

The status of the Cirl Bunting in the UK in 2009

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Abstract A survey of breeding Cirl Buntings *Emberiza cirlus* in the United Kingdom in 2009 recorded an estimated 862 territories (95% confidence limits 785–975), in 136 occupied tetrads. These were confined largely to south Devon, but a small population now exists in Cornwall as a result of an ongoing reintroduction project. From the lows of the 1980s, the UK Cirl Bunting population continues to recover, in terms of both abundance and distribution. Between 2003 and 2009, the population estimate increased by 24% and the number of occupied tetrads by 15%. However, there is little evidence to suggest that the species is naturally recolonising areas beyond its core range in south Devon. Further work will evaluate recent trends in relation to agri-environment scheme delivery.

The Cirl Bunting *Emberiza cirlus* is a scarce and localised breeding bird in the UK whose population has seen changing fortunes over the last two centuries. The bird is resident in the UK, but the population is at the northern edge of the species' global range, which is largely confined to southern Europe. The Cirl Bunting was not discovered in the UK until 1800, when Colonel Montagu recorded birds at Kingsbridge in Devon (Holloway 1996). Following this, the species appears to have gone through a period of expansion. A population zenith occurred between the late 1800s and the 1930s, when the bird was found in 39 counties as far north as north Wales. This expansion was probably fuelled by both a continental influx and successful breeding in Britain (Evans 1997).

Having once been widespread in southern England and Wales, Cirl Buntings then suffered a steady decline, a trend that became more pronounced during the 1970s (Sitters 1982). National surveys of the species conducted in 1982 and 1989 gave population estimates of just 167 and 118 territories

respectively (Sitters 1985; Evans 1992). By 1989, Cirl Buntings were confined largely to south Devon. This collapse in population was probably due to the decline in traditional mixed-farming practices leading, in particular, to the loss of invertebrate-rich grasslands and weed-rich overwinter stubbles, which are known to be key foraging habitats for the species (Evans & Smith 1994; Evans *et al.* 1997).

In 1995, the Cirl Bunting was included in the list of priority species in the UK Biodiversity Action Plan (BAP), and the RSPB and English Nature (now Natural England) launched a species recovery project. Since then, there have been encouraging signs of recovery. A national survey in 1998 estimated 453 (95% confidence limits 415–504) territories, although the birds remained confined to south Devon (Wotton *et al.* 2000). Another national survey, in 2003, estimated the population at 697 (95% confidence limits 645–770) territories (Wotton *et al.* 2004). This was a significant landmark because it meant that the UK BAP target for 2003 (550 territories – UK Biodiversity Group 1999)

had been exceeded by nearly 150 territories. Most of the increase occurred within the core breeding areas, with the population showing only very limited signs of range expansion.

Conservation action for the species has focused on delivering its year-round habitat requirements through bespoke prescriptions within agri-environment schemes. Indeed, the recovery of the Cirl Bunting has rightly been celebrated as a success story for the Countryside Stewardship Scheme (CSS), with the species showing significantly higher increases on CSS land (146%) compared with non-CSS land (58%) between 1992 and 2003 (Wotton & Peach 2008). However, CSS was superseded by Environmental Stewardship (ES) in 2005 and concerns have been raised over whether the new scheme will be as effective as its predecessor at conserving Cirl Buntings.

The Cirl Bunting has been used as a flagship species to promote environmentally sensitive farming practices within south Devon, with the aim of conserving a range of wildlife. Recent research has shown that agri-environment scheme prescriptions targeted at Cirl Buntings also provide benefits for plants and animals more generally (Michael Macdonald in prep.).

Despite the recent population recovery, the Cirl Bunting remains on the Red list of Birds of Conservation Concern in the UK (Eaton *et al.* 2009). One of the UK BAP targets seeks to ensure a wider geographical spread of the species by re-establishing populations outside their south Devon range. In 2003, a partnership project involving the RSPB, Natural England, the National Trust and Paignton Zoo (with veterinary support from the Zoological Society of London) was launched to re-establish a population in southwest Cornwall. Since 2006, young Cirl Bunting chicks have been collected under licence from core areas in south Devon and hand-reared by trained aviculturists, with the aim of releasing a minimum of 60 birds each year at the release site. The final year of these releases is planned for 2011 (Cath Jeffs pers. comm.). Monitoring at the release site will continue, to establish whether the population becomes self-sustaining.

The objectives of the 2009 survey were as follows:

1. to obtain a revised estimate of the abundance and distribution of the Cirl Bunting by means of a full population census; and
2. to investigate the effectiveness of agri-environment schemes (both CSS and ES)



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388. Male Cirl Bunting *Emberiza cirlus*, Devon, July 2008.

in conserving the Cirl Bunting (and other high-priority farmland birds) in south Devon.

This paper reports on the results of the UK population census. Further papers will assess the effectiveness of agri-environment schemes in delivering the recovery of priority farmland birds in south Devon.

Methods

Survey area

The survey area was defined on a tetrad (2 km × 2 km square) basis. All tetrads occupied by Cirl Buntings during the previous national survey, in 2003, together with any additional squares in which the species had been recorded subsequently, provided a 'core area' of 145 tetrads in south and east Devon. All core squares were surveyed. In addition, a 'buffer' area, defined as the 149 tetrads adjacent to those in the 'core', was surveyed to assess potential range expansion (fig. 1). The re-established population in Cornwall was covered in the same manner, with four 'core' tetrads and 12 'buffer' tetrads surveyed.

Since 2003, there have been a number of sightings reported from elsewhere in southern England. The same core/buffer-tetrad selection process was used and an additional 36 tetrads were surveyed in south-

east Cornwall, north Devon, Dorset, the Isle of Wight and the Mendips (Somerset). Additional outlying areas in the Channel Islands were not covered, as the species no longer breeds there (Michael Dryden pers. comm.).

Field methods

The survey followed the same methods used for censusing Cirl Buntings since 1989. Each tetrad was visited twice during the breeding season. The first visit was carried out between the beginning of April and the middle of June, and the second between the middle of June and the end of August, with a minimum of two weeks between each visit.

Surveys were conducted almost entirely during the morning. Tetrads were covered by walking all public rights of way (including all roads and footpaths), and areas of public open access. Singing Cirl Buntings are audible for up to 500 m (Gilbert *et al.* 1998), which means that the majority of tetrads could be covered using this method. Access to private land was organised in some cases, but this was very rarely necessary. RSPB staff conducted the majority of the fieldwork, but volunteers surveyed 42 tetrads.

As in the 2003 survey (Wotton *et al.* 2004), the following priority farmland bird species were also recorded: Grey Partridge

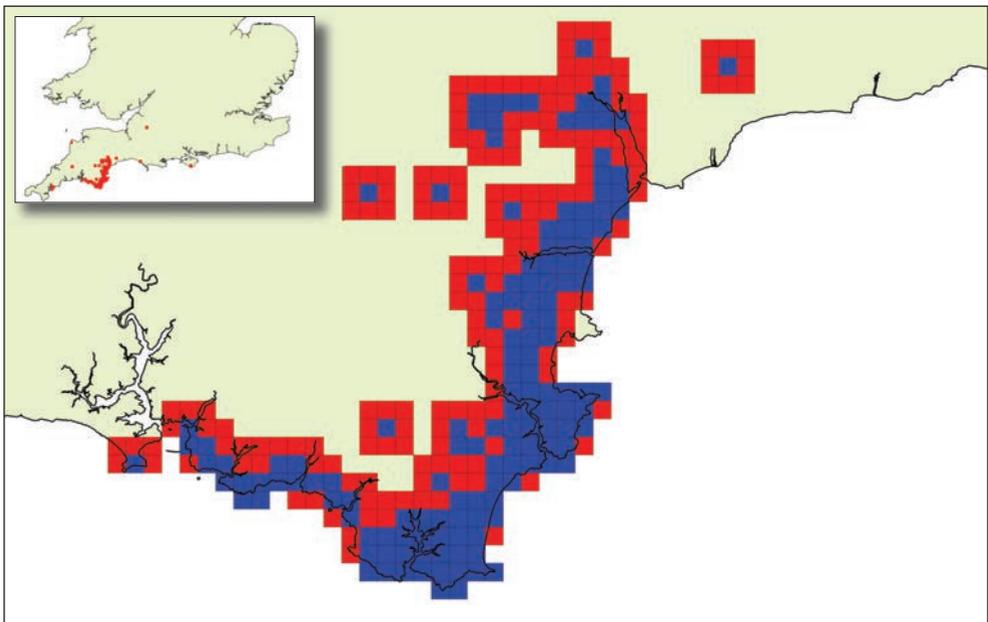


Fig. 1. The core survey area in 2009, with 'core' tetrads shown in blue and 'buffer' tetrads in red. The inset map shows the full extent of survey coverage in southern England.



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389. A typical mixed-farming landscape in south Devon, with spring-sown barley, low-intensity grasslands and scrub, which provides year-round habitat for Cirl Buntings *Emberiza cirlus* (July 2007).

Perdix perdix, Common Kestrel *Falco tinnunculus*, Northern Lapwing *Vanellus vanellus*, Turtle Dove *Streptopelia turtur*, Grasshopper Warbler *Locustella naevia*, Linnet *Carduelis cannabina*, Yellowhammer *Emberiza citrinella* and Reed Bunting *E. schoeniclus*. These data are presented in a separate paper (Stanbury *et al.* 2010).

Data analysis and population estimation

The tetrads surveyed in the core and buffer areas were assumed to cover the entire breeding range of the Cirl Bunting. Field observations were analysed to produce a maximum and minimum number of territories within each tetrad, based on the interpretation of breeding activity described in Gibbons *et al.* (1993). The minimum number comprised 'confirmed' and 'probable' territories, while the maximum figure included 'possible' breeding birds that showed no signs of breeding activity. Adjacent Cirl Bunting territories were classed as different when they were more than 200 m apart on different visits.

Evans (1992) found that conducting four visits during the breeding season located almost all (99%) of the territories present. However, it is possible to estimate the number of territories that may have been missed in tetrads surveyed only twice by using a correction factor derived from a sample of tetrads visited four times. In the 2003 survey, a stratified random sample of 25 core tetrads and 16 buffer tetrads was visited four times, 24 of which were occupied (Wotton *et al.* 2004). From this sample, the proportion of territories found after the first two visits was calculated and used as a correction factor. In 2009, owing to the limited resources available and the increased survey area to cover, each tetrad was visited only twice, so the correction factor derived from the 2003 survey was applied to all tetrads in the 2009 survey.

The new population estimates are thus derived from a census corrected in this fashion. The confidence limits¹ presented here incorporate the uncertainty in applying that correction.

¹ Confidence limits were obtained by bootstrapping (Greenwood 1991) from the 24 four-visit tetrads in 2003 to obtain 999 population estimates. These values were sorted and the 25th and 975th estimates taken as the lower and upper confidence limits respectively. It was also possible to produce 95% confidence limits of the percentage change in the population between 2003 and 2009, by deriving 999 percentage change estimates from the bootstrapped 2003 and 2009 population estimates. To increase comparability between the 2003 and 2009 surveys, the 2003 bird data from the 24 occupied tetrads visited on four occasions were reanalysed using just the first- and third-visit records.

Results

During the 2009 survey, 687 Cirl Bunting territories (including 37 possible breeding territories) were identified. Almost all of these (676) were located in south Devon, with concentrations around the Kingsbridge, Dart and Teign estuaries. Single territories were found in both east Devon and southeast Cornwall, while the other nine were located around the reintroduction site in Cornwall. Of the 330 tetrads surveyed, 136 were occupied, all but three of those in Devon (the remainder in Cornwall). Cirl Buntings remain concentrated in south Devon, with 57% of territories being found within 1 km of either the coast or estuaries. No birds were located elsewhere in the country, despite searches of areas outside the core range where there have been recent reports.

Sixty-seven additional Cirl Bunting territories were identified within the survey area from other sources, such as the reintroduction project, Devon Bird Watching & Preservation Society and local birdwatchers. Again,

these were located either within their core range (64) or at the Cornish reintroduction site (three). The additional territories were not included in any population estimate as the methods were not comparable with previous Cirl Bunting surveys. Coverage of five core tetrads was missed in 2009, but tetrad totals were extrapolated from the overall change between 2003 and 2009, and these were included in the population estimates.

National population estimates

The population estimate for the UK in 2009 is between a minimum of 849 (758–982, 95% cl) and a maximum of 862 (785–975, 95% cl) territories. As Cirl Buntings are a difficult species to find, particularly where they occur at low densities, the maximum number of Cirl Bunting territories (i.e. including ‘possible’ breeders) was considered to represent a more accurate assessment of true population size within a tetrad (Wotton *et al.* 2004). Trends in population, distribution and tetrad occupancy since 1989 are summarised in tables 1 & 2, and figs. 2 & 3.

The results of the 2009 survey indicate that there has been a 23.7% increase in population size since the previous survey in 2003. Despite being considerably less than the 54% increase seen between 1998 and 2003, the increase in occupied tetrads remained consistent (15%). The 95% confidence limits of the 24% increase between 2003 and 2009 were 21.4% to 26.6%, showing that this increase is significant.

Table 1. The maximum number of Cirl Bunting *Emberiza cirius* territories found during full national surveys since 1989. Data from Evans (1992, 1994), Wotton *et al.* (2000, 2004) and this survey.

| Year | Tetrads surveyed | Tetrads occupied | Pop ⁿ estimate (max) | % change between surveys |
|-------|------------------|------------------|---------------------------------|--------------------------|
| 1989* | 104 | 52 | 118 (108–131) | – |
| 1993 | 127 | 95 | 352** | +198% |
| 1998 | 263 | 103 | 453 (415–504) | +29% |
| 2003 | 281 | 118 | 697 (645–770) | +54% |
| 2009 | 330 | 136 | 862 (785–975) | +24% |

* Includes two territories in Cornwall and two in Somerset.

** High survey effort in 1993 led to the assumption that all birds were detected (Evans 1994).

Table 2. Tetrad occupancy by Cirl Buntings *Emberiza cirius* since 1989. Data from Evans (1992, 1994), Wotton *et al.* (2000, 2004) and this survey.

| Survey year | Tetrads surveyed | Occupied tetrads | % change in occupied tetrads between surveys | No. of tetrads with ten or more territories | No. of tetrads colonised since last survey | No. of tetrads abandoned since last survey |
|-------------|------------------|------------------|--|---|--|--|
| 1989 | 104 | 52 | – | 0 | – | – |
| 1993 | 127 | 95 | +90% | 5 | 51 | 8 |
| 1998 | 263 | 103 | +8% | 7 | 32 | 24 |
| 2003 | 281 | 118 | +15% | 23 | 36 | 21 |
| 2009 | 330 | 136 | +15% | 21 | 29 | 11 |

Fewer new tetrads were colonised in 2009 compared with 2003, but occupied-tetrad retention was much higher during this survey. Interestingly, the number of tetrads holding more than ten territories showed a slight decrease, from 23 to 21 (table 2).

Changes in Cirl Bunting distribution across south Devon

Although the population in the ‘core’ range has shown a 22% increase over the last six years, this trend is not consistent across south Devon (fig. 4). Of the tetrads occupied in either 2003 or 2009, 54% have seen increases, while declines were detected in 36%, some of which were within areas that hold high densities (the remainder were unchanged).

Discussion

The 2009 survey has shown that the Cirl Bunting population in the UK has increased by 24% since 2003, to an estimated 862 (785–975) territories. Much of this increase

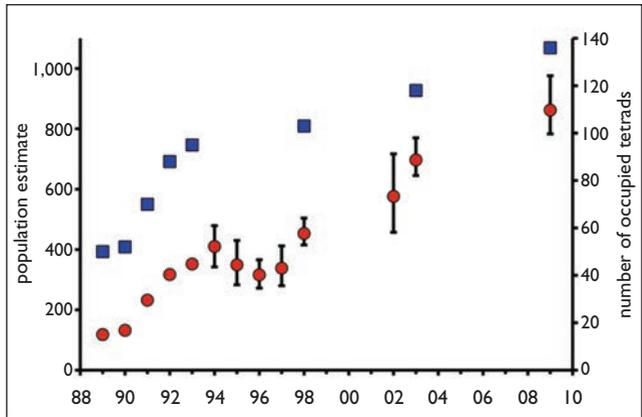


Fig. 2. Trends in Cirl Bunting *Emberiza cirlus* population estimates (red circles, with 95% confidence limits) and tetrad occupancy (blue squares) since 1989. Data from Evans (1992, 1994), Wooton (2002), Wotton *et al.* (2000, 2004) and this survey.

has occurred within the bird’s core range, in south Devon. Particularly encouraging are the increases around the upper Kingsbridge Estuary, west of Salcombe, inland from Dawlish and the isolated population in the upper Teign Valley. Also of note is a pair that successfully bred on the east side of the River Exe in east Devon, the first for over 20 years (although a male was seen in east Devon during the 2003 survey), and a pair just across the Devon border at Rame Head, in Cornwall.



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390. Low-intensity coastal grassland with hedgerows and scrub is ideal breeding habitat for Cirl Buntings *Emberiza cirlus* in south Devon; Labrador Bay, June 2008.

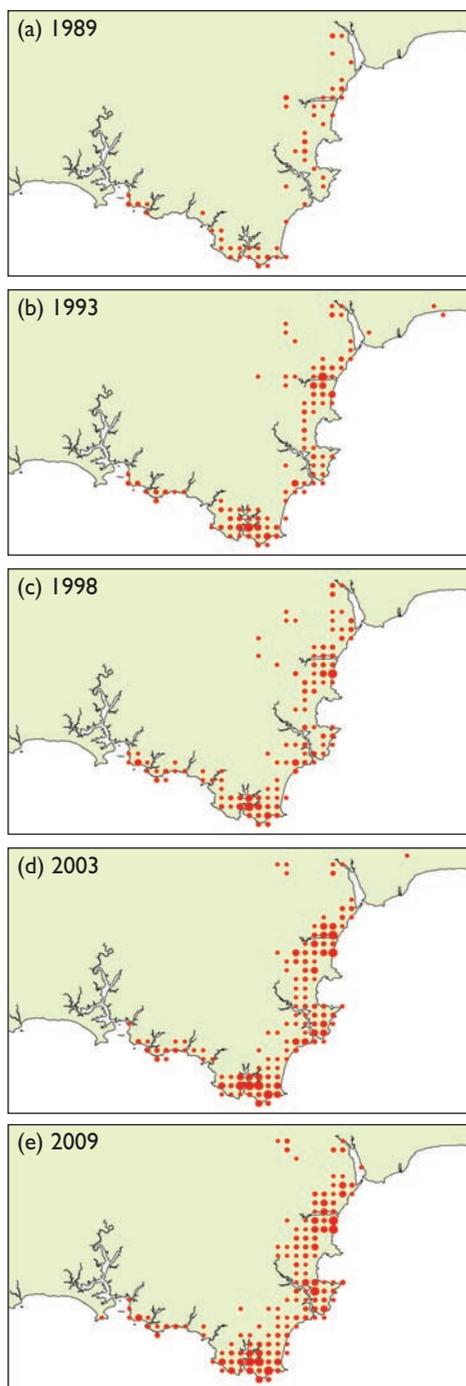


Fig. 3. Cirl Bunting *Emberiza cirlus* distribution by tetrad in (a) 1989, (b) 1993, (c) 1998, (d) 2003 and (e) 2009. The four sizes of filled circle show 1–3, 4–8, 9–14 and 15–26 territories; note that for 2009, the occupied tetrads at the reintroduction site in Cornwall are not shown. Data from Evans (1992), Evans (1994), Wotton *et al.* (2000), Wotton *et al.* (2004) and this survey.

It is also encouraging to note that the percentage increase in number of occupied tetrads was very similar to that seen in the previous survey, indicating that, despite the smaller population increase, the expansion into new areas has continued at a similar rate. Away from their core range, a small population of 12 territorial males and 13 nesting females now exists at the reintroduction site in Cornwall. These birds fledged at least 42 young in 2009 (Stuart Croft pers. comm.). No birds were found elsewhere in the country despite coverage of the areas where there have been recent reports.

Results from the previous national survey, in 2003, found that the Cirl Bunting had increased across the majority of its range (Wotton *et al.* 2004). However, data from 2009 have shown that although there has been an overall increase in abundance, the picture is not uniform across the species' range. Declines have been recorded in a number of core areas, such as around the middle reaches of the Salcombe estuary, the north side of the lower Teign estuary, Abbotskerswell, and the mouth of the River Dart. Some of these were highlighted as areas that showed the main increase between 1998 and 2003 (Wotton *et al.* 2004). There are also declines on the coast between the Rivers Yealm and Avon, just east of Plymouth. If the latter trend continues, it will result in the population along this coast becoming isolated from the main breeding concentration.

Some of the main increases detected during this survey have been in tetrads that held relatively low numbers in 2003, an encouraging sign of expansion. Some of the tetrads that contained large populations in 2003 have shown little change in numbers or even declines. This could be due to a number of factors, such as a decline in habitat quality or extent or simply the fact that the 2003 population was near the carrying capacity of an area.

The UK's Biodiversity Action Plan for the Cirl Bunting (www.ukbap-reporting.org.uk) had a target of 1,050 pairs within 140 occupied tetrads by 2010. This was based upon a net increase of 50 pairs per year and a range expansion of 16 tetrads every five years. If on schedule, the 2009 population should be at 1,000 pairs within 137 tetrads. Data from this

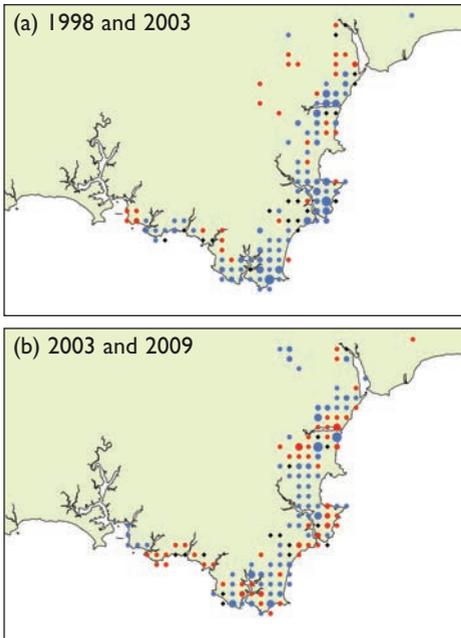


Fig. 4. Changes in Cirl Bunting *Emberiza cirlus* distribution across south Devon between (a) 1998 and 2003 and (b) 2003 and 2009. Blue circles show increases of 1–3, 4–6, 7–9 and 10–12 territories per tetrad and red circles show declines of 1–3, 4–6 and 7–9 territories per tetrad. Unchanged tetrads are shown as black diamonds. Data from Wotton *et al.* (2000), Wotton *et al.* (2004) and this survey.

survey show that although the range is close to the target, the current population size falls short by around 140 pairs.

A number of factors could be inhibiting the continued recovery of the species. There is evidence that cool wet summers can have a negative effect on Cirl Bunting productivity (Cath Jeffs pers. comm.), so the recent poor summers may have been a contributing factor. Grasshoppers and crickets (Orthoptera) are an important food source for Cirl Buntings during the chick-rearing period (Evans *et al.* 1997), and their abundance is often linked to climatic conditions (Ragge 1965). Land management issues, such as the lack of spring-sown barley, may have contributed to some of the local declines. The national loss of set-aside in 2007 might have also played a part, as set-aside stubbles were known to be a key winter foraging habitat (Buckingham *et al.* 1999), especially where none were being provided in agri-environment agreements. Past research has demonstrated that by working with farmers and using the agri-environment schemes, the species recovery project has been effective in delivering optimal Cirl Bunting habitat and facilitating the recovery of the species (Wotton & Peach 2008). However, the CSS



391. Cirl Buntings *Emberiza cirlus* nest in dense cover, such as thick thorn hedgerows and scrub; Cornwall, June 2008.

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was superseded by ES in 2005. Further analysis will assess whether the new scheme is effective for this species and may highlight some of the reasons behind local trends.

Conclusions

The 2009 survey showed that Cirl Buntings continue to increase in both abundance and distribution in the UK. However, the limited range expansion during the period of population recovery over the last 20 years (fig. 3) suggests that it is unlikely that Cirl Buntings will expand greatly outside south Devon in the near future. Where declines have been observed (fig. 4b), further investigations are required to understand and act upon the reasons behind them. Targeted conservation action needs to be directed at Cirl Buntings on the edge of their range, to consolidate and enhance range expansion. Since the last survey in 2003, the reintroduction project has established a small population in Cornwall, although further releases are required to ensure that this population becomes self-sustaining.

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392. Male Cirl Bunting *Emberiza cirlus* feeding in winter stubble at Labrador Bay RSPB reserve, Devon, March 2009.

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