



REVISED PLAN MAY 2017

RARE BUMBLEBEES

Bombus humilis and *B. ruderatus*

1. INTRODUCTION

This action plan focuses on two of the sub-region's rarest surviving bumblebees, the brown-banded carder bee (*Bombus humilis*) and the large garden bumblebee (*B. ruderatus*). Both species have shown severe national declines and are therefore National Biodiversity Action Plan species. Warwickshire, like many other parts of central Britain, once supported fifteen species of bumblebee, and most of these were widespread, if not actually common; only six species remain common.



B. ruderatus
© Warwickshire Museum

Bombus humilis (the brown-banded carder bee) closely resembles the chestnut-coloured common carder bee (*B. pascuorum*) but its queens emerge later (typically in May). It nests at the base of long vegetation such as coarse grasses. *Bombus ruderatus* (the large garden bumblebee but not actually a garden species) has huge and distinctive queens but workers are difficult to distinguish from the common small garden bumblebee (*B. hortorum*) and like *B. humilis*, it emerges relatively late. In both species, worker production seems to be timed to take advantage of the mid-summer flowering peak of plants with particularly deep corollas such as bird's-foot trefoils, kidney vetch, clovers (all members of the *Leguminosae* - now *Fabaceae*) and lamiates (*Labiatae*). Nearly all their pollen comes from legumes which are especially rich in protein and, in addition, unusually rich in essential amino acids which animals cannot synthesize (Goulson, 2013). Queens of *B. ruderatus* also favour white dead nettle and late spring shrub blossom (e.g. late willow and crab apple). Males of both species favour thistles and knapweeds.

These bumblebees seem to require very large flower-rich sites or landscapes that provide much flower-rich habitat (especially in coastal districts). The distance that bumblebees travel has been estimated to be between averages of 268m and 553m, depending on the species, but is much greater - over 2km - for colonies in parts of the landscape with fewer flowers (Centre for Ecology & Hydrology, 2013). Given the huge amount of energy needed for flight, the ability to navigate accurately and swiftly between flower patches and the nest must be the key to survival.

Adding more flower patches to the landscape will clearly help our rarer species to survive and perhaps not surprisingly gardens house more nests than the countryside; one study found an average of 36 bumblebee nests per hectare. Gardens provide many places with cavities, such as old compost heaps, sheds, patios and rockeries as well as a huge variety of flowers, though individual gardens are very variable. Farmland has fewer places for nests, and arable fields often none, being regularly tilled; hedgerows and fence lines are the best places as they have some flowers though there are fewer of these than there used to be as fields have got bigger (Goulson, 2013).

Other rare bumblebees still present in Warwickshire are *B. ruderarius* (the red-shanked carder bee) which has requirement similar to the above two, and *B. jonellus* (the heath bumblebee), which has been recorded at some acidic sites in the north. The extinct

species here are *B.distinguendus*, *B.muscorum*, *B.soroensis*, *B.subterraneus* and *B.sylvarum*. *B. subterraneus* is believed to have become extinct in Britain as a whole in the late 1900's.

Pollinating insects are widely recognised for their benefits to food production, with an increasing awareness of the role of naturally occurring wild bees. Bumblebees have been found to make up 50% of the potential pollinators present in grass margins and arable areas sown with wild bird seed mixtures (Stoate, 2014). Their nests support an enormous variety of other organisms, some of which are predators and parasites of the bees, others simply [commensals](#) and [inquilines](#); clearly the importance of bumblebees in supporting biodiversity goes far beyond their role as pollinators of wild flowers (Goulson,2013).

2.	OBJECTIVES	TARGETS
Associated Action Plans are: 'Allotments', 'Lowland Heathland', 'Lowland Calcareous Grassland', 'Lowland Neutral Grassland', 'Quarries & Gravel Pits', 'Roadside Verges', 'Gardens', 'Open Mosaic Habitats on Previously Developed Land', 'Dotted Bee-fly' and 'A Cuckoo Bee'		
PLEASE CONSULT THE 'GENERIC SPECIES' ACTION PLAN IN CONJUNCTION WITH THIS DOCUMENT FOR OBJECTIVES COMMON TO ALL SPECIES PLANS		
A.	To monitor and maintain up-to-date listings of sites.	ongoing
B.	To maintain the size and range of known populations of rare bumblebees.	ongoing
C.	To increase population size and range in the sub-region.	2020

3. NATIONAL BAP OBJECTIVES & TARGETS

Bombus humilis and *B.ruderatus* are both on the current UK Biodiversity Action Plan (BAP) Priority Species list published in 2007([Joint Nature Conservation Committee](#)). The targets and objectives for the BAPs, updated in 2010, may be seen online:

- [Bombus humilis](#) BAP
- [Bombus ruderatus](#) BAP

4. CURRENT STATUS

Agricultural intensification and the associated loss of flower-rich grasslands has resulted in disappearances of *B. humilis* and *B. ruderatus* from over 95% of their known localities nationally over the past 100 years leaving them vulnerable to national extinction. However, Warwickshire's populations suggest that large, sensitively managed brown-field sites such as old limestone quarries may help arrest this decline. In the [Wild Pollinator and Farm Wildlife Package](#) produced by NE in 2016, Entry Level (ELS), Higher Level (HLS) and Organic HLS options that support bumblebees by increasing the amount of worker foraging habitat are:

- EF4/HF4/OHF4: nectar flower mix (over 90% of uptake)
- HF14:un-harvested fertiliser-free conservation headland
- EF11/ HF11/ HF20: uncropped, cultivated margins and cultivated fallow plots or margins for rare arable plants.
- HK2/HK7/HE10/HK8: maintenance, restoration and creation of species-rich semi-natural grassland.

Both bumblebees had long been considered extinct in Warwickshire until 1995 when a single *B. humilis* worker was discovered on flower-rich limestone grassland at Frankton Fields near Princethorpe, and 1999, when several *B. ruderatus* queens were seen near the old fish pond at the deserted village of Ditchford Frary, south west of Shipston-on-Stour.

Since then, *B. humilis* has been recorded at Napton Upper Quarry and at Southam (Long Itchington) Quarry in 2001/02, both designated Local Wildlife Sites (LWS) and also at Ratley Grange Quarry.

In the last 10 years *B. ruderatus* has become quite widespread in the south of the county with records from about 20 sites (S.Falk, 2011) including the [Upton Estate](#), parts of which have LWS status; also from 7 sites between Stretton-on-Fosse and Great Wolford and 2 sites around Ettington (P.Clayton, 2004-8), none of which have Local Wildlife Site (LWS) status (2013). This has resulted in South Warwickshire being designated the second national stronghold for this species. The species is mainly found in arable areas with red clover margins and flowery old quarries or road verges; it has also been noted in suburban Warwick twice (2011). In 2016 it was recorded from the A46 at Broom (Falk) and at Sun Rising Natural Burial Ground, Tysoe. It is clearly in a period of expansion nationally, which is particularly pronounced in Warwickshire.

Nationally, both species show a widespread former range extending into northern England followed by a massive recent decline that has resulted in an almost complete disappearance from Central Britain and a mainly coastal distribution in the case of *B. humilis*. *Bombus ruderatus* is classified as Nationally Scarce (Falk, 1991) and *B. humilis* is informally categorised as Nationally Local (in the [Recorder](#) database) and Regionally Scarce by the Warwickshire Biological Records Centre. Given the extent of their declines, they are now both candidates for the [IUCN Red List of Threatened Species](#) but the taxa have not yet been assessed.

4.1 Legal and Policy Status

A wide range of species and habitats are protected under international and domestic laws, including the [Wild Birds Directive](#) (1979), the [Wildlife and Countryside Act](#) (1981), the [Conservation Regulations](#) (1994) and [EC Habitats Directive](#) (1992). Protection of sites is afforded nationally through [Sites of Special Scientific Interest](#) (SSSI) designation, [Special Areas of Conservation](#) (SAC) and [Local Nature Reserve](#) (LNR) statutory status. Other sites are offered recognition of their value through Local Wildlife Site status (LWS), Local Character Areas and identified Landscape Scale Areas. The [National Planning Policy Framework](#) (2012) chapter/section 11 states conditions with regard to any development negatively affecting biodiversity, including protected sites, ancient woodland and other irreplaceable habitats (paragraph 118). The Wildlife & Countryside Act and schedule 2 of

the [Conservation of Habitats & Species Regulations](#) (2010) make it an offence to intentionally kill, injure, take, possess, sell, buy or transport a range of species.

No legal protection exists for the bees themselves but as Nationally or Regionally Scarce species, both bees can be used to support SSSI and LWS designation.

4.2 Current Factors Affecting the Species

- **The threat of development** facing many biodiverse brown-field sites.
- **Continuing loss of flower-rich habitats** in the countryside, e.g. semi-improved grasslands and field boundaries.
- **The negative effect of pesticides**, in particular the systemic [neonicotinoids](#), used to dress seed, on pollinating insects.
- **Scrub encroachment** and other successional processes that result in the loss of extensive flower-rich habitat with legumes and labiates.
- **Land-filling or unsympathetic landscaping** of sites.
- **Excessive disturbance of sites** where this leads to catastrophic habitat loss e.g. vegetation clearance, new quarrying regimes, new grass-cutting or grazing regimes. However, piecemeal disturbance can be beneficial by creating new flower-rich habitat and more diverse conditions.
- **The lack of formal designation** (SSSI or LWS) for some of the known sites.

5. LOCAL ACTION

- Entomological survey work by [Steven Falk](#) until 2012 has clarified our understanding of the rare bumblebees in the county.
- The Habitat Biodiversity Audit provides a very detailed overview of the extent of flower-rich habitats in the county and indicates places where stewardship schemes might be used to encourage spread of the bees.
- Ongoing LWS designation should soon allow assessment and formal designation of all important rare bumblebee sites, and possibly the consideration of some new SSSIs.
- [Higher Level Stewardship](#) and ongoing experimentation of red clover-rich wildflower seed mixes is helping to boost populations of the *B. ruderatus* in some areas, notably the Upton Estate near Edge Hill.
- The Stour Valley Wildlife Action Group (SVWAG) has undertaken recording of *B. ruderatus* in the south of the county (2004-2008)
- The [Warwick & Leamington Beekeepers](#) run courses on beekeeping. The website gives more details.
- Preston on Stour Environmental Group 2016 - a talk on the important issue of the decline of bees by Brigit Strawbridge, a tireless and passionate campaigner on the environment.
- In 2016 [Butterfly Conservation Warwickshire](#) advised on work for bumblebees (species benefitting are *Bombus ruderatus*, *B. humilis* and *B. ruderarius*) at 8

Warwickshire, Coventry and Solihull Local Biodiversity Action Plan

sites: Berkswell Quarry, Tarmac Mancetter, Malpass & Parkfield Road Rugby, Nelsons and Southam Quarry (Cemex), Marsh Farm Salford Priors, Cross Hands & Grey Goose Quarry Long Compton and a small quarry near Cranhill.

- [Natural England](#) (NE) (2016): 40 beekeepers visited Lord Willoughby's estate between Stratford on Avon and Shipston on Stour.

6. PROPOSED LOCAL ACTIONS

ACTION	Lead	Partners	By
PLEASE CONSULT THE '<i>GENERIC SPECIES</i>' ACTION PLAN IN CONJUNCTION WITH THIS DOCUMENT FOR ACTIONS COMMON TO ALL SPECIES PLANS			
Policy, Legislation & Protection			
PL1. Designate all remaining rare bumblebee sites, and any new sites, that qualify as LWSs at the earliest instance.	LWSP	WWT HBA LAs	ongoing
Site / Species Safeguard & Management			
SM1. Prepare and implement management plans that increase the quality of at least 1 of the 7 existing sites between Stretton-on-Fosse and Great Wolford by 2016, and a further 4 by 2020, to fulfil the habitat requirements of the rarer bumblebees.	WCC	NE WWT LOs QOs SDC RBC LWSP SVWAG	2016-2020
SM2. Work with quarrying companies to improve the quality of habitat around existing colonies of the rarer bumblebees as opportunities arise.	WCC	WWT LWSP SDC RBC QOs	2015
SM3. Using information gained by RM3 , double the number of sites for rare bumblebees, aiming at strategic locations to strengthen existing populations and extend the range, potentially in the south of the county around Stretton-on-Fosse.	WCC	WWT CRec QOs SVWAG	2017-2020
SM4. Actively target appropriate sites to include the habitat requirements of rare bumblebees in the management agreements of agri-environment schemes . Encourage uptake of the NE Wild Pollinator and Farm Wildlife Package.	NE	CFE WCC	ongoing
Advisory			
A1. Contact owners/managers of important bumblebee sites, explaining the significance of the populations on their land and providing advice on	WCC	NE WWT LWSP QOs LOs SDC	ongoing

best practice management.		RBC	
Research & Monitoring			
RM1. Maintain an up-to-date listing of rare bumblebee sites and monitor losses and gains.	WBRC	CRec	ongoing
RM2. Monitor the effectiveness and success of habitat management, enhancements and creation undertaken at key sites, and write up case studies.	WBRC	WWT Unis	HBA 2016
RM3. Identify more potential sites for rare bumblebees, targeting areas near to existing colonies e.g. in the Great Wolford to Stretton-on-Fosse area.	WBRC	Unis HBA SVWAG	WWT 2016

Abbreviations: CFE – Campaign for the Farmed Environment, CRec – County Recorder, HBA – Habitat Biodiversity Audit partnership, LAs – Local Authorities, LOs - Landowners, LWSP – Local Wildlife Sites Project, NE – Natural England, QOs – Quarry owners, RBC – Rugby Borough Council, SDC – Stratford District Council, SVWAG – Stour Valley Wildlife Action Group, WCC - Warwickshire County Council, Unis – Universities, WBRC – Warwickshire Biological Record Centre, WWT – Warwickshire Wildlife Trust.

7. PROGRESS WITH ACTIONS

From 2015–2020 there will be a rolling programme of reporting on progress, of 10 action plans per year with an annual summary of results. Progress with this plan up to 2016 can be seen at www.warwickshirewildlifetrust.org.uk/LBAP

8. BIBLIOGRAPHY

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Bee, Wasp and Ant Recording Society (BWARS) (2006) [Distribution maps of bees.](#)

Feltwell, J. (2006). Bumblebees (Wildlife Matters, Henley's Down, Battle, E.Sussex

Lawton, J.H. (2010) [Making Space for Nature](#): a review of England's wildlife sites and ecological network. Report to Defra, advocating a landscape-scale approach guided by four key principles, summarised as '*more, bigger, better and joined*'.

Falk, S.J. (2011) [Warwickshire's Bumblebees](#). Online booklet.

Defra (2011) [Biodiversity 2020](#): A strategy for England's wildlife and ecosystem services.

Goulson, D. (2013) *A Sting in the Tale: My Adventures with Bumblebees*. Vintage.

Centre for Ecology & Hydrology (2103) 'Landscapes and bees' in *British Wildlife* Vol.25 no.1, p68.

Stoate, C. (2014) *Wildlife has its uses: managing farmland for ecosystem services*. *British Wildlife* vol.25: no.3.

[Task Force on Systemic Pesticides](#) (2014) – the response of the scientific community to concern about the impact of systemic pesticides on biodiversity and ecosystems.

Defra (2014) [National Pollinator Strategy](#) – a 10 year shared plan of action between voluntary, business and public sector organisations to deliver across 5 areas of concern.

Goulson, D. (2014) *A Buzz in the Meadow* - tells how, over a decade, the author has restored a derelict farm in France, creating a place for bumblebees to thrive. The book is also a wake-up call, urging us to cherish and protect life on earth in all its forms. Jonathan Cape.

IUCN (2015) [European Red List of Bees](#) provides information on the status of all wild bees in Europe. 9.2% of the 1,965 species are threatened with extinction, affecting a broad variety of stakeholders, given the bee's key role in the pollination of crops and wild flowers which is essential to society and agriculture.

Falk, S. (2015) [Field Guide to the Bees of Great Britain and Ireland](#). Illustrated by Richard Lewington. Bloomsbury.

RSPB (2016) [State of Nature](#) – a stocktake of all our native wildlife by over 50 wildlife organisations.

Natural England (2016) [Conservation Strategy for the 21st Century](#). Sets out how NE will help deliver DEFRA's ambitions for the environment to reverse biodiversity loss, sustain distinctive landscapes and enhance engagement with nature.

Woodcock, B.A. *et al.* (2016). [Impacts of neonicotinoid use on long-term population changes in wild bees in England](#). *Nature Communications*, 7.

Friends of the Earth (2016) [Farming without neonicotinoids](#) suggests that a number of non-chemical methods could be used instead of pesticides to reduce disease and pests but that more research is needed.

9. FURTHER INFORMATION

Habitat Biodiversity Audit (HBA) for Warwickshire, Coventry & Solihull – mapping data set and associated information. Phase 1 ([JNCC](#)) 1996-2002 and Phase 2 (Local Wildlife Sites) ongoing.

Kirby, P. (1992). [Habitat management for Invertebrates](#): a Practical Handbook. RSPB.

Agricultural research for sustainable land management, National Bumblebee Nest Survey, Rothamsted Research, Harpenden, Herts. AL5 2QJ

[Bumblebee Conservation Trust](#) - founded with the aim of protecting bumblebees and their associated habitats through conservation and education. '[About bumblebees](#)' fact sheet.

Friends of the Earth – in 2014, 23000 people took part in [The Great British Bee Count](#), recording sightings of 830000 bees over 12 weeks from June to August. In 2015 numbers of recorders was up to 29000; the commonest bees were the garden (*Bombus hortorum*) and buff-tailed (*B. terrestris*) bumble bees; numbers of the tree bumble bee (*B.hypnorum*) which often nests in bird boxes has rocketed.

Farmed Environment Company - Operation Bumble Bee ' Buzz Project'.

MineralsUK - the British Geological Survey's [Centre for Sustainable Mineral Development](#). This website has a wealth of information on mineral resources, mineral planning, policy and legislation, sustainable development, statistics and exploration.

[Nature After Minerals](#) is a resource for everyone with an interest in quarry restoration & minerals planning for biodiversity.

[Warwickshire CC Mineral Strategy](#) - the minerals development framework consists of a number of documents.

[Bees, Wasps & Ants Recording Society](#) (BWARS) is the national society dedicated to studying and recording bees, wasps & ants (aculeate Hymenoptera) in Britain & Ireland.

Brigit Strawbridge raises awareness and sharing information about the importance of biodiversity, especially bees.

['How to grow nectar flower mixtures'](#) - these mixes cater for several of our rare Bumblebees. Natural England Technical Information sheet TIN094.

House of Commons Environmental Audit Committee report (2013) [Pollinators and Pesticides](#) recommends the introduction of a precautionary ban on three neonicotinoid pesticides.

Defra (2013) [Bees and other pollinators: their health and value](#) - a report outlining the current and proposed government led policies and initiatives to support bees and other pollinators in England.

Defra (2014) [National Pollinator Strategy](#): for bees and other pollinators in England – a consultation document.

Buglife (2104) [Brownfield hub](#) - a one stop shop for information on brownfields and their invertebrates.

[Hymettus](#) – an organisation providing specialist advice on the conservation of bees, wasps and ants.

10. CONTACT

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