

# Monitoring and Research

## Introduction

One of our core values has long been that conservation depends on local knowledge and good science. Existing regional conservation organisations combined to form the Wildlife Trust BCN as we know it today and we remain evidence-led in our approach to conservation. This is especially important as the challenges of wildlife conservation increase with climate change and an ever-growing human population.

The environment is changing in many ways and it cannot be assumed that established conservation techniques will be successful in the future (Fuller et al., 2016). Data is essential to everything we do and allows us to make informed decisions about habitat management and species conservation. This data is collected by staff and volunteers, both carrying out essential work. We could not do our work without volunteers, from data crunchers to those on the ground carrying out a vast variety of surveys alongside staff.

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*“ We will always do what we think is best for a nature reserve, but only the response of species will confirm that we are right ”*

**Brian Eversham, Chief Executive Officer (CEO), Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire**

We have a program of grassland surveys, which are carried out on a rotational basis. These tell us how our grasslands are faring and how our management is influencing them. Photo © Gwen Hitchcock



## Evidence champions

Conservation Evidence, a Cambridge University initiative promoting evidence-based conservation, recognises us as being an Evidence Champion. This means that we consider scientific evidence when carrying out our conservation work. When we are planning the management of our reserves, we consider the evidence to ensure we use the most effective management techniques. Our monitoring tells us if we are getting our practical habitat management right. Where possible we then publish the results of our research so that others can learn from our experience.

## Monitoring using drones

The advent of affordable drones has allowed us to take advantage of this exciting and incredibly useful technology. We now have several staff licenced to fly a drone within the Trust and this is enabling us to see our reserves in new ways. We can now fly over a site and take detailed aerial images. These images, through special analysis tools, allow us to determine the extent of scrub or bare earth on a site and inform management plans. Drones have also allowed us to map out the extent of non-native species on sites. This technology has increasingly become an important aspect of our work and there are many exciting possibilities for its use in the future.

### Shepreth L Moor nature reserve



Drone imagery was used to calculate shrub, tree and grassland extent. This fed into the management plan for the site. Map © OpenStreetMap contributors. Photo © Josh Hellon

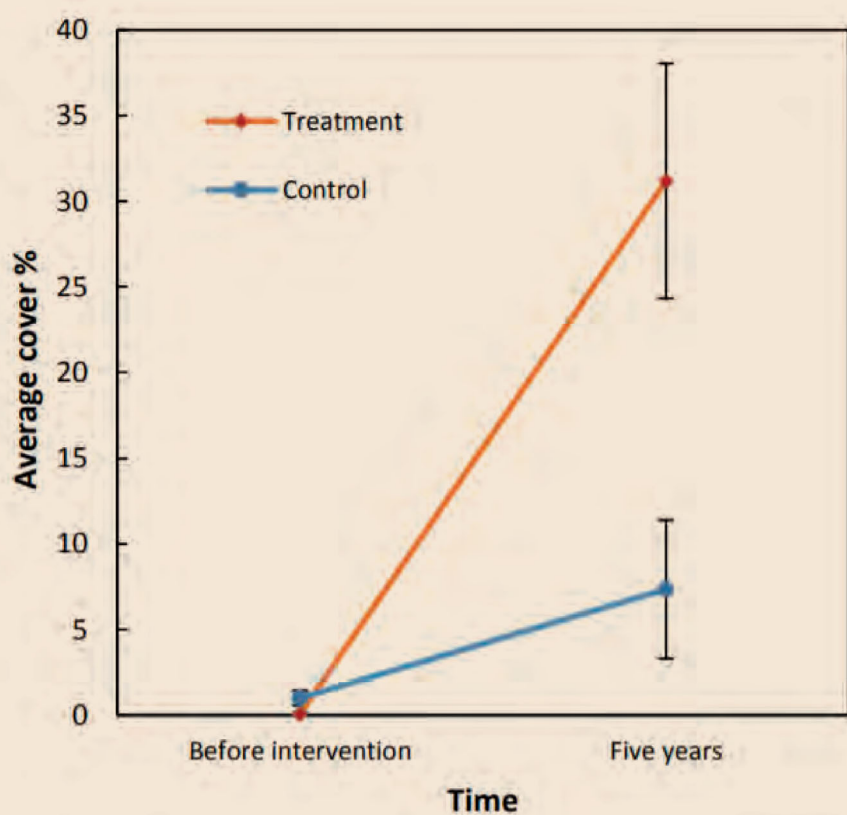
## Heathland restoration trial

Heathland is an extremely rare and precious habitat in our area. Our Cooper's Hill reserve is the best remaining example in Bedfordshire of the once more extensive heathland situated on the thin acidic soils of the Lower Greensand ridge. Whilst the extent of heathland on this site has remained constant, some of the older heather *Calluna vulgaris* was being replaced by dense grassy swards. This was due to outbreaks of the heather beetle *Lochmaea suturalis*, which killed areas of heather, allowing grass to establish. The age structure of the heather was also biased towards mature heather.

It was hypothesised that any heather seedlings would have difficulty competing with the grasses and we tested this by removing the turf to expose the nutrient-poor sandy soil in seven small plots across the reserve. Some plots also had seed-rich heather brash added to them (Hitchcock, 2018). We ensured that we had control plots and carried out systematic surveying of the plots to ensure accurate results. The trial showed that tuft stripping is an effective way to restore heather rich areas and that adding seed-rich heather brash did not increase the amount of heather growing in the plots. This work was published in 'Conservation Evidence', a journal that shares the results of management interventions to help develop best practice in this area.



The percentage cover of heather in the treatment and control plots over time (Hitchcock, 2018).



There was statistically more heather in the turf stripped areas compared with the control areas.



## Bat monitoring and research

Bats can tell us a lot about the condition of our woodland sites and habitat connectivity. Bats are highly mobile yet dependant on a network of landscape features and connectivity within that network. Each night, bats can commute several kilometres to their foraging sites, so their activity is spread over a large area of the landscape. This means that bat populations are not affected solely by the condition of a particular reserve but also its place in the landscape.

Within the Trust, we have several licensed bat surveyors who carry out monitoring and research on our sites and in the wider landscape. Our Big Wetland Bat surveys highlight the importance of our wetlands for bats and tell us about the condition of them. This information feeds back into the management of the sites. Alongside this, we have been carrying out a long programme of Bat Pathfinders surveys.

The Bat Pathfinder surveys aim to instigate landscape-scale monitoring of woodland linkage projects and use information on bat behaviour to monitor the success of these. This project is giving us valuable data about the importance of a wide variety of linear features for bats including hedgerows, trees and canals. As this is a landscape-scale project, cross-organisational working is essential and we work closely with a wide variety of organisations and groups to generate robust data.

Advances in equipment are allowing us to survey bats on our reserves and the wider landscape in new and exciting ways. Until now, we have been completely reliant on large numbers of volunteers and bat detectors to survey bats.

In 2019 we obtained a project licence to survey bats using mist nets and harp traps and plan to do more so in the future. This process is carried out by experienced surveyors trained in the use of these methods and bat handling. This will vastly improve our knowledge of the species in the area, as we can survey species not suited to bat detectors such as brown long-eared bats and acoustically cryptic *Myotis* species. It will also tell us about the importance of our sites during different life stages such as breeding. Getting a close look at the bats allows us to establish population age structures and breeding condition and the importance of sites for maternity roosts.

We also are looking to purchase small static bat detectors called AudioMoths. These will allow us to survey new areas efficiently and survey for longer periods, allowing us to target our volunteer bat surveyors on key areas.

Finally, we are looking to carry out radio tracking in the future. This technique would allow us to see exactly where individual bats fly in a night. This will further improve our knowledge of habitat connectivity in some key areas for bats. Our work on bats is really exciting and will generate knowledge of how the landscape is functioning for a wide variety of other species.

## Calcareous grassland restoration

In autumn of 2008, the Wildlife Trust purchased Cherry Hinton East Pit, part of Cherry Hinton Chalk Pits Site of Special Scientific Interest (SSSI). This site had been unmanaged since quarrying ceased in the 1980s. The ridges and bowls left by quarrying were still present, but most of the pit had been colonised by buddleia. This invasive plant was shading out the calcareous grassland species for which the SSSI was selected. Therefore, the Trust reprofiled the site and removed buddleia using heavy machinery, which returned large areas to bare chalk.

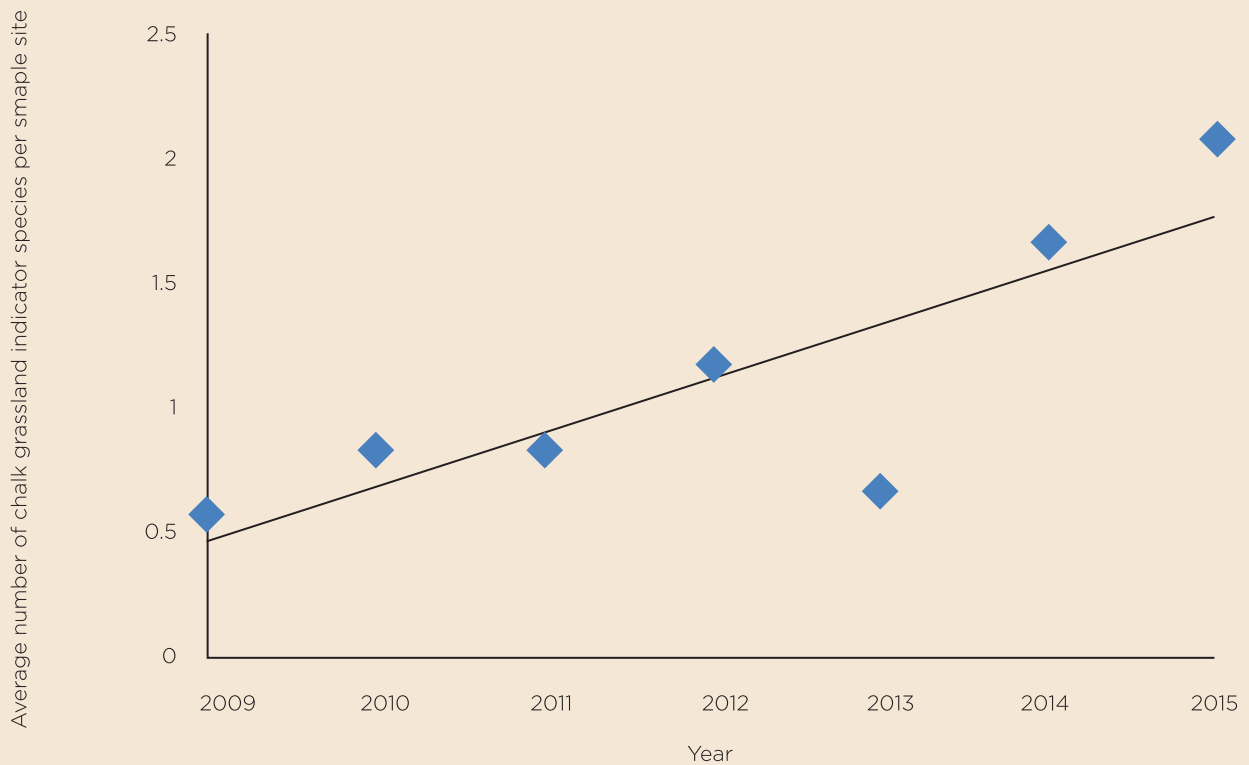
Monitoring work was then carried out to see how long it took chalk grassland herbs to colonise the bare chalk. This sat alongside extensive invertebrate surveys which highlighted that every successional stage had important invertebrates associated with it and that a mosaic of habitats was required.



As its name suggests, the brown long-eared bat *Plecotus auritus* has large ears, allowing it to call quietly. This means that it is usually not picked up on bat detectors. Trapping of bats will allow us to find out more about the populations of a wide variety of species on our reserves. Photo © Gwen Hitchcock



## Change in frequency of chalk grassland indicator species over time



A graph showing the increase in frequency of chalk grassland indicator species over time in an area of Cherry Hinton Chalk Pit (Williams, 2017)



East Pit of Cherry Hinton Chalk Pit was originally covered in buddleia and scrub when the Wildlife Trust purchased the site. The site was reprofiled and returned to bare chalk, important for a wide variety of species. The chalk grassland for which the site is designated has returned benefitting a wide variety of invertebrates, plants, lichens and bryophytes. Photos © Jonathan Graham and Siân Williams

## Orchid monitoring

Our nature reserves across the three counties are important for several orchid species. One example of this is Totternhoe Nature Reserve. Totternhoe is a chalk grassland reserve, which is home to a wide variety of amazing species, including three rare specialist calcareous grassland orchids. These are the man *Orchis anthropophora*, musk *Herminium monorchis* and frog *Dactylorhiza viridis* orchids. The populations of these species peaked in the 1980s (Revels, Boon and Bellamy, 2015). In 2012, the Wildlife Trust set up a programme to monitor these orchids, following on from previous work by local naturalist Terry Wells dating back to 1966.

Our work not only looked at where on the site the orchids are found but also gave us an insight into their ecology. We monitored individual orchids to establish the percentage that flower and set seed each year and the microhabitats that the orchids are found in. We also looked at the effect of caging orchids; this is where a wire mesh is placed over the plants to stop the damage from grazing and trampling. We found that caging orchids protects them from grazing and trampling while not effecting the likelihood of successful pollination (Revels, Boon and Bellamy, 2015; Hitchcock, 2019).

All this work fed back into the management of the site including targetted scrub removal around key areas for these species. It also informed attempts to recreate similar habitats in other areas. Early indications suggest that the number of man orchids on the site has increased in areas where we have targeted scrub removal.



Man orchid *Orchis anthropophora* showing its beautiful flowers. Our monitoring work has shown that the number of man orchids at Totternhoe nature reserve appears to have increased in the areas where we have targeted scrub removal. Photo © Ryan Clark

## Wildlife Training Workshops

Species identification and habitat knowledge are at the heart of our work. For over twenty years we have organised a programme of training workshops. These started with guided walks on some of our best reserves but are now more specialised. The workshops are now mainly focused on species identification, habitat knowledge and survey skills.

On average, we run between 40 – 45 workshops per year with between 400 - 500 people attending across the three counties. We have organised over 1000 workshops (over 10,000 bookings) focussing on everything from identifying bryophytes, to using trail cams to monitor wildlife. Many of the participants are members of the public from

across the three counties and beyond, providing an affordable way for the public to learn about local wildlife from knowledgeable local naturalists. We also use these workshops to train staff and volunteers, this being the initial reason we started the programme. We believe that habitat and species knowledge are fundamental to our work, and it is essential that we invest in training staff and volunteers in these skills. The training workshop programme is an area that we are very proud of as a Trust. Some participants have even gone on to become county recorders or enjoy a lifelong passion following attendance.



Explore our current programme  
[wildlifebcn.org/training-workshops](https://wildlifebcn.org/training-workshops)

## Local Environmental Records Centres

The Wildlife Trust hosts three local environmental records centres, which collectively cover the whole of our area. Although they are independent of the Trust, we work with them extremely closely. They are the guardians of the species, habitat, and site designation data, that is essential for every aspect of our conservation work. They currently hold over 5 million records of species in their databases; every record gives us a better picture of how our wildlife is faring. Our work also generates a significant amount of data, which we feed back into the records centres to ensure this data can be used as part of wider conservation measures locally and nationally.



Find out more  
[wildlifebcn.org/record-centres](http://wildlifebcn.org/record-centres)

## Acknowledgements

Our monitoring and research would not be possible without the volunteers who help us survey sites in all weathers and help process the data from surveys; we would like to thank them for all of their hard work in monitoring our area.

## References

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