

Wytham Woods BeeWalk

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Wytham Woods BeeWalk Citizen Science Project

Why Study the Bees of Wytham?

The global decline in bees, from huge losses of commercial honeybee colonies (*Apis spp*) to dramatic reductions in the range and diversity of wild species, has caused concern about reductions in pollination services. Ecologically, pollination by wild bees is essential for the persistence of native plant species and communities. Economically they are estimated to contribute nearly €15 billion per annum in Europe alone (approximately 12% of the total economic value of annual crop production), increasing the quantity and quality of crops produced. Most importantly, however, we have a fundamental duty to protect our biodiversity. Together, these factors have led to an increase in the amount of research into bee declines and a huge boost in public interest in pollinators.

Citizen Science

Oxford University's mandate "to allow the woods to continue to be used for education and research, and that the woods be enjoyed by the inhabitants of Oxford" is met on all three counts by citizen science projects. By forming a citizen science bee-monitoring project, not only do we capitalise on the renewed public interest in bees but also we increase visits to the woods, advertise the other research projects, and inexpensively generate a long-term data set on an important group of organisms. These data could be combined with existing experiments or used in research projects. Not only are they among the more charismatic bee species, they can be identified to species level with a relatively small amount of training. The [Bumblebee Conservation Trust](#) has an existing scheme, known as the [BeeWalk](#), which we use at Wytham Woods.

"Set up by the Bumblebee Conservation Trust after a successful trial in 2008, BeeWalk is a long-term national recording scheme to monitor the abundance of bumblebees on fixed routes (transects) across the country. These transects would be impossible without volunteers, who identify and count the bumblebees they see on about an hour's walk each month from March to October.

The information collected by BeeWalk volunteers is integral to monitoring how bumblebee populations change through time, and will allow us to detect early warning signs of population declines. All data collected will contribute to important long-term monitoring of bumblebee population changes in response to changes in land-use and climate change, and, ultimately, to informing how we manage the countryside."

Taken from "[The BeeWalk Pack](#)"

By joining this programme, the citizen scientists can benefit from its excellent support network (<http://www.beewalk.org.uk>), and the data will automatically contribute to a national research project as well as generating useful data for use at a local level too.

The Wytham Woods BeeWalk

The BeeWalk was designed for individuals to carry out in their local area. However, given the likely interest in such a project at Wytham and the potential additional uses for the data, the proposed project will extend the BeeWalk to include floral data. By recording what is in flower during each monthly transect walk, we can build a picture of how well pollinators are provided for, and, over time, identify any changes in flowering time or shifts in abundance.

The Protocol

1. The BeeWalk must be carried out monthly between March and October, ideally between 11am and 5pm.
2. It is best if the weather is warm and sunny, with no more than a light breeze.
3. BeeWalks should ideally be carried out in pairs, both in case of an accident occurring and to reduce the overall workload, with one volunteer recording the flowers in bloom, and one recording bees. These roles could be reversed between transects.
4. Collect a **BeeWalk pack (see below)** from the office at the sawmill.
5. Approximately 10 minutes should be taken to walk each **transect (see below)**. By keeping to this pace, the recording effort will be maintained from month to month.
6. Record bumblebee sightings and environmental information on form F2, and the floral data on form F3.
7. Photos of the plants and bees can be taken and uploaded to the Wytham Woods BeeWalk facebook page. This allows us to verify records, or confirm an identity if the recorder is unsure.
8. Deposit completed forms and BeeWalk packs back at the sawmill office.

The Transects

The suggested transects are outlined on the map below, with the numbers on the map corresponding to the transect descriptions in Table 1.

Each transect is approximately 50m in length and marked with signposts. These transects have been chosen to try to encompass a mixture of the wood's floristic habitats while still being survey-able throughout the year. Most of the transects are on the main rides and those which are not are in areas that will be walkable in appropriate footwear throughout the year.

Transect	Habitat Type	Additional Notes
1	Area of 2° woodland (pre 1900).	
2	Approx. 4m wide ride into area of 2° woodland (pre 1900).	
3	3-4m verge of calcareous grassland immediately bordering 2° woodland (pre 1900) and area of bracken on far side of road.	
4	Large patch of calcareous grassland bordered by 2° woodland (pre 1900) and close to 19th Century Plantation.	
5	Same as 4 but larger and closer to grazed calcareous grassland (6).	
6	Grazed calcareous grassland and bracken. Requires addition of styles.	
7	Calcareous grassland verge between grazed calcareous grassland (6) and 2° woodland (pre-1900).	
8	Area of ancient woodland (hornbeam, hawthorn etc.).	Close to the Charles Elton sign
9	Ride edge with grazed calcareous grassland either side.	Close to the grazing plots and drought experiment
10	Large area of grazed grassland.	

Table 1 shows primary habitat type/description of each transect. Additional notes includes information of modifications that may need to be made to the site and points of interest for early, guided runs of the programme.

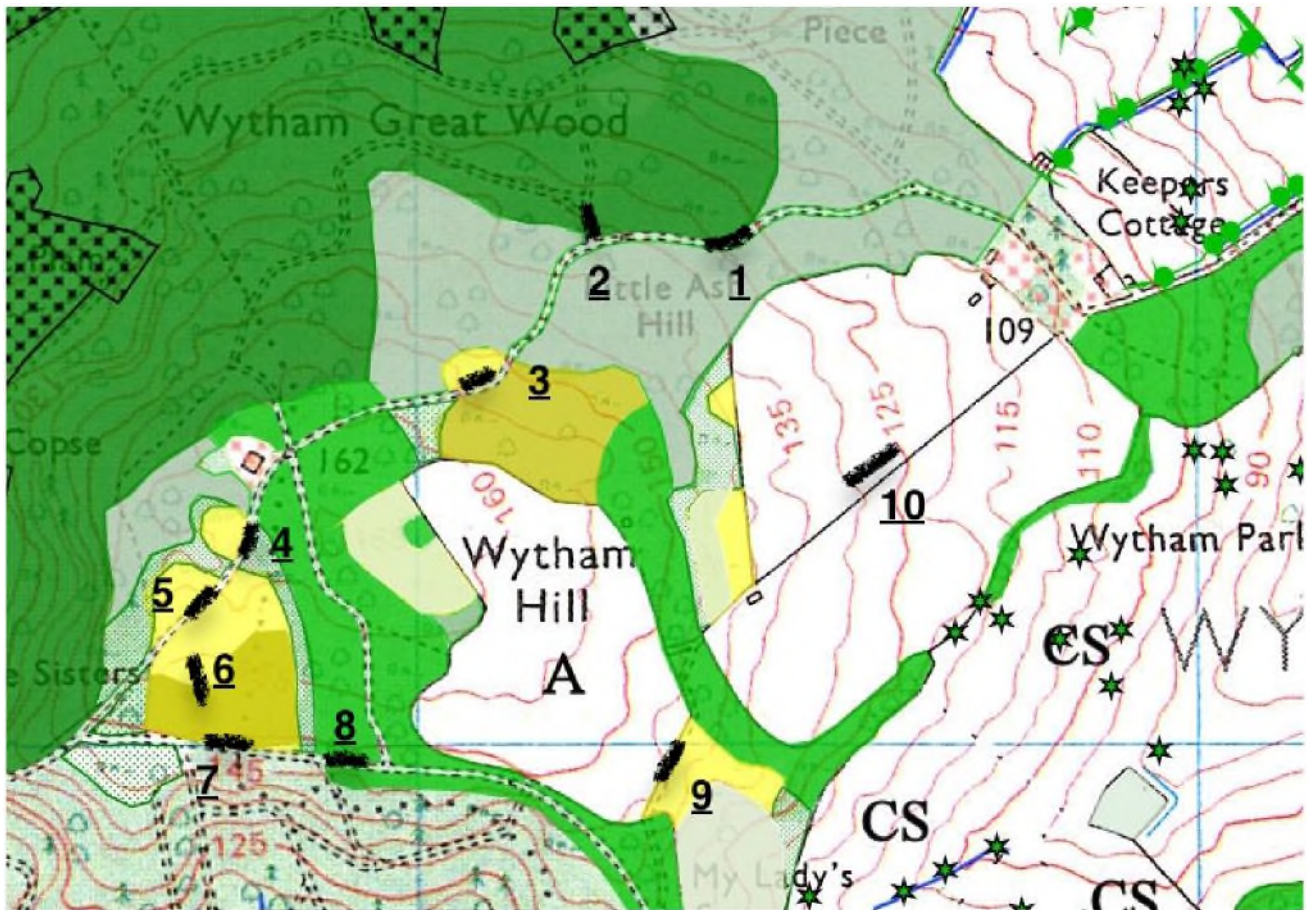


Figure 1 Map showing the approximate location of the 10 Wytham Woods transects

Additional BeeWalk Guidance

The information below is adapted from the Bumblebee Conservation Trust's guide to the BeeWalk. As our programme will be slightly different, elements of the original information booklet could be confusing to our citizen scientists and so have been omitted. Sections with specific reference to Wytham or the form F3 have been added and do not necessarily reflect the views of the Bumblebee Conservation Trust or its partners.



Welcome to BeeWalk!

Furry, brightly-coloured and instantly recognisable, bumblebees are icons of the British summer, and they also contribute more than £400 million every year to the British economy through pollinating crops. But they're in trouble. Bumblebees are declining across the country (we've already lost two species), and to better understand the reasons why, we need data – lots of data – on where we can find the remaining bees, how many there are and what they're doing.

That's where BeeWalk comes in. Set up by the Bumblebee Conservation Trust after a successful trial in 2008, BeeWalk is a long-term national recording scheme to monitor the abundance of bumblebees on fixed routes (transects) across the country. These transects would be impossible without volunteers, who identify and count the bumblebees they see on about an hour's walk each month from March to October.

The information collected by BeeWalk volunteers is integral to monitoring how bumblebee populations change through time, and will allow us to detect early warning signs of population declines. All data collected will contribute to important long-term monitoring of bumblebee population changes in response to changes in land-use and climate change, and, ultimately, to informing how we manage the countryside.

Anyone can become a BeeWalker – all you need is a spare hour or so every month to walk a fixed route of about a mile (you choose where it goes), and send us your sightings. It's essential that your transect is a fixed route to allow direct comparisons of bumblebee population trends over time.

We'll help as much as possible with identification – we've got ID resources online and on paper, or you can photograph your mystery species and upload them to our BeeWatch site, or to the website forum where you'll also find a community of fellow bumblebee enthusiasts.

I hope you'll be able to join in – without the fundamental information provided by volunteers across the country, we're fighting blind in the struggle to reverse the plight of the bumblebee.

Best Wishes,

Richard Comont

Data Monitoring Officer
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Recording bumblebees

- **Bumblebees should be recorded on form F2 along with the flowers they are seen on.** A separate form should be used for each month. Honeybees should also be noted if possible.
- **All flowers in bloom should be recorded on form F3.** This part of the recording scheme is unique to our programme here at Wytham.
- **Fill in the environmental and whole-transect details first.** Before you begin walking fill in your name, site, date, weather conditions and start time in the spaces provided on the form.
- **Walk your transect route at a steady pace.** Do not linger in hotspots to improve your count, as this will bias results.
- **Record all the bumblebees you see within your 'recording box'.** This extends 2m either side of you and 4m ahead. Do not look behind, and do not count bees seen outside this box.
- **Where possible record the caste (queen, worker, male) of each individual** as well as species, and make a note of any interesting behaviour.
- **Nets and pots can be used** to capture bumblebees for closer examination when necessary. For details on suppliers see the BeeWalk website.
- **Ensure that all recording is completed at the end of each walk.** Double-check for errors and omissions, as it will be impossible to accurately fill in any blanks later.
- **Where estimates have to be made** (e.g. when numbers are too large to count accurately) make sure an actual figure is recorded (e.g. 46 rather than 40+).
- **If something unusual is recorded, add a note at the bottom of the recording sheet to confirm that what you have recorded is correct.** If it's an unusual species, it should ideally be photographed for confirmation. Otherwise anomalous-looking data will be omitted, or you'll be asked to confirm later.
- **Don't forget to fill in the finish time at the end of your walk.**

Verification of records

There are around seven common and widespread species of bumblebee in Britain, but many of the rest are scarce or rare (see <http://bumblebeeconservation.org/about-bees/identification/scarce/> and <http://bumblebeeconservation.org/about-bees/identification/very-rare/> for details). Some, like the Great Yellow bumblebee (*Bombus distinguendus*) are distinctive when seen, but others, such as the Moss Carder (*Bombus muscorum*) are very similar to common species and can be difficult to tell apart in the field.

If you're lucky enough to see a rare bumblebee, please do try and photograph it – range changes for rare species are significant and it is important to verify sightings, so please don't be offended if the sighting is checked. Bees can be tricky to identify from photos, but it at least helps rule species in or out! We've written a guide on which bits of the bee you need to photograph to maximise the chances of an ID – it's at the end of this document.

We will also be keen for photos of the bees seen on these transect walks to be uploaded to the Wytham Woods Citizen Science Facebook Page.

Identification training

Don't let inexperience deter you from taking part in BeeWalk. Even if you can only confidently identify a few species and mark the remainder as unknown, you are making a valuable contribution to bumblebee conservation – and you'll be amazed how quickly you can pick up ID skills once you start looking!

To help the learning process as much as possible, we have a forum on our website (<http://bumblebeeconservation.org/forum>) with a separate BeeWalk section. This is where you can talk to fellow BeeWalkers, post questions (including 'what's this bee?'), and share experiences. The registration process is very simple, and if you've bought a Trust membership through our website, the login you created for this also works for the forum.

We've put a section on our website dedicated to tips for bumblebee identification (<http://bumblebeeconservation.org/about-bees/identification/top-tips-for-bee-id/>) and the resources section of the BeeWalk website lists several other useful books and sites. There's only a handful of species that you're likely to see on a regular basis and you'll quickly learn these and spot anything that looks a bit different – check these out in a bit more detail! If you want to double-check, post the photo to iSpot (<http://www.ispotnature.org>) and experts will (hopefully!) get back to you with the identification.

We will also be organizing training sessions for our volunteers here at Wytham.

Health and Safety

- Let at least one other person know when and where you are going out and when you will return (let them know when you have returned).
- Wear appropriate footwear and clothing for the terrain and weather conditions.
- Take a mobile phone with you, and water and sunblock as necessary.

If you are still unsure of anything, please don't hesitate to contact me. Happy BeeWalking!!

A photographer's guide to taking identifiable bumblebee photos

Taking photos of the bees you see is a really useful thing to do – in particular, it's a great way to confirm your sightings, especially with scarcer species that you're less familiar with.

Although it is very useful, seeing a photograph is still second-best to having a specimen in the field or in the hand. Cameras and lighting can alter colours, and supplementary information is lost – size, behaviour, habitat, location, time, date, and movement/flight characteristics can all be important in getting to the right species. What's in the photo is all we have – there's no way to see the bits that aren't shown, or aren't in focus, and very limited opportunity to zoom in on smaller features. That means getting the right bits in-shot and in focus is crucial.

Bumblebees aren't the easiest things to ID from photos, as they have useful ID features scattered all over their bodies. Typically, when on flowers, they curl up into a semicircle, hide their head and tip of the tail, and tuck their legs in, which hides some of the most useful features. The best way to make sure your mystery bee is identifiable from photographs is to take several, from different angles, showing as many ID areas as possible.



Bombus pascuorum – Richard Comont

Figure 2 A typical bee-on flower view. We can see the thorax well, and the head well enough, but most of the abdomen is hidden, including the tip of the tail. The antennae are clearly present, but you'd struggle to see details of the segments, and all the useful features on the hind legs are hidden.

Head



Bombus pascuorum – Richard Comont

Face shape is essentially impossible to see from a top-down picture, but is a useful ID feature to split round-faced/long-faced/very long faced bees, in particular the Garden bumblebee (*Bombus hortorum*) and the Ruderal bumblebee (*Bombus ruderatus*).

The presence and colour of facial hair is important for several species, particularly in deciding the sex of the bee.

The antennal segments are also useful for this – males and females have different numbers of segments, while the shape of some of the antennal segments can be used to split some species pairs, particularly males of the Gypsy and Southern cuckoo bumblebees (*Bombus bohemicus/vestalis*)

Hind leg & side



Bombus lapidarius – Tessa Bramall



Bombus pascuorum – Richard Whitson

It's really useful to see the femur of the hind leg, as it's the easiest way to sex the social bumblebees and to split them from cuckoos. Only female social bumblebees collect pollen, and when not carrying pollen they have wide, flattened, shiny femurs with long fringing hairs, forming the pollen basket. Male socials have thinner, hairier legs without a pollen basket, and cuckoos also have hairy legs without a cleared space for pollen.

Additionally, the legs carry useful ID features for some species – for example red hairs fringing the pollen basket split the Red-shanked carder (*Bombus ruderarius*) from the Red-tailed bumblebee (*Bombus lapidarius*), and the spines are also useful for some species.

Tail tip



Tail colour is usually very important in bumblebee ID. It can often be seen from above, but bees on flowers often curl round so that it's not always obvious, particularly with species that don't have much colour to the tail.

Also, several species have two-tone tails, with a different colour on the very tip.

Tail shape is useful to help sex the bee – males have a blunt, rounded back end while females come to a point, which can help make sense of other ID pointers.

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