Wyre Forest Study Group

Wood Ants in Wyre

DAVE BARNETT

Wood Ants, specifically the Southern Wood Ant *Formica rufa*, are everywhere in the Wyre Forest. Or are they? A question that has puzzled me since searching for the Shining Guest Ant *Formicoxenus nitidulus*, a tiny ant which cohabits the Wood Ant nest with the males often seen emerging from the nest in autumn. So, in the autumn of 2023 I began searching for and recording the location of Wood Ant nests, but had no success in finding the Shining Guest Ant until a year later. On 9th August 2024, John and Denise Bingham led the Wyre Forest Study Group (WFSG) to a nest in Earnwood Coppice where we saw Shining Guest Ants fleetingly appearing amongst the Wood Ants on the nest surface. A week later I found the same tiny ants on a Wood Ant's nest elsewhere and was thrilled to submit my first Shining Guest Ant record. When I began exploring past records of *Formica rufa* on iRecord I noticed many records by Paul Wilson in 2010. He had done an extensive study of Wood Ant nest distribution in five woodland rides in Wyre Forest for his MSc dissertation (Wilson, 2010) and wrote an Article in the WFSG REVIEW (Wilson 2011). His 2010 records have provided a useful dataset for comparison with the same area today, fifteen years later.

Locating and recording *Formica rufa* nests during 2024 and 2025 has involved many excursions with friends and the Wyre Forest Study Group, during which time we have added 500 records. I thank all those who have added records and especially to John and Denise Bingham who have been very active recording Wood Ants. Rosemary Winnall and Mike Averill, amongst others, have added many records to iRecord, which has enabled us to identify areas potentially devoid of nests, and hopefully confirm the absence or presence of nests, and to visit old sites to confirm and record long existing nests, and new ones not recorded.

Figure 1 shows the location of, and provides a good indication of the distribution of, Wood Ants in Wyre today. The concentration of nests on the northern, Shropshire, side of Dowles Brook highlights their preference for sunny, south facing slopes. On the opposite side of the Dowles Brook, in New Parks, Town Coppice and Hitterhill Coppice, few nests exist. The requirement for sunshine early in the year when the ants are seen massing is essential for raising the nest temperature (insolation) and establishing the first, crucial 'winter' brood before the leaf canopy has formed.

Ribbesford Woods

For me, a breakthrough came after reading the excellent book by Jenni Stockan and Elva Robinson '*Wood ant Ecology and Conservation*'. It provided a fresh insight, into the complex world of Wood Ant biology, in particular, how they reproduce and distribute.

On 10th December 2024 a successful visit was made to Ribbesford Woods where a very large

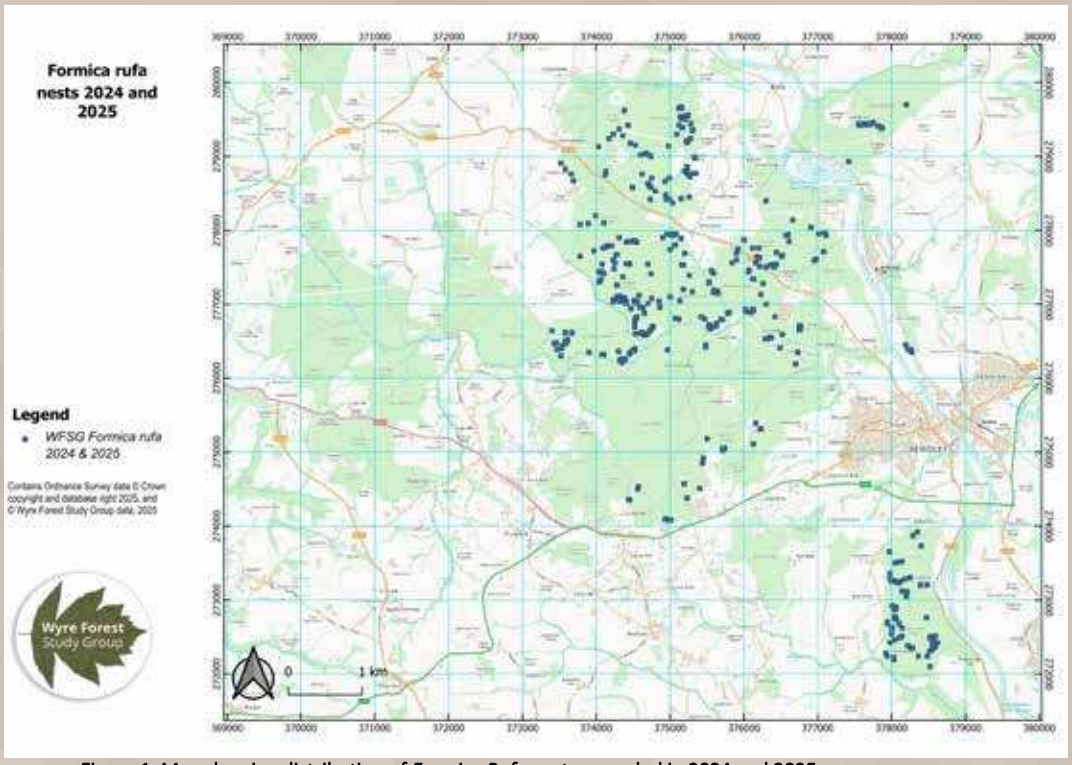


Figure 1. Map showing distribution of *Formica Rufa* nests recorded in 2024 and 2025.

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nest, recorded by Rosemary Winnall in 2023, was located (Figure 2). The photograph shows Dave Howarth and myself standing next to the nest. The second photo (Figure 3) shows a clearing nearby (SO780729) where we found many small nests. This was a particularly special moment, as here was an example of a colony spreading from a long-established large natal nest by budding. The future of the extended colony will be interesting. Forestry England confirmed the area was cleared of Larch in October 2023 and replanted with various broad-leaved saplings 2024 as part of their conservation programme. The growth of the young trees, and undergrowth could shade the young nests before they become fully established. Without the protection of trees, they are more exposed to the elements and lose the nearby aphid honeydew food source from the trees, having to forage much further and expend unaffordable energy.



Figure 2. Large *Formica rufa* nest in Ribbesford Woods. Peter Barnett



Figure 3. Clearing in Ribbesford Woods with several smaller nests. Dave Barnett

It is not yet established if any of the nests were there before the Larch was cleared. The position of the nests has been recorded and is being monitored.

Conservation niche

The Wyre Forest is nationally important for the conservation of *Formica rufa* and is regarded as one of the key indicator species of ancient woodland. Further west and north into Wales it is replaced by another wood ant species, the Northern Wood Ant, also known as the Hairy Wood Ant *Formica lugubris* which can be found north of Clun in Blakeridge Woods, and on the Stiperstones. If there is any doubt about the identification of the species a microscopic examination of collected specimens must be made to confirm which species is present, as they all look identical in the field. Wyre specimens have repeatedly been checked, and we are confident the Wyre Forest wood ant nests, which are formed from mounds of needles or organic litter, are *Formica rufa*. This has made recording easier. A photograph of the nest and an eight-figure grid reference being acceptable for verification and of sufficient accuracy to locate in the future. Over winter is a good time to make records as even if the ants are inactive the nest can be recorded.

Wood Ant distribution in Wyre

The big question: where is *Formica rufa* in Wyre today can only be answered by recording the whole forest, the presence of ants, and active nests, but also where they are not found, which is impossible. The best we can do is to continue recording, and to use old records to show where we should be looking if records are absent. iRecord has records since 1946. Figure 4 was compiled from screen shots on iRecord, showing older records in blue (pre-2022) and later records (2022 to 2024) in red. The smallest squares have an 8 figure grid reference, indicating an area 10 x 10m which are difficult to pick out; the slightly larger squares are 6 figure grid references, 100 x 100m; and the largest squares 4 figure grid references, 1 x 1 km. I assume that all records are accurately recorded.

Locations recorded today are determined by GPS, or by phone app. The most reliable scale seems to be an 8-figure grid reference, with 10-figure being too unreliable, and 6-figure insufficiently accurate to locate the same nest, or group of nests later. Records of a survey by Paul Wilson in 2010, along

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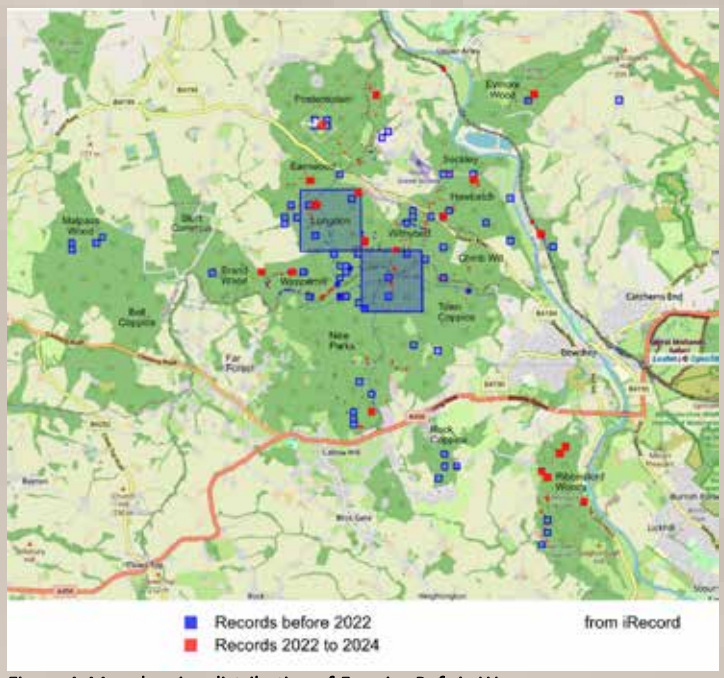


Figure 4. Map showing distribution of *Formica Rufa* in Wyre.

four rides on the Shropshire side of Dowles Brook, are available to 8-figure accuracy for 10 x 10m quadrats. This has enabled us to revisit the same locations to compare the nests. We are indebted to the Worcestershire Biological Record Centre (WBRC) for providing these records which predate the use of iRecord (before 2012). The location of anecdotal records such as Norman Hickin's count of 35 nests along Dowles in 1965 we can only guess at.

Wyre consists of fragmented woodland separated by farmland, roads, rivers and built-up areas, which prevent the free spread of Wood Ants by budding, and where colonies exist, they have likely been there for, maybe, hundreds of years surviving in isolation from the main Wyre Forest block. Ribbesford Woods is an example of a healthy population separated from the main part of Wyre by Bewdley town, with many nests distributed widely throughout the woodland. In Eymore Wood, across the River Severn, there are just a few nests, and its future seems less certain. In Eymore Wood the small community of nests were visited in May 2024. Some active nests were found along the edge of a path, but others in an adjacent cleared area appeared abandoned. However, all may not be lost. With support from the healthy nests, fresh queens and workers could reoccupy and rebuild the old nests. This would be a good example of the beneficial interaction between a group of socially interlinked nests, termed 'polydomy'.

Wood ants outside Wyre

Hickin (1971) quoted Collingwood 1955, '*The overall picture is one of decline and extinction in smaller woodlands of the region (The South Midlands), whilst the species continues in great abundance in parts of the larger woodlands*'. This could be true today.

The Wyre Forest is a stronghold for Wood Ants but finding them elsewhere is challenging. A handful of records from outlying woods appear on iRecord. Shrawley Woods was recorded by John Bingham 2012, and Ankerdine Hill by Dave Scott 1982 and Harry Green 2003, I visited both sites in 2024 and didn't find any nests. This was worrying and they should be revisited. If populations are extinct, they are very unlikely to recolonise. Large ancient woods are the most likely places to find ant nests. Small woodlands have not fared well, often surrounded by farmland, the canopy too close to the field and the trees allowed to mature creating too much shade for nests to survive.

Further afield, another species, the Hairy Wood Ant *Formica lugubris* can be found. It is not found in Wyre but can easily be mistaken for *Formica rufa*. It is mound building and almost identical to *Formica rufa* requiring microscopic examination for hairs around the back of the head, and minute hairs on the eye surface. Any new areas, and even in areas where *Formica rufa* exists, should be checked. To satisfy my curiosity I visited Blakeridge Wood, north of Clun on 8th October 2024 and found several healthy nests where *Formica lugubris* had been previously recorded. None have

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been found in Wyre so far, and are only known further West in Wales, or in the North of England.

Biology

The spread of colonies involves two distribution processes, budding and temporary social parasitism. Both processes only allow spread over short distances a few kilometres at the most. Distant colonies will not have reached there in recent times, but perhaps long ago when woodland was better connected.

An understanding of *Formica rufa* biology helps to understand how the colony disperses. A healthy nest must contain at least fertile queens and workers (Figure 5). The brood is raised by the workers who tend to the eggs, feed the larvae and tend the pupae until they hatch. The nest temperature is maintained between 25 and 30ºC throughout the season. The queen lays her first batch of eggs (Winter brood) as early as possible in Spring when the nest has warmed. These emerge as winged sexuals, males (Figure 6), and gynes (reproductive females) in May or June when mating takes place. Subsequent summer broods only develop as workers.

In polygynous nests (multiple queens), mating normally takes place on the nest, the queen often shedding her wings before mating, and remaining in the natal nest, possibly leaving later on foot to occupy another nest, or form a new nest by budding. If she remains winged, she could fly and occupy a nest elsewhere, or that of a host species to form a new nest by temporary social parasitism, a process more likely to happen in species such as *Formica lugubris* which have monogynous (single queen) nests, and where a nuptial flight is performed before shedding their wings (Stockan and Robinson, 2016).

An active nest may have 100,000 or more workers, but in order to survive it must have at least one fertile queen. The future depending on a heathy



Figure 5. Queen and workers on a nest. Rosemary Winnall



Figure 6. Winged males in New Parks. Rosemary Winnall

queen laying eggs continuously. Without a queen the nest becomes moribund, the workers are not being replaced and eventually die out. Workers can live for up to three years and the queen for five years or more. A large nest may have many queens which are capable of dispersal.

Budding

Budding seems to be a common process by which *Formica rufa* replicates in the UK. This is possible where multiple queens exist in the same nest. One or more queens leave the natal nest with a small force of workers to establish a new nest. The assistance of the workers is essential as the queen is incapable of raising her brood alone, her sole function being to lay eggs. When a suitable place is found, which could be an abandoned nest, satellite nest with accepting workers, or somewhere providing warmth and protection, a fallen branch, tree stump, or other refuge, the queen lays her eggs, and the workers raise the brood before nest building. Budding has the most chance of success as it enables the spread of the colony over small distances, up to 100m. The conditions need be suitable. Warm sunlit areas being preferred, with a lack of competition, predation or rivalry from other colonies. Budding can create large numbers of foundling nests in close proximity (polydomy), and within the colony's territory, feeding and foraging area.

This process can be observed in Wyre on any open ground lacking bracken or dense coppice regrowth, for example places where there has been recent tree felling, thinning, or coppicing. Small nests close to each other are likely to be the same colony spread by budding from a larger natal nest nearby. The future of these nests will depend on the survival and support of the interlinked nests.

In 2012, Rosemary Winnall and John Bingham were examining the occupants of a *Formica rufa* nest in Postensplain (SO740791). There, they noted there

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were several queens in the same nest, showing that multiple queen nests (polygynous) exist in Wyre.

Rivalry between other *Formica rufa* colonies can be intense, fighting to the death. Wood Ants recognise each other by scent, approaching each other and touching antennae, the result being acceptance or combat. Budding colonies can spread and create a territory of interlinked nests. The full territory is defended and will include the area where they forage for food, especially any nearby trees where they collect honeydew from aphids in the canopy.

Temporary Social Parasitism

Donisthorpe 1927 writes: '*after the marriage flight large numbers of females are received back into the parent nest or other nests in the vicinity; some find nests of another race, or of their own species elsewhere, whilst a considerably smaller number having flown to rufa-free ground endeavour to enter a nest of Formica fusca*'.

The theory of temporary social parasitism explains how *Formica rufa* can establish nests far afield from her own natal nest. On arrival she will find a suitable host such as *Formica fusca*, an ant commonly found on open ground with small nests under stones. She enters the nest and, if accepted by the occupants, usurps and kills the queen. The orphaned *Formica fusca* workers help raise the first brood and progeny of the parasitic queen. Over time the nest will become a pure colony of the parasitic queen, in this case *Formica rufa*.

We have yet to see temporary social parasitism in Wyre. *Formica fusca* is common in open and heathland areas and where there are lone foundling Wood Ant nests we could examine the contents. The presence of mixed *F. rufa* and *F. fusca* workers might be proof of this.

Wimperhill Wood, Wilson 2010 and today

Wimperhill Wood is an appropriate area within Wyre Forest to compare old records with recent records. It is the area where Norman Hickin counted 35 nests along the Dowles Brook and where Andrew Girling and Paul Wilson conducted their studies (Wilson, 2011). Figure 7 shows Paul Wilson's records 2010 in blue, the recent records (to 2025) in red. The conifer areas are traced from a satellite image to show the south facing edges of the conifer blocks. The red dots are all recent records for the whole area and shows areas where *Formica rufa* is absent, in particular the most shaded areas, such as the conifer stands and Beech dominated Brand Wood.

Wilson 2010 surveyed the three rides for his MSc, Figure 7. Ride 1 (brook) had just been cleared in the winter of 2009/10, Ride 3 cleared five years previously, and Ride 4 cleared some time before that. He recorded 132 active nests from 79

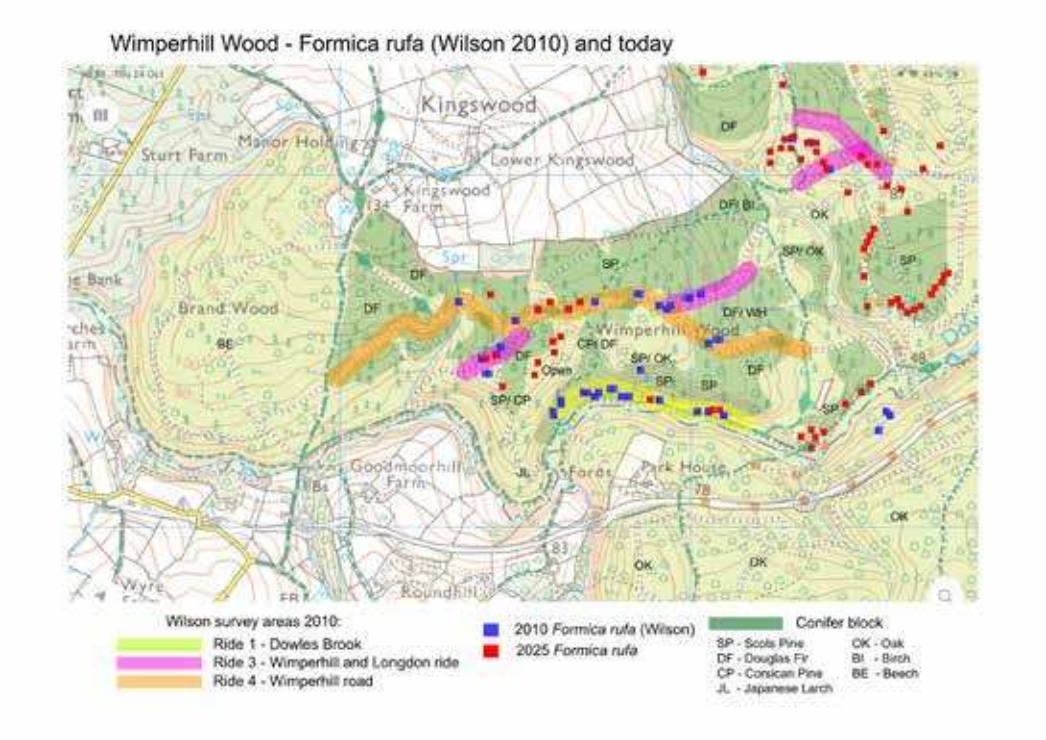


Figure 7. Distribution of *Formica rufa* recorded by Wilson in 2010 and the author in 2025 in Wimperhill Wood.

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quadrats showing an abundance of nests. The 2010 survey shows a clear spread of nests into the newly opened rides, attracted to the sunny, northern side of the rides, and lack of ground layer regrowth competition after clearing. Today, there are few nests on the rides, but larger nests can be found confined to the inside edge of the tree line, away from the thick bracken and other competing vegetation on the ride. These are probably the same nests that were recorded in 2010. A photo in Wilson (2011) shows nests on the bank above Dowles Brook standing proud, on the cleared ground below the pines lacking any ground layer vegetation.

There is an abundance of red dots in an 'Open' area today (Figure 7). This was cleared around six years ago. The nests are on the Southeast side of a Douglas Fir plantation. The newly formed colony may well have spread from a large well-established nest nearby under the conifers. Elsewhere, few nests exist in open ground, preferring to hug the tree line where there is less bracken and scrub. Different ways of controlling the bracken are being tried by Forestry England. The upper ride photo 2024 (Figure 8) shows a very large nest, flattened after scalping and mowing. The same nest was not found in 2025; after losing its thatch it may not have survived the winter rains.

Along the lower ride towards the experimental pool, many nests exist happily under Scots Pine (Figure 9). These long-established nests were revisited in 2024 and 2025 and appear quite healthy. They overlook the brook, high on a south facing bank, warmed by the spring sunshine and protected from the winter rain and excessive heat of summer sunshine. These well-established nests, and others elsewhere in the forest under trees should continue to survive as long as they are left undisturbed, with an adequate supply of food (honeydew from aphids and other prey) and adequate sunlight. Nests inside rides could



Figure 9. Nest on lower ride, Wimperhill, Dave Barnett

be failing, either being too small and succumbing to exposure to the weather, human activity, and shading by vegetation, or destroyed by mowing.

Chamberline Wood - broad-leaf woodland

A visit was made to Chamberline wood on 22nd November 2024 to see if we could find any nests under the mature Oak canopy. Some isolated nests were found along the ridge where the southerly slope descends more steeply to the brook. The example (Figure 10) is a large nest built around a branch on the ground, the nest surface is quite flat and showing disturbance with holes, but the nest was active with ants. This is an established nest, surviving next to a Birch glade, permitting the sunlight through. Wood Ants do survive despite being shaded in broad-leaved woodland, maybe not in large numbers, but when the situation favours, for example in a clearing, thinned area or south facing view, catching the sunlight before the leaves unfold and the canopy closes in.

After 1930, large areas of Wyre were planted with conifer. These stands have such dense shading that few, if any nests can be found within them. No nests are found under Beech for the same reason. Brand Wood, to the west of Wimperhill, is largely Beech and has no nests.



Figure 8. Large nest on upper ride, Dave Barnett



Figure 9. Nest under Scots Pine (lower ride). Dave Barnett

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Paul Wilson – method and conclusions

Paul Wilson's dissertation (Wilson, 2010) was important to illustrate the method and challenge of interpreting the data. Using 10m x 10m quadrats was a practical size for recording nests and is the same size as the eight-figure grid square record. There can be a significant number of nests in a single quadrat, especially the smaller budded nests. The diagram at Figure 11 shows a large nest close to the tree line where they are most likely to be found. The smaller foundling nests are further out and into the ride.

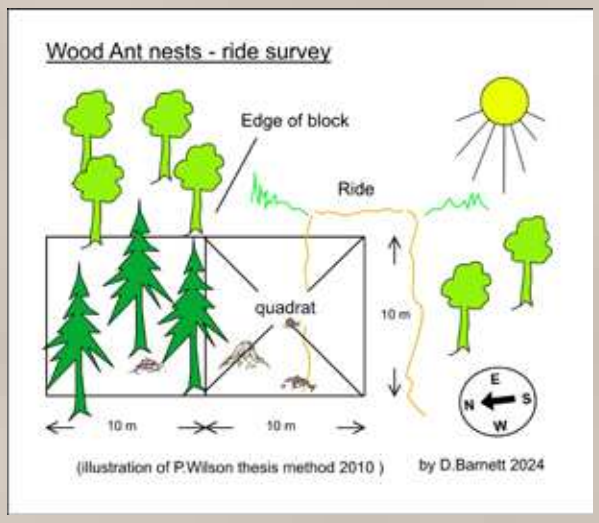


Figure 11. Diagram showing layout of Paul Wilson's quadrats, 2010. (Wilson, 2010) Dave Barnett

For his study, twenty 10 x 10m quadrats were chosen at random from each ride. They were studied in pairs joining along the woodland edge, one quadrat in the ride, the other in the woodland. The nests were counted, measured and statistically compared with factors such as shade, temperature and tree type, and the position in the woodland or in the ride.

Wood Ants of Wyre (Wilson, 2011) summarises his study in the REVIEW. Some conclusions from his dissertation are useful; he found 48% nests on the edge of the canopy and 49% in the open ride. Only 3% of nests were found in woodland away from the ride. Only four woodland nests were found in 78 quadrats. Nest shading above 30% was usually caused by bracken.

Conclusions and ideas for further research

1. Fragmentation of woodlands has left remaining colonies isolated and unable to interact. These should be monitored by regular recording.
2. Shading is a major factor in the distribution of Wood Ants in Wyre. Since the 1930s large stands of Oak, previously coppiced, have been left to mature. Areas of Beech and conifer stands planted in the 1940s and 1960s now shade large areas of the forest; Wood Ants are absent from these areas. Regular recording of areas without records should be carried out.
3. Nests are most often found along the Southern edge of woodland blocks. These are often larger and older 'natal' nests and are essential for the colony to spread by budding into new areas. Larger nests are most likely to have a supply of queens and workers surplus to their requirements who can move out and establish a new nest nearby.
4. Protecting nests, preventing damage, and increasing the sunlight by tree thinning and control of the undergrowth are essential to prevent loss of natal nests, and the survival and spread of colonies.
5. We need to understand what effect climate and weather is having on Wood Ants. The maximum shade that can be tolerated, protection by trees and overall effect of the ecology and environment, locally.
6. The effect of coppicing and felling (which appears to be essential to provide a constant supply of new, undergrowth free, sunlit areas for the spread of new nests) needs to be understood over an extended time frame.
7. A long-term study of the Wood ant colonisation process, by budding, or temporary social parasitism in newly coppiced or cleared areas over several years will help us better understand how foundling nests progress or fail as the habitat changes over time. Records of *Formica fusca* in open areas for example.
8. What effect do other species have on the spread or survival of *Formica rufa*. Ant species such as *Formica fusca* and *Formica sanguinea*, and which types of aphid and other food sources are preferred.

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