Ring ouzel

Ring ouzel *Turdus torquatus* L.

Climate Change Sensitivity:	HIGH	Ability to Manage:	MEDIUM
Non climatic threats:	MEDIUM	Vulnerability:	HIGH

Summary

The ring ouzel is a scarce breeding bird of the UK uplands which has probably been in decline here for at least one hundred years, with breeding atlases showing a reduction in range of 44% between 1972 and 2011, and UK breeding surveys indicating a 29% decline in numbers between 1999 and 2012 (Sharrock 1976; Gibbons *et al* 1993; Balmer *et al* 2013; Wotton *et al* 2016). Reasons for these declines are not well understood, although research has shown that poor first year survival may be one of the key factors.

Their reliance on upland habitats, and long-term declines in lowland parts of the UK, suggests that ouzels may be vulnerable to climate change, and this has also been suggested elsewhere in Europe. Habitat preferences have been well studied in the UK and trial management is underway in an attempt to determine if populations can be increased through habitat manipulation. Hopefully, the results will help to inform methods of increasing the resilience of this species to climate change through habitat creation and maintenance.

Description

The ring ouzel is a medium-sized thrush, very similar to but slightly smaller and less stocky than a blackbird, and with slightly longer wings and a distinctive white-cream breast band or gorget in adults. Unlike blackbirds, ouzels have silvery panels in the wings and silver-grey edges to the lower body feathers, often giving them a scaly appearance, which fades with time following the annual moult. Compared to blackbirds, they are generally shy and retiring, often restless, and have a harsh 'tacking' call and a plaintive, tri-syllabic, fluted song (Cramp 1988; Clement & Hathway 2000).

Ecology and distribution

Ring ouzels generally arrive back in the UK from their Iberian and north African wintering quarters from mid-March onwards. They breed on open heather moorland and mountainsides, especially those with crags, scattered rocks, trees and shrubs. Nests are built on or under rocky ledges or banks in steep valleys and ravines, or on craggy hillsides, and are often overhung by heather. Very occasionally they nest in small trees, bushes and bracken. This contrasts with most of their European range, where they nest almost exclusively in trees (Flegg & Glue 1975; Cramp 1988).

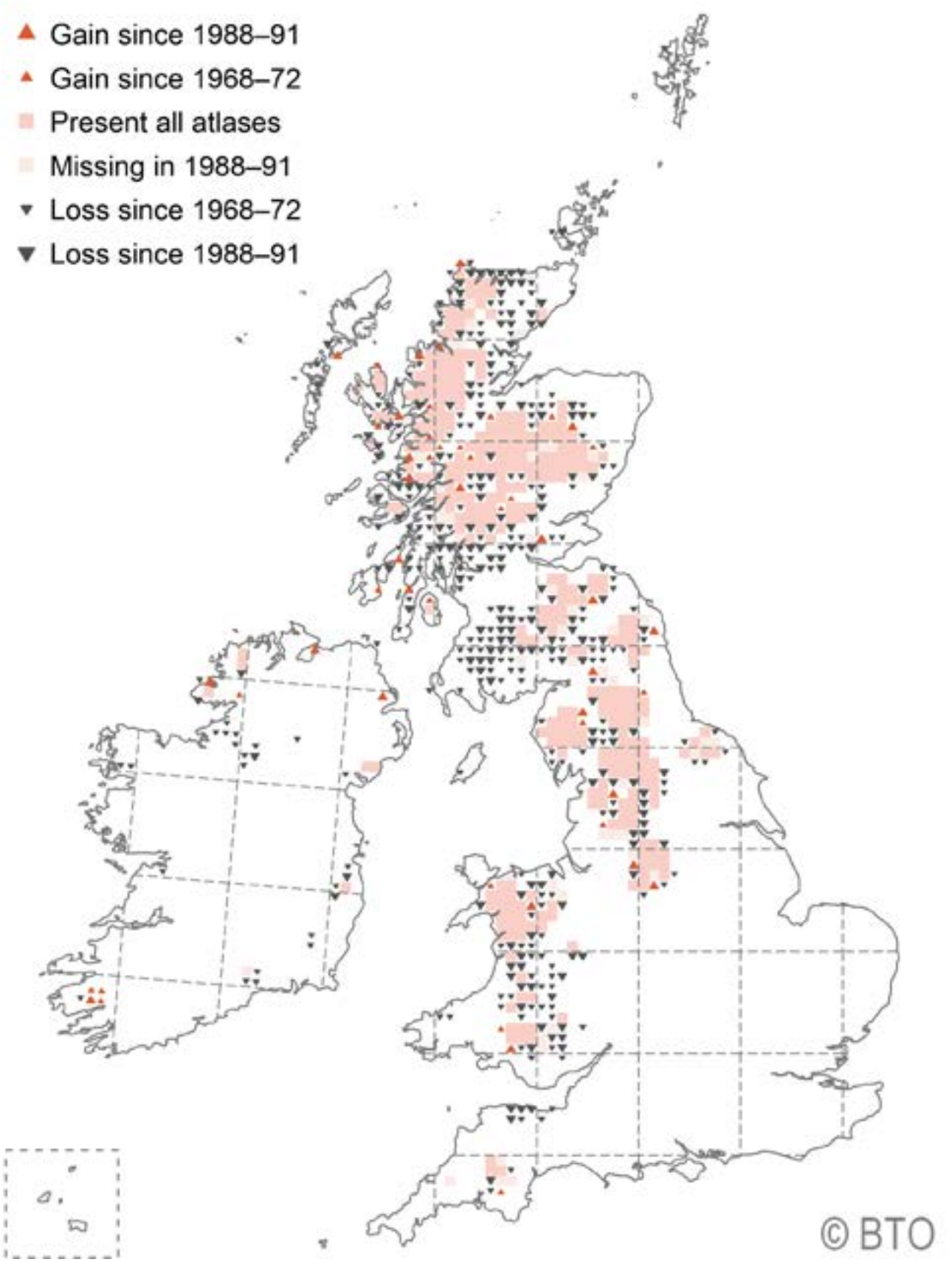
During the breeding season, diet consists of a range of invertebrates, especially earthworms and beetles, with some leatherjackets, spiders, sawflies etc. These are usually obtained on the ground, and birds feeding young can fly several hundred metres to earthworm-rich pastures, where they will forage in company with birds from nearby territories. In late summer and on autumn passage, the berries of bilberry, crowberry, rowan, hawthorn and juniper are important. On passage, ouzels can be seen in lowland, especially coastal, locations. Groups of up to a dozen can often be seen moving through the hills in autumn, feeding on berries as they go. Most breeding ouzels leave the UK by mid-October, but some may linger, and Fennoscandian migrants continue on into November and December. In some years, a few individuals overwinter in the UK, but most spend the winter in the juniper scrub belt of the High Atlas Mountains of Morocco and Algeria (Cramp 1988; Appleyard 1994; Burfield 2002; Rollie 2007).

On migration, ring ouzels can be seen anywhere in the UK, but breeding is largely restricted to heathery upland areas above 250 m, exceptionally down to sea level in suitable habitat in northern Scotland. In 2012, the UK breeding population was estimated to be 5,332 pairs, with the bulk of these being in the Scottish Highlands and the Pennines, with smaller populations in Wales, southern Scotland, Lake District, North York Moors and Dartmoor, and a scattering of pairs on some of the inner Western and Argyll Isles.

Declines in breeding range have occurred throughout the UK, but between 1972 and 1991 were most pronounced in southwest England, Wales and Northern Ireland. Between 1991 and 2011, they ceased to breed in Northern Ireland, Galloway, Shropshire and Exmoor, while the small population on Dartmoor has declined by two thirds since the 1990s and is now very vulnerable (Jones 1996; Wotton *et al* 2016).

Historic changes in the distribution of the ring ouzel

(reproduced with permission of the BTO, from Balmer *et al* 2013)



Confidence in climate change impacts[34]

Distribution change: **HIGH CONFIDENCE** Mechanism: **LOW CONFIDENCE**

The Climatic Atlas of European Breeding Birds (Huntley *et al* 2007) predicts that, as a result of the projected increase in global temperatures, the shift in the simulated climate space for ring ouzel could be significant and might exclude England and Wales. While these simulations do not predict actual future range, they do show where suitable climate conditions are likely to be present and thereby indicate the potential range as a result of unameliorated climate change (Huntley *et al* 2007).

Given the restricted upland breeding distribution of ring ouzel and the long-term declines from lowland parts of the UK, climate change has often been mentioned as a possible cause, though often with little or no discussion of the possible mechanisms involved (Williamson 1975; Durman 1978; Poxton 1986; Cramp 1988). Burfield (2002) suggested that warmer conditions may allow blackbirds or other thrushes to expand their range into the uplands, increasing competition with ouzels, and this has also been mentioned by others (Parslow 1973; Sharrock 1976; Durman 1978). However, he found no evidence of occupancy by other thrushes of the many abandoned ring ouzel territories in the Moorfoot Hills (Borders) between 1998-2000, in his comparative study of the declining population there and the stable population at Glen Esk in Tayside.

Buchanan *et al* (2003) undertook the first objective study of the proposed causes of population declines through a correlative analysis of environmental, habitat and management variables potentially involved in ring ouzel declines between 1988-1991 and 1999. One of the key findings was that declines were more likely on flatter ground, and outwith an altitude range of 350-750m (i.e. above and below the core breeding altitudinal range of the species). In addition, between the periods 1952-85 and 1998-2000 breeding sites in the declining Moorfoot's population were more likely to have remained occupied if they were at higher altitude and had good heather cover (Sim *et al* 2007).

The growing interest in the potential impacts of climate change on upland species, prompted Beale *et al* (2006) to model the effect of temperature and rainfall on the breeding success and territory occupancy of ring ouzels in northern Britain. They used data from a range of study areas, including the Moorfoot Hills, where there was a long-term decline in ouzel abundance.

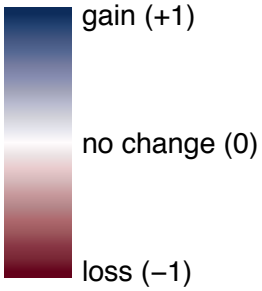
A link was found between change in territory occupancy and UK rainfall and temperature in late summer of the preceding year, and to rainfall in the wintering area two years previously. High UK temperature in late summer and intermediate late summer rainfall in the previous year, and high spring rainfall in Morocco (juniper flowering period) two years previously all had negative impacts on subsequent territory occupancy.

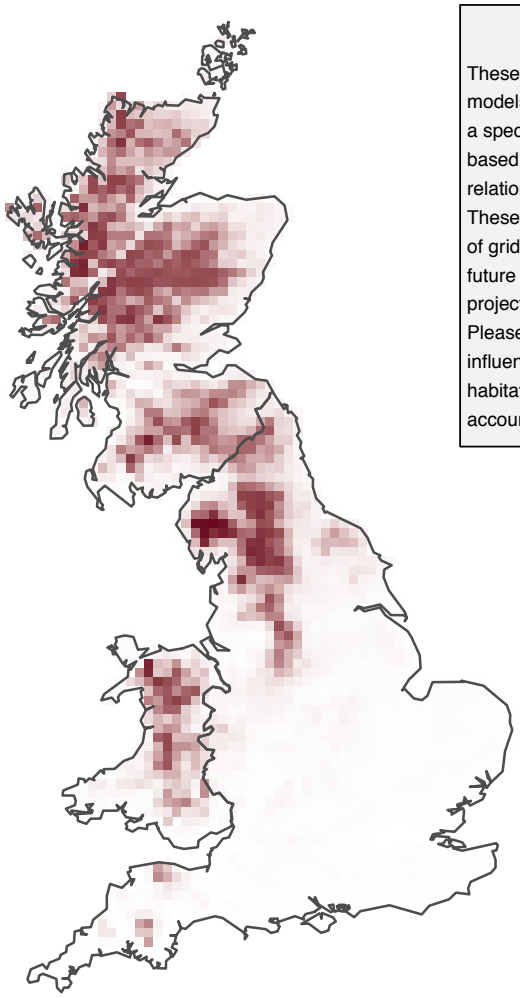
34 An assessment of the strength of evidence that distributions are changing and the mechanisms causing change are understood. Refer to Part B, section 5 of the species section introduction for more information.

In recent decades there has been a significant increase in British summer temperatures and a significant decrease in summer rainfall, and the modelling suggested that these changes could underlie the declines in British ring ouzels (Beale *et al* 2006). This could affect both foraging adults and fledged young through reducing invertebrate food abundance, particularly earthworms, and/or through impacts on the fruiting period and abundance of billberry *Vaccinium myrtilis* and crowberry *Empetrum nigrum*. In an investigation of habitat preferences by juvenile ring ouzels in relation to seasonal variations in foraging conditions, no evidence was found that juveniles switched to berries due to a decline in earthworm abundance, nor that warmer, late summers were leading to a drying out of soils and reducing earthworm biomass (Sim *et al* 2013). However, the study was undertaken over only two years (one very wet) and on a population which had significantly declined over the previous decade (Sim *et al* 2013). For these reasons further work on this topic is needed.

Potential climate change impacts on ring ouzels have also been suggested in Switzerland, where models of climate change and habitat variables predict that there will be a decline of suitable habitat of as much as 20% and that median breeding ring ouzel range will be up to 440 m higher by 2070, contrasting with an increase in habitat at higher altitudes for blackbird (Busshe *et al* 2008; Satter *et al* 2016).

Projected change in potential distribution of ring ouzel in the UK with a temperature rise of 2°C (Pearce-Higgins *et al* 2015).





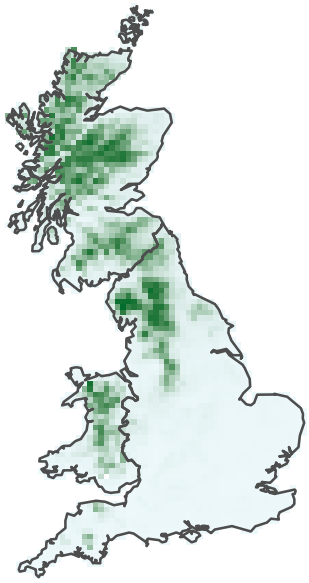
Climate suitability

These maps are created using statistical models which describe the probability that a species will be found in a 10 km grid square, based on its current distribution and its relationship to a number of climatic variables. These can be used to model the suitability of grid squares for a species under possible future climates when climate change projections are taken into account. Please note that other variables that influence species distributions, such as habitat and land–use change, are not accounted for in the modelling process.

Confidence of change

An assessment of the available data and other factors, as part of Natural England's Research Report NECR175, suggests that our confidence in this projection is very high. N.B. many confidence assessments are rated as low because there is a lack of published information on the likely influence of climate on the species concerned.

Current climate scenario



Climate suitability

Low (2°C change) climate scenario

Created by:	University of York	Created for:	Natural England	Created on:	August 17 2016

Further information on these projections can be found in the introduction to the species section (Part A, Section 3 and Part B Section 5). Note that this is a guide to where a species may be able to survive, it does not capture other issues such as habitat availability and fragmentation – see text above for further details. Contains public sector information licensed under the Open Government Licence v3.0. Please also see acknowledgement and copyright at the beginning of this manual.

Please read this case study alongside the relevant habitat sheets.

Adaptation options

The main aim of adaptation for the ring ouzel within England is to secure healthy populations within their current range. It may however be most effective to focus on areas likely to remain climatically suitable for the species, largely in the north of the country. This includes ensuring optimum management of key reserves and protected sites that currently support breeding ring ouzels, and improving the condition of other sites in parts of the country that are likely to remain climatically suitable.

Currently, it is unclear what actions need to be taken as we are unsure about the relative importance of climate change, loss of suitable habitat/food sources or anthropogenic factors in driving population change, and if these factors are acting on the breeding, migration or wintering grounds. However, as a result of recent research, we do know enough about ring ouzel breeding ecology and habitat requirements to begin to at least make their existing and potential breeding areas more attractive to them and thereby, hopefully, more resilient to climate change.

Research has highlighted the importance of heather and short grass mosaics, together with the availability nearby of berries such as bilberry and crowberry (Burfield 2002; Buchanan *et al* 2003; Sim *et al* 2013). We also know that conifer afforestation within or near key breeding areas is detrimental to ouzels, probably for a variety of reasons but certainly including direct habitat loss, changes in grazing regimes and increased numbers of predators (Buchanan *et al* 2003; Smith and Green 2000).

Potential adaptation actions for the ring ouzel include:

- Protect existing breeding areas from overgrazing, over-burning, or inappropriate woodland planting.
- Create and maintain suitable heather and grass mosaics through appropriate grazing and burning regimes and controlling excessive bracken encroachment.
- Create invertebrate-rich areas through appropriate management, including drain-blocking.
- Consider controlling predators where predation is known to be significant.
- Identify topographically suitable but vacant areas within the existing breeding range and manage them with a view to attracting ring ouzels, where this is thought feasible.
- Manage and maintain habitat (e.g. areas of short grass mixed with berry-bearing shrubs) at known stop-off points on migration routes.
- Investigate migration movements and wintering areas with a view to positively influencing the numbers of ouzels returning to the UK annually, thereby increasing population resilience.

To support these actions, it is also important to:

- Establish a robust monitoring regime to determine population trends and the effectiveness of interventions.
- Monitor population trends. Minimal numbers of 1 km squares in UK and England are currently covered by the Breeding Bird Survey to enable annual population estimates; more monitoring, particularly in Scotland is required.

Relevant Countryside Stewardship options

UP1 Enclosed rough grazing

UP2 Management of rough grazing for birds

UP3 Management of moorland

UP6 Upland livestock exclusion supplement

Case Studies

The RSPB, with support from Natural England, is currently undertaking trial management for ring ouzels on its reserves at Geltsdale in Cumbria and Dove Stone in the Peak District. This project began in 2014, and initial results are promising. At Geltsdale, breeding numbers in the valley being managed increased from no pairs in 2014-15, to 1 pair in 2016 and 2 pairs in 2017. Here the management intervention was to introduce grazing by Exmoor ponies in order to reduce excessive bracken cover and create short grass sward for foraging ouzels. At Dove Stone, breeding numbers in the valley being managed increased from 2 pairs in 2014-15, to 3 pairs in 2016 and 4 pairs in 2017. Here, it was thought that overgrazing in the past had reduced the extent of dwarf-shrub cover used by ouzels for nesting. Thus, a fence was erected to exclude sheep grazing from the upper slopes, in order to encourage the growth of dwarf-shrub cover. Meanwhile, breeding numbers in nearby 'control' valleys, where no management work is being carried out, decreased from 3 to 1 pairs at Geltsdale, and from 8 to 2 pairs at Dove Stone. These initial results are promising, but more time is needed to determine if these apparent changes are sustained in the longer term. The project is planned to continue in the future, with monitoring taking place at 3-year intervals from 2020.

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