


Narrow-headed Ant (*Formica exsecta*) 2024 report

Captive mating, queen rearing and release, and nest census

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Saving the small things that run the planet

Executive summary

The Narrow-headed Ant (*Formica exsecta*) is a rare species of wood ant. Over the last 100 years there has been a decline in this species across southern England. This has resulted in the species being restricted to the Scottish Highlands, and an isolated population in Devon on the edge of Dartmoor National Park. Being reduced to an isolated population means this species is at high risk of extinction in England.

Over the 2024 survey season activities were undertaken across the three known Narrow-headed Ant sites in England. A nest census was carried out to better understand the population size and the distribution of nests across the nature reserves. Captive mating and release was also conducted, catching queens and males from different nests and placing them in rearing cages giving them the opportunity to mate. These individuals were then released in new areas at Chudleigh Knighton Heath and Teigngrace Meadows to increase the distribution of the Narrow-headed Ant. Finally, mini nests were created in captivity from queens that had been mated. This allows the colony to become better established so when released it is more likely to be successful.

The total number of nests recorded in the 2024 survey season was 209 across all compartments at Chudleigh Knighton Heath. This is an increase in numbers from both 2019 (177 nests) and 2023 (152 nests).

From 11 July 2024, captive mating was carried out. Queen and male Narrow-headed Ants were caught during their nuptial flight period in Compartment 8 of Chudleigh Knighton Heath and mated in flight cages on site. In total, 34 mated queens were released within Chudleigh Knighton Heath and 20 were taken into captivity with permission from Natural England and Devon Wildlife Trust. These queens were combined with worker cocoons from other nests to create mini nests which can be released in other locations without damaging the existing population of Narrow-headed Ants.

The nest census found 108 active Narrow-headed Ant nests in Compartment 8, the most populated and thoroughly surveyed compartment of the heath. This is a 17% increase from the 92 nests seen in 2023 showing that they are beginning to recover from the reduced management during covid lockdown in 2021. Previous to this there had been 148 nests in 2019.

New clusters in the furthest north areas of the heath have further multiplied and in the east of Compartment 5 recent swaling has allowed nests to produce extra satellites and expand from 16 to 39.

The biggest success is the re-discovery of a nest which was translocated to the eastern area of the heath as part of the Back from the Brink project in 2018 and was thought to have become inactive by April 2019. This nest now seems to have moved a few metres and is thriving! It has produced a satellite and in addition there are 7 new nests along the adjoining road verge and 4 in nearby compartment 4. Although we can't prove their origins for certain, it seems probable that one translocation eventually resulted in 13 new nests, and suggests that other historical translocation attempts may yet prove successful.

One nest translocated to Teigngrace meadow in 2020 is still thriving and has possible satellites. Queen and mini nest releases within Chudleigh Knighton and to Bovey Heathfield in 2023 are still being monitored and may with time produce results.

Contents

1. Introduction

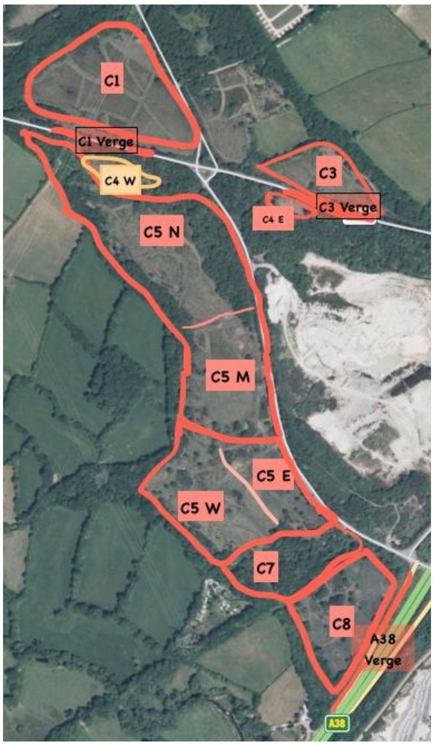
The Narrow-headed Ant (*Formica exsecta*) is a rare species of wood ant. Over the last 100 years there has been a decline in this species across southern England, particularly in the last 50 years. This has resulted in the species being restricted to the Scottish Highlands, and an isolated population in Devon on the edge of Dartmoor National Park. Being reduced to an isolated population means this species is at high risk of extinction in England and as such was listed as a priority species for conservation action under the UK Biodiversity Action Plan and is a Section 41 species under the Natural Environment and Rural Communities (NERC) Act (2006).

Work was undertaken throughout June to October 2024 to survey the current status of the Devon population of the Narrow-headed Ant, at its main stronghold on Chudleigh Knighton Heath and to carry out captive mating and release of queen ants. The goals are to try to maintain and expand the population of Narrow-headed Ants within Chudleigh Knighton Heath and to continue to establish populations at two nearby sites, Bovey Heathfield and Teigngrace Meadow. In the long run we hope to increase the current range of the Narrow-headed Ant in Devon.

Chudleigh Knighton Heath and Bovey Heathfield are both designated as Sites of Special Scientific Interest and both sites are managed as nature reserves by Devon Wildlife Trust. The work this year on Narrow-headed Ants follows on from work done in 2023 (Vulliamy, 2024) and from work done as part of the Back from the Brink Project between 2018 and 2021. The project is scheduled to continue in 2025. For background information and previous work see Carroll (2022), Vulliamy (2020), Walters (2020), Walters (2019), and Walters (2018).

2. Nest census of Chudleigh Knighton Heath

Chudleigh Knighton Heath is divided into numbered compartments. The main compartments known to contain Narrow-headed Ant nests are 1, 5, 7, and 8 within the reserve boundary. Narrow-headed Ant nests are also present alongside the A38 road verge adjacent to the south-eastern end of the reserve. These areas are shown on **Error! Reference source not found.**. Map 10 shows the distribution of Narrow-headed Ant nests across the whole of Chudleigh Knighton Heath.



Map 1: A map showing the compartments of Chudleigh Knighton Heath where Narrow-headed Ant nests have been located. The main compartments where Narrow-headed Ant nests have been found are circled in red. Compartment 5 has been divided into north, middle, south-east, and south-west for ease of description see section 2.4. The west part of the compartment, circled in yellow, has no Narrow-headed Ants but does have Southern Wood Ant (*Formica rufa*) nests.

A nest census of the heath was performed between June and October 2024. The largest area is compartment 5 and this was surveyed with the aid of helpers from Buglife and Devon County Council on 11 September 2024. This area was revisited, and the rest of the site was surveyed by Stephen Carroll, Betsy Vulliamy, and Laura Krusin (Buglife) whilst on site for captive mating and release, and on extra visits in September and October 2024. Table 1 shows the results of the nest census in 2024, as well as in previous years. The number of Narrow-headed Ant nests increased between 2023 and 2024. There was a significant decline between 2019 and 2023 due to the impact of the COVID-19 pandemic on conservation work. Management was unable to be undertaken over the pandemic leading to scrub encroachment and shading of the nests. The increase from 2023 to 2024 follows habitat management on site to reduce scrub and open up areas around the nests. This is having a positive impact on the number of Narrow-headed Ant nests with a 37.5% increase in one year (Table 1). Survey effort was the same across both years, so this is unlikely to be the reason behind the increase.

Table 1: Number of Narrow-headed Ant nests at Chudleigh Knighton Heath in 2019, 2023, and 2024. Following COVID-19 lockdown, post 2019, there was a decline in the number of nests due to lack of management and scrub encroachment. In 2024, following habitat management there has been an increase in the number of Narrow-headed Ant nests present.

Compartment Name	2019	2023	2024	Comments
Compartment 8 and A38 Verge	148	92	108	Decreased during lockdown but starting to recover.
Compartment 5 SW	4	11	11	Increase due to increased survey effort.
Compartment 5 SE	19	16	39	
Compartment 5 N	0	13	24	Increase due to increased survey effort.
Compartment 5 M	4	4	4	The nests have moved but there are still four present.
Compartment 7	2	7	4	Numbers have declined but the range has increased.
Compartment 4	0	0	4	Only discovered in 2024
Compartment 1	2	2	1	Nest in spoil by gatepost now overgrown with brambles.
Road Verge Compartment 1	0	7	5	Some nests were damaged in 2024, it is therefore uncertain how many will survive.
Compartment 3	0	0	2	Translocation done in 2018 appeared unsuccessful until 2024.
Road Verge Compartment 3	0	0	7	Only discovered in 2024.
Totals	**177**	**152**	**209**	

The majority of nests were surveyed in late autumn. This is when the ants have built up their numbers over the summer and have also built a thatch on their nests. The nests are therefore more visible and most likely to be found at this time. Any newly formed nests should be more apparent (Figure 1).

Figure 1: The left-hand image shows an 'ideal' Narrow-headed Ant nest, taken in September 2024. The nest has a thick layer of thatch in preparation for winter. The image on the right-hand side shows a smaller, less obvious nest, taken in early summer. This nest has a small amount of thatch.

In 2024 every single nest was re-marked with numbered pebbles and bamboo canes (**Error! Reference source not found.**Figure 2). All nests had previously been numbered between 2018 and 2020, but many were lost during and after the COVID-19 lockdown when it wasn't possible to visit the site regularly. The canes can be replaced as needed and will make surveying much faster in future years. The canes mean that they can be easily seen and monitored, and management can take place without risk of damaging nests. In the past it has been thought that the nests should not be made this obvious due to their conspicuousness and visual intrusiveness in views over the site, but we feel that the Narrow-headed Ant population is now too vulnerable to risk management without working around individual nests.

Figure 2: The left-hand photograph shows a Narrow-headed Ant nest with number. The right-hand photograph shows the bamboo canes used to mark the nests. This is to enable accurate identification of the nest and allow for comparison between the years, as well as improving the visibility to increase efficiency of surveys.

2.1. Compartment 8

Compartment 8 of Chudleigh Knighton Heath is the main habitat for the Narrow-headed Ant in Devon. It has been subdivided into lettered sub-compartments for ease of monitoring as shown on **Error! Reference source not found.**.

As the nests had not been thoroughly marked since 2019 it was not always possible to tell which nests were new and which were established nests. In Compartment 8 the original number was used where known from GPS locations or previous markers. Otherwise, a new number was given beginning with compartment and year e.g. C8/24/1.

Exact numbers of ant nests are difficult to work out as nests move around and there is a continuous turnover of nests dying and new ones being created. The numbers also vary due to search effort. The survey of Compartment 8 was very thorough in both 2023 and 2024 so these figures are relatively accurate. This year's monitoring found 108 currently active Narrow-headed Ant nests in Compartment 8 including nine nests along the A38 road verge. This is still lower than the 148 active nests known in 2019 but shows that they are starting to recover from the 92 nests found in 2023 (Table 1). The significant decline 2019-2022 was due to the lack of management during and after the COVID-19 lockdown meaning that unchecked scrub growth shaded out many nests. Additional management over the last two years is starting to show positive results. Map 3 shows the distribution of Narrow-headed Ant nests in Compartment 8.

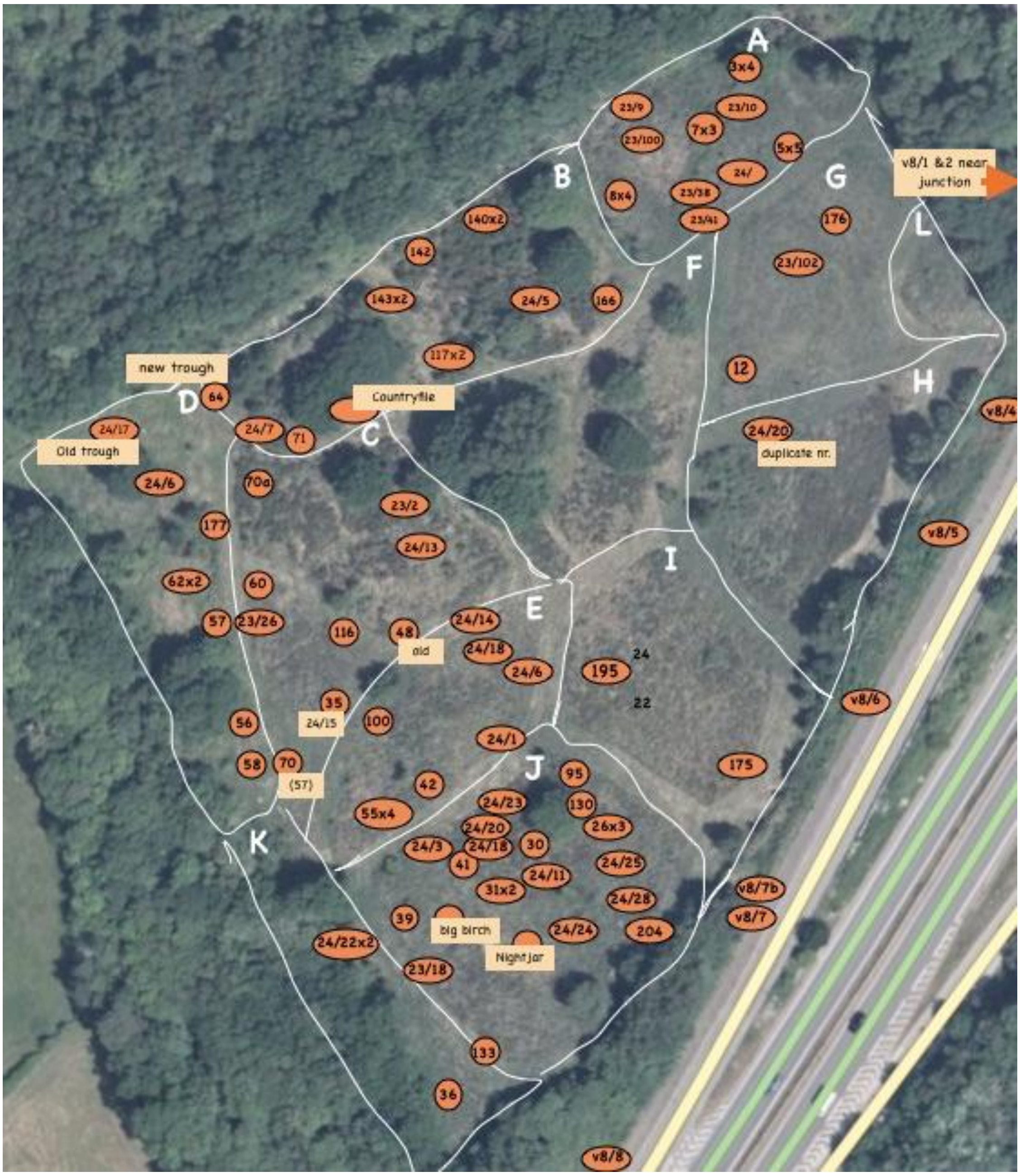
Map 2: A map showing Compartment 8 at Chudleigh Knighton Heath with the sub-divisions A-L. Compartment 8 is sub-divided to increase the ease of monitoring as this compartment has the largest number of Narrow-headed Ant nests.

Some *Formica fusca* nests were also located and recorded as these can be relevant to future colonisation by Narrow-headed Ants and where accessible may be used for a supply of cocoons to top up captive nests. These are incidental records made whilst surveying for Narrow-headed Ants but actual numbers of *Formica fusca* nests are likely to be higher than found during a targeted Narrow-headed Ant nest search.

2.2. A38 verge beside Compartment 8

There are currently still nine active nests on the A38 verge beside Compartment 8 as there were in 2023. In autumn 2023 this verge was mowed by highways and tall vegetation was reduced. Stephen Carroll and the National Highways Ecologist were present acting under direct watching brief, to make sure the nests were not damaged, and Stephen Carroll and Betsy Vulliamy cleared round the nests the day before to make them more obvious. This seemed very successful, however later in the year an unknown Highways operative re-mowed the same verge, apparently due to an internal Highways admin error, and damaged the nests. Most 2023 nests were active again in spring 2024, but at least one was destroyed, and others knocked back. This needs to be prevented from happening again.

Full data of nest numbers and locations is given in Appendix 1. Map 3**Error! Reference source not found.** shows the dispersal of nests in Compartment 8 in 2024.



Map 3: The distribution of Narrow-headed Ant nests at Chudleigh Knighton Heath in Compartment 8 and alongside the A38 verge.

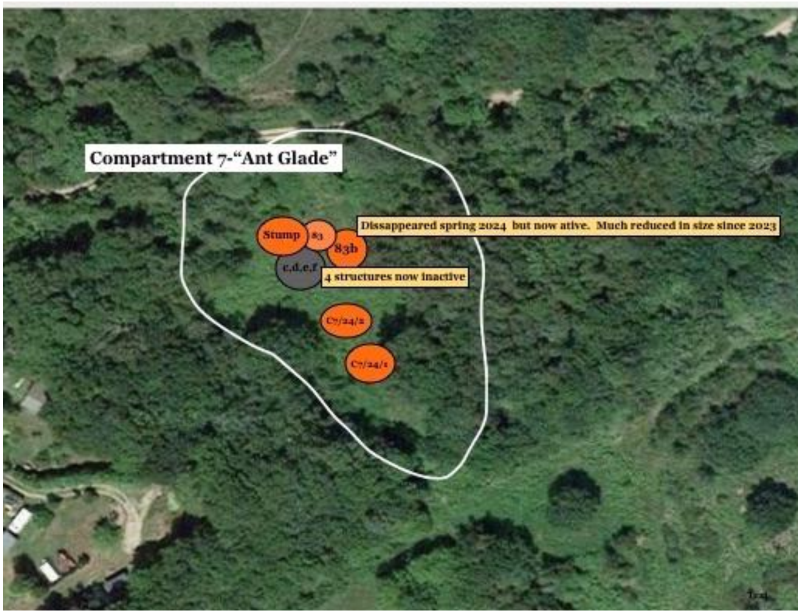
2.3. Compartment 7

Compartment 7, also referred to as 'The Ant Glade' (Map 4) connects Compartment 8 to Compartment 5. This area contained one very large nest for several years, first directly recorded in 2017 during the Back from the Brink project. Prior to the Back from the Brink project, sporadic monitoring between 2007 and 2010 recorded approximately three nests in this compartment. There were two nests present in this compartment by 2019 which developed satellites and increased to seven by 2023.

The main nest structure was seemingly abandoned in spring 2024 due to scrub encroachment, with a large new nest structure arising around 8-10 metres away, assumed to be a re-location of the original main nest. Spot clearing around the original nest led to some reactivation by the autumn, with the new nest also remaining vigorously active.

Some of the satellite nests recorded in 2022-2023 had scrubbed over by 2024, while others have appeared to merge, or they may have only been transient satellite nests in 2023. Further satellites or separate nests have appeared across a larger area whilst others have been lost, resulting in the number of nest structures in Compartment 7 declining from seven in 2023 to four in 2024.

One discrete new nest grouping, comprising a main nest and one or two possible transitory satellite nest structures, was found in 2023 several metres south of the main nest, and is regarded as an additional, separate nest colony from the main nest. In late 2024, an additional new nest was found much further south again than any has been before, so that the overall range of nests in this compartment has increased. This latter nest was much closer to Compartment 8, and although this cannot be certain, it is possible the nest originated from Compartment 8. If so, this would indicate that the gradually opened habitat corridor between Compartment 8 and Compartment 5 through Compartment 7 may be starting to gain an effect. The large main nest was also supplementarily fed in 2023, which may have stimulated nest budding activity.



Map 4: Compartment 7, also referred to as the Ant Glade. This compartment connects Compartment 8 and Compartment 5.

2.4. Compartment 5

In Compartment 5 most of the old markers from the Back from the Brink project have been lost and the vegetation has changed meaning very few of the nests had existing numbers. The numbering system was re-started with all nests numbered with compartment/year/nest number e.g. ‘C5/24/1’ except in one area where, a discrete cluster of nests were discovered towards the north of Compartment 5 in 2023. For these nests, the 2023 nest reference numbers were retained.

Compartment 5 was initially surveyed with a team of helpers from Buglife and Devon County Council on 20 September 2024. Further surveys were then made by Stephen Carroll, Betsy Vulliamy, and Laura Krusin between July and October.

At the end of October 2024, Compartment 5 had 73 active Narrow-headed Ant nests compared to 57 in 2023. Some of these may have been missed in 2023 due to inaccessibility of the area and bad weather during the main census day.

The farthest north section of Compartment 5 had 24 nests in 2024, an 84.6% increase from 2023 when 13 nests were recorded (Map 5**Map *5***). Many of these nests appeared to be new, so hopefully they are multiplying. Now that all of the nests are marked following the 2024 census, we will be able to tell for certain if numbers increase in 2025.

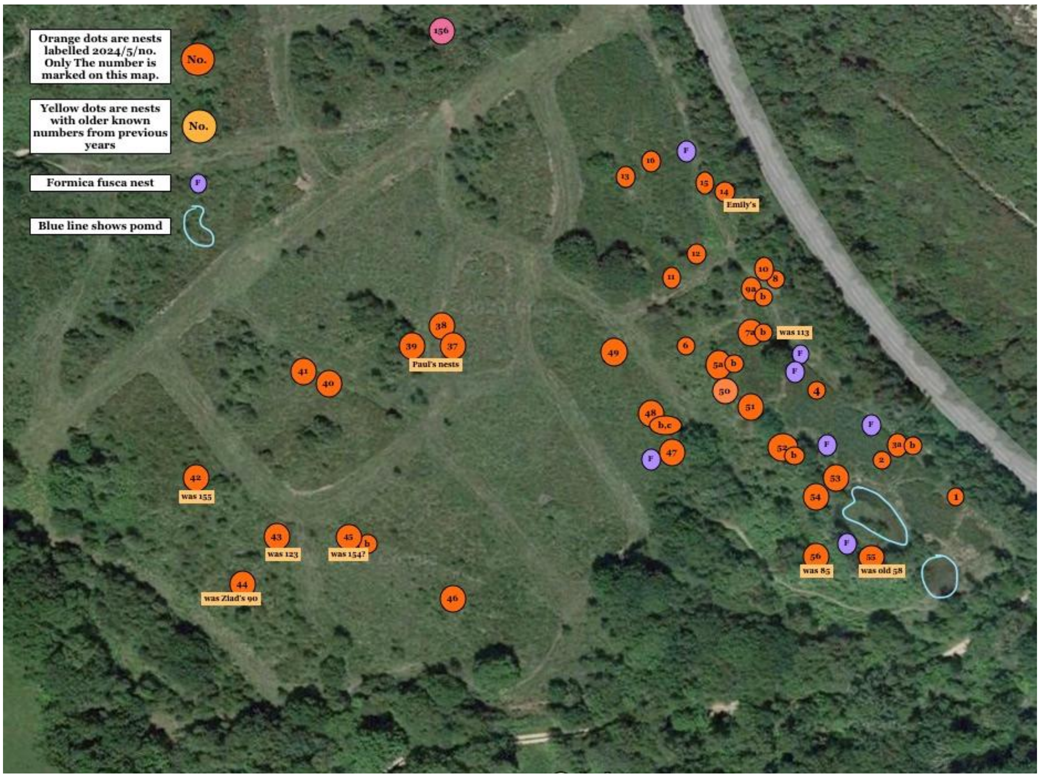
The middle section of Compartment 5 remains relatively stable with just a few nests (Map 6). With a change in management to encourage more structurally heterogeneous vegetation, these nests might be able to spread. For example, paths could be mowed through dense stands of gorse to allow for variation in the vegetation structure.

The south east section of compartment 5 (Map 7) lost three nests between 2019 and 2023. Between 2023 and 2024, the number of nests increased from 16 nests to 39, a 58% increase. This area was surveyed thoroughly in 2023 as it had been known to contain nests pre-covid which unfortunately were not found. Many of the extra new nests found in 2024 were small or close together suggesting that they were either new or satellites. These seem to have arisen in response to swaling done by Devon Wildlife Trust in the area in spring 2023, knocking back the very dense gorse and creating open areas which are once again suitable for nests to be reactivated and disperse.

Mated queens were released in the north of Compartment 5 (‘Lovely Tussocks’ Map 5) in 2023. Following surveys in 2024, there is no sign that these releases have been successful but if the queens had created new nests, they would not be big enough to be noticeable for several years. This area will continue to be monitored.

Map 5: Northern section of Compartment 5 showing active Narrow-headed Ant nests in 2024 and Southern Wood Ant nest only slightly further north.

Map 6: Middle section of Compartment 5 showing active Narrow-headed Ant nests in 2024. The purple dot is a *Formica fusca* nest which appears to have replaced a Narrow-headed Ant nest.



Map 7: Southern section of Compartment 5 of Chudleigh Knighton Heath. On the south east side nest numbers have increased from 16 in 2023 to 39 in 2024.

2.5. Compartment 1

Compartment 1 has for many years had one very successful nest. Unfortunately, this nest was accidentally mown during the winters of 2021 and 2022, resulting in the large, thatched dome being completely flattened each time. Although the nest continues to do well it has never fully recovered. In March 2024, a permanent fence post marker and bent rebar and chicken wire were put over the nest to protect it from future mowing (**Error! Reference source not found.** 3). By July 2024, the ants had laid thatch over the chicken wire making it almost invisible.

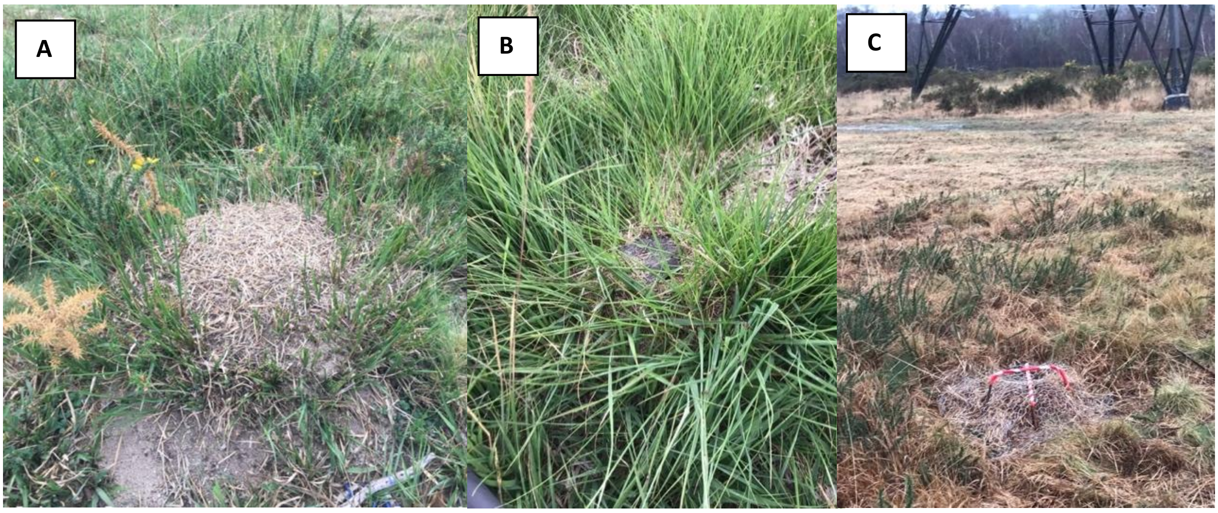


Figure 3: A) the single nest in Compartment 1 in September 2020. B) The nest is pictured in June 2023 after recovery from mowing during the winters of 2021 and 2022. C) The nest in 2024 with new protection of chicken wire and rebar.

A second nest next to the gate in Compartment 1 still appeared to be active in 2023 despite being completely overgrown with brambles. However, when surveyed in 2024 there was no noticeable activity.

2.6. B3334 Road Verge

On 31 July 2023, seven new nests were found on the B3334 road verge alongside Compartment 1 (**Error! Reference source not found.**). These are not easy to spot and are on a dangerous stretch of road so high-viz gear must be worn to inspect them.

On 18 November 2024 a meeting was held with Devon County Council Highways and a Devon County Council Ecologist to discuss management of this verge (this is the responsibility of the County Council, as an adopted public road, unlike the A38 slip road verge, which is part of a national trunk road managed by National Highways). It turned out that some drainage work had already been done on the Compartment 1 verge whilst the meeting was being organised, and the tops had been scraped off some of the nests. Five nests which had been checked in June seem to have been destroyed. This made their exact positions difficult to find. They will be re-checked in spring to see whether they recover and exactly how many still remain.

There is also still at least one small Southern Wood Ant nest noted on the Compartment 1 verge. The presence of Southern Wood Ant on the verge will continue to be monitored as it is only the width of the road that separates them from the Narrow-headed Ants, and they are frequently seen crawling all over the road in summer. The Purple Moor Grass (*Molinia caerulea*) glades west of Dunley Cross in Compartment 4 (**Error! Reference source not found.**) contain at least two Southern Wood Ant nests, whereas they might otherwise have been suitable for Narrow-headed Ants. The Southern Wood Ant nests here must be monitored in case of expansion or colonisation beyond this area, which is near to the open heathland and Narrow-headed Ant nests in Compartments 1 and 5.

Map 8: Narrow-headed Ant nests in Compartment 1 of Chudleigh Knighton Heath and along the adjoining B3334 road verge. The nests on this verge were damaged during drainage works in autumn 2024. The nearby site where mated queens were released in 2024 is highlighted on the map in the white box. Southern Wood Ant nests in Compartment 4 are also indicated. These must be monitored as they may encroach on Compartment 6 if scrub becomes denser.

2.7. Compartment 3, Compartment 4, and adjacent B3334 road verge.

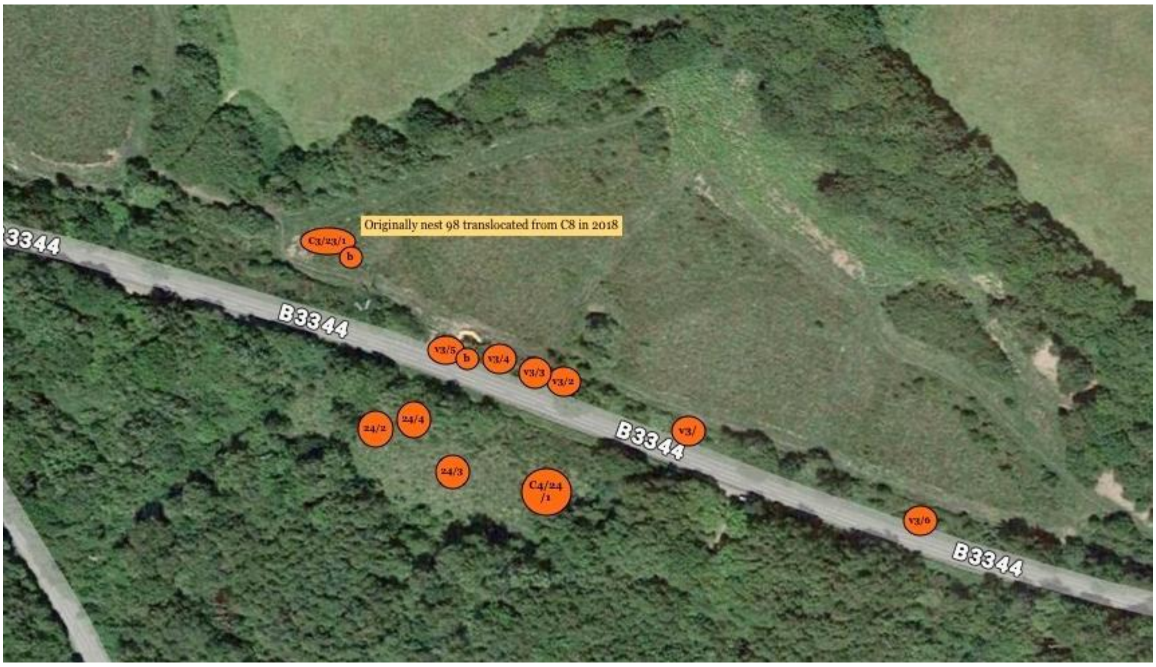
In November and December 2023, the site of a previously translocated, but assumed failed, nest from the Back from the Brink project was noted to be covered with thatch. This was observed during winter meaning the nest was inactive at that time. The nest location was revisited in May 2024 and was confirmed to be a Narrow-headed Ant nest. The 2023 structure was now minimally active but with a sizeable and vigorous nest with well-maintained thatch in a nearby Purple Moor Grass tussock. This structure has remained throughout 2024 and is interpreted to be a main nest and satellite nest of a single colony. The location is directly on, or at most 1-3 metres, from the location of the nest that was translocated during the Back from the Brink project in 2018 (Map 9). Formerly, no activity was recorded at this nest post-translocation after late spring 2019 (Carroll, 2022). The nest is of a size and distance away from other known nests that the most likely explanation would seem to be that this is the same nest colony as was translocated in autumn 2018 (Back from the Brink nest number 98), and not a new nest that has naturally colonised. If so, this would represent a successful translocation, although it has taken 6 years to cycle through building up nest population and to increase in size enough to be noticeable.

Following the successful searches for nests on the road verge adjacent to Compartment 1 on the western side of Dunley Cross by BV in 2023, the road verge on the eastern side of Dunley Cross adjacent to Compartment 3 was surveyed in autumn 2024. An additional seven nests were found on the verge (Figure 4).

It was also recognised that the wooded sections at the east and west of Compartment 4, immediately south of the B3344, which had previously been ruled out as being suitable due to being under the tree canopy with dense scrub, in fact contain three open glades of Purple Moor Grass tussocks, (two west of Dunley Cross, one east of Dunley Cross) which could serve as suitable habitat for Narrow-headed Ant nests. These were surveyed in autumn 2024, with four nests found in the glade on the south side of the B3344 eastern side of Dunley Cross (Compartment 4 E on **Error! Reference source not found.**, **Error! Reference source not found.**). We have no way of knowing how long the nests on the verge and in the Compartment 4 glade have been here as they have not previously been surveyed. It is possible that they have existed for a long time without being discovered. However, there are no other nests nearby and it is a possibility that all of these nests have spread from the original nest 98, relocated to Compartment 3 in 2018. This would indicate that the translocation attempts during the Back from the Brink project were far more successful than previously thought. However, we cannot be certain of the origin of these nests.

Devon County Council highways department are now aware of all of the new nests on the B3334 and they have been marked with verge posts. At the section beside Compartment 1, the highways will not cut the area between verge posts. If drainage is needed the Devon County Council Ecology team will be contacted, and further management will not happen without an ecologist present and pre-marking of nests. The area by Compartment 3 is not cut by the highways department. It may occasionally be cut by Sibleco (the site landowner from whom Devon Wildlife Trust leases the site) but Devon County Council will discuss possible management options.

Figure 4: Location of the seven new nests found in 2024 on the B3334 road verge adjacent to Compartment 3.



Map 9: Compartment 3 and 4 of Chudleigh Knighton Heath and the B3334 road which runs adjacent. The map highlights nest 98 which was translocated from Compartment 5 to Compartment 3 of Chudleigh Knighton Heath in 2018 as part of the Back

from the Brink project. This nest was thought to have failed until rediscovery in 2024. The nests highlighted on the B3334 road verge and in Compartment 4 were discovered in 2024. These nests may have been unknown for a while as the location was initially thought of as unsuitable, alternatively they may have originated from the nest 98 which was translocated in 2018.

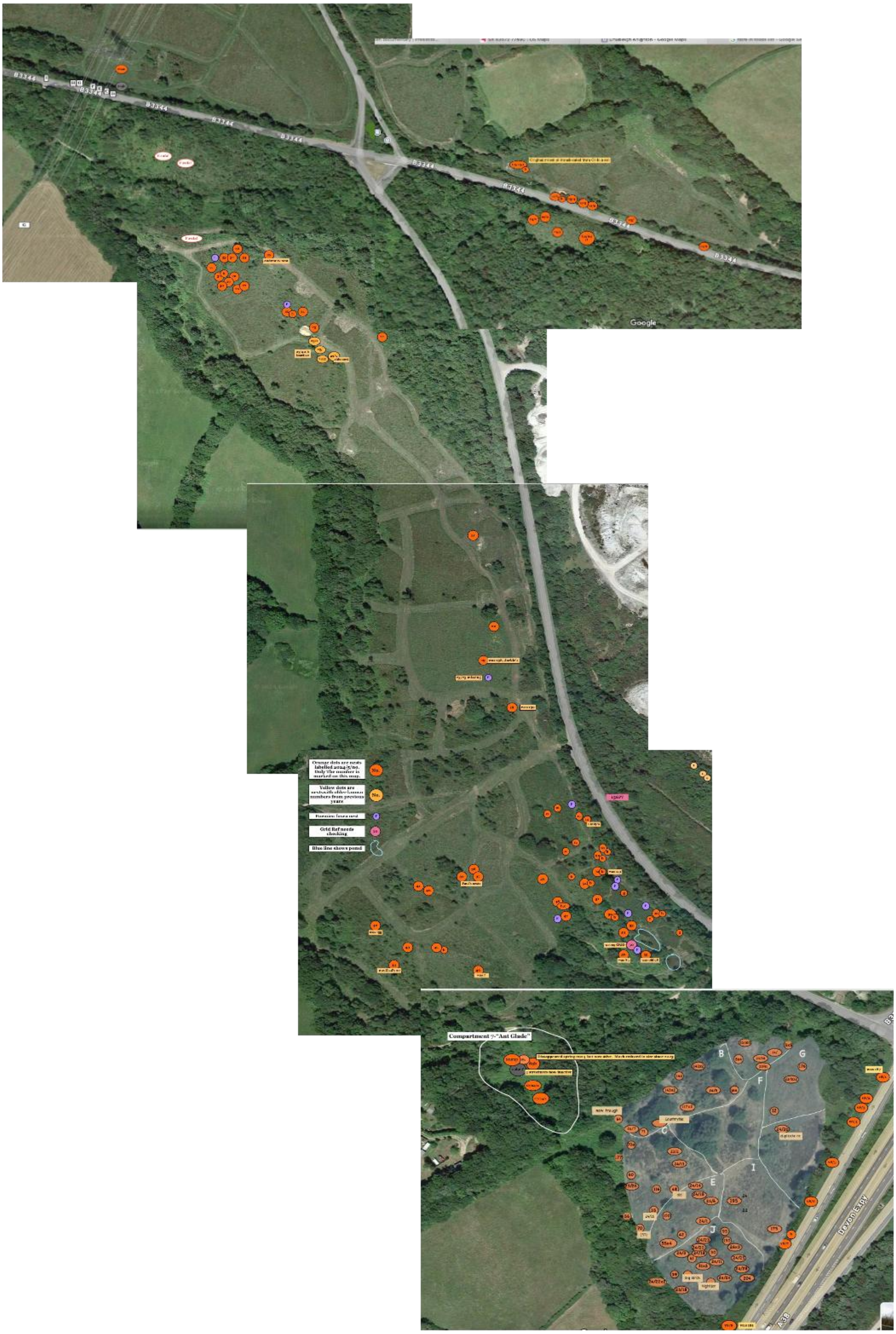
2.8. Whole site summary

Over the whole of Chudleigh Knighton Heath 209 nests were counted in 2024. This increase from the 165 nests found in 2023 is partly due to the discovery of more nests in the north of Compartment 5. The nest translocated to Compartment 3 in 2018 as part of the Back from the Brink project has been rediscovered at or very close to its last known location and appears to have a satellite nest. Close to this a newly found cluster of nests have been discovered along the adjacent B3334 road verge and across the road in Compartment 4. We have no way of knowing how long these nests have been here but either they remained undiscovered for a long time, or they may all have come from the original Back from the Brink translocation to Compartment 3 in 2018 which was previously thought to have failed.

The other main increases are in Compartment 8 where there has been a 17% increase in nest numbers since 2023, and in the SE section of Compartment 5 where swaling in February and March 2024 has opened the area up resulting in a 143.8% increase in nest numbers from 16 to 39.

Compartment 8 has always had the greatest survey effort, and surveys has been very thorough since 2019. Therefore, for this compartment the data will then be the most complete and be the most accurate in showing changes across time. There were 148 known active nests in Compartment 8 in 2019, 92 in 2023, and 108 in 2024, This is an increase of 17% since 2023 and is a massive improvement on the 37% loss in the four years between 2019 and 2023.

There was a reduction in practical management of Chudleigh Knighton Heath from 2020 to 2022 which was due to the COVID-19 outbreak. The heath became much more overgrown during this time and many nests were visibly shaded out by tall gorse and bracken. However, the increase between 2023 and 2024 suggests that management since then is starting to allow a recovery.



Map 10: The distribution of Narrow-headed Ant nests across the whole of Chudleigh Knighton Heath in 2024.

3. Nest census at Bovey Heathfield

Mated queens and mini nests were released at Bovey Heathfield in 2023. Although there were around 30 active Narrow-headed Ants in one mini nest on 29 March 2024 (pers. comm. John Walters) there were only *Lasius sp.* In the same nest by 7 May 2024. Since then, the release areas have been checked but no evidence of Narrow-headed Ants has been seen. These areas will continue to be monitored as we would not expect new nests to be visible for several years. A recent paper studying Narrow-headed Ants in Finland found that it can take 3-5 years for a new queen to establish a nest colony and generate alates (Sundström & Vitikainen, 2022). This shows that they are slow to develop, and it may take years before a nest gets large enough for us to spot and see whether releases have been successful.

4. Nest census at Teigngrace Meadow

One nest, translocated to Teigngrace meadow in November 2019 and filmed for 'The One Show' is still thriving and doing so well that Narrow-headed Ants are commonly dispersed for six or seven metres around the nest. The unusual substrate at Teigngrace meadow, which is overburden spoil from a clay mine, means that the ants seem able to disappear into a hollow layer below the surface. Ants seem to appear from holes several metres away from the original nest and it is not clear whether these are satellites of the main nest. It seems possible that the very exposed sunny hillside means that there is no need for a typical thatch. In the absence of Purple Moor Grass, the thatch on the main nest is composed largely of heather fragments, as on nests in Scotland and as was present on nests on the former site at Bovey Heathfield.

One mini nest was released in this area in 2023 as well as a further mini nest which had been in captivity since 2020 and included some *Formica fusca* 'slave' workers. There is no sign of activity in either of the release areas but again, this will continue to be monitored.

There was a risk of invasion from Southern Wood Ant on this site in 2023 (Vulliamy, 2024) but the encroaching nests were removed, and scrub was cleared by Devon Wildlife Trust volunteers to make the habitat less suitable for them. The area was surveyed three times in 2024 and the habitat looked unsuitable for Southern Wood Ant and there was no sign of their return. Scrub encroachment is a risk on this site as Southern Wood Ant are so nearby, meaning regular management must continue to protect the Narrow-headed Ants here.

5. Habitat management Chudleigh Knighton Heath

All Narrow-headed Ant nests on Chudleigh Knighton Heath have now been marked with bamboo canes so that they can be easily seen, and management can take place without risk to existing ant nests.

Over the winter season, November 2023 to March 2024, Devon Wildlife Trust swaled two of the stands in Compartment 8 and a main block in Compartment 5 which now look suitable for Narrow-headed Ant colonisation. In Compartment 5, we found some of the lost nests still present and were revealed by the swaling. Devon Wildlife Trust had intended to swale more areas but due to high winds and wet weather it was not safe to do so.

On 18 November Stephen Carroll and Betsy Vulliamy met Devon Wildlife Trust Reserve Officer Chris Moulton in Compartment 8 of Chudleigh Knighton to discuss habitat management. It was suggested that the densest patches of the heath, (sections G and I) should have a network of paths mowed through them with patches of gorse, birch, and alder buckthorn left as foodplants. As can be seen from Map 4, there are very few nests in these areas so careful swaling would also be an option.

After this, urgent work is still needed in section J as this is where most nests are concentrated, especially queen producing nests, and in parts, scrub cover has become very dense. Some clearing was done in this area by Devon Wildlife Trust volunteers in autumn 2024 but opening this area up further with more brush cutting or a robo-flail would be advantageous.

For ongoing management, cattle should be allowed into this compartment either briefly very early in the spring or after the nuptial flight season at the end of July. Although there is some risk of cattle damaging nests, it is extremely important that this area doesn't scrub over. The use of cattle or possibly ponies is needed to keep the site open, the rides clear, and to create the tussocky grassland the Narrow-headed Ants prefer but must continue to be carefully monitored in case the pressure becomes too high.

Stephen Carroll and Betsy Vulliamy should be notified when management is planned.

On Compartment 5 the level of cattle grazing seems effective. The denser areas would also benefit from being opened up with a robo-flail or brush cutters to form a mosaic of scrub and grassy areas. In most areas swaling would also be possible as long as the location of nests has been noted. The middle part of Compartment 5 has for a long time had a few ant nests, but these do not seem to increase. There is very dense gorse which although quite low has very few openings in it and infrequent birch trees which may make it unsuitable for Narrow-headed Ants. Cutting rides through the largest of these areas may be more beneficial than swaling as it would create more diverse sward heights. Once mowed the cattle may keep these areas more open and future swaling would result in more diverse vegetation.

Compartment 7 is extremely overgrown and again needs open areas to be recovered. This compartment has become very shady, and removal of some trees may also be needed to maintain a sunny clearing.

It seems clear that the swaling in the south east of Compartment 5 in winter 2023/2024 has resulted in an improvement in nest numbers. The opening up of mowed routes through these compartments also encouraged dispersal and several new nests were found on these open paths. This quick colonisation may have been because there were still existing nests on the edges of this compartment ready to disperse.

The swaled areas in Compartment 8 (H and I) have not yet had the same results but there were so few remaining nests near to the swaled sections that it might take longer for them to recolonise. It seems hopeful that we may see nests in these sections in 2025. The other difference in Compartment 8 is that due to fencing work taking place outside the flight season, no cattle were put on the site at all in 2024 and the rides became very overgrown. The cattle are an important part of keeping down the fast-growing bracken and grass after mowing or burning and the combination would probably be more successful.

6. Captive mating and release

6.1. Queen and male surveys

Starting on 10 June 2024 visits were made to Chudleigh Knighton to add felt tiles (3-5 cm squares of roofing felt) to nests in Compartment 8 of Chudleigh Knighton Heath in addition to some already placed by Pete Burgess (Devon Wildlife Trust) earlier in the year.

On return visits on cool sunny mornings these tiles can be lifted to inspect the ants and brood which are brought to warm up under the tiles. It is then possible to tell whether there are large alate (winged ant) cocoons under the tiles or just small worker cocoons (Vulliamy, 2020). The teneral (newly hatched) adults bask under the tiles while they mature so fully formed males and queens can also be seen. The males are narrow and black all over and the queens are usually fatter with reddish legs.

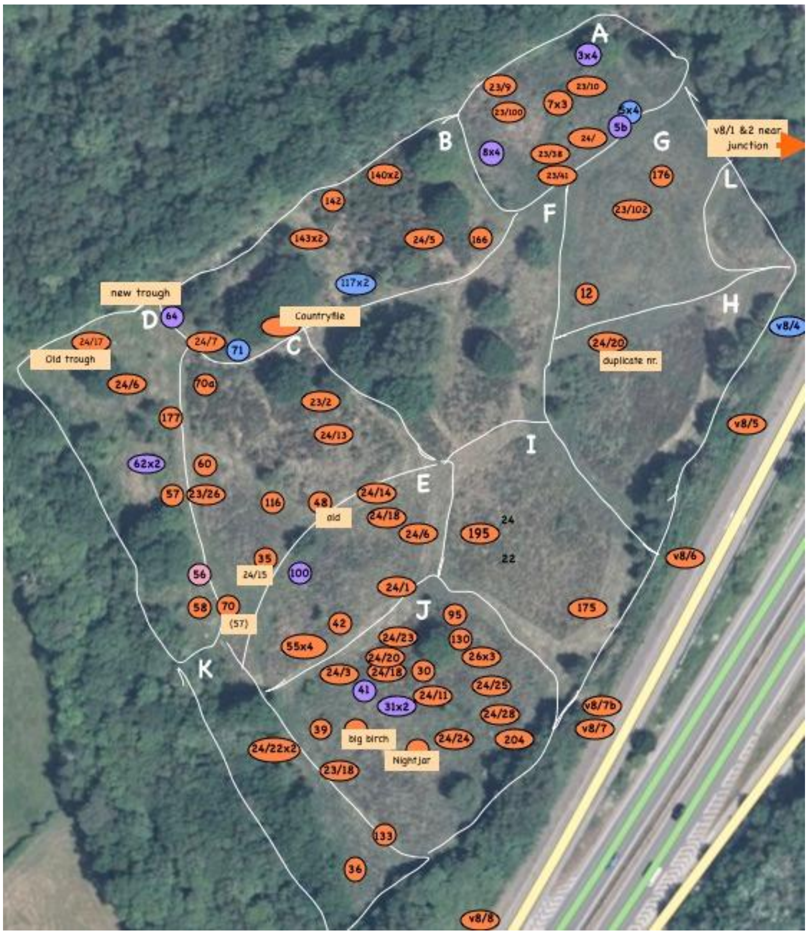
The first alate cocoons were noted on 17 June. Winged males were seen warming under the tiles on 25 June (only three days earlier than in 2023) and winged queens were seen on 2 July. For ease of collecting, the preparation was concentrated in Compartment 8 where there are most nests, and they are well known (Table 1).

In 2020 we knew that in Compartment 8 there were at least 12 nests producing queens and 28 producing males. In 2023 search effort was lower due to short notice to start the project but six nests produced queens, and 10 nests produced males (three of these were producing both). In 2024 search effort was higher, but the weather was not ideal for seeing basking alates. Winged adults were seen at 16 nests, nine of which had both queens and males. In total 11 had queens and 14 had males, a further seven had alate cocoons but the adults were never seen. Table 2 shows which nests were producing alates and these nests can be located on **Error! Reference source not found.**. This means the total number of nests we had available to collect queens from was similar to that in 2020 but the overall number of nests producing alates was much lower and the number found with males was around half as can be seen in **Error! Reference source not found.**.

Table 2: Nests with alate cocoons (A), winged males (M), or queens (Q) seen basking under felt tiles or ready to fly in 2024.

	Date													
Nest Number	**17/06/2024**	**25/06/2024**	**02/07/2024**	**06/07/2024**	**11/07/2024**	**12/07/2024**	**13/07/2024**	**18/07/2024**	**19/07/2024**	**23/07/2024**	**27/07/2024**	**28/07/2024**	**29/07/2024**	**30/07/2024**
3				M	M			A	Q	Q	Q	Q		
A38 V4						M								
5			M	M	Q/M	Q/M	M	A						
8		M	M			Q/M	Q/M							
22							A							
31					Q/M								M	M
36								A						
39			A											
41			A		M		A		M		M/Q	Q		M
56						A	Q							
57								A						
62			A			Q	Q/M	A				Q/M		
64					M		Q							
71						M	M	A/M	M	M	M		M	
85			A/Q		Q		Q							
100			A	M							Q	Q	Q	Q
117				A		M	M							
175								A						

3a	A													
3b			A	Q/M	Q	A/Q		A						
5b			Q	Q/M	Q		Q	A	Q					
8a	A	A												
C5 24/9			A											



Map 11: Locations of Compartment 8 nests producing winged males (blue), queens (pink), or both queens and winged males (purple).

Table 3: Number of nests seen producing alates in 2020, 2023, and 2024. This is not an accurate measure of how many nests were producing alates each year as the number recorded depended greatly on the number of nests checked, as well as weather conditions and time of day. However, it shows the sample we had available to collect from for onsite captive mating.

Year	**Total number of nests with winged adults**	**Number of nests with queens**	**Number of nests with winged males**
2020	33	12	28
2023	16	9	10
2024	16	11	14

6.2. Nuptial flights and onsite captive mating

Queens and males were caught when leaving the nest during the nuptial flight rather than being collected in advance. Reasons for this are explained in previous reports (Vulliamy, 2020; Vulliamy, 2023).

Winged adults will mate very readily and immediately on the day, on site in the weather conditions they have chosen to fly in, if they are caught after they leave the nest.

From 11 July onwards at least one person arrived on site at around 07:30am, before the sun hit the nests, and observed as many of the chosen alate producing nests as possible. It was not always easy to choose which nest to focus on, but we tried to check them in the order that the sun first hit them and then focused on the ones which looked most active or where alates had been seen waiting the previous day. Often the workers start running up the grass stems just before the alates fly and the nest tends to get busy. Inevitably we will have missed some alates by being at the wrong nest at the wrong time. However, a good number of alates were still observed.

The nuptial flight was first seen on 11 July 2024 on a sunny morning at 18°C with the first queen seen emerging from nest 3b at 07:50 and males emerging 20 minutes later from nest 5 at 08:10. Queens and males were caught whilst climbing grass stems around the nests. They were put into large net cages hung in a tree in direct sunlight. Queens were put in a net near to their own nest and males were added from another nest, from as far away as possible to avoid mating males and queens from too near to each other which might be more closely related. It was very difficult with only one or two people to watch several nests at once and catch alates as well as keeping track of what was going on in the nets. We recorded how many queens and males from which nest were added to each net but could not keep track of any individuals (Table 4).

Table 4: Number of winged males and queens caught and added to cages for onsite captive mating at Chudleigh Knighton Heath.

Date	Net no.	Queens added	From nests	Males added	From nests	Total	Release	To	
11/07/2024	a	4	*C5/56 (old 85)*	9	*5*	**8**	Queens	**C3**	SX 83846 77566
Flight from to	b	2	*C5/56 (old 85)*	4	*3,3b*	**18**	Males	**C3**	SX 83846 77566
07:50:00-10:30	c	2	*3b*	5	*64*				
	d	12	*3b*	13	*31,41*	**12**	Queens	**Captivity BV**	For 'Mini nests'
						13	Males	**C1,**	SX 83530 77651
18/07/2024	a	1	*100*	2	*3*	**0**	Sun went in so no mating, re-released at own nests		
19/07/2024	a	8	*5b*	14	*71*	**10**	Queens	**C1,**	SX 83530 77651
07:30:00-10:30	b	2	*3*	5	*41*	**20**	Males	**C1,**	SX 83530 77651
				1	*100*				
23/07/2024	a	4	*3*	9		**4**	Queens	**C1,**	SX 83530 77651
07:45					*71*	**9**	Males	**C1,**	SX 83530 77651
27/07/2024	a	1	*41*	10	*71*	**5 but one escaped**	Queens	**C1,**	SX 83530 77651
09:13	a	4	*100*	1	*41*	**11**	Males	**C1,**	SX 83530 77651
28/07/2024	a	2	*41*	1	*57*	**7 and 1 escaped**	Queens	**Captivity JW**	
08:30-11:20	a	3	*100*			**3**	Males	**Captivity died**	
	b	3	*3*	1	*71*				
29/07/2024	a	8	*100*	4	*71*	**8**	Queens	**Teigngrace meadow**	SX 8405 7575
	a			1	*31*	**5**	Males	**Teigngrace meadow**	SX 8405 7576
30/07/2024	a	1	*100*	2	*41*	**1**	Queens	**Captivity SC**	
						2	Males	**Captivity died**	
Days flying observed		**Queens caught**	***Number of nests***	**Males caught**	**Number of nests**	**Queens released at:**			**Released**
8		57	*6*	80	9	**C3**		8	34
						C1		18	
						Teingrace		8	
						Captivity Betsy Vulliamy		12	20
						Captivity John Walters		7	
						Captivity Stephen Carroll		1	
						1 re-released, 2 escaped, so TOTAL		**54**	

The alates were left in the nets hanging in a tree to mimic their natural "lekking" behaviour, where we assume they all meet at a high point, probably at a treeline as alates tended to collect at the top of the net (Figure 5). When the sun had been shining on a net for a while some mating was observed. The ants were left in the nets for as long as possible, at least until no more were leaving the nests, usually until 12:00. We know from previous work that mating does not occur after 12:00 (Vulliamy, 2020; Perret, 2019). They were moved to release sites still in the nets so that mating could continue on route.

Figure 5: Male and queen Narrow-headed Ants mating in insect cages. Males and queens typically stay at the top of the cages during mating.

Males and queens which had been in a net together for a morning were presumed to have mated as long as some mating had been seen in that net. They were then either released at another site or taken into captivity and kept as mini nests.

Alates were captured on eight mornings. On 18 July 2024 only one queen and two males were caught. The sun went in, and no mating was seen so these were released back to their own nests. Other than this 56 Queens were caught and mated in cages in 2024 which was only slightly more than the 51 caught in 2023. We had hoped to collect higher numbers having found and tiled the alate nests earlier in 2024, but the weather was very changeable, many mornings were cloudy and cool, and the nuptial flight seemed to happen more slowly than in previous years. After the first day when 20 queens were caught in one day, there was only a slow trickle of alates leaving the observed nests. In total 57 queens were captured between 11 July and 30 of July. All details of capture and matings are shown in Error! Reference source not found..

6.3. Release

Two queens escaped from their mating nets somewhere within Chudleigh Knighton Heath and 34 were released at three locations: Compartment 1, Compartment 3, and Teigngrace meadow. All of these release sites are close to an existing nest which have been present for some time. Because of this we know that the vegetation and resources are suitable and hope that the threat from other ant species is not too high. The hope is that these populations can be expanded and strengthened therefore expanding the range of the Narrow-headed Ant in a more stable and permanent way.

There was also a plan to release some queens at Bovey Heathfield which was the last site Narrow-headed Ants were lost from. Queens and mini nests were released at Bovey Heathfield in 2023. We would not yet expect to see any sign of the queens as it is likely to take several years to build up a nest to a detectable size. However, two of the four mini nests were immediately taken over by black ants (*Lasius niger*) and the remaining two had been lost by May 2024. The ants must either have been killed or moved to an alternative location. The release sites will continue to be monitored but it is unlikely that we will see new nests before summer 2025 or 2026.

In 2023 queens were released into pre-prepared tussocks (Vulliamy, 2023) with food and sometimes worker cocoons. However, this was time consuming. These tussocks and the food seemed to attract other ant species such as *Lasius sp.* and the queen sometimes flew away rather than entering the tussock. On return visits we never found any queens or cocoons remaining in the release tussock and there is no evidence that they helped the success of the release. Therefore, this was not done in 2024.

In 2024 we simply released queen ants into an area of suitable vegetation at around midday, straight after captive mating. Where there were remaining males which were not kept for use the next morning, these were also released alongside the queens where there might be further mating opportunities with those or with queens from the nearby nests. These are also recorded in Table 4.

7. Captive mini nests

On three dates mated queens were taken into captivity by Betsy Vulliamy (11 July 2024), John Walters (28 July 2024), or Stephen Carroll (30 July 2024) as shown in Table 4 and Table 5. A total of 20 queens were taken. Their progress is shown in Table 5**Error! Reference source not found.**. The queens were taken away in the net cage where they had mated. At least two workers from the same nest were taken with each queen. A small jar of worker cocoons from a mixture of nests were also collected.

Table 5: Table indicating which nests queens were taken from, which nests the males they mated with were from, and who the mini nests are being kept by.

Queen number	Mini nests kept by	Queen from nest number	Mated with males from nest number	Date mated	Mini nest name	Next step
1	BV	3b	31 or 41	11/07/2024	B1	Overwintering in captivity
2	BV	3b	31 or 41	11/07/2024	B2	Queen died 09/08/2024, workers added to B9
3	BV	3b	31 or 41	11/07/2024	B3	Overwintering in captivity
4	BV	3b	31 or 41	11/07/2024	B4	Overwintering in captivity
5	BV	3b	31 or 41	11/07/2024	B5	Overwintering in captivity
6	BV	3b	31 or 41	11/07/2024	B6	Overwintering in captivity
7	BV	3b	31 or 41	11/07/2024	B7	Overwintering in captivity
8	BV	3b	31 or 41	11/07/2024	B8	Queen died 19/07/2024, Workers added to B8
9	BV	3b	31 or 41	11/07/2024	B9	Overwintering in captivity
10	BV	3b	31 or 41	11/07/2024	B10	Overwintering in captivity
11	BV	3b	31 or 41	11/07/2024	B11	Queen died 16/07/2024
12	BV	3b	31 or 41	11/07/2024	B12	Queen died 16/07/2024
13	JW	3	71	28/07/2024	JW1	Released to Bovey Heathfield
14	JW	41	57	28/07/2024	JW2	Released to Bovey Heathfield
15	JW	100	57 or 71	28/07/2024	JW3	Released to Bovey Heathfield
16	JW	3	71	28/07/2024	JW4	Released to Bovey Heathfield

17	JW	3	71	28/07/2024	JW-3A	Overwintering in captivity
18	JW	41	57	28/07/2024	JW-41B	Overwintering in captivity
19	JW	100	57 or 71	28/07/2024	JW-100C	Overwintering in captivity
20	SC	100	41	30/07/2024	SC1	Overwintering in captivity

These were kept in Tupperware boxes with net areas glued into the lids (Figure 6). Methods were used as piloted in Vulliamy, 2020. A minimal nest structure was created so that the ants could stay undercover but would not be completely hidden and could still be easily inspected. A small handful of soil was added to the base of the container. A ring of grass was placed on top of the soil to create a cavity. Two or more workers from the same nest as the queen were placed in the cavity along with around half a teaspoon of worker cocoons, from different Narrow-headed Ant nests, along with the mated queen. A felt tile was placed on top.

Betsy Vulliamy took home 12 mated queens. Four of these died in the first month and eight are still surviving. Each time a queen died the workers and cocoons from her nest were combined with another nest and seemed to be easily accepted. It was obvious when a queen died as the workers would remove her and put her in a waste pile in the corner of the container along with any empty cocoon cases. In total 12 queens are still overwintering in captivity and believed to be healthy.

The 'BV' mini nests were kept in a garden shed by a south facing window. On rainy or cloudy days they were also heated with heat lamps between 09:00am and 12:00am in case the window light was not enough. They were fed in a milk bottle top in a corner of the container with honey, apple, and insect-based fish food (FLUVAL Bug Bites Bottom Feeder Granules). Food was refreshed every few days and the nests were misted daily with rainwater from a garden spray bottle. Whenever available dead flies, earthworms, or caterpillars were also offered. It was not always obvious which food was being taken but between 1 September and 23 September these dead insects were taken inside the nests, so we assume the queen had a need for protein. The felt tile was lifted every few days and the queens were recorded when seen. The nests were also topped up with extra Narrow-headed Ant cocoons whenever they could be collected from a mixture of nests in Compartment 8.

On 4 August, queen B5 was seen and had lost her wings. This was surprising as when mated queens were previously kept in captivity in 2020 and 2023, they never lost their wings. By 30 August, at least six of the eight queens had lost their wings. This also coincided with when protein was accepted by the workers. In other ant species queens lose their wings after successful mating so hopefully these may be signs that the queens are preparing to lay eggs.

On 22 August, four of the nests were offered organic coconut flowerpots full of soil and chopped grass, topped with a felt tile. All four nests moved into these pots overnight (Figure 7). As this was successful on the 30 of August, the other four nests were dismantled carefully to check for queens and then offered similar pots. The ants seemed settled in these pots and made tunnels in the soil. However, after this date it was difficult to monitor the queens.

On 16 October, BV7 was connected by a plastic tube to a purpose-built plastic and plaster ant farm (Figure 9). The ants chose to move into this ant farm overnight. The old Tupperware and coconut were left connected so that they could move back. After a couple of days, the ants mostly seemed to clump in one cell in the plaster.

Figure 6: Mini nests set up in Tupperware containers with netting inserted in the lids.

Figure 7: Organic coconut fibre pots filled with soil which the mini nests readily moved into on 22 August 2024.

There was a plan to use *Formica fusca* cocoons as well as Narrow-headed Ants as this had been shown to work to boost numbers in a longer-term captive nest (Vulliamy, 2023). However, in practice these were more difficult to find and collect at the right time so only Narrow-headed Ants were used except in the nest kept by Stephen Carroll.

Stephen Carroll kept one nest in captivity in a vivarium plastic tank with netted lid, heat lamp, and similar substrate 'turret' of Purple Moor Grass, filled with loose peat-free compost and cut up grass fragments for thatch (Figure 8). In addition to Narrow-headed Ant cocoons, this nest was topped up with small numbers of *Formica fusca* cocoons on 23, 24, and 30 September. No teneral *Formica fusca* adults have yet been seen (as of January 2025).

Figure 8: Mini nest looked after by Stephen Carroll. *Formica fusca* cocoons were added to this nest in addition to Narrow-headed Ant cocoons.

John Walters took seven queens into captivity and kept mini nests in a similar arrangement to BV but in a south facing window without heat lamps. Four of these were released at Bovey Heathfield on 4 August 2024 and 21 August 2024. However, a few days later they had either been taken over by *Myrmeca sp.* And *Lasius sp.* or had vanished. These areas will continue to be checked in case the nests have moved. See **Error! Reference source not found.** for locations. The three remaining queens are still overwintering, two in plastic bug pots with net lids and one in a pre-cast "ant house" as described above. The queen in the ant house is believed to be within the thatch as seen in **Error! Reference source not found.**Figure 9.

Figure 9: 'Ant farms' with moulded plaster inside a Perspex box. There is access to an open area on the top of the plaster. A) BV7 showing the open accessible area on the top of the ant house, which is covered with a net. B) Nest BV7 connected to its original Tupperware mini nest by a tube. C) BV7 showing the ants are all clumped in one cell. It is assumed the queen is among them. D) JW3a with thatch that has been brought into a cell. It is assumed the queen is inside.

Table 6: Showing progress and notes on all mated queens taken into captivity (this does not include the first 4 taken by BV which died in July and August).

Mini nest	21st -30th Jul	3rd Aug	4th Aug	10th Aug	14th Aug	16th Aug	21st Aug	22nd Aug	22nd Aug	23rd Aug	30th Aug	30th Aug	30th Aug
B1	Q winged					Q lost wings		Offered coconut pot		Moved in to pot			
B3	Q winged					Q lost wings					Dismantled nest	Q lost wings	
B4	Q winged							Offered coconut pot	Q lost wings	Moved in to pot			
B5	Q winged		Q lost wings					Q no wings			Dismantled nest	Q not seen	
B6	Q winged					Q has wings		Offered coconut pot		Moved in to pot			
B7	Q winged										Dismantled nest	Q lost wings	
B9	Q winged				workers from B2 added			Offered coconut pot		Moved in to pot			protein taken
B10	Q winged										Dismantled nest	Q lost wings	
JW-3A	Q winged												
JW-41B	Q winged												
JW-100C	Q winged												
SC1	Q winged	Topped up cocoons +1	Dead workers found										
JW1	Q winged						Released SX82273 76460						
JW2	Q winged		Released to SX82111 76914	taken over by Myrmica sp.									
JW3	Q winged		Released to SX82122 76898	taken over by Lasisus sp.									
JW4	Q winged						Released SX82268 76447						

Mini nest	1st Sept		6th Sept	19 Sept	20 Sept	23rd Sept	24th and 3	16th Ovt	4th Dec	Current status			Queen last seen
B1	flies taken		cocoons accepted			Caterpillars accepted				Overwintering in coconut pot			16-Aug
B3	flies taken		cocoons accepted			Caterpillars accepted				Overwintering in coconut pot			30-Aug
B4	flies taken		cocoons accepted			Caterpillars accepted				Overwintering in coconut pot			22-Aug
B5			cocoons accepted			Caterpillars accepted				Overwintering in coconut pot			16-Aug
B6	flies taken		cocoons accepted							Overwintering in coconut pot			16-Aug
B7	flies taken		cocoons accepted		Q no wings	Caterpillars accepted		Moved to 'ant house'		overwintering in 'ant house'			20-Sep
B9			cocoons accepted			Caterpillars accepted				Overwintering in coconut pot			30th July
B10	flies taken		cocoons accepted			Caterpillars accepted				Overwintering in coconut pot			30th Aug
JW-3A										overwintering in 'ant house' within thatch			?
JW-41B									Q has wings	Overwintering in Bug Pot			4th Dec
JW-100C										Overwintering in Bug Pot			?
SC1						F.fusca coccoons added	F.fusca coccoons added			Overwintering in terrarium			4th Dec-wing visible
JW1				Nothing seen						Released			
JW2										Released			
JW3										Released			
JW4				Nothing seen						Released			

8. Acknowledgements

I would like to thank Stephen Carroll who has worked on the Narrow-headed Ant for many years and who volunteered to help with all of the fieldwork involved in this project in 2023 and 2024. This meant we achieved twice as much as we would otherwise have done. Stephen also did a full week each year of capturing queens unsociably early in the morning and providing invaluable advice on habitat management. Laura Krusin (Bug Life), also accompanied us on several field trips, found lots of nests and made sure all the paperwork ran smoothly. Other Buglife staff, volunteers, and Devon County Council ecologists also helped us with our main nest census of Compartment 5.

I would also like to thank Pete Burgess who located and tiled ant nests early in the season in his free time as well as regularly 'gardening' around ant nests to let the sun in. This made our job much easier when we began our surveys. John Walters volunteered to collect mated queens and look after them at home as well as attempting releases and keeping an eye out for ants at Bovey Heathfield. We are also very grateful to all of the South Devon and Dartmoor Volunteer team who came on several scrub bashing visits to keep the site suitable for Narrow-headed Ants. Finally thank you to Andrew Ross who keeps an eye on the Teigngrace ant slope and nurtured our most successful translocated nest at Teigngrace Meadow until it seems big and happy enough to look after itself.

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Appendix 1: Nest census data

COMPARTMENT 8 and A38 verge			
Count	**Nest Name**	GPS (Garmin)	**2024 Date recorded**
	Road verge A38 slip road adj cmpt 8 (National Highways) survey records 17 June 2024 (and 2 July 202		
1	**24/v8 x 8 (181)**	SX 83977 76583	
2	**24/v8 x 7 a**	SX 84021 76651	
3	**24/v8 x 7 b**	SX 84028 76663	
4	**24/v8 x 6**	SX 84039 76682	
5	**24/v8 x 5**	SX 84050 76701	
6	**24/v8 x 4**	SX 84071 76739	
7	**24/v8 x 3**	SX 84076 76744	
8	**24/v/8 x 2**	SX 84078 76752	
9	**24/v8/ x 1 (187)**	SX 84094 76780	
10	**3**	SX 84022 76812	25/06/2024
11	**3a**	SX 84021 76808	17/06/2024
12	**3b**	SX 84019 76802	17/06/2024
13	**3c**	SX 84019 76803	17/06/2024
14	**5**	SX 84022 76802	17/06/2024
16	**5a**	SX 84021 76801	17/06/2024
17	**5b**	SX 84025 76798	17/06/2024
18	**5c**	SX 84025 76798	
19	**5d**	SX 84025 76798	
20	**7**	SX 84017 76802	17/06/2024
21	**7b**	SX 84017 76797	17/06/2024
22	**7c**	SX 84017 76797	17/06/2024
23	**8a**	SX 84003 76791	17/06/2024
24	**8b**	SX 84001 76793	25/06/2024
25	**8**	SX 84001 76794	17/06/2024
26	**12**	SX 84016 76751	02/07/2024
27	**22**	SX 83976 76690	
28	**24**	SX 83979 76692	18/05/2024
29	**26**	SX 83986 76665	19/05/2024
30	**26**	SX 83986 76666	
31	**26b**	SX 83983 76660	10/06/2024
32	**26c**	SX 83986 76667	
33	**30**	SX 83971 76655	18/05/2024
34	**31**	SX 83954 76656	02/07/2024
35	**31a**	SX 83955 76657	19/05/2024
36	**32**	SX 83953 76653	14/10/2024
37	**36**	SX 83963 76607	10/06/2024
38	**23/81**	SX 83948 76627	10/06/2024
39	**39**	SX 83948 76635	18/05/2024
40	**41**	SX 83949 76658	19/05/2024
41	**42**	SX 83934 76672	18/05/2024
42	**48 (numbered old?)**	SX 83960 76701	
43	**55**	SX 83940 76672	18/05/2024
44	**56**	SX 83938 76677	
45	**55b (or 24/2)**	SX 83943 76674	19/05/2024
46	**55c**	SX 83943 76675	
47	**57 (actually 70)**	SX 83919 76676	
48	**58 (23/30)**	SX 83916 76674	02/07/2024
49	**60 (labelled 62 or 76)**	SX 83909 76707	
50	**62b?**	SX 83901 76726	
51	**62**	SX 83900 76723	
52	**64**	SX 83902 76751	
53	**70a**	83912 76701	
54	**71**	SX 83914 76750	02/07/2024
55	**95**	SX 83982 76660	
56	**100**	SX 83936 76689	02/07/2024
57	**116 (24/15)**	SX 83948 76699	
58	**117b**	SX 83953 76776	
59	**117(23/3)**	SX 83955 76754	06/07/2024
60	**130**	SX 83986 76663	19/05/2024
61	**133 (24/12)**	SX 8395 7660	
62	**135 (caned 24/15)**	SX 83951 76698	

63	**140b**	SX 83952 76778	
64	**143b**	**SX 83934 76776**	
65	**140**	SX 83952 76776	
66	**142**	SX 83943 76777	02/07/2024
67	**143**	**SX 83934 76775**	
68	**175**	SX 84017 76673	
69	**176**	SX 84021 76774	02/07/2024
70	**177b New trough nest**	SX 83904 76728	14/10/2024
71	**195**	SX 83982 76700	25/06/2024
72	**204**	SX 83982 76643	10/06/2024
73	**23/2**	SX 83945 76734	19/05/2024
74	**23/8**	SX 83984 76644	10/06/2024
75	**23/9**	SX 83993 76807	17/06/2024
76	**23/100**	SX 83998 76801	17/06/2024
77	**23/26?**	SX 83910 76701	
78	**23/38**	SX 84008 76795	17/06/2024
79	**23/41**	SX 84016 76794	17/06/2024
80	**23/10**	SX 84030 76796	17/06/2024
81	**23/102**	SX 84033 76784	18/05/2024
82	**24/1**	SX 83964 76680	18/05/2024
83	**24/3**	SX 83936 76656	19/05/2024
84	**24/4**	SX 84022 76801	17/06/2024
85	**24/5**	SX 83971 76760	
86	**24/6**	SX 83904 76742	02/07/2024
87	**24/7**	SX 83910 76745	02/07/2024
88	**24/8**	SX 83955 76653	02/07/2024
89	**24/11**	SX 83970 76650	06/07/2024
90	**24/13**	SX 83941 76720	13/07/2024
91	**24/14a**	SX 83964 76702	23/07/2024
92	**24/14b**	SX 83964 76702	23/07/2024
93	**24/16**	SX 83967 76692	27/07/2024
94	**24/17-old trough nest**	SX 83895 76756	
95	**24/18**	SX 83967 76691	
96	**24/20**	SX 83951 76653	
97	**24/20 double**	SX 84106 76743	
98	**24/21**	SX 83949 76665	
99	**24/22**	SX 83913 76627	
100	**24/22b**	SX 83913 76628	
101	**24/23**	SX 83947 76657	10/06/2024
102	**A38/v/new**	SX 84028 76666	02/07/2024
103	**Big birch**	SX 83955 76635	18/05/2024
104	**Countryfile**	SX 83953 76758	25/06/2024
105	**24/24**	SX 83971 76645	25/06/2024
106	**24/25 abelled new?)**	SX 83982 76648	25/06/2024
107	**166(new?)**	SX 83983 76772	
108	**Nightjar**	SX 83962 76659	18/05/2024
	Total nests	108	
	Inactive nests		
	27	SX 83962 76666	18/05/2024
	120	SX 84005 76763	18/05/2024
	15a		02/07/2024
	143b		02/07/2024
	23/7	SX 83978 76629	10/06/2024
	23/79	SX 83973 76617	10/06/2024
	23/99		
	43	SX 83948 76666	19/05/2024
	Fusca	SX83944 76887	
	NB some C8 24/nests numbers missing as we used the numbers in C5 then changed them.		

COMPARTMENTS 5,6,7 and 3 and B3334 verge			
		Nests logged Mon 16 Sept, Tues 24 Sept, Mon 30 Sept, Mon 7 Oct, Mon 14 C	
		2024 nest number or original if known	**Grid ref (from handheld GI**
	count	**(C5 SE) Southern section by gate, eastern side; burnt swaled area 2024 to pyl**	
C5 SE	1	24/5/1	SX 83942 76898
C5 SE	2	24/5/2	SX 83920 76906
C5 SE	3	24/5/3a	SX 83924 76910
C5 SE	4	24/5/3b	SX 83926 76910
C5 SE	5	24/5/4	SX 83902 76921
C5 SE	6	24/5/5a	SX 83876 76934
C5 SE	7	24/5/5b	SX 83871 76938
C5 SE	8	24/5/6	SX 83867 76938
C5 SE	9	24/5/7a	SX 83881 76943
C5 SE	10	24/5/7b	SX 83882 76944
C5 SE	11	24/5/8	SX 83887 76954
C5 SE	12	24/5/9a	SX 83886 76964
C5 SE	13	24/5/9b	SX 83886 76964
C5 SE	14	24/5/10	SX 83884 76967
C5 SE	15	24/5/11	SX 83878 76954
C5 SE	16	24/5/12	SX 83863 76966
C5 SE	17	24/5/13	SX 83853 76987
C5 SE	18	24/5/14	SX 83877 76986
C5 SE	19	24/5/15	SX 83869 76990
C5 SE	20	24/5/16	SX 83853 76995
C5 SE	21	24/5/17 (156)	SX 83902 77043
C5 SE	22	24/5/22	SX 88702 77421
		C6 S Jackies nest section	
C6 S	23	24/5/20	SX 83798 77151
C6 S	24	24/5/21	SX 88786 77242
C6 S	25	24/5/18 (159)	SX 83818 77078
C6 S	26	24/5/19 (158)	SX 83787 77118
		(C6 N) North east/ connecting to Lovely tussocks	
C6 N	27	23/1 old no. retained	SX 83654 77414
C6 N	28	23/2 old no. retained	SX 83655 77411
C6 N	29	23/3 old no. retained	SX 83663 77398
		23/4/a & b	GONE – nr 23/1 and 23/3
C6 N	30	23/5 / 'ride nest'	SX 83674 77410
		Northernmost section – by and beyond fenced off pond	
C6 N	31	24/5/23	SX 83656 77435
C6N	32	24/5/24	SX 83636 77441
C6 N	33	24/5/25a	SX 83633 77445
C6N	34	24/5/25b	SX 83633 77445
C6 N	35	24/5/26	SX 83590 77466
C6N	36	24/5/27	SX 83592 77469
C6 N	37	24/5/28	SX 83589 77476
C6N	38	24/5/29	SX 83583 77476
C6 N	39	24/5/30	SX 83583 77475
C6N	40	24/5/31a	SX 83580 77479
C6 N	41	24/5/31b	SX 83581 77480
C6N	42	24/5/32	SX 83585 77490
C6 N	43	24/5/33	SX 83586 77491
C6N	44	24/5/34	SX 83591 77494
C6 N	45	24/5/35	SX 83643 77488
C6N	46	24/5/36	SX 83579 77497
C6 N	47	24/5/57	SX 83569 77480
		NOTE 1: fusca nests in this area	
C6 N	48		SX 83624 77447
C6N	49		SX 83572 77490
C6 N	50		SX 83576 77501
		NOTE 2: large F. rufa nest not too far away on other side of fence by fence bou	
			SX 83535 77515

		By birch copse & opposite past translocated nest 87; 'Paul's nest(s)'	
C5 SW	51	24/5/37	SX 83792 76938
C5 SW	52	24/5/38	SX 83789 76944
C5 SW	53	24/5/39	SX 83766 76949
C5 SW		**(C5 W) Other nests in subcmpts/stands south west of cmpt 5 – flagged 24/09**	
C5 SW	54	24/5/40	SX 83754 76935
C5 SW	55	24/5/41	SX 83753 76938
C5 SW	56	24/5/42 (155)	SX 83714 76903
C5 SW	57	24/5/43	SX 83736 76886
C5 SW	58	24/5/44	SX 83731 76875
C5 SW		**Second most westerly stand around nest(s) originally numbered 154 (these r**	
C5 SW	59	24/5/45 a	SX 83764 76882
C5 SW	60	b	SX 83764 76883
C5 SW	61	24/5/46	SX 83789 76868
		CHECK nests around cmpt 5 SX 83747 77002 and any match with 2023 record	
		(C5 E) South of cmpt 5, behind/west of ponds – flagged 16/09/24, numbered	
C5 SE	62	24/5/47 (86a/b [T])	SX 83852 76905
C5 SE	63	24/5/48 a	SX 83855 76917
C5 SE	64	B	SX 83855 76917
C5 SE	65	C	SX 83855 76917
C5 SE	66	24/5/49	SX 83849 76949
C5 SE	67	24/5/50	SX 83830 76940
C5 SE	68	24/5/51	SX 83882 76913
C5 SE	69	24/5/52 a	SX 83892 76906
C5 SE	70	24/5/52 b	
C5 SE	71	24/5/53	SX 83899 76902
C5 SE	72	24/5/54	SX 83905 76901
C5 SE	73	24/5/55	SX 83914 76878
C5 SE	74	24/5/56 (85)	SX 83903 76874

		Compartment 7 ('ant glade') flagged but not numbered 30/09. Bramble grown u	
C7		83 (original large main nest 83)	SX 83825 76799
C7		83 b	SX 83833 76798
C7		83 c INACTIVE	
C7		83 satellite nest'	SX 83824 76796
C7		83 d INACTIVE	
C7		'stump nest'	SX 83824 76805
C7		83 e (2-3 nest structures) INACTIVE	
C7		'hazel nest(s)'	SX 83819 76800
C7		24/7/1	SX 83843 76765
C7		24/7/2	SX 83836 76792
		Compartment 1	
C1		24/1/ x (174 [a])	83500 77656
C1		(174b)	
		Road verge B3344 adj cmpt 1 (Devon County Council?) survey records 27 May 202	
		Check grid refs and possibly mark with canes	
		New?	?SX 83387 77672? (check g
V1		23 C1 I	SX 83434 77662
V1		23 C1 H	SX 83466 77655
V1		24 C1 E	SX 83491 77649
V1		25 C1 Da	SX 83509 77645
V1		25 C1 Db	SX 83509 77645
		Compartment 3	
		Marked flagged	
C3		23/3/1	
C3		24/3/1 a (98)	SX 83846 77566
C3		24/3/1 b (98)	SX 83847 77566
		Considering nest above and nests on adjacent road verge, worth checking other op	
		Road verge B3344 adj cmpt 3 (Devon County Council 'special verge'). All marked	
V3		24/v3/5	SX 83886 77545
V3		24/v3/5 b	SX 83886 77547
V3		24/v3/4	SX 83891 77540
V3		24/v3/3	SX 83905 77533
V3		24/v3/2	SX 83909 77521
V3		24/v3/1	SX 83949 77515
V3		24/v3/6	SX 84026 77483
		24/v3/6b	SX 84028 76666
		Compartment 4	
		grass glade north of path. East of Dunley Cross opposite cmpt 3 – exsecta nests all	
C4		24/4/1	SX 83904 77497
C5		24/4/2	SX 83879 77518
C6		24/4/3	SX 83887 77504
C7		24/4/4	SX 83887 77518
		grass glade north of path. West of Dunley Cross opposite cmpt 1, nr newt pond – n	
		Rufa nest	SX 83556 77579
		Rufa nest	SX 83586 77570
		Rufa nest	
		Cmpt 5 F. fusca nests (not flagged, but marked with wool)	
		In or around southern area in from gate / burnt swaled area and ponds	
F			SX 83907 76887
F			SX 83894 76938
F			SX 83892 76927
F			SX 83919 76906
F			SX 83900 76916
F			SX 83855 76994
F			SX 83852 76908
F			SX 83779 77113
		F. fusca nests in northernmost subcmpt of cmpt 5 (same as already listed above):	
F			SX 83624 77447
F			SX 83572 77490
F			SX 83576 77501

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