



Definition of Favourable Conservation Status for Eurasian Curlew *Numenius arquata*

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 the **Eurasian Curlew *Numenius arquata***. 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 to 5 describe the evidence considered when defining FCS for each of the three parameters. Annex 1 lists the references and Annex 2 sets out the UK and England position in the 10th Birds 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

England supports globally important numbers of the nominate race of the Eurasian Curlew (Curlew from here on) during both breeding and non-breeding seasons (up to 32% and 21% of the Europe and North & West Africa breeding and non-breeding populations respectively). It is now considered globally Near Threatened and is a red-listed Bird of Conservation Concern in the UK. A species of upland moors, bogs, heaths and wet grassland during the breeding season, and coastal mudflats and grazing marshes in the winter, curlews are still widespread in England despite recent range contractions. However, breeding numbers in particular are now in sharp decline. Achievement of favourable conservation status requires both recovery of breeding range and breeding and non-breeding populations. Specifically, the breeding range as estimated in the early 1970s must be substantially restored, requiring the restoration/creation of suitable habitat in around 75 10 km squares, largely in the southwest and the West Midlands. The population levels of breeding and non-breeding birds should be recovered to those in the 1990s, i.e. at least 51,000 breeding pairs and 65,000 non-breeding individuals in England. Range and population recovery would require restoration of suitable habitat at a landscape scale, both in lowland wet, extensively grazed grasslands and in upland grasslands, rush pastures and moorland.

Definitions and ecosystem context

Species definition

Eurasian Curlew *Numenius arquata*

Subspecies: *Numenius arquata arquata*

Only birds of the nominate race have been recorded in England (Brown & Grice 2005)

Sources: *Brown & Grice*

Confidence: *Moderate*

Threat status

Red list status:

- **Global: IUCN red list: Near threatened** <http://www.iucnredlist.org/details/22693190/0>
- **European: IUCN European red list: Vulnerable**
<http://www.iucnredlist.org/details/22693190/1>
- **GB: Birds of Conservation Concern 4: Red list**
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 breeds on upland moors, peat bogs, wet and dry heathlands, fens, rush pastures, lowland wet grasslands and meadows. During the winter the species frequents open coasts and estuaries with intertidal mud and sand and saltmarshes, and inland grazing marshes. During the breeding season curlews require a structural mosaic of vegetation of different heights to aid concealment of nests and chicks in taller vegetation while allowing adults and chicks to forage in shorter vegetation with nearby cover. While grazing is necessary to maintain sward heterogeneity, low stocking densities are important to reduce disturbance and trampling of nests and chicks. Curlews require abundant soil invertebrates (earthworms, leatherjackets, beetles, etc.) for foraging and chick provisioning. Non-breeding birds require extensive intertidal areas and/or wet grassland with abundant mud/soil invertebrate prey for foraging.

Curlews are vulnerable to disturbance during both the breeding and non-breeding seasons. Significant disturbance of nesting, foraging or roosting areas can change feeding or roosting behaviour, increase energy expenditure due to flight, and result in abandonment of nest sites or displacement from non-breeding foraging areas and roost sites.

This species is known to favour large areas of open terrain, largely free of obstructions, in and around its nesting, roosting and feeding areas. Often there is a need to maintain an unobstructed line of sight within nesting, feeding or roosting habitat to detect approaching predators, or to ensure visibility of displaying behaviour.

Sources: *Cramp & Simmons 1983; del Hoyo and others 1996; Grant 1997; Gibbons and others 1993; Robson 1998*

Confidence: *Poor/Moderate*

Ecosystem context

The Curlew's breeding distribution is globally restricted to the temperate and boreal regions of Europe and Asia. The species is polytypic with two subspecies described. The nominate race *N. a. arquata* occurs across Europe to western Siberia, where it grades into *N. a. orientalis* which breeds in the eastern part of the range in central Asia. In Europe, they have an essentially northern temperate distribution, occurring in greatest numbers in Scandinavia, the Low Countries, and in Britain and Ireland. Their distribution becomes thinner and more localised in the south of Europe.

In winter, Curlews migrate south from their breeding areas to wintering grounds on the coastal fringes of the Atlantic and Mediterranean, with the majority of *N. a. arquata* population wintering in northwest Europe, particularly around the coasts of Britain, Ireland, France and the Wadden Sea (Delany and others 2009).

The Curlew is a widespread breeding species throughout much of Britain, but is absent from most parts of south-east and much of south-west England, north-west Scotland and parts of Ireland. Despite its expansion into lowland agricultural habitats during the last century, the species remains more abundant in the uplands and northern regions with extensive areas of moorland and rough grazing. The main pressures and threats to breeding birds in England are land management changes including the intensification of grassland management, over-grazing and trampling by livestock, drainage of wetlands and wind energy production. Increased nest and chick predation are also implicated in the decline, perhaps especially affecting small, isolated populations restricted to relatively fragmented habitat.

In winter Curlews are found around most of the coastline of Britain and Ireland and they also frequent inland areas with extensive wet grasslands. Pressures and threats to non-breeding birds are habitat loss as result of coastal squeeze, drainage of wetlands, intensification of lowland farmland, and recreational disturbance at coastal locations.

Sources: *Stroud and others 2001; Delany and others 2009*

Confidence: *Moderate*

Natural range and distribution

Metric
<p>10 km square is the best available metric as there are good data showing numbers of 10 km squares used by curlews across the UK from the first Bird Atlas in 1968 to 1972. There are no other data available to quantify range at a national scale.</p>
Historical range
<p>Breeding: Up to the 1960s breeding curlews were widely distributed in northern and western England, with some significant outlying numbers in areas in the East Midlands and East of England (particularly Breckland). Around 650 10 km squares in England supported breeding birds (probable/confirmed breeding only) during the 1968 to 1972 breeding bird atlas survey. Since this time the curlew's breeding range has contracted, with particularly notable losses in the lowlands of Devon, Somerset and Dorset north into Wiltshire and the West Midlands. Over 100 10 km squares lost their breeding birds between 1968 to 1972 and 2007 to 2011 (Breeding Atlases). There is also some indication of possible loss of range in the uplands, particularly from enclosed areas of marginal upland farmland, although range changes have not been quantified (Gibbons and others 1993). More recently there have been some localised increases in range with relatively small numbers of birds now breeding in Cambridgeshire, Northamptonshire and Lincolnshire and on the Suffolk and Essex coasts (Breeding Atlas). Although welcome, these range extensions do not compensate for much more significant declines elsewhere.</p> <p>Non-breeding: Overall range, at least in the early 1980s, was less extensive than currently, with an apparent 15% increase in Britain since 1981 to 1984 (Balmer and others 2013). Much of this expansion occurred in England, particularly in inland areas of the Midlands, the East of England and in the north.</p> <p>See maps at http://blx1.bto.org/mapstore/StoreServlet?id=203</p> <p>Sources: <i>Stroud and others 2001; Balmer and others 2013</i></p> <p>Confidence: <i>Moderate</i></p>
Current range
<p>Breeding: Breeding curlews occupied around 544 10 km squares in England during the 2007 to 2011 Atlas survey, with the majority of probable or confirmed breeding in northern England and West Midlands and more localised breeding in southern England and the East of England.</p> <p>Non-breeding: English breeding birds move to the coast and adjacent farmland in the winter, where they are joined by large numbers of migrants from northern Europe. Birds are spread widely around much of the English coast, with the highest concentrations on the major estuaries of the east, southeast and northwest.</p> <p>See http://blx1.bto.org/mapstore/StoreServlet?id=203</p> <p>Sources: <i>Balmer and others 2013; Gibbons and others 1993</i></p> <p>Confidence: <i>Moderate</i></p>
Range required for future maintenance of populations and diversity
<p>The natural range required to maintain or restore the diversity associated with the species in the next 50 to 100 years is close to the breeding range as mapped in 1968 to 1972, requiring re-establishment of birds to c. 75 10 km squares in the south-west and the West Midlands. The non-breeding range should be maintained as described by the 2007 to 2011 Atlas.</p> <p>Climate change might affect the future range of this species. Huntley and others (2004) predicted that the species will come to have a northerly distribution, with an absence of birds in large areas of England. For non-breeding birds, Pearce-Higgins and others, (2011) anticipate a 25% to 50% increase in spring passage numbers within SPAs.</p>

Sources: *Balmer and others 2013; Brown & Grice 2005; Gibbons and others 1993; Huntley and others 2004; Pearce-Higgins and others 2011*

Confidence: *Poor/Moderate*

Potential for restoration of the natural range

Breeding range recovery would require restoration of suitable habitat in lowland areas, primarily wet, extensively grazed grasslands with essential elements of sward heterogeneity and hydrology. Other issues that would need to be resolved in some localities are high levels of nest and chick predation and/or recreational disturbance. There should be no significant impact on other habitats or species if existing low-value grassland habitats are targeted for restoration. Changes to grassland habitats currently used by other breeding wader species, such as increased rush cover, might have some impact if not carefully managed.

Sources: *Backshall and others 2001; Douglas and others 2014; MacDonald & Bolton 2008; Robson 1998; Pearce-Higgins & Grant 2014*

Confidence: *Poor/Moderate*

Favourable range

As the conservation of the Curlew is of the highest priority (reflecting the international significance of the GB population and the level of threat it faces here and abroad) and there is good technical potential for reversing historic losses, it is considered appropriate to recover at least 75% of historic losses. Accordingly, a breeding range which represents FCS is considered to be approximately 620 10 km squares. The non-breeding range should be maintained as described by the 2007 to 2011 Atlas. Range should be measured by a repeat of the BTO atlas (normally repeated at around twenty year intervals and next due around 2027).

Comparison with situation in 1981

The Favourable Range is at least that when the Directive came into force

Population

Population metric
<p>Breeding pairs and non-breeding individuals as described in Musgrove and others 2013. Current and historical data are available nationally for these metrics and they are employed in monitoring population trends.</p>
Historical populations
<p>Breeding population: Although no population estimate is available before the 1990s, there are indications of a decline since the 1970s and more recent declines of 48% in the UK and 33% in England from 1995 to 2014. It is therefore highly likely that numbers were much higher in the middle of the last century than currently.</p> <p>There is no formal population estimate for England. Brown & Grice (2005) estimated 30,000 to 40,000 pairs in England based on a UK population estimate of 75,000 pairs (Grant 1997). The UK figure appears to have been a significant underestimate as it was re-estimated to 107,000 pairs (99,500 to 125,000 pairs in 1985 to 1998) and 105,000 pairs in GB (Baker and others 2006). This suggests that the English breeding population, as calculated by Brown & Grice (2005), might have been closer to 42,000 to 56,000 pairs in the late 1990s.</p> <p>The great majority of breeding birds were found in the lowlands of northern England and in upland northern England, with much smaller numbers on lowland wet grassland and other habitats in southern England. Wilson and others (2005) confirm relatively small numbers were present in the lowlands, largely on lowland wet grassland and heathland.</p> <p>BTO estimate a 29% decline in England during 1967 to 2005, although some of this period was covered by a very small sample of monitoring plots. This suggests that the English breeding population might have been around 40% higher in the 1960s, i.e. 59,000 to 79,000 pairs.</p> <p>The decline in breeding numbers is considered most likely to be due to changes in the extent and suitability of upland grassland and moor and lowland wet grassland and heathland. Agricultural changes such as the improvement and homogenisation of grasslands through drainage, fertilisation and silage management are likely to be largely responsible for these changes. There is also wide evidence of insufficient breeding productivity, most typically because of high egg and chick predation.</p> <p>Non-breeding population: The non-breeding population, consisting of resident English breeders and migrants from northern Europe, increased steadily from the 1970s reaching peak numbers at around 150,000 individuals in GB in the 1990s (Baker and others 2006). BTO estimated around 64,000 individuals in England from 2004-2009 (Calbrade and others 2011), although numbers may already have dropped from their peak by that time, given that the GB population was estimated to have fallen by around 10,000 individuals from the 1990s to 2004-2009 (Musgrove and others 2013). Assuming the rate of decline was similar across GB, it is estimated that peak numbers in the 1990s in England might have been around 6.7% (10,000/150,000) higher than in 2004-2009, resulting in an estimate of around 68,000 individuals. The causes of this decline are unknown. It is certain that the decline of breeding birds, both in the UK and elsewhere in Europe, will eventually affect non-breeding numbers, although changes in migration patterns and overwintering distribution in response to climate change and site-based habitat deterioration due to effects such as disturbance might also contribute to the change in numbers both nationally and locally.</p> <p>Sources: <i>Balmer and others 2013; Brown & Grice 2005; Brown and others 2015; Calbrade and others 2011; Grant 1997; Baker and others 2006; Harris and others 2016; Musgrove and others 2011; Wilson and others 2005</i></p> <p>Confidence: <i>Poor/Moderate</i></p>
Current population
<p>Breeding population: The most recent GB estimate is 66,000 pairs (Musgrove and others 2013) based on O'Brien (2004) and extrapolated forward using BBS trends up to 2009. Assuming that at</p>

least 40% breed in England (Brown & Grice 2005) suggests that the English population was at least 26,000 pairs in 2009. Given that numbers have continued to decline since 2009 (e.g. -13% 2014-2015, www.bto.org/bbs) it is highly likely that the current population is now significantly smaller.

The great majority of breeding birds are found on heather moorland, blanket bogs, enclosed rushy pastures and meadows. The core areas in England are thus, both historically and currently, the North and South Pennines, Bowland Fells, Northumberland and the North York Moors as well as some lowland areas of northern England.

Non-breeding population It is estimated that numbers declined in the UK by around 12% from 2003/04 to 2013/14 (Frost and others 2016). Assuming a similar decline in England indicates that the English population was around 56,000 in 2013/14 (i.e. around 12,000 fewer individuals than the number estimated to be present during the 1990s). WeBS data indicate particularly significant declines (greater than 25%) at several locations around the English coast: Medway Estuary, Morecambe Bay, Poole Harbour, Solent & Southampton Water and the Solway.

Sources: Brown & Grice 2005; Frost and others 2016; Musgrove and others 2011; O'Brien 2004

Confidence: Poor/Moderate

Population required for future maintenance of populations and diversity

Population levels similar to those in the 1990s.

Sources: Baker and others 2006; Balmer and others 2013; Brown & Grice, 2005; Calbrade and others 2011; Grant 1997; Harris and others 2016; Musgrove and others 2011

Confidence: Poor/Moderate

Potential for restoration of populations

Breeding population: Restoration of breeding populations is feasible through habitat restoration. Defragmentation of habitat might help to reduce nest and chick predation to sustainable levels, although some predator control measures might still be necessary in some locations. With careful targeting and management no negative impacts on other habitats or species are foreseen (indeed it is likely that other wetland waders and wetland species more generally would benefit).

Non-breeding population: Restoration of breeding habitat might reverse the current decline in non-breeding numbers. The feasibility of reversing declines caused by other factors would depend on which factors are responsible. For example, if declines are largely attributable to changes in migration patterns as a result of climate change then restoring numbers in England might be unachievable.

Sources: Backshall and others 2001; Douglas and others 2014; MacDonald & Bolton 2008; Robson 1998; Pearce-Higgins & Grant 2014

Confidence: Poor/Moderate

Favourable population

As the conservation of the Curlew is of the highest priority (reflecting the international significance of the GB population and the level of threat it faces here and abroad) and there is good technical potential for reversing historic losses, it is considered appropriate to recover at least 75% of historic losses to produce an estimated favourable population level of at least 51,000 breeding pairs and 65,000 non-breeding individuals. The breeding population should be monitored by BBS and periodic national surveys (e.g BTO atlas surveys). The non-breeding population should be monitored by WeBS.

Comparison with situation in 1981

The Favourable Population is at least that when the Directive came into force.

Habitat for the species

Metric
<p>10 km square. Measurements of habitat availability can only be inferred from curlew distribution at the 10 km square resolution, as employed by the national Breeding Bird Atlases. This would exaggerate habitat extent as not all areas of any given 10 km square are likely to be used by curlews. It may be possible to further refine estimates of required habitat by using tetrad (2 km square) level data.</p>
Historical area
<p>Past extent of the specific habitats required by breeding curlew is not known. However, an indication of past area can be gained from the past distribution (see Historic range).</p> <p>Source: http://blx1.bto.org/mapstore</p> <p>Confidence: <i>Poor</i></p>
Current area
<p>No data are available on the extent of habitat suitable for breeding curlew. However, an indication of the current habitat availability can be gained from the current distribution (see Current range).</p> <p>Source: <i>Balmer and others 2013, Gibbons and others 1993</i></p> <p>Confidence: <i>Poor</i></p>
Area required for future maintenance of populations and diversity
<p>There is currently no information available to enable area of habitat for the favourable breeding population to be defined. However, an indication of habitat availability can be gained from the range requirement.</p> <p>Source: <i>Balmer and others 2013; Gibbons and others 1993</i></p> <p>Confidence: <i>Poor</i></p>
Potential for habitat restoration
<p>Habitat restoration would require creation and restoration of suitable habitat in lowland areas, primarily wet, extensively grazed grasslands with essential elements of sward heterogeneity and hydrology. Some habitat restoration is also likely to be necessary in upland areas where lack of management, or unsuitable management, of moorland, rush pastures and meadows has reduced densities of breeding birds. Habitat creation and restoration would be required at a landscape scale to reverse and to avoid further habitat fragmentation and edge effects. Such restoration is technically feasible as much is already known about breeding curlew habitat requirements. Work is currently underway to refine our knowledge of habitat and predator management which should assist habitat restoration. However, feasibility also depends on bringing a sufficient area of land under suitable management. Other issues that would need to be resolved in some localities are high levels of nest and chick predation and/or recreational disturbance.</p> <p>There should be no significant impact on other habitats and species if existing low-value grassland habitats are targeted for restoration. Changes to areas of lowland wet grassland currently used by other breeding wader species, such as increased rush cover, might have some impact if not carefully managed.</p> <p>Source: <i>Backshall and others 2001; Douglas and others 2014; MacDonald & Bolton 2008; Robson 1998; Pearce-Higgins & Grant 2014</i></p> <p>Confidence: <i>Poor/Moderate</i></p>

Favourable supporting habitat

The area for the habitat when in Favourable Conservation Status should be around 620 10 km squares supporting extensive areas of habitat suitable for breeding birds, measured using the same methods employed by earlier breeding bird atlases.

For non-breeding birds we need to maintain the extent and quality of existing habitats i.e. coastal intertidal habitats and wet grassland.

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Annex 2: 10th UK Birds Directive Reporting

UK context from the 10th UK Birds Directive report

Current UK conservation status: no status defined within Birds Directive Article 12 reporting

- **Range: 168,200 km²** *Confidence: Complete survey or statistically robust estimate*
- **Breeding population: 68,000 pairs** *Confidence: Estimate based on partial data with some extrapolation and/or modelling*
- **Wintering population: 150,000 individuals** *Confidence: Estimate based on partial data with some extrapolation and/or modelling*
- **Habitat for species: N/A**
- **Overall: N/A**

Source: 10th UK Birds Directive Reporting 2012, species factsheet

http://cdr.eionet.europa.eu/Converters/run_conversion?file=gb/eu/art12/envuzl7q/UK_birds_report_s-14328-12614.xml&conv=343&source=remote

Current UK favourable reference values:

- **Range** no UK FRVs set
- **Population** no UK FRVs set

Proportion of UK species within England

No England level data available

Proportion of UK species within protected sites

N2K:

Breeding population: 456 pairs in the South Pennine Moors Phase 2 SPA (where part of an upland assemblage) (Note: JNCC SPA accounts state 12% as they include curlew as a feature of the North Pennine Moors SPA which is not correct. The species is listed in the SPA review for this SPA but it has yet to be formally classified. JNCC did not include curlew as a feature of the South Pennine Moors SPA even though it is mentioned as a part of the qualifying upland breeding bird assemblage on the SPA citation)

Wintering population: 49,255 /150,000 individuals = 33% (Note: BTO estimates 42%)

Source: 10th UK Birds Directive Reporting 2012, species factsheet

http://cdr.eionet.europa.eu/Converters/run_conversion?file=gb/eu/art12/envuzl7q/UK_birds_report_s-14328-12614.xml&conv=343&source=remote

(and JNCC SPA Bird Species Accounts <http://jncc.defra.gov.uk/pdf/UKSPA/UKSPA-A6-73A.pdf>

and <http://jncc.defra.gov.uk/pdf/UKSPA/UKSPA-A6-73B.pdf>)

Protected areas outwith N2K: Allendale Moors and Dark Peak SSSIs

Proportion of Atlantic biogeographic region within UK:

Breeding population: 33,000/120,000 = 28%

(Note: 68,000/210,000-330,000 pairs = 21-32% according to AEWA 2012)

Wintering population: 115,000/348,000 = 33%

(Note: 150,000/700,000-1,000,000 = 15-21% according to AEWA 2012)

Source: JNCC SPA Bird Species Accounts <http://jncc.defra.gov.uk/pdf/UKSPA/UKSPA-A6-73A.pdf> and <http://jncc.defra.gov.uk/pdf/UKSPA/UKSPA-A6-73B.pdf>

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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Cover image

Eurasian Curlew *Numenius arquata*
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