

## Back from the Brink – Species summary

### Necklace Ground Beetle

BftB project: IP03 Colour in the Margins

Project lead organisation: Plantlife

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Species name – common & scientific	Necklace Ground Beetle <i>Carabus monilis</i>
Photograph	 <p>© Matt Berry / Back from the Brink</p>
Taxon group	Invertebrates: Ground Beetle
Conservation status	Endangered
UK distribution	<p>Necklace Ground Beetle is restricted to west central Europe, and importantly, Britain represents the northernmost limit. Records from the UK were collated from four sources and produced 566 records:</p> <ul style="list-style-type: none"> <li>• Ground Beetle Recording Scheme (528 records),</li> <li>• iRecord (21 records),</li> <li>• Buglife’s 2015 Breckland Ground Beetle Report (0 records),</li> <li>• Beetles of Britain and Ireland Facebook Group (3 records),</li> <li>• Supplied directly from individual recorders (14 records).</li> </ul> <p>The records were mapped in two date periods: pre-1990 and post-1990 (Figure 1).</p> <p>The records cover a total of 253 10km squares scattered across England. There are very few from northern England and some unusually isolated historic observations from Isle of Rum and Sutherland (considered to be unexplained outliers). The collated data show a reduction in the number of squares in which the species has been observed since 1990 with</p>

	around two-thirds (65%) of occupied 10km squares containing pre-1990 records only. However, Mark Telfer notes there has been a marked increase in records recently since this species was assessed as Endangered ( <i>pers. comm.</i> ): approximately 64% of all post-1990 records are in previously unrecorded 10km squares. The recent records are scattered within a polygon from Devon to Cheshire to East Riding and to Kent. The patchy current distribution and previous more contiguous distribution, along with a more recent proliferation of records would suggest that the species has been under-recorded, but also indicate some potential changes and local extirpations.
<b>Habitat associations</b>	Arable, dry tussocky grassland and floodplain meadows.
<b>BftB work carried out:</b>	
<b>Survey &amp; Monitoring</b>	<p>Five farms in north Norfolk were surveyed for Necklace Ground Beetle using a combination of methods including timed 20-minute hand searches and suction sampling. Annually cultivated uncropped margins, beetle banks and wildflower strips were targeted for surveys.</p> <p>No Necklace Ground Beetles were found during the survey, but the surveys may have been too early for this particular species to emerge, especially given the cool spring. Other ground beetles were observed.</p>
<b>Sites habitat management works</b>	No site management works were undertaken for this species. However, general management advice for ground beetles was provided to the farmers and farm managers along with maps using target notes about the management of habitat features for ground beetles on their holding.
<b>Technical advice provision</b>	<p>Three documents have been created through the Colour in the Margins project:</p> <ul style="list-style-type: none"> <li>• <a href="#">Necklace Ground Beetle briefing sheet</a></li> <li>• <a href="#">Management for ground beetles guide</a></li> <li>• A technical report about the project's target species including Necklace Ground Beetle.</li> </ul>
<b>Links made with other taxa / conservation work?</b>	Other ground beetles; Arable farmland flora
<b>Wider engagement &amp; advocacy activities?</b>	The management guide and leaflets are available on the web and links were sent to Rob Hawkes who has been leading the work with the farm cluster across Breckland to pass onto the farmers.
<b>BftB results obtained:</b>	
<b>Recorded Distribution (in BftB focal areas)</b>	Breckland
<b>Recorded Abundance of species populations</b>	<p>Due to lack of structured monitoring in the past, there is no method by which a comparison of abundance can be made. However, as part of the technical report commissioned by Colour in the Margins, convex mapping has been undertaken and a degree of decline can be understood:</p> <p>The range of Necklace Ground Beetle as understood from a convex hull based on post-1990 records is very substantial at 123,550 km<sup>2</sup> (Figure 2). However, occupancy post-1990 has declined by 68% and the population (as represented by the number of records) by 69%. One of the criteria for Endangered status is a population size reduction of &gt;50% where the reason for reduction may not have ceased. If the reduction</p>

	<p>between pre-1990 and post-1990 is used, this species should therefore remain as Endangered. It is flightless, and therefore a reduction in occupancy is of concern, as dispersal is limited. It is noted however, that it may be persisting more widely than was previously thought, although the recent increase in records may be due to its re-classification as Endangered which raised its profile. In addition, it is large, accessible, relatively easily identified species with an explanatory common name. Climate change may allow a northerly expansion, although habitat fragmentation is likely to be an issue for such a dispersal limited species.</p>
<p><b>Species Recovery Curve progress made</b></p>	<p>This species has moved from the start point of 2 (fully) to 5 (partial), a consequence of previous studies and survey work and the review of status and distribution carried out here. The start point was perhaps conservative, as there was already knowledge of the habitat requirements of the species. The target end point 6 was unrealistic as the trial of recovery solutions was not planned as part of the project. Some of the best recent sites for the species have been on lowland floodplain meadows rather than arable fields so it was a challenge for CitM, an arable project, to address the species recovery actions for this species.</p>
<p><b>Recommendations for future work:-</b></p>	<ul style="list-style-type: none"> <li>• Further strategic surveying of historical locations to identify whether this species has declined or is perhaps under-surveyed.</li> <li>• Assess mortality and breeding success under different pesticide regimes.</li> <li>• Identify the generic habitat factors that are most influential for this species, such as bare ground, ruderal plant seeds (forage), physical disturbance (depth and type of tillage and use of herbicides), pesticide use, undulating/varied topology, habitat continuity and extent (particularly for this flightless ground beetle), scrub and hedges and plant litter. Due to the recent increase in the types of habitats where Necklace Ground Beetle has been found, the exact habitat requirements are not well known.</li> </ul>

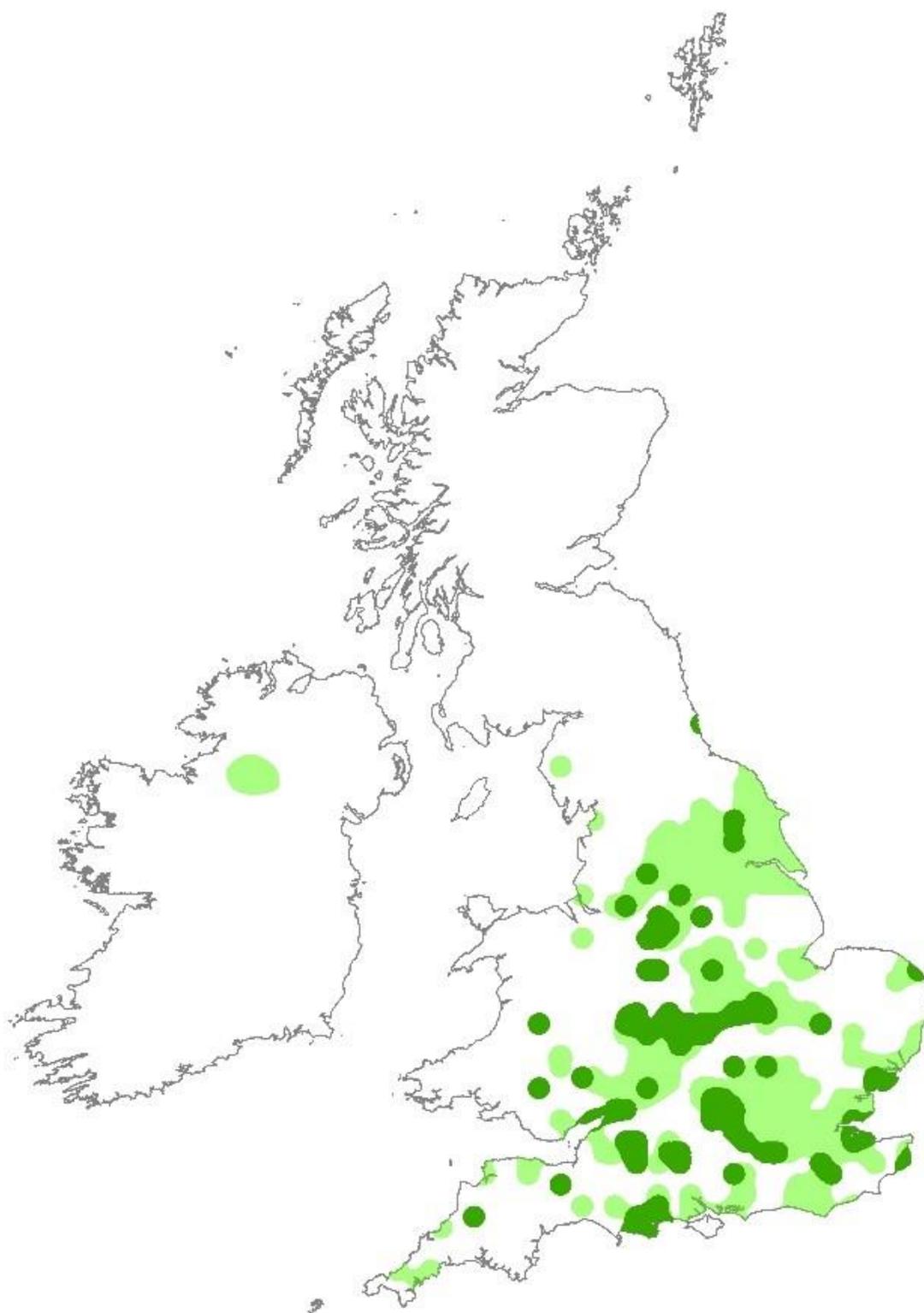


Figure 1: Distribution of Necklace Ground Beetle *Carabus monilis* (dark green post 1990 and light-green pre-1990).

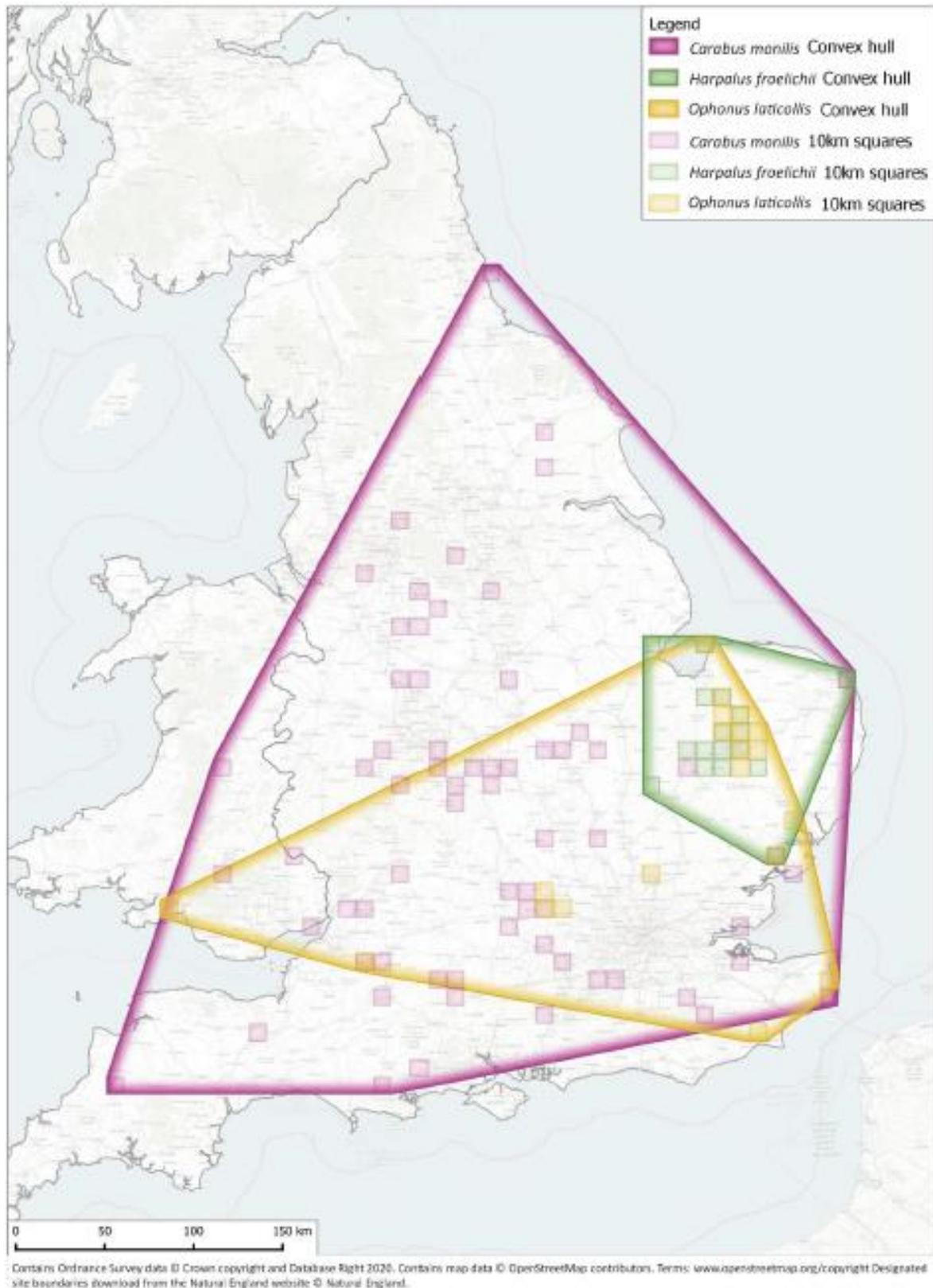


Figure 2: Convex hull based on post-1990 records of Necklace Ground Beetle *Carabus monilis*.