The changing status of the Common Crane in the UK

Andrew Stanbury and the UK Crane Working Group

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Abstract The Common Crane *Grus grus* was a familiar part of the UK avifauna up until the sixteenth century, although there is more evidence of a regular wintering population than widespread breeding. The species became extinct, probably through overexploitation, with the last evidence of breeding in England in 1542. Cranes subsequently became rare in the UK, but since the 1950s have become increasingly regular passage migrants. Two subadult Cranes, which arrived in the Norfolk Broads in autumn 1979, stayed and eventually bred there in 1981, and Cranes have bred in the Broads every year since. Population growth to 1997 was slow, mainly because of poor productivity, but since then success has improved and the number of pairs has increased steadily. Elsewhere, one pair has bred in Yorkshire since 2002, while up to three pairs have nested in the Fens of East Anglia since 2007. In 2010, there were 13–14 breeding pairs (which fledged eight young), three non-breeding pairs and a wintering population of c. 50 birds in the UK. It is unclear whether the new populations arose from emigration from the Broads or from continental Europe. The Common Crane remains a rare breeding species in the UK, but should continue to colonise new areas if present trends continue. It is not yet known whether one or more of the following factors – habitat availability, predation, human disturbance, collision risk – will constrain population growth.

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Introduction

There are few more inspiring wildlife experiences in the UK than the sight and sound of Common Cranes *Grus grus* dancing and duetting in the early morning mist. Thanks to the efforts of a dedicated band of people who have worked to protect Common Cranes since their recolonisation, this spectacle is something that an increasing number of people are able to appreciate. In an attempt to reduce the impact of human disturbance on this vulnerable species, much secrecy has surrounded its recolonisation. Perhaps unsurprisingly, therefore, previously published information about the birds contains a number of inaccuracies. This paper aims to provide a definitive record of the return of the Common Crane to the UK. Information has been sourced directly from landowners, site managers, conservationists and those who volunteered their time and energy to ensure that the return of the species was a success.

The Common Crane is the third most abundant crane in the world. Globally, the species is currently classed as of 'Least Concern', with an estimated population of around 360,000–370,000 mature individuals (www.birdlife.org). The European population of the Common Crane (hereafter referred to simply as the Crane) declined substantially through to the middle of the twentieth century, and the species disappeared from parts of southern and western Europe, the Balkan peninsula, and southern Ukraine. This was thought to be due mainly to overexploitation and habitat loss. The population began to show signs of recovery in the 1960s and since then has increased markedly, while Cranes have started to recolonise parts of their former breeding range (Meine & Archibald 1996). Europe now holds over half of the world breeding population, with an estimated 74,000–110,000 pairs in 2004, yet the species has probably still not recovered to the levels that preceded its decline. For this reason, it is classed as 'depleted' within Europe by BirdLife International (BirdLife International 2004). The west European population winters mainly in the Iberian Peninsula and in North and East Africa (Snow & Perrins 1998), but since the mid 1970s a significant proportion has overwintered at autumn staging areas in France (Lundin 2005).

John Buxton

237. These two Common Cranes *Grus grus*, photographed here in 1981, are the pioneering pair that arrived at Horsey, in the Norfolk Broads, in September 1979. These birds, which were subadults when they first arrived, remained in the area and first bred in 1981. Cranes have bred in the Broads every year since then.

The historical status of Cranes in the UK

Evidence shows that Cranes were a familiar part of the UK avifauna from the Mesolithic through to the sixteenth century. This evidence comes in the form of archaeological remains (including those of young birds), historical place-names, illustrations in manuscripts and written references, including in recipes and feast menus (Southwell 1901; Gurney 1921; King 1962; Yapp 1981; Harrison 1987; Boisseau & Yalden 1998). Holloway (1996) questioned the reliability of some of the written evidence, on the basis that the name 'crane' has been used to refer to other species in the past, including herons (Ardeidae) or even cormorants (Phalacrocoracidae), but Gurney (1921) suggested that this confusion may not have started until after Cranes became extinct. Even when this possibility is taken into consideration, however, the evidence of Cranes is compelling and widespread, although less information is available for Scotland and Wales compared with England.

There is a long history of Cranes being hunted. In medieval England, they represented 'the noblest quarry' at which 'the falconer could fly his Hawks'. 'King John in pursuit of this royal sport flew his Gyrfalcons [*Falco rusticolus*] at cranes so successfully that in December 1212, at Ashwell, in Cambridgeshire, he killed seven, and on another even more successful occasion in Lincolnshire in February 1213 he brought down nine' (Southwell 1901). Cranes were also a familiar part of medieval feasts and banquets of the period; for example, the Christmas feast of Henry III at York in 1251 included 115 Cranes, while a banquet to celebrate George Neville's enthronement as Archbishop of York in September 1465 supposedly included 204 Cranes (Gurney 1921).

Cranes were clearly not uncommon in Britain during this period but there are uncertainties over their true status. The majority of written references concern birds in winter, but it is not known whether all the Cranes that wintered here also bred, or if birds from elsewhere in Europe supplemented the population in winter. The few written records that indicate breeding birds (Southwell 1901; Gurney 1921) do not support the theory that there was a wide-

David Tipling

238. The Norfolk Broads, heartland of the UK's Common Crane *Grus grus* breeding population, June 2011. As well as the suitable habitat, the (relative) remoteness of the area and lack of disturbance have been important factors in allowing a small population of Cranes to become established.

spread breeding population, but that could be because Cranes disappeared from many parts of the country before written records were widely kept. The fenlands of East Anglia were probably one of their last strongholds (Boisseau & Yalden 1998; Brown & Grice 2005).

By the sixteenth century, the remaining Crane population in the UK was probably severely depleted. In 1534, Henry VIII introduced a statute to prohibit the taking of the eggs of any wildfowl between March and June. This included imprisonment and a fine of 20 silver pennies for every Crane egg taken; this, along with that for the Great Bustard *Otis tarda*, was the highest penalty allowed under the statute (Gurney 1921). This was probably the first legislation to protect Cranes in Europe. The last evidence of breeding in Britain was in June 1542, when the accounts of Chamberlains of Norwich refer to a payment of five shillings for a 'young pyper crane' taken from Hickling, Norfolk (Gurney 1921).

In 1533, the accounts of the Le Strange family at Hunstanton, Norfolk, show two records of 'a Cranne kyllyd w^{t} the Gun'. Both Southwell (1901) and Gurney (1921) suggested that the introduction and subsequent improvements of firearms ushered in a new era that led rapidly to the Crane's extinction. By the time that Queen Elizabeth visited Kirtlinge in Cambridgeshire, on 1st September 1577, only one Crane was provided in celebration of the event, compared with 'seventy Bitterns, twenty-eight young Herons, and twelve Spoonbills' (Gurney 1921). The Crane's low reproductive rate made it susceptible to overexploitation, particularly through the taking of eggs and flightless young. This seems the most likely explanation for its disappearance, since the species' demise predates the major land-drainage schemes of the seventeenth century.

The situation in Scotland seems similar to that in England, although there is less evidence. Crane bones have been found at several Scottish archaeological sites, representing time periods from the Iron Age to the Medieval, and from sites in Lothian & Borders, Orkney (including a chick) and the Outer Hebrides (Forrester *et al.* 2007).

There are several references to Cranes in England during the seventeenth century,

Chris Gomersall (rspb-images.com)

239. Displaying Common Cranes *Grus grus* in the Norfolk Broads, March 2007. Since 2000, the UK breeding population of Cranes has increased by approximately 13% per year (9% in the Broads), and the national total had reached 13–14 breeding pairs by 2010.

including by Sir Thomas Browne, who remarked in around 1662 that Cranes were often to be seen in Norfolk in hard winters (Gurney 1921). Sometime before 1672, Willughby wrote that Cranes still came 'often into England, and in the fen countries, in Lincolnshire and Cambridgeshire, there are great flocks of them' (Ray 1678), but Southwell (1901) doubted that this was still relevant when it was written. However, the possibility remains that Cranes from elsewhere in northern Europe continued to winter in the UK after the species had disappeared as a breeding bird.

Status since 1950

After their extinction, Cranes became rare visitors to the UK, and Naylor (1996) noted just 73 British records between 1773 and 1950. The situation began to change in the early 1950s, when Cranes began to occur annually (fig. 1). This corresponds roughly with the start of population recovery in Europe. A particularly notable influx occurred between 29th October and 3rd November 1963, when an estimated 500 or more arrived, predominantly on the south coast between Beachy Head (Sussex) and the Isle of Wight. These were continental birds, perhaps mainly from the Baltic States and eastern Europe, which arrived on the English south coast in response to weather conditions over the Continent and in the North Sea and English Channel (Harber 1964).

There was another step change from the mid 1970s, with Cranes becoming ever more frequent, although numbers fluctuated from year to year. It is not known whether this increase has been solely a reflection of rising numbers in northern Europe, or to what extent increasing numbers of observers and other factors have played a part. As well as becoming more numerous, more birds are now staying for longer (fig. 1).

The return of the Crane as a breeding species

In the autumn of 1979, two Cranes, thought to be subadults and two or three years old, arrived at Horsey, in the Norfolk Broads. They were probably first seen on 13th September, and were joined by a third bird on 10th October. A fourth bird was taken into care nearby on 7th October and released at Horsey the following spring. Only the original two birds remained beyond the spring of 1980. These two eventually paired up and first attempted to breed in 1981. That year one chick hatched successfully but was predated when it was about a month old. The following year the pair managed to fledge a single chick, thought to be the first in the UK for over 400 years, and another followed in 1983. Buxton & Durdin (2011) recently

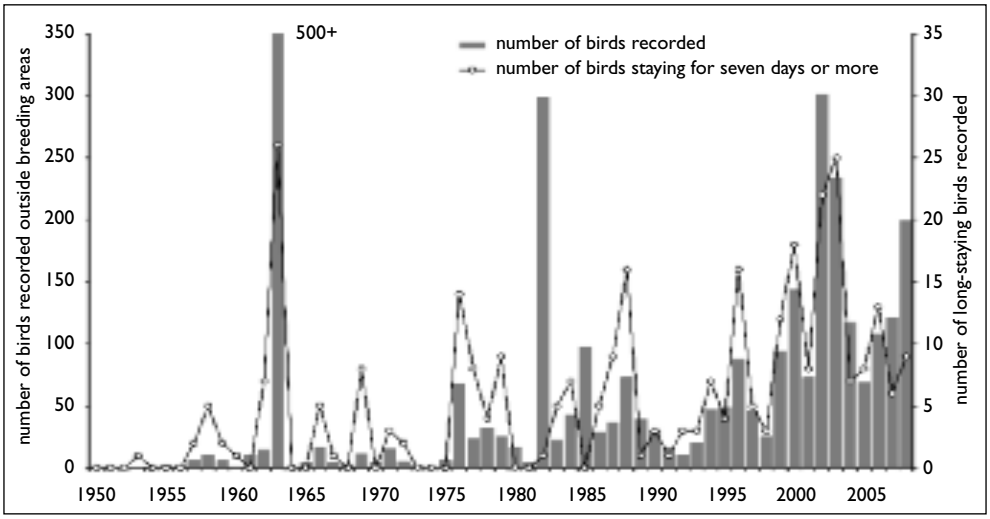

Fig. 1. Trends in the number of Common Cranes *Grus grus* recorded in the UK since 1950. Data from Norfolk and other breeding sites has been excluded to reduce the potential bias caused by the resident birds. (Data from Peter Fraser/BBRC, County Bird Recorders and county bird reports.)

published a detailed account of the Horsey Cranes.

There has been speculation that the original birds in the Broads were of captive origin. However, a number of factors suggest that they were more likely to have been wild birds. First, there had been many records of Cranes in Britain in the preceding four years, 1976–79 (Rogers *et al.* 1980; see also fig. 1). Second, the timing of the birds' arrival in autumn 1979 coincided with other sightings. Four other Cranes were recorded in England around the same time as the two birds arrived in the Broads (in mid September; Rogers *et al.* 1980). The two at Minsmere on 14th September are not thought to have been the same as the two found in the Broads. Interestingly, there were three other long-staying birds in England that autumn and winter (Rogers *et al.* 1980). The fact that the Horsey Cranes wintered in the UK has sometimes been used to support the argument that they were of captive origin – yet there is good evidence that, historically, Cranes wintered in the UK as a matter of course.

During the first two decades, the recolonisation proceeded very slowly. The original pair continued to breed alone until 1988, when the first two young, fledged in 1982 and 1983, paired up and started breeding (John Buxton pers. comm.). The original pair disappeared during snowy weather in early 1990 and failed to return. The Broads population increased to three breeding pairs in 1992 and four in 1997 (Buxton & Durdin 2011). Throughout this period, breeding productivity was poor, mainly a result of high rates of predation. Just four young were fledged from 14 breeding attempts over the first 11 years. At this stage, it was felt that the recolonisation might fail without intervention. A licence was granted by English Nature to take up to six eggs from the wild for captive-rearing and subsequently release any fledged young, so bypassing the vulnerable egg and chick stages. In 1992, two clutches were collected from one pair and one from another. At this stage it became evident that one pair was infertile (this pair attempted to breed annually between 1991 and 2002 but hatched no young). A male, believed to be from this pair, was found dead in autumn 2002. Although the bird probably died from avian tuberculosis, a post-mortem showed that it contained lead shot. The shotgun pellets were few in number and would not have been the direct cause of death but may explain the pair's infertility. This bird was thought to have arrived as a juvenile in 1985, and may not have been shot locally. Young were hatched from the other clutches collected but for various reasons none was released back into the wild (Buxton & Durdin 2011).

The population's fortunes seemed to change in 1997, when at least two (and possibly four) young were fledged. Since then, breeding productivity has improved, and young have fledged in all but two years. This has led to a steady increase in the Broadland population (fig. 2). It is worth noting that as young reach breeding age (at about four years old), there is often a corresponding increase in the number of breeding pairs. The Broadland population increased from four

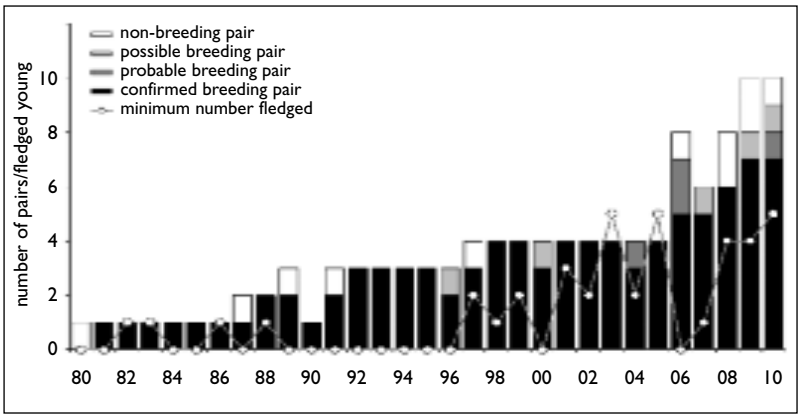

Fig. 2. Trends in the number of breeding pairs of Common Cranes *Grus grus*, and productivity in the Broads, since recolonisation in 1979. An extra two young may have fledged in both 1997 and 2004, but this could not be substantiated. (Data from landowners, site managers, conservation bodies and the UK Crane Working Group.)

breeding pairs in 2005 to between eight and nine in 2010. Since recolonisation, 40–44 young have been fledged in the Broads, a third of these in the three years 2008–10. The reasons behind this increase in productivity are currently unclear, but a factor may be that, up to 2000, all breeding attempts were within one site, but since then the Cranes have colonised new sites. This change in behaviour may have reduced the risk of predation.

During the early stages of recolonisation, each breeding pair could be recognised by differences in plumage, particularly the colour of the birds' 'bustles' (the elongated tertials that give the impression of long tail feathers when the wings are folded), but as numbers have increased this has become more difficult (John Buxton pers. comm.).

Since recolonisation, migrant Cranes have regularly joined the resident birds in the Broads, but many of these migrants eventually move on. In 2000, 11 birds were present all year. Of these, only four were thought to be migrants; the rest were probably reared locally (Buxton & Durdin 2011). Additional birds have continued to join the population; for example, between the winters of 2004/05 and 2005/06 numbers appeared to increase more than can be explained by the addition of locally reared young. However, without data on mortality and emigration rates for the Broadland population, it is difficult to quantify the extent of immigration from other populations precisely.

Cranes breeding elsewhere in the UK

Since 1980, there have been at least ten occasions when apparently paired Cranes have stayed for extended periods (more than two weeks) during the nesting season (late March to June) elsewhere in the UK (Peter Fraser pers. comm.). These occurrences, some involving pairs seen in more than one recording area, have been mainly along the east side of the UK, with records from Cleveland, Cumbria, Denbigh & Flint, Dumfries & Galloway, Essex, Highland, Leicestershire, Moray & Nairn, Northumberland, Orkney, Shetland, Shropshire, Suffolk, and Yorkshire. None of these were observed showing signs of breeding activity, other than the 'dancing' display, and are assumed to refer to subadults in the process of pair-bonding.

Before 2000, there was just one potential breeding attempt outside the Broads, when a pair summered on a large expanse of bog in Caithness in 1997. Although breeding was never proved, and it is not thought that any young fledged, the adults were observed behaving in a manner that strongly suggested the presence of young of pre-fledging age (Corbett *et al.* 2000). Two birds returned to the site the following April, but unfortunately one died after colliding with power lines within a week of arrival (Forrester *et al.* 2007).

Since 2000, Cranes have bred in two other areas in England (fig. 3). Pairs began summering at a site in Yorkshire from 2001 and a single pair has bred there every year since 2002. The first youngster was fledged in 2005 and since then the birds have fledged a further four young, making them one of the most successful pairs in the country. An additional pair has summered in the same area since 2009 but has not yet

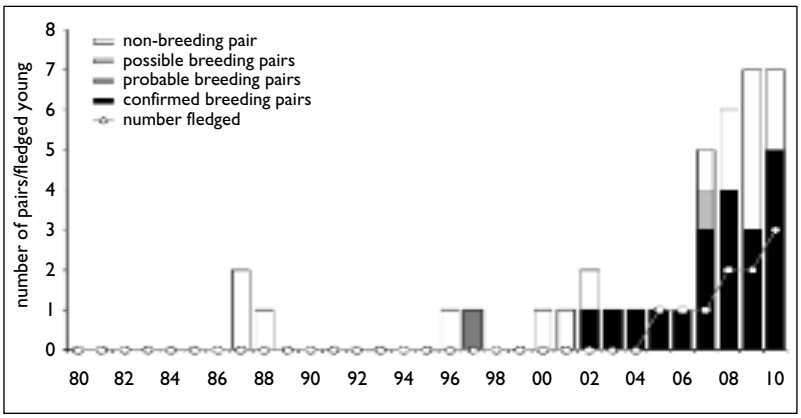

Fig. 3. Trends in the number of breeding pairs of Common Cranes *Grus grus*, and productivity away from the Broads, since 1980. (Data from landowners, site managers, conservation bodies and the UK Crane Working Group.)

Hugh Harrop

240. Common Cranes *Grus grus*, Loch of Spiggie, Shetland, May 2007. As described in the text, there have been several occasions when apparently paired Cranes have stopped off in areas of the UK in recent decades. These two birds frequented the south end of Shetland for a week or so in mid May 2007 (and may have been in the islands for almost a month); they were occasionally observed dancing and duetting.

bred. The East Anglian Fens were colonised in 2007, with up to three pairs now breeding there annually; four young have fledged from ten or eleven breeding attempts.

We do not know for certain whether these two populations have developed as a result of expansion from the Broads population or whether they derive from continental migrants, but the evidence for the former is stronger. The pair that breeds in Yorkshire is believed to winter in the Broads. In 2006, no young were fledged in the Broads but a pair with a single juvenile was present throughout winter 2006/07 (and one bird was fledged in Yorkshire in 2006). In addition, a pair has been tracked flying along the east coast from north Norfolk to its breeding site in Yorkshire on at least one occasion. Interestingly, in 1997, two or possibly four young were fledged in the Broads, but they were not believed to be part of the flock in 2000 (Buxton & Durdin 2011). Could these birds account for the pair that first summered in Yorkshire in 2001 and bred the following year? As for the population in the Fens, a small reduction was noted in the Broadland wintering and breeding population between 2006 and 2007, just when the Fens were colonised.

The only evidence to suggest that the fenland/Yorkshire birds may be of continental origin is the fact that they tend to lay eggs up to a month earlier than those in the Broads. It is, however, worth noting that a similar situation occurs with breeding Eurasian Bitterns *Botaurus stellaris* (i.e. birds in the Broads nest later than those elsewhere in Britain; Simon Wotton pers. comm.), and differences in land management could help to explain this pattern. During 2010, moulted feathers were collected from many of the breeding pairs in the UK. These have been sent to Germany for DNA analysis, in an attempt to try to determine the origins of the various populations.

Crane habitats

Across their range, Cranes utilise a broad spectrum of landscapes that offer inaccessible nest-sites within moist or wetland habitats. These may include reed swamp, quaking bogs, mires and swampy clearings within deciduous and coniferous forests, treeless habitats such as moors, *Sphagnum* bogs and

dwarf heath communities and pools within steppe or semi-desert areas (Cramp & Simmons 1980).

All but one of the recent breeding attempts in the UK have been within extensive areas of wetland (>200 ha). Here, the Cranes nest in mainly undisturbed areas of reedbed and sedge fen, but they also use lowland raised bogs and floodplain grasslands. After the young hatch, the families generally forage close to the nest but, as the young get older, they make use of other areas, including grazing marsh, hay meadows, rough grasslands and arable farmland. The home range of families in England appears to be smaller than that recorded in continental Europe. It is currently not known whether this is a response to high food availability, human disturbance or other factors.

Cranes are great opportunists, finding their food through visual cues. During the breeding season, they are omnivorous, taking a range of vertebrate and invertebrate prey, as well as plant material. Research on the Continent has shown that large invertebrates are a significant part of their diet during the chick-rearing period (Nowald 2001), and the English Cranes have also been seen to eat ducklings and even Avocet *Recurvirostra avosetta* chicks (John Buxton pers. comm.).

The resident Broads population continues to use grazing marshes during the winter, but the birds also feed on the surrounding arable fields, taking advantage of spilt grain in stubbles and waste potatoes, for example. Indeed, potatoes are particularly favoured during the winter, and farmers in the Broads regularly leave out piles of waste potatoes as a supplementary food source.

Crane breeding productivity in the UK

Since their recolonisation, there has been a minimum of 116 and maximum of 122 breeding attempts (pairs/year) in the UK. Thirteen of these attempts involved either the infertile pair or nests where the clutch was removed for captive-rearing. The 103–109

Table 1. Breeding productivity data of Common Cranes *Grus grus* at the three main breeding areas and elsewhere in the UK since recolonisation. The data exclude known infertile pairs and nesting attempts in 1992 when clutches were taken for captive-rearing.

	Cumulative total of viable breeding attempts (min–max)*	Proportion of monitored nests where eggs hatched	Proportion of monitored broods from which at least one chick fledged	Young fledged	Mean productivity (fledged young per breeding pair/year)*
The Broads	82–87	52% (n=55)	57% (n=47)	40–44	0.46–0.54
The Fens	10–11	100% (n=9)	33% (n=9)	4	0.36–0.40
Yorkshire	9	100% (n=9)	44% (n=9)	5	0.56
Elsewhere in UK	2	100%	50% (n=2)	1	0.50
Overall	**103–109**	**64% (n=72)**	**53% (n=64)**	**50–54**	**0.46–0.52**

* Minimum number represents confirmed and probable breeding, while the maximum figure includes possible attempts.

Table 2. Common Crane *Grus grus* breeding productivity in the Broads during three periods since 1981. The data exclude known infertile pairs and nesting attempts in 1992 when clutches were taken for captive-rearing.

	1981–1996	1997–2007	2008–2010
Number of breeding attempts*	21–22	40–42	21–23
Number of young fledged	4	23–27	13
Mean productivity (fledged young per breeding pair/year)	0.18–0.19	0.55–0.67	0.57–0.62

* Minimum number represents confirmed and probable breeding, while the maximum figure includes possible attempts.

remaining attempts have produced 50–54 fledged young, a mean productivity of 0.46–0.52 fledged young per breeding pair/year. Of the successful breeding attempts, most have fledged a single chick (n=28), while two chicks have fledged on only 11–13 occasions. In 2010, all eight fledglings were single chicks.

Since Yorkshire and the Fens have been colonised only relatively recently, the number of breeding attempts within these areas (9 and 9–10 respectively) are much lower than those in the Broads (82–87). Although the sample sizes are small, overall productivity has generally been better in Yorkshire than in the Broads (table 1), although breeding success in the Broads has improved over time (table 2). Until 1997, productivity in the Broads was very poor (0.18–0.19 fledged young per pair/year), even when the infertile pair is removed from the statistics. Since then, it has improved and 0.57–0.62 young fledged per breeding pair each year during 2008–10. It has been suggested that young pairs may be less successful than older, more experienced birds, though there is insufficient data from the UK to confirm this. Research in Europe shows that Cranes do not pair for life, but routinely change partners (Beate Blahy and Eberhard Henne pers. comm.).

In the early stages of recolonisation in the Broads, each breeding attempt was closely monitored, but as numbers have increased, particularly over the last ten years, monitoring has become less intensive for many of the breeding attempts. In some cases, it has simply been a matter of seeing how many young fly out at the end of the season! This does not reflect a lack of interest; in many cases, it is part of an intentional effort to limit human disturbance. However, such an approach makes the diagnosis of the causes of breeding failure more difficult. Nonetheless, it appears that the increase in overall productivity is due to an increase in both nest survival and brood survival in the Broads after 1997, from 44% to 62% and 29% to 68% respectively.

There appear to be differences in nest and brood survival between the different breeding areas (table 1). All of the known Crane nests outside the Broads have reached the hatching stage, while in the Broads recent hatching rates (2008–10) have been 62%. Of the 28 known nest failures in the Broads (excluding the known infertile pair), seven were assumed to have been predated, four were either abandoned or the eggs were addled, and in two cases the nest was flooded. The reasons for the failure of the remaining 15 were unknown, but probably represent mostly additional predation events. Both nests and young (even those which are near-fledged) are vulnerable to predators. Red Foxes *Vulpes vulpes* are believed to represent the greatest threat, but only one predation event by a Fox has actually been witnessed in the UK. Nonetheless, Cranes have been seen to defend their nests and young from predators, including Foxes, at a number of sites in the UK.

Cranes will relay if clutches, or even young broods, are lost, but rarely after the end of May. There was no significant difference in hatching success between first and replacement clutches in the Broads (51% (n=39) and 56% (n=16) respectively), but there have been only five known cases where chicks have fledged from replacement clutches. This emphasises the importance of the first attempt. While nest survival is lower in the Broads than elsewhere, brood survival is better there.

Although breeding success in the UK has improved since the 1980s and early 1990s, it is still lower than elsewhere in Europe. Breeding productivity of 0.7–0.8 has been recorded in central Europe (Prange 2006), 0.76 in Estonia (Aivar Leito pers. comm.) and around 0.9 fledged young/pair in Germany (Mewes 2006).

Crane movements in the UK

Most of the UK Cranes appear to be largely sedentary within their breeding areas, although they are thought to wander occasionally during spring, autumn and periods of severe winter weather (Buxton & Durdin 2011). The exception to this, as noted above, is the pair that breeds in Yorkshire, which is thought to winter in the Broads.

Most records of Cranes elsewhere in the UK are of birds found from March to mid June, with the peak in England being around three weeks earlier than that in Scotland (fig.

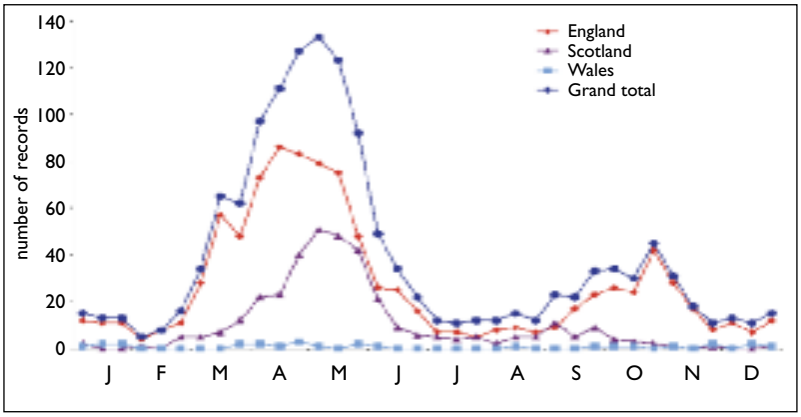

Fig. 4. Distribution of Common Crane *Grus grus* arrival dates in England, Scotland & Wales between 1980 and 2008. Data from Norfolk and other breeding sites has been excluded to reduce bias caused by the resident birds. Note that the peak in late October is partly due to a small influx that took place in 1982. (Data from Peter Fraser/BBRC, County Bird Recorders and county bird reports.)

4). Smaller movements occur between mid September and early November. These peaks are most likely to be of passage birds. One of the main migration routes for the birds that breed in northern Europe passes along and across the Baltic Sea through Germany, Belgium and the Netherlands to their wintering grounds in France, Iberia and beyond (Meine & Archibald 1996) and many of the migrants recorded in the UK are probably birds which have deviated from this route. The highest number of records comes from the eastern side of the UK, particularly southeast England, East Anglia, northeast England, northeast Scotland, Caithness and the Northern Isles (fig. 5).

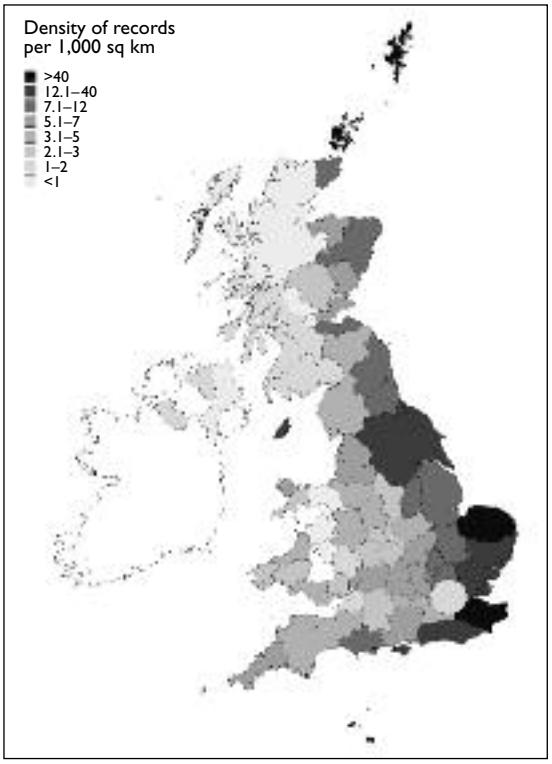

Fig. 5. Density of Common Crane *Grus grus* records across the UK from 1980 to 2008, excluding breeding sites. (Data from Peter Fraser/BBRC, County Bird Recorders and county bird reports.)

Data from Norfolk and from other breeding sites have been excluded from fig. 4 to remove the potential confusion caused by the resident birds. It is worth noting, however, that Crane records in the Broads and elsewhere in Norfolk show a similar pattern to that elsewhere in England, suggesting that either the Broads population shows similar movement patterns or some of the records there involve migrants.

Winter population

The UK Cranes winter mainly in two areas, the Broads and the Fens. Counts from the Broads have been used to monitor trends and over recent winters have built up to over 40 birds (fig. 6). As the population has increased, it has become more difficult to count accurately because the birds are more dispersed and no longer roost in one area. Caution is also needed in interpreting the data, since the population is not an isolated one and migrants and birds joining the group temporarily may increase counts.

Since about 2003, the wintering

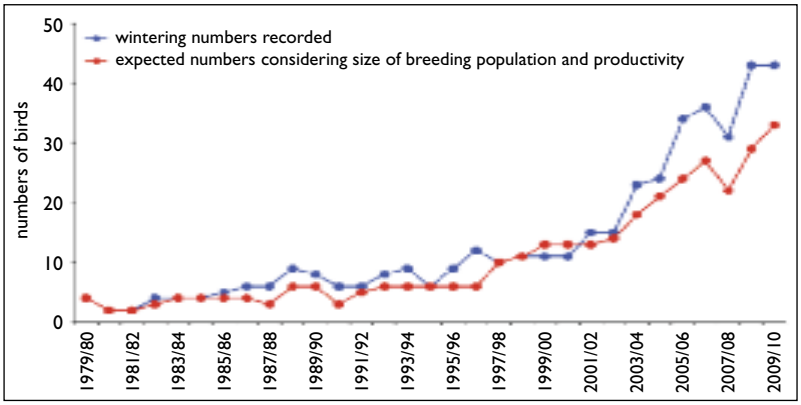

Fig. 6. Comparison between the peak number of Common Cranes *Grus grus* seen in the Broads during the winter since 1979, and the approximate number of individuals expected given the size of the breeding population (number of breeding adults in the Broads and north of England plus young from previous four years). (Data from landowners, site managers, conservation bodies and the UK Crane Working Group.)

population in the Broads has been larger than expected considering the size of the known local and Yorkshire breeding populations (fig. 6), i.e. the number of breeding adults plus young of pre-breeding age. For example, in winter 2009/10, the maximum count in the Broads was 43 birds. During the 2010 breeding season, a maximum of 12 pairs were present in the Broads and Yorkshire, along with approximately 12 non-breeders. This total is thus seven short of the previous winter's peak figure, suggesting that either pairs are breeding at unknown sites in the UK or birds have started wintering from breeding grounds elsewhere. The recent winter figures are also greater than can be explained by local productivity in the Broads and Yorkshire alone. Even if there had been zero mortality (besides the five known deaths), which is unlikely to be true, and no emigration, the current winter peak counts are still higher than could have been produced by local birds alone. This once again points towards recent immigration, but without better data on mortality and emigration rates, the exact figure will remain unknown.

The population in the Fens is largely sedentary, although birds do undertake local movements outside the breeding season, particularly to the washes of the Ouse and Nene. In the winter of 2009/10, there were at least seven birds in the area. When these are added to the Broadland population (43) and two birds elsewhere, this makes a UK wintering population of at least 52 birds.

Discussion

After an absence of over 400 years, Common Cranes bred once again in the UK in 1981. For almost two decades the process of recolonisation was very slow, which led Mathews & MacDonald (2001) to conclude that regular immigration or releases would be necessary to sustain the population in the long term. Fortunately, much has changed since then. Breeding productivity has improved since the late 1990s, and the population in the Broads has increased steadily to between eight and nine breeding pairs (and one non-breeding pair) in 2010. Breeding densities there have reached one pair per 110 ha.

The fact that the Broadland birds tend to nest later than those elsewhere in England means that they have a shorter breeding season. This, along with low nest and brood survival, together with the presence of an infertile pair, probably explains the low productivity in the early part of the recolonisation period. Much of the increase in the breeding population of the Broads since 2004 appears to be due to local productivity, although immigration from the Continent almost certainly continues. In recent years, there has been an unexplained difference between breeding and wintering numbers. However, counts for winter 2010/11 suggest that the current Broads wintering population is around 36–38 birds (45–50 birds nationally), which is close to the level expected, considering the size of the breeding population and its productivity.

Since 2002, Cranes have colonised

Yorkshire and the East Anglian Fens, but it is currently unclear whether these populations are a result of emigration from the Broads or immigration from the Continent.

Recently, the picture in England has been partly confused by the release of birds of captive origin from one or more sites, with four birds joining the wild population since 2007. All these have narrow colour rings, either above or below the 'knee' on the right leg, although these rings are surprisingly difficult to see in the field. At least one of these birds has now joined the breeding population in the Fens, and other birds were noted at various sites across central and southern England in 2010. Since 2010, it has been illegal to release Cranes into the wild without a licence in England and Wales, under an amendment to Schedule 9 of the Wildlife and Countryside Act 1981 (www.legislation.gov.uk).

Over the last decade, the national population has increased from four to 13–14 breeding pairs. This represents an annual increase of approximately 13% (9% in the Broads). The species remains a rare breeder in the UK, but these trends are very encouraging. If they were to continue, the national population could reach 26 breeding pairs by 2015. In addition, as the population on the Continent continues to recover, more birds are likely to pass through the UK on passage. This will increase the likelihood of further augmentation of existing colonies and perhaps colonisation elsewhere in the UK.

Andy Hay (rspb-images.com)

Andy Hay (rspb-images.com)

241 & 242. After 20 years of slow progress in the Norfolk Broads, a pair of Common Cranes *Grus grus* first bred in Yorkshire in 2002, while the East Anglian Fens were colonised in 2007. Breeding was confirmed at the RSPB's Lakenheath reserve in Suffolk in 2007, and these photos show the breeding pair in May of that year.

The RSPB, Wildfowl and Wetlands Trust, Pensthorpe Conservation Trust and Viridor Credits launched the Great Crane Project (www.thegreatcraneproject.org.uk) in 2006, with the aim of returning breeding Cranes to other parts of their former UK range. In August 2010, 20 juvenile Cranes (all of which are colour-ringed) were released into the Somerset Levels as the first stage of this project. It is hoped that the breeding population there will reach at least 20 pairs by 2030.

The future of Cranes in the UK looks

Observing Cranes in Britain

BOX 1

Common Cranes are very vulnerable to human disturbance, especially during the breeding season, which may extend from March to August. Although passage birds also occur during this time, pairs seen together may be prospecting potential breeding areas and these should not be disturbed either.

Because they favour wide open spaces, but can keep themselves hidden for much of the time, they can often be aware of human presence long before they are noticed by people. Although they may become accustomed to regular movements by people if these activities do not result in interference, it is nevertheless sensible to leave them well alone and not to pursue the birds in order to get a better view.

We suggest that birdwatchers keen to see Cranes should visit one of two places where they can be regularly observed. Within the Norfolk Broads, Stubb Mill, part of the Norfolk Wildlife Trust's Hickling Broad Nature Reserve, is a good site to see Cranes all year round but particularly as they come in to roost during the winter. There is an observation point at TG437220, which is accessed by foot from the visitor centre at TG427220.

Alternatively, Cranes can sometimes be seen from footpaths within the RSPB's Lakenheath Fen reserve in Suffolk (TL722864), where the species has bred in recent years, but the nature of the landscape means that sightings are by no means guaranteed here.

Contributed by Mark Holling, Secretary of the Rare Breeding Birds Panel

positive, but there are factors that could limit their expansion. Firstly, Cranes are wary birds that are susceptible to human disturbance. This can lead, directly or indirectly, to reproductive failure and even mortality. Such interference can occur at any time of year, but is most critical during the breeding season (Meine & Archibald 1996). How many Cranes ultimately breed in the UK will probably depend on how tolerant they become to human disturbance. Currently, the population is confined to extensive areas of undisturbed wetland, but it is still unclear how habitat availability will constrain the population. Elsewhere in Europe, for example in Germany, Cranes are colonising more populated agricultural landscapes, nesting within relatively small wetlands (<1 ha) surrounded by meadows, cereals and other crops. Even in such areas, Cranes still select sites away from human activity and roads (Nowald 2001). Cranes may start to colonise more agricultural landscapes in Britain, but a number of studies have shown that they have lower breeding productivity in more disturbed environments (Toland 1999; Leito *et al.* 2005). Families need to forage throughout the majority of daylight hours in order for the young to gain enough energy to sustain a high metabolic growth rate. A negative energy balance, resulting from too much disturbance, can lead to a decline in reproductive success (Nowald 2001).

Another threat that Cranes face across their range is collision. Accidental collisions with electricity cables have resulted in high rates of injuries and death in a number of Crane populations (Haas *et al.* 2005), and this is believed to be the leading cause of premature adult mortality of Cranes on their Spanish wintering grounds (Alonso *et al.* 1992). In Spain, collision rates with 400 Kv power lines have been estimated at 2.36 birds/km/year or approximately one collision in every 25,000 crossings (Janss & Ferrer 2000). There have been no documented cases of Cranes colliding with fixed objects in the Broads, mainly because there are no high-voltage lines in their core breeding area. However, there have been five known collisions with power lines elsewhere in the UK. One of these was believed to involve a newly fledged Crane in Yorkshire, which, like three of the other recorded cases, resulted in the death of the bird. Such collisions could affect the rate of expansion in the UK. Sedentary populations could be less susceptible as it has been suggested that they develop an in-depth knowledge of their territories and the surrounding hazards (Beate Blahy pers. comm.).

It seems likely that Cranes might again become a familiar part of the UK avifauna

over the coming decades and their bugling calls will become a more frequent feature of our wetlands once again. The rate of increase will depend on a range of factors. The species is vulnerable to disturbance, predation and flooding. A number of measures can be adopted to help minimise the likelihood of predation and thus help to maximise productivity. These include:

- Minimising human disturbance within favoured breeding areas.
- Completing any management, such as reed cutting, within key nesting areas by mid February. This could encourage earlier nesting and therefore extend the length of the breeding season.
- Careful control of water levels during the nesting season to avoid nest pools drying out and therefore reducing the likelihood of predation.
- Provision of roost pools within foraging areas used by Crane families to reduce the likelihood of nocturnal predation.

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Appendix 1. Crane breeding status

The following criteria have been developed to distinguish between the different breeding categories. They are based on the standard BTO breeding-evidence definitions (www.bto.org), but have been amended to suit Cranes.

Confirmed breeding

- Nest, incubating bird or young seen.
- Post-breeding evidence of eggs being laid or young being present.
- Crane family seen post-fledging. Careful consideration should be given to the likely provenance of any fledged juvenile given the potential geographical movement.

Probable breeding

- Adults acting in a manner that strongly suggests the presence of a nest or young.
- Adults entering or leaving nest-site in circumstances indicating nest or active breeding.
- Agitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby.

Possible breeding

- Pair present (or breeding calls heard) in suitable nesting habitat for 14 days or more between mid-April and the end of June. Evidence suggests that they may have bred, but this could not be substantiated owing to a lack of either information or monitoring.
- Pair built a nest, but did not appear to lay eggs.

Non-breeding pair

- Two birds present at one or more sites for 14 days or more between mid-April and the end of June, seen or heard displaying, but evidence suggests they did not breed.

Two long-staying birds

- Two birds present at one or more sites for 14 days or more, between mid-April and the end of June. Not seen or heard displaying.

Inadequate records to suspect breeding or summering pair

- Sites with insufficient records (<14 days) to suspect breeding or summering pair.