

The former status of Great Bustard in Britain

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ABSTRACT The recorded breeding distribution of the Great Bustard *Otis tarda* in Britain, prior to its last nesting in 1832, is presented here. Details are given of the available information on how numerous this species was, and reasons for its extinction in England are discussed. The controversy of whether the British stock was resident or migratory is examined.

This paper examines the evidence concerning the numbers, distribution, reasons for extinction, and migratory status of the former population of the Great Bustard *Otis tarda* in Britain. These subjects have caused much controversy in the past and are of interest (but not critically so) in the light of the present re-establishment project. The 'clouded' early history of the species in Britain, going back to the fourteenth century, was outlined by Gurney (1921) and Southwell (1890). Gurney judged that it was never very common, despite admitting some evidence to the contrary, as it 'required wide extents of open country'. Topsell (1972), writing in the early seventeenth century but not published for over three centuries, gave a surprisingly detailed account, both factual and fanciful, of the bustard, which he himself had seen. His account does not suggest that it was uncommon in England. John Aubrey's text (1969), first published in 1847 but written in the second half of the seventeenth century, says that Salisbury Plain 'abound[s] with hares, fallow deer, partridges, and bustards'. Such indications of large numbers are contradicted by Ray (1678), who suggested that Great Bustards were scarce in Britain, asserting that, because of its wholesomeness 'but chiefly for its rarity, the bustard sells very dear, serving only to furnish princes and great mens [*sic*] tables'. But perhaps the high price simply reflected the difficulty of securing them at that time? Much of the literature on Great Bustards in Britain simply quotes earlier accounts and is often not critical. This paper gives more weight to contemporary

accounts by reliable writers who provided sufficient detail.

Former distribution and numbers

In the Palearctic, the Great Bustard increased as forests were cleared and crops became more attractive than the natural steppe (Snow & Perrins 1998). Range expansion probably peaked in the late eighteenth century, a period when many data are available for England. Perhaps surprisingly, the *Handbook* (Witherby *et al.* 1940) does not list all the counties where it formerly bred. Saunders' (1882-84) statement that, up to the time of Henry VIII, it inhabited 'all the undulating plains and wolds from the Bristol Channel to the Firth of Forth' is often quoted. This mention of the Firth of Forth probably depends on Sibbald's 1684 reference to East Lothian but the translation in Gurney (1921) refers only to one having been seen there, rather than to breeding. The earlier Scottish record of Hector Boece or Boethius, the first Principal of the new University of Aberdeen, in his *Scotorum Historia* of 1526, of breeding in the Merse (in the southeast of Berwickshire) sounds convincing. He described these birds as being 'called Gustards in the vulgar tongue, not unlike partridges in the colour of their plumage and their flesh, but which surpass Swans in bulk of body. This bird is rare, and particularly shuns the sight of man' (translation in Evans 1911). Despite this, Bannerman (1962) regarded this species only as a straggler in Britain beyond the English borders. He mentions Boece's record but adds 'but what truth there is in this who can tell'. The species is

Table 1. English counties where the Great Bustard *Otis tarda* is recorded as formerly breeding.

County	Status	Authority
<i>Listed by Kirkman (1912)</i>		
Berkshire	A former resident	Noble 1906
Cambridgeshire	A former breeder	Saunders 1882-84
Dorset	A former resident	Mansel-Pleydell 1888
Hampshire	A former resident	Kelsall & Munn 1905
Hertfordshire	Bred until about 1800	Foster 1914
Lincolnshire	Bred on the Wold	Lorand & Atkin 1989
Norfolk	Breeder in droves of up to 40	Stevenson 1870
Suffolk	Breeder in the breck district	Ticehurst 1932
Sussex	Great numbers on the downs	Walpole-Bond 1938
Wiltshire	Its stronghold in Britain	Smith 1887
Yorkshire	A former resident	Nelson 1907
<i>Not listed by Kirkman (1912)</i>		
Devon	Breeding in 1827	Holloway 1996
Essex	May have nested about 1712	Cox 1984
Kent	May have existed on the North Downs	Harrison 1953
Northamptonshire	Recorded as common at one time	Morris 1855
Northumberland	See text	Bolan 1912
Oxfordshire	Possible former breeder	See text

not mentioned in any of the Acts of the Parliament of Scotland (Baxter & Rintoul 1953).

Kirkman (1912) lists breeding in 11 English counties (table 1) but, in some, the evidence for nesting is vague. Whatever the breeding distribution, and this may well have varied over time and contracted with the bird's decline, almost all accounts record the main areas of population as East Anglia, Wiltshire and Yorkshire. Most early authors concentrate on just one of these areas, which will now be considered in turn.

East Anglia

The East Anglian population was hardly mentioned in writing before the nineteenth century but this region was the last footing of the indigenous population (Saunders 1882-84). At least in the eighteenth and the beginning of the nineteenth centuries, there were three principal flocks or droves in East Anglia (Babington 1884-86). These were (1) the area around Swaffham, especially Westacre, in Norfolk; (2) the area around Thetford, in Norfolk, but stretching south into Suffolk; and (3) the area around Newmarket, partly in Suffolk and partly in Cambridgeshire. Great Bustards may possibly have bred on the coastal sandlings as well but evidence is scant (Piotrowski 2003). Babington claimed that these main droves sometimes intermingled, so records of numbers are far from easy to assess. A count of 27 was made for

the Westacre drove in the early nineteenth century and at about this time F. J. Nash remembered seeing '9 flights of bustards in one day' although 'some of these birds were probably seen more than once' (Stevenson 1870). As late as the summer of 1819, 19 were observed together at Westacre (Sheppard & Whitear 1827). In the Thetford drove, the birds shifted their ground from place to place. 'Tradition gives 40 to 30 as the strength of the drove' in the eighteenth century, and there were about the same number at the start of the nineteenth, according to several eyewitnesses examined by Stevenson. For example, in about 1812 and just after harvest, a drove of 40 birds, 'large and small', was seen at Elveden. Stevenson regarded the year of 1812 as perhaps the bustard's 'grand climacteric' – the turning point of its existence in this locality. Thereafter, numbers fell quickly and the last generally accepted successful breeding record was at Thetford Warren (Suffolk) in 1832. A few native bustards, all hens, lingered on for several years, and perhaps as late as 1845 in Norfolk. As numbers declined, it becomes increasingly difficult for us to determine which birds were of indigenous stock and which were likely to be continental immigrants arriving in the winter. Piotrowski (2003) quoted Ticehurst (1932) as stating there were 40-50 in the Icklingham area in 1812 but, in fact, 'about 40' is the highest figure that is mentioned by Ticehurst. The numbers in the Newmarket

drove are less well documented. This drove died out earlier than the other two and, as Newton (1893-96) pointed out, it disappeared without note being taken of the event. Lord Lilford, in Stevenson (1870), considered that more birds occurred in Norfolk than on Salisbury Plain, but the largest group he heard of on the Plain was of 14 (but see below).

Wiltshire

Thomas Pennant (1768) wrote: 'In autumn they are [in Wiltshire] generally found in large turnip fields near the Downs, and in flocks of 50 or more.' George Montagu (1753-1815), one of the eminent ornithologists of his time, was born and spent much of his life in Wiltshire, before moving to Devon in 1798. Montagu (1802, 1813) gave no details of numbers but recorded a rapid decline of Great Bustards in Wiltshire. The history of the Wiltshire birds was given in detail by Smith (1887), yet he also provided little evidence of the numbers involved. Any such details referred to the time that the birds were in steep decline; for example, a group of seven was seen in June or July 1812. Unlike in East Anglia, the number of droves is not given, and even their distribution within Wiltshire is uncertain, but observations came from widely scattered parts of the county. In the seventeenth century, Aubrey (1969) wrote that: 'On Salisbury plains, especially about Stonehenge, are bustards. They are also in the fields above Lavington: they do not often come to Chalke' (presumably Broad Chalke, 10 km southwest of Salisbury). Probably referring to the late eighteenth century, Smith (1887) implied that the bustard was a prominent dish at the Mayor of Salisbury's inauguration feast and that this was an annual event.

Yorkshire

In Yorkshire, it was described as formerly 'in great numbers on the Wolds of Eastern Yorkshire, when in their virgin state as undulating barren sheepwalks' (Clarke & Roebuck 1881). There are but two published eighteenth-century contemporary allusions to bustards in Yorkshire (Nelson 1907). This is explained, perhaps unconvincingly for such a spectacular species, as being a consequence of the bird's very abundance. The same explanation is also given in the two other standard avifaunas of Yorkshire, Clarke & Roebuck (1881) and Mather (1986); the latter added that, even today, observers

rarely report on the common birds. Nelson (1907) records 'broods' of 7 and 12 known to Tunstall and 15 were 'counted' early in the nineteenth century. There is no date for the largest flock mentioned for Yorkshire, of about 25. A gamekeeper is said to have killed 11 at one shoot at Borrow, near Sledmere, in March 1808 (full details in Nelson 1907), which suggests that birds were still plentiful up to then.

Other counties

Of the other counties in England (see table 1), perhaps Sussex had the greatest number of Great Bustards, or at least it is the county best documented. Walpole-Bond, in his monumental *A History of Sussex Birds* (1938), quoted Dr John Hill, writing in 1752: 'I have seen great numbers of them on the downs in Sussex.' Thereafter, there is little indication of numbers, even in Walpole-Bond's detailed account. Indeed, there is controversy about the date when these native birds became extinct; apparently definite statements range from about 1770 to the middle 1820s, a range of over 50 years. Borrer (1891) recorded that they were often hunted with greyhounds by his grandfather, who died at an advanced age in 1844. He generally found them in small parties of 5-10 and sometimes took five or six in a morning, commonly young birds. Borrer's father, while riding on the downs near Patcham about 1810, saw nine birds.

In Berkshire, there is little doubt that the bustard was resident and bred on the open downs, but records are meagre in the extreme (Noble 1906). Nonetheless, observations by Dr Charles Lamb of Newbury, written in about 1814 (though not published until 1880) and covering a quarter of a century, record birds on the Lambourn Downs and seen as late as March 1802 (Standley *et al.* 1996).

Dorset is usually included in the species' former range. J. C. Mansel-Pleydell's *The Birds of Dorsetshire* (1888) states that their downs 'at one time were its favourite haunts' but gives no detail. He quotes an episode from *Anecdotes of Cranbourn Chase* (given in more detail in Dewar 1899) when the Rev. W. Chafin's gun disturbed 25 bustards in 1751 near Winterslow Hut; yet this is in Wiltshire, and Chafin's account of this much-quoted event does not indicate a connection with Cranbourn Chase. This incident is repeated in *The Birds of Hampshire and the Isle of Wight* (Kelsall & Munn 1905), perhaps because Chafin was then living

in Wallop, Hampshire. This book also gives the record of Gilbert White's informer of a flock of 18 in about 1770, on a lonely farm between Andover and Winton. Gilbert White's own records of bustards are disappointingly few but, although he was not a great traveller, he did see them himself on Salisbury Plain and likened them to Fallow Deer *Dama dama* at a distance. His brother, the Rev. Henry White, in his diary of 10th October 1780, recorded 18 on a trip to Stonehenge and Winton, but did not clarify which side of the Hampshire/Wiltshire border the birds were (Dewar 1899). Clark & Eyre (1993) mention Hampshire flocks of 25 and 12 in the second half of the eighteenth century, but their reference for this is Kelsall & Munn (1905), whose only mention of 25 clearly refers to the 1751 Winterslow Hut sighting, in Wiltshire (above). The largest number recorded in Hampshire therefore remains uncertain.

Farther north, in Hertfordshire, Great Bustards were recorded as breeding in the wilder country near Therfield and Royston up to the end of the eighteenth century (Foster 1914). The species bred on the Lincolnshire Wolds until the early years of the nineteenth century (Yarrell 1841; Lorand & Atkin 1989).

In addition to the estimates given above, there are a few other mentions of large numbers. Morris (1855) recorded winter flocks of up to 50 'or even, it is said, a couple of hundred'. Smith (1887) quoted Graves' volume of 1821 as indicating flocks of 40-50 in various parts of the country. Shrubbs's (2003) reference to several hundred in Yorkshire in the latter half of the eighteenth century, and similar numbers in Sussex and in Wiltshire, is presumably based on his general impression from the literature rather than firm numbers.

There are claims of breeding from a number of counties not listed in Kirkman (1912). For example, Holloway (1996) described it breeding widely from Devon to Yorkshire at the end of the eighteenth century. The standard avifaunas of Devon make no statement of breeding and the 'much discussed egg' in the collection of Captain S. T. Stidston, claimed to be from Dartmoor on 2nd June 1827, is not otherwise accepted (Jenks 2004). Early Devon ornithologists regarded the unexplored vastness of Dartmoor as the breeding place for many unlikely species, from Grey Plover *Pluvialis squatarola* to Great Bustard (D'Urban & Mathew 1895). In Essex, the reference to the *Spectator* for 4th

March 1712 (Cox 1984) may not suggest good evidence for breeding. The reference is to an advertisement for the rent of the seat of Sir Peter Soame, deceased, at Heyden in Essex, with a gentle hill and 'all game in great plenty, even to the Bustard and Pheasant'. Heyden was transferred from Essex to Cambridgeshire in a boundary reorganisation in 1895, and this may have included this estate. In Kent, a record based on hearsay information, but published in the *Zoologist*, that Great Bustard was 'not uncommon' around Romney Marsh, was doubted by Ticehurst (1909), although he later thought it possible that a drove may have existed on the North Downs in Kent, just as they did on the South Downs in Sussex (Harrison 1953). Morris (1855), not always a reliable source, mentioned an unspecified old history of Northamptonshire which described the bustard as at one time common; the reference for this remains elusive. Bolam (1912) seems to be the only reference to nesting in Northumberland. It is not recorded as a breeding species in the avifaunas of Oxfordshire but a large part of north-west Berkshire was transferred to Oxfordshire in 1974. This area included the edge of the Lambourn Downs, often mentioned as a breeding haunt of bustards, but whether they ever nested north of the present boundary is not clear.

Reasons for extinction

The possible factors that led to extinction in England will now be considered. If these no longer apply, the present reintroduction is more likely to be successful. The earliest British records of the Great Bustard are from the early Holocene (the last 10,000 years; Harrison 1988). General environmental factors (table 2) do not seem particularly important in the bird's demise. When humans first influenced their numbers is unknown. The earliest written records are from King's Lynn, Norfolk, in 1371 (Southwell 1890), and based on the family name of Bustard in Yorkshire from 1391 and *The Boke of Keruyng* (*The Book of Carving*) in 1413 (Gurney 1921). Many early records are of bustards killed by the crossbow for feasts. It is not possible to get any idea of numbers or population trends until the eighteenth century; and it should be remembered that 'different explanations might apply to the same species in different places or circumstances' (Jenkins 2003). The literature suggests a fairly rapid decline in

Table 2. Factors influencing the numbers of Great Bustards *Otis tarda* in England.

General environmental factors

Climate The 'Little Ice Age' lasted from the thirteenth century until about 1850, and reached its peak in the latter half of the seventeenth century.

Food supply This is related to climate and other factors.

Natural predators These include Red Fox *Vulpes vulpes*, raptors (chicks) and corvids (eggs).

Habitat Natural changes.

Human and human-related factors

Crossbow This was probably the main method of killing bustards until the Middle Ages.

Falconry Birds of prey were known to have been flown in England since Saxon times but with what success against bustards?

Dogs Despite denials from several authors, there are many convincing accounts of coursing, both young and adult bustards, with dogs. Feral dogs and sheepdogs were also predators of eggs and chicks.

Agricultural machines In the seventeenth century, drills were developed for sowing and the horse-hoe for weeding, which greatly increased egg losses.

Crop changes Wheat, increased at the expense of rye, and other crops (sainfoin and clover) were planted in the seventeenth century.

Landscape changes Enclosures, tree belts and plantations became increasingly widespread in the seventeenth century. There was a loss of the original down grassland but bustards increasingly nested in crops. The enclosures themselves may not have been as important as many accounts suggest.

Shooting Shooting for sport, ornaments and the pot increased as firearms developed. Legislation was not effective but some individual landowners did provide protection.

Netting Females on nests were sometimes taken with nets.

Gin traps Sometimes caught bustards.

Egg-collecting This was mainly for eating but also for breeding and ornament.

Disturbance This increased as the human population of England increased and especially as the numbers of rural workers grew from about 1750.

numbers at the end of the eighteenth century, with only small numbers surviving into the early 1800s. A statute of 1775 protected this species from 1st March to 1st September, and may indicate that it was then deemed in need of such protection. This statute seems to have been no more effective in protecting the bustard than the earlier Act of Henry VIII. Many of the factors listed in table 2 operated over a long period of time and changed only slowly. Great Bustards are long-lived and survival of about 15 years has been recorded in the wild (Morales & Martin 2002), with age of first breeding at 2-4 years in females and 5-6 years in males. Unless there is high adult mortality, this population decline is likely to be relatively slow. We now consider factors that coincided particularly with the main period of decline, in the second half of the eighteenth century (and the early 1800s in East Anglia).

The eighteenth century was a period of great agricultural change, with the establishment of many enclosures, rotation of crops and planting of tree belts (Shrubbs 2003). By 1750, most English farmland was enclosed and there was a

large and increasing agricultural labouring class (which did not decline until about 1840). These rural workers were needed to feed the rapidly growing human population (which in England and Wales increased from about 6.2 million in 1750 to some 9.2 million in 1800 and 12.0 million by 1821) and to sustain a profitable export trade in cereals. The loss of common land and the low wages caused considerable rural poverty, reaching the darkest days at the end of the eighteenth century and the beginning of the next. As an eighteenth century rhyme has it:

*Hang the man and flog the woman
Who steal the goose from off the Common,
But leave the far worse villain loose
Who steals the Common off the goose*

No wonder these labourers took all the eggs and any chicks that they could find. The enclosures have often been blamed as the cause for the bustards' decline. Indeed, Nelson (1907) described the Enclosures Act as giving them 'notice to quit'. But Great Bustards do remain,

and even nest, close to tree belts. In the Saratov region of Russia, at least four nests were found recently in a long, narrow field of corn with tree belts only 300 m apart (DW pers. obs.). A clear view of over 1 km on at least three sides (Morales & Martin 2002) is, therefore, not essential. The invention, improvement and increasing use of agricultural implements and the introduction of new crops took place at just the period that bustards were declining. Increasingly, bustards nested for preference in crops rather than in natural grassland. Stevenson (1870) commented that the eggs were nearly always laid in winter-sown corn. This was formerly rye, 'sown broadcast after the old fashion'. Wheat was then substituted for rye and sown with a corn-drill. This allowed weeding between the rows, first performed by children and then by the horse-hoe. 'Thus, every nest made by a Bustard in a wheat field was sure to be discovered' and the eggs taken or destroyed (Saunders 1882-84). The Rev. Richard Lubbock (1798-1876), whose observations are well regarded, wrote to Yarrell (1841): 'The

system of weeding out corn in the spring has tended perhaps more than any other cause to the decrease of Bustards; since egg collectors became numerous, a nest is a valuable prize indeed.' The introduction of sainfoin and clover, crops that were cut early, led to further destruction (Nelson 1907). Females were said to be netted on their nests (Ticehurst 1932; Bannerman 1962), although Macpherson (1897) could find no evidence for this within the historical period. Montagu (1802) recorded that eggs were also hatched successfully under domestic hens and wrote that this practice would lead to 'a total extinction in a few years'. The practice of taking young birds alive and fattening them for the table was well known (Macpherson 1897).

Increased human predation on eggs and chicks may, therefore, have been the main cause of the bustards' decline, but shooting, for food, sport, dressing flies and for specimens for cabinets of large houses, was certainly an important factor in the final stages of the extinction. The design of guns gradually improved (Tapper 1992) posing an increasing threat to bustards. Though some landowners protected their birds (Stevenson 1870), others allowed shooting even beyond the boundary of their manors (Nelson 1907). One larder was described as generally having a bustard or two hanging up (Stevenson 1870). Any list of records of bustards in the nineteenth century depends heavily on birds that were shot. Bannerman (1962) blamed one head keeper in Norfolk, the notorious 'otidicide' of Stevenson (1870), as the single individual who was more responsible than any other for hastening the bustards' end in this country: four large guns, trained on a spot where bustards were induced to feed, killed seven at one discharge in about 1812. It is said that other sportsmen in Cambridgeshire used cribs, covered with furze and bramble, moving on four wheels with the aid of ropes, posts and a windlass which would gradually wind the crib until the bustards were within shot (Macpherson 1897). In Yorkshire, the equipment of a wolds keeper included a stalking horse, a coat made of horse hide with the hair outside and a blunderbuss, sometimes so heavy that even the strongest man could not hold it without a



Fig. 1. Displaying male Great Bustard *Otis tarda*, as portrayed by Charles Whymper in Charles Dixon's book *Lost and Vanishing Birds* (John MacQueen, London, 1898).

rest (Nelson 1907). Some travelled great distances to shoot bustards. Lord Lilford recorded a blacksmith at Shrewton, in Wiltshire, who well remembers people coming from London to Salisbury Plain. They would drive around bustards in a cart, in gradually diminishing circles, and a good many were killed in this manner (in Stevenson 1870). As bustards became scarcer, they became more desirable to collectors. Shooting for specimens may have been directed at the fully mature males, which became increasingly scarce in the nineteenth century. As Shrubbs (2003) concluded, the nineteenth-century avifaunas made it clear that the decline in bustards was at least partly due to persecution and it is impossible to know whether they might have adapted to high farming as 'they were never given the chance'.

Thus the practice of enclosure was probably not responsible for the extermination of the bustard; instead it was the changes in agricultural practice, the bustards' increasing habit of nesting in crops, and the increase in numbers of agricultural workers, all of which resulted in increased human predation (Dixon 1898; Shrubbs 2003). Nonetheless, some parts of the downs and wolds have always remained open (Shrubbs 2003). In the later stages of the bustards' demise, shooting, especially of mature males, probably hastened the extinction. These factors either do not operate today or can be modified to the advantage of the birds. This gives support to the present reintroduction on Salisbury Plain.

Migratory status

The first *List of British Birds* (BOU 1883) described the Great Bustard as formerly resident (found throughout the year), while the sixth edition (BOU 1992) simply described it as a former breeder, without categorising it as either a resident or migrant, thus following Witherby *et al.* (1940), Snow (1971) and Cramp & Simmons (1980). Professor Alfred Newton (Newton 1893-96) was particularly interested in the Great Bustard and wrote that 'not many birds have had more written about them' but that much uncertainty remained. One uncertainty was whether the British stock was migratory or not. For Newton, this was a moot point 'which will most likely always remain undecided'. Thus some claim that it was resident in Britain while others (and, as John Walpole-Bond wrote in 1938, in 'high quarters, too')

contend that it came to Britain only to breed.

It is important to distinguish between 'true migration' and other, less regular forms of bird movement. True migration occurs at predictable times of the year, between breeding and non-breeding areas, and involves movements in specific directions. As Evans (1985) pointed out, it places emphasis on populations and produces a change in the geographical centre of the population. In connection with the Great Bustard in Britain, the question is whether birds migrated regularly (leaving the country), as they do in the eastern parts of their range (Morales & Martin 2002) – though even here the trigger for movement is usually snow cover rather than frost and low temperatures. Considering the East Anglian population first, an interesting footnote by Thomas Southwell in Browne (1902) stated that a manuscript, dated 1605, gives a 'Monthlie Table for a Dietorie' where the bustard is mentioned as in season from October to May. Even when bustards were becoming scarce in Norfolk, a letter dated 28th April 1824 was sent by Robert Hammond to P. J. Selby offering to show him bustards if he paid him a visit; Hammond added 'I am certain in winter, if not in summer' (Southwell 1890). Of course, bustards in winter could have been migrants from the continent, which then held a larger population, although Southwell (1890) pointed out that it had not then been shown that it was common for bustards to visit England in midwinter. Selby (1833) believed the species to frequent its native haunts through the whole year, except in deep snow, when it sought more shelter or coastal areas. Further evidence for its status as a resident was given by Mudie (1834), who observed that in Norfolk they frequent large cornfields in summer and turnip grounds in winter, moving nearer the coast and sometimes forming small flocks if the weather is particularly severe. In contrast, Stevenson (1870), one of the best chroniclers of the Great Bustard in Britain, describes the males as 'at any rate, partial migrants'; they disappeared at the end of spring and the beginning of summer. Less certain were the movements of the females, but these seemed to disappear from the time of the harvest to the beginning of the new year. Perhaps the strongest evidence that the East Anglian birds at least embarked upon some sort of migration is given in Ticehurst (1932), based at least partly on Newton. The males disappeared early in the summer; the females with

young gathered in a flock, after the rye was cut, for 4-6 weeks, before they too disappeared. The herd reappeared in January, frequenting turnip fields (Ticehurst 1932). Newton considered that they may have visited the fens in the intervening time but Ticehurst admits that there was no definite information on this. He wrote: 'it is quite certain that Bustards were rare in September and were never seen in their haunts during the next three months. It seems, however, much more probable that the Bustard was migratory and left the country altogether.' In Babington (1884-86) there is a footnote that 'Mr. J. H. Gurney jun. considers that there can be hardly any doubt that the bustard, commonly spoken of as a resident in East Anglia, left England for the south as soon as the nesting season was over, i.e. in September.'

In contrast with these views of migration, which seem to apply only to the East Anglian birds, Thomas Pennant (1768), one of the best known of eighteenth-century British zoologists and a correspondent of Gilbert White, wrote: 'they keep near their old haunts, seldom wandering above 20 or 30 miles'. In a separate section at the end of the appendix on birds, Pennant recorded that the bustard 'inhabits our downs and their neighbourhood all the year'. Gilbert White documented sightings of bustards on Salisbury Plain on 13th February 1770 (Johnson 1931). Although these might have been immigrants from the continent, Southwell (1890) pointed out that such immigrants occur most often away from the ancient haunts of native birds, which is not surprising when the limited extent of their breeding haunts is compared with the rest of the country. George Montagu knew the bird well from his time in Wiltshire, and believed that 'The bustard is not properly migratory with us; it only leaves its usual haunts in very severe winters, when the downs are covered with snow for some time; pressed by hunger it repairs to more enclosed and sheltered situations in small flocks, and even strays to a great distance' (Montagu 1802). As an example of this, he mentioned a bird killed near Plymouth and others in Devon. These too may, of course, have been immigrants from the continent, but either way, as Montagu put it, 'these occasional migrations always prove fatal'.

Discussion

The available evidence does not enable us to give an accurate estimate of the population of

Great Bustards at any time during their existence as a breeding species in Britain. A review of the literature serves only to emphasise how little value even such extreme terms as 'common' and 'rare' have; it depends on what they are being compared with. Some of the evidence for the scarcity of bustards is the high price they fetched. But this may have been related to the difficulty of obtaining the birds before modern guns were available. To support this, costs of other game were also high; Bourne (2003) gives sixteenth-century prices as 20-72 old pennies for a bustard compared with 24-80 for Common Crane *Grus grus* and 36-96 for domesticated swans. An earlier manuscript gave one bustard as broadly equal to four [Grey] Partridges *Perdix perdix*, two [Common] Pheasants *Phasianus colchicus* or a lamb (Harrison 1953). Another reason put forward for rarity was the lack of open habitat that they were thought to require. But this requirement seems to have been exaggerated, since bustards are not confined to wide open spaces and even occur in open oak *Quercus* woodland and olive groves in Iberia (Morales & Martin 2002). Most counts date from the period when the bird was probably already in decline. Flocks of much over 50 do not seem to have been noted but perhaps such numbers were simply not counted then. Population estimates are not possible as, in most areas, we do not know how many flocks there were. Smaller numbers occurred in other suitable habitats but, away from the traditional areas, the bird was probably something of a rarity and wanderers were often killed. These scattered records, which fill much of the literature about this species in county avifaunas, may have been of British stock, but increasingly during the nineteenth century are likely to have been of continental origin. Indeed, it has been suggested that England received additions to its breeding numbers from the plains of Germany (Macpherson 1897). While it is possible that some migrants may have stayed to breed, it is now known that females usually return to their natal site to breed (Morales & Martin 2002). We may conclude that, in the eighteenth century, the centres of the population were on Salisbury Plain (together with the Hampshire and Sussex downs), in East Anglia, and in Yorkshire (with Lincolnshire). Great Bustards were then probably breeding in 11 counties in England, and possibly in a few others (table 1). Their fragmented range therefore extended over some

400 km, probably with little interchange between the separate populations. This suggests a sizeable total population in England. Extinction came fairly suddenly, the main decline occurring in less than 30 years, probably as a result of increased predation by humans on eggs, chicks and adult birds.

In East Anglia, the migratory pattern of the bustard seems uncertain. It is not possible to distinguish local movements, perhaps undertaken regularly on a seasonal basis, from irregular cold-weather or food-seeking dispersal. Such local movements were perhaps not then fully understood. For example, Lord Lilford thought that the main body of bustards arrive in Spain early in March (Stevenson 1870): 'The greater number leave Spain [in] about October, though a good many always remain in Andalusia during the winter.' Most, if not all, Spanish birds are now known to remain in Spain throughout the year. The clear and repeated evidence of Pennant, probably from Wiltshire and nearby, is that bustards do not migrate any great distance, while Montagu clearly believed that the bird was 'not properly migratory with us' (Montagu 1813). Such definite and detailed statements from these two distinguished and contemporary authorities should surely be accepted. The Wiltshire bustards, at least, were generally resident.

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Appendix I. Update on the Salisbury Plain reintroduction project

The first release of Russian-born Great Bustards on Salisbury Plain occurred in 2004. In August, 28 bustard chicks were imported; four were lost during the quarantine process, and two more were injured and could not be released. However, the remaining 22 (20 of which were fitted with radio transmitters) were released in September, into a 4-acre pen with no roof netting, so that the bustards could fly out if they wanted to. The pen had been planted out with various crops to which Great Bustards are partial, including several varieties of kale, lucerne and tic beans. Initially, most of the birds remained in the pen and grazed continually. One male (Dudley) – inevitably one of the two birds without a transmitter – left the pen on 18th September and has never returned. Eventually, reports were received that he was living with a group of partridges nearby; Dudley is



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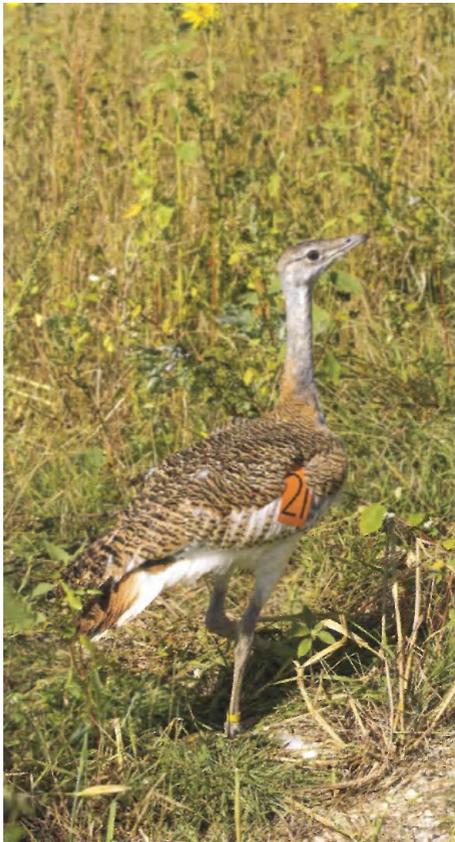
162 & 163. Great Bustard *Otis tarda* chicks in Russia, being prepared for translocation to the UK. The chicks are fed by a 'bustard glove puppet' for around two weeks, until they can fend for themselves. The goose decoys covered in fur were used as the chicks' 'mother figure' and these were also placed in the quarantine pens in Britain for continuity.

seen quite often and continues to do well.

At the time of writing (early May 2005), there are nine of the 22 birds remaining. The main causes of mortality have been predation by Red Foxes *Vulpes vulpes* and impact injuries. The foxes are dealt with on a weekly basis, but the collisions with fences have been more of a problem than anticipated. Inevitably, there has been a steep learning curve in this first year but, having learnt a lot about potential problems in year one, better results are anticipated in year two. For example, many of the problem fences have been removed and those which simply cannot be removed have been marked so that they are much more visible to the birds. One of the problems could relate to the birds' binocular vision, and also to the fact that their pen has been built on undulating ground. Since most of the casualties had radio transmitters attached to them, the bodies were retrieved and analysed in

all cases, and it was found that the birds had been in good condition, having clearly fed well, which is encouraging.

The young bustards fly out of the pen quite frequently and the females, being so much lighter than the males, are particularly spectacular. Radio-tracking has shown movements of up to 10 km from the release pen. A further 40 chicks are scheduled to arrive from Russia this September, and the Great Bustard Group has a trial licence to import the birds annually for ten years.



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164-166. Juvenile Great Bustards *Otis tarda*, part of the first phase of the current reintroduction scheme on Salisbury Plain, autumn 2004. All of the birds were fitted with individually recognisable patagial tags, and most of them were also radio-tagged.



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