood defence structures and activities, erosion and higher sea levels the available habitat for little terns may be less than in the past. However, as there is not a good set of historic and current aerial images at high tide, good evidence in support of this is lacking. It is considered that change in the absolute area of sand and shingle is not likely to be the limiting factor in most areas and coastal processes can lead to as much habitat creation as loss.

Source: *Balmer and others. 2013*

Confidence: *Moderate*

Area required for future maintenance of populations and diversity

Many little tern colonies face an increasing risk of being washed out due to rising sea-levels, and a reduction in size of breeding beaches due to beach scouring and dune encroachment. This risk is likely to increase if shoreline management policies do not allow foreshore and beaches to roll-back and so adapt and become resilient to climate change. Increased storm events in the future could also reduce habitat availability.

Coastal processes may also be affected by coastal management, for example the addition or removal of groynes could cause previously accreting beaches to erode and reduce the amount of breeding habitat, or could alter the size and type of material deposited and affect the suitability of an area for nesting. Prey availability may also be reduced if sand banks are lost. Conversely, altered hydrodynamics in the marine environment that may arise following construction of man-made structures at sea can also lead to the creation of suitable habitat. For example, following the construction of the Scroby Sands offshore windfarm it is possible that scour of subtidal sediment around the turbine bases and its deposition downstream has led to the re-emergence of a sandbank several kilometres offshore and on which little terns, and other species of tern, are now nesting. However, around 100 pairs were washed out at this location in 2017. Accreting beaches can provide new nesting areas. For example, little terns now nest on recently accreted sediments at Kessingland in Suffolk, near to the old colony's location but outside the SPA.

As noted above, using the total amount of sand/shingle habitat in 10 km squares calculations approach indicates that breeding little terns in England currently occupy roughly 55% of the area occupied in the first (1968 to 1972) Breeding Bird Atlas. Based on this, the area of breeding habitat required to achieve FCS for little tern could be considered to be that recorded in the 1968-72 Breeding Bird Atlas. It should be noted that it is the sum total of sand/shingle across all the 1968-72 known breeding sites which needs to be present in order for these colonies to nest somewhere within them each year and to potentially move around within them from year to year.

Little terns require relatively small areas of land for nesting and larger areas of nearshore waters for foraging. The 10 km squares supporting little terns will generally contain only very small areas of available habitat. Although suitable sand/shingle habitat might not be in short supply at many locations, availability is often reduced by the presence of people and dogs over much of the otherwise suitable habitat, for example at Blakeney and the long shingle spit, the little terns just choose two small areas to nest along this large area. Although the approach taken to estimate the area of habitat required does not consider the limiting effects of food availability, predation, disturbance etc., this is the only practicable approach available without attempting extensive and long-term site-specific investigations of these other limiting factors.

Habitat creation schemes are best targeted at areas free of disturbance (e.g. islands) or where resources are available to manage recreational access. Islands within lagoons (landward) may present the best options for managing disturbance and predation, but there will be issues of competition with other nesting birds.

Source: *Info on little tern EU Life project from:*
http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4755&docType=pdf
https://ww.rspb.org.uk/our-work/conservation/conservation-projects/details/370840-little-tern-recovery-project
http://www.littleternproject.org.uk/

Confidence: *Moderate*

Potential for habitat restoration

There is potential to increase breeding numbers at existing colonies by management which protects little terns, their nests and eggs from recreational disturbance and predation. Similarly, it may be possible to restore and create new habitat at former (especially recently abandoned) sites:

- Existing degraded habitat can be restored using a variety of micro-management techniques (e.g. vegetation management through removal or burial, re-profiling) to make it suitable for nesting little terns. E.g. at Botany Bay (Australia), the clearing of vegetation to create an open sandy nesting area allowed a colony of little terns to successfully relocate when their original site was developed during an airport construction (Charlton 2003).
- New habitat can potentially be created by the construction of offshore islands or through the strengthening and stabilising of (or destabilising and creation of more dynamic) beaches. Material to create such habitats can come from port dredgings, e.g. parts of the south-east coast of the UK have benefited by the strategic placement of dredged material as 'beach recharge' to aid sea defences, and in the process created viable nesting habitats for terns.
- Examples where little terns have taken advantage of beach recharge and habitat creation works that may or may not have been targeted at them include at the Blackwater Estuary (Charlton 2003), and at various locations within Hamford Water NNR (Charlton 2003) and Langstone Harbour (Langstone Harbour Board 2013; 2014).

Newly created islands could have the potential to provide higher quality habitat than nearby natural habitat as:

- they will initially be vegetation free;
- they usually lack mammalian predators; and,
- they are often inaccessible to humans.

Pakanen and others. (2014) compared little tern breeding success (nest and hatching success) on natural habitat (sandy beaches) and artificial port habitat (dredged and translocated material of silt, sand and small stones) at Bothnian Bay, Finland between 2006 and2011. The results showed nest success to be higher on the artificial habitat (82%) than on the natural habitat (58%) (Pakanen and others. 2014).
Whilst the creation of islands and habitats can be very beneficial to terns and other wildlife, they should not be seen as an alternative to the protection and maintenance of naturally occurring islands and beaches.

Source: *Charlton 2003; Smart 2003; Langstone Harbour Board 2013; 2014*

Confidence: *Moderate*

Favourable supporting habitat

We consider FCS to be 242 km2 of potential breeding habitat, which is the area of suitable habitat available in the first (1968 to 1972) Breeding Bird Atlas. Breeding little terns in England currently occupy very approximately 55% of the area occupied in the 1968 to 1972 Breeding Bird Atlas (see above, especially for caveats).

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Annex 2: Tenth Birds Directive Reporting

UK context from the 10th UK Birds Directive report

UK conservation status:

- **Range:** 10,100 km^2 *Confidence: Complete survey or statistically robust estimate*
- **Population:** 1,900 pairs *Confidence: Complete survey or statistically robust estimate*
- **Habitat for species:** N/A
- **Overall:** N/A

UK favourable reference values:

No UK FRVs set

Proportion of UK species within England:

No England level data available

Proportion of UKspecies within protected sites:

- **N2K:** 1,156/1,900 pairs = 61%

  Source: 10th UK Birds Directive Reporting 2012, species factsheet *http://cdr.eionet.europa.eu/Converters/run_conversion?file=gb/eu/art12/envuzl7g/UK_birds_reports-14328-12614.xml&conv=343&source=remote*

- **Protected areas outwith N2K:** No data available

European context

Proportion of Atlantic biogeographic region within UK: 9.7% (*ssp. albifrons*)

Source: *JNCC Marine Biodiversity Accounts* *http://jncc.defra.gov.uk/page-2897*

Further information

Natural England evidence can be downloaded from our **Access to Evidence Catalogue**. For more information about Natural England and our work see **Gov.UK**. For any queries contact the Natural England Enquiry Service on 0300 060 3900 or e-mail **enquiries@naturalengland.org.uk** .

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Little Tern Sternula albifrons
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