

## WOOD ANT ACTION PLAN

### SPECIES PROFILE

**Scientific Names:** *Formica aquilonia* Scottish Wood Ant

**UK Biodiversity Status:** Priority Species.

**Relevant Priority Habitats:** Native Pinewood, Upland Oakwood.

**Statutory Protection:** None.

**Only the Scottish wood ant has been recorded in the Stirling Council Area. However the hairy wood ant has been recorded just outside the area on an island in Loch Lomond. It is possible that further survey will uncover populations of this species in our area.**

### BIODIVERSITY CONTEXT

In the UK, the Scottish wood ant is only found in Scotland and one site in Northern Ireland. In Europe it is found from the Alps to Siberia and from Northern Italy to Arctic Norway. This species is classified as Nationally Scarce meaning it has been recorded in 16 to 100, 10 x 10 kilometre squares in GB.

There is a UK Biodiversity Action Plan for the Scottish wood ant. Its objectives are:

- Maintain the natural range of this ant in the UK.
- Maintain populations at all known sites.

In the UK, the hairy wood ant's distribution extends from the Highlands through the upland areas of northern England as far south as mid-Wales. It is also found across the northern Palearctic and in cooler mountainous regions of central and southern Europe and Asia. In much of its range this species is reported as threatened by disturbance, development and woodland management. In several European countries (not the UK) hairy wood ants are protected by law and in others they are included in national Red Data books.

There is a UK Biodiversity Species Statement for the hairy wood ant. Its objective is:

- Maintain the range of the hairy wood ant.

### OBJECTIVES

**Objective 1** Maintain the population of wood ants in the Stirling Council Area.

Target By 2003, collate all known records of wood ants in the Stirling Council Area.

Target By 2004, ensure that woodland managers in areas where these ants are currently found are aware of their habitat requirements.

**Objective 2 Expand the population of the Scottish wood ant in the Stirling Council Area.**

Target Continue the expansion of suitable woodland cover where wood ants are found Stirling Council Area.

## CURRENT STATUS AND DISTRIBUTION

Wood ants are strongly associated with areas of semi-natural woodland (e.g. Drumore wood SSSI, the woods at the Pass of Leny and Coille Choire Cuilc SSSI), either in these woodlands or close to them. This may be more to do with the long history of woodland cover at these sites rather than their species composition, as colonies have expanded from these areas to colonise the surrounding, more recent spruce *Picea* spp. plantations.

### Scottish wood ant.

This species is found in several woods in the Stirling Council Area. Over 250 nests have been recorded throughout the Trossachs in both oak *Quercus* spp. and spruce woodlands (M. Steward pers. comm.), nests are also found in woodland on both sides of the Pass of Leny (N. Murray pers. comm.). The other population of these ants is found in the pinewood of Coille Coire Chuilc. It appears that both these populations are stable and under no immediate threat.

However, the isolated nature of the pinewood in Coille Coire Chuilc does make the population of ants there vulnerable to events could destroy the existing habitat, for example fire.

The Scottish wood ant is more tolerant of shading than the hairy wood ant and its nests tend to be in more sheltered spots. The interior of plantation blocks is usually too densely shaded for this species. However, nests have been found where the plantation trees perform badly leaving gaps in the canopy.

### Hairy wood ant.

This species is found just outwith the Stirling Council Area on the island Inchconnachan on Loch Lomond. The nearest record to this is from Comrie. It is suspected that this ant is under-recorded in Scotland and locally it is possible that colonies may be found north and west of Loch Lomond.

This ant nests in more open situations than the Scottish wood ant as they need more sunshine to raise solaria temperature high enough for brood development. It can be locally common where it is found and the UK populations of this ant appear to be stable, even increasing at some sites.

## CULTURE, ETYMOLOGY AND FOLKLORE

*Formica* is the classical Latin name for an ant. The specific names *aquilonia* and *lugubris* mean northern (actually a town in northern Greece) and mournful respectively.

These ants can spray attackers with hot formic acid from glands in their abdomen. This is done by curling the abdomen under the body and aiming a spray of acid at the attacker. Some birds exploit this by “anting”, this activity involves alighting on a nest and disturbing the ants to encourage them to spray acid. It is thought that the acid may help control parasites living amongst the feathers. Formic acid gets its name from the ants themselves.

The name ant has the same root as the less used name of emmet, this comes from Old English *aemette*, this is similar to Old Norse *meita*.

Some Scot's names of the ant are eemock, immick or emerteen, others are pish-minnie, pishmire, pish-mither and pismool, The first three all come from the north east and the other four come from west central or south west Scotland.

Pismire was first recorded in the 14<sup>th</sup> century it means the urinating ant, *mire* meaning ant, this word is of Scandinavian origin compare with Old Norse *maurr* and Middle Low German *mire*.

The Gaelic for ant is *seangan*, this means the slim one.

## ECOLOGY AND MANAGEMENT

The presence of wood ants within a woodland often indicates good quality habitat, as wood ants will only thrive in relatively undisturbed woodland with a diverse age and vegetation structure (Hughes 1999).

Much of this section comes from the two SNH species dossiers (Douglas 2001) and Phillips (2000).

### **Appearance.**

Where found, wood ants are amongst the most conspicuous members of the invertebrate fauna in woodland. The three species found in Scotland are similar in that they are large ants, up to 10 millimetres long, with a dark-brown head and abdomen and a red thorax. All three species built thatched nests, the size of these nests varying from species to species.

Specific identification requires a hand lens to check the pattern of hairs and structure of the head, even so a definitive identification of one of these ants is notoriously difficult. For a general key see Skinner (1998), for a more detailed keys see Skinner and Allen (1996) or Bolton and Collingwood (1975). For a key to just the Scottish species see the guide written by Hughes, copies are available direct from the author his contact is

Adult wood ants fall into three groups: winged makes, queens and sterile female workers. The worker ants are the most abundant type within the nest, large nest may contain up to 300,000 for the very largest nests in Scotland

## **Scottish wood ant.**

The Scottish wood ant can be locally common in undisturbed woodland, including native pinewood and birchwood. It also occurs on the borders and in clearings of forestry plantations. Nests are often built on well-drained slopes or small ridges.

The nests found in The Trossachs differ depending on the habitat they are found in. Nests in plantations are constructed out of needles, nests in oakwoods are constructed out of the buds of the oak trees (Mike Steward pers. comm.). The nests have underground tunnels topped by a mound of thatched vegetation fragments, usually whatever is available in the wood. These nests of the Scottish wood ant can reach over 1.5 metres in height.

Often nests are found at the edges of open areas of woodland where sunlight can warm the thatch of the nest mound. From local observation, nests are most common on the sunny south side of trees (N. Murray pers. comm.). Within the nest are chambers in which worker ants tend to the brood of eggs, larvae and pupae. The brood is moved around the nest so that it is kept at the best available temperature. If the nest is threatened, the brood is moved deeper into the solarium (nest mound). During spring and summer the worker ants often bring the eggs and larvae to chambers near the surface of the nest where they can develop more quickly in the warmth. The movement of the brood around the nest is common to all species of wood ant.

## **Reproduction.**

Each nest may contain several queen ants, which lay the eggs that produce all the workers, males and young queens. Individual queens can live for many years and nest mounds can be active over much longer periods.

Each year the colony rears males and both forms of females - if climatic conditions allow. The winged males and queens leave the nest for a nuptial flight during which they mate. These flights are often on warm, humid, still days in July to August; the winged adults fly from many nests at the same time. Nuptial flights are uncommon in the UK. Once mated, the queens may return to the nest where they were reared, however many of them land far from the parent nest.

Queens accepted into a nest mound can start new nest mounds by budding from the existing nest - more common in *F. exsecta*. They take a few workers with them to establish a small new mound usually connected to the old one by a definite trail. Colonies of linked mounds can be formed in this way, they can cover upto 1 hectare.

## **Food.**

Studies in Finland indicate the main factors in determining distribution are the availability of suitable nest sites, a favourable microclimate and a good food supply. Sap feeding bugs are especially important, both as prey and for the honeydew that they produce. It has been estimated that 90% of foraging activity by the ants is in the canopy of trees near the nest.

A very significant part of the diet of wood ants is prey such as caterpillars and plant feeding bugs captured in the canopy of the surrounding tree. Very large numbers of prey may be carried into individual nests.

## Hairy wood ant

This species' nests have networks of tunnels underneath the ground and are covered by the visible mound which can be up to 0.5m in height. There are chambers within the nest mound where worker ants tend the brood of eggs, larvae and pupae. Suitable habitat may sustain numerous small to medium colonies which may be linked by trails to form super colonies. These ants exhibit some very territorial behaviour. Most territories are maintained without hostility although some inter-nest battles ensue. Fighting has been observed between neighbouring nests, resulting in the destruction of one of the nests. The first reports of wood ant battles go back to 1860s.

Often after mating the queen will not return to her nest of origin and may start a new nest. Queens that are accepted into a nest mound can start a new nest by budding from the existing structure. On occasion a queen may also join the nest of another species such as *F. lemni*, killing the resident queen and leaving the resident workers to rear her brood. This social parasitism does seem to be more of an exception than the norm and most nests are started by budding, through possibly not in Scotland.

Like other wood ants, the hairy ant is a major scavenger and predator of other invertebrates. They feed on a wide range of invertebrates such as caterpillars Lepidoptera, flies Diptera, woodlice Crustacea, aphids Aphidoidea, beetles Coleoptera and spiders Arachnidae amongst others. The exact ratio, which exists between predation and scavenging, is unclear.

Very large quantities of prey may be carried into the nest mounds over a given period of time. The removal of these plant-eating insects can produce measurable improvements in tree growth near wood ant nests. To exploit this in Italy and elsewhere, the hairy wood ant has been translocated into new areas of forestry.

## CURRENT FACTORS CAUSING LOSS OR DECLINE AND FUTURE THREATS

- Clear felling of woodlands where these ants exist, nests that survive the felling are lost to weather damage and starvation. Colonisation of these clear zones may take long periods, especially for the Scottish wood ant that relies on nest budding to form new nests.
- Damage to nests and the networks between them eg. during felling operations.
- Small area of suitable native pinewood, leading to a vulnerability to catastrophic one off events (Scottish wood ants in Coille Choire Chuilc only).
- Climate change: may be good for *F. lugubris*, which may displace *F. aquilonia* in places although more research required.

## OPPORTUNITIES AND CURRENT ACTION

- Local and National HAPs for Upland Oakwood and Native Pinewood.
- Expansion of native pinewood and oakwood which contain wood ants.
- Dr David Phillips of SNH will identify any ant specimens that people would like identified. **Send them to: 2, Anderson Place, Edinburgh, EH6 5NP.**

- Positive management of existing oakwoods, native pinewoods and commercial woodlands for this species:
  - Preserving nests nearby as a source of colonists in clear fell areas or where possible avoiding clear fell in the immediate vicinity of the nests.
  - Ensuring the presence of some suitable habitat when planning planting. Scrub along the edges of rides and firebreaks can provide shelter and additional food. Although dense scrub along rides is actually very bad for wood ants, some young trees would be desirable.
  - The maintenance or creation of refuges within commercial plantations. These may be corridors of broadleaved riparian woodland and/or broadleaved/open Scots pine woodland planted alongside rides and glades. Forest design is key, and should always take account of the existing distribution of ants in the proposed area.

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