

A visit to Wytham Woods,

Oxford University's Wildlife Conservation

Research Unit

Thursday 23rd November

Introduction

Wytham Woods is 5km outside Oxford in a loop of the river Thames and was given to the University of Oxford by Raymond ffennell in 1943 (ECN, 2006) to be used for conservation research. The University's Wildlife Conservation Research Unit (WildCRU), founded in 1986 by Professor David Macdonald (Oxford University Biology Dept. 2006), is based at Wytham Woods. The altitude of the site ranges from 60m up to 160m above sea level and is made up of about 600 hectares of woodland and 600 hectares of farmland (Taylor, 2006).

This report will investigate the habitats and some of the issues of managing Wytham Woods. In addition, a sample of the scientific studies undertaken at Wytham Woods will be described, including monitoring of the badger population, breeding data for tits, especially the great tit, and the 'impacts of climate change on grassland and woodland ecosystems' (ECN, 2006). Finally, an range of other research projects ongoing with the WildCRU will be discussed, including 'endangered wildlife' and 'wildlife in conflict' (Oxford University Biology Dept. 2006).

Habitats at Wytham Woods

Wytham Woods is a designated Site of Special Scientific Interest (SSSI) for both its 'Broadleaved, mixed and yew woodland – lowland' and its 'Calcareous grassland – lowland' habitats (English Nature, 2006). The Wytham estate includes woodland of approximately 415 hectares (WildCRU, 2006 and ECN, 2006) 370 hectares of farmland (ECN, 2006).

The woodland is split evenly into areas of ancient woodland (over 200 years' old) secondary woodland and plantations. The natural regrowth in the secondary woodland is mainly ash (*Fraxinus* spp.) and sycamore (*Acer*

pseudoplatanus), and the current balance is about 50/50 (although sycamore is fast growing and can be invasive). The plantations, mainly beech (*Fagus sylvatica*), are reverting back to natural woodland. The beech woodland is over 200 years old and the wide, open canopy suggests that the area was more open when the trees were immature. The area also hosts naturally regenerated sycamore.

The farmland is typical of lowland Britain and the upper Thames region. The farm is a mixed farm and is now organic, with sheep, beef, poultry but no dairy. Prior to becoming organic farming included beef, sheep and dairy. The farmland is farmed on a sustainable basis and animal welfare issues are taken into consideration – for example: the pigs' tails are not docked and the pigs live in groups. The farm also includes an area of short rotation willow coppice.

The grassland is on calcareous Coral Rag Limestone at top of hill with shallow, well-draining soil. Some fields, that were formerly barley but were difficult to plough as the depth of the soil was only 20-25cm, have been ploughed and left to regenerate naturally creating various scrub areas (Taylor, 2006) containing species such as Hawthorn.

The management of the habitats at Wytham Woods

The Woodlands are managed with very little intervention. There is no planned felling or management there is a 'dead wood policy', which meant that trees which fell over were left to create natural habitats, especially for invertebrates. The vegetation in the woodlands was monitored using a grid of posts with yellow/orange tops to measure exact location from the posts. Seedling regeneration was monitored using a 'presence/absence' of species basis with quadrats of 40cm x 40cm set on ground (Taylor, 2006). The deer population peaked in 1996/7 and at this time there was a decline in bramble and regeneration of tree species in the woodlands. Although the decline of some tree species may have been due to deer grazing, there are likely to be other factors controlling this, including a reduction in light penetration due to canopy growth.

Deer were culled in a management scheme, on the advice of the Deer Society and now there are about 60 Fallow deer (*Dama dama*) per hectare (Taylor, 2006). There are also Roe (*Capreolus capreolus*) and Muntjac (*Muntiacus reevesi*) deer on the site. Although some areas are fenced off to exclude the deer, the size of the fence allows Muntjac to pass. The vegetation has been measured in the fenced off areas and has concluded that bramble (*Rubus fruticosus*) and hawthorn regeneration has begun. Longworth traps set in the fenced off areas found more mammals than elsewhere.

Grassland productivity is measured four times per year and the level has fallen since the farm became organic, but the diversity of grasses and other species has increased (Taylor, 2006). The barley (*Hordeum vulgare*) field that was ploughed and left to regenerate naturally in 1981 (25 years ago) is now

well established scrub. This shows that grassland needs to be managed, especially when near woodland.

The ECN climate project at Wytham Woods

The ECN operates a network of 12 terrestrial sites, including Wytham Woods and 45 Fresh Water sites in the UK (ECN, 2006). The sites vary geographically, in altitude and habitat. Despite being managed by different groups, these sites employ standard methodology for environmental monitoring and take samples on the same day at the same time to aid standardization. The countryside is changing and these changes need to be monitored to inform policymakers who need whole picture 20-40 years in advance (Taylor, 2006).

The ECN's objectives are:

- To establish and maintain a selected network of sites within the UK from which to obtain comparable long-term datasets through the monitoring of a range of variables identified as being of major environmental importance.
- To provide for the integration and analysis of these data, so as to identify natural and man-induced environmental changes and improve understanding of the causes of change.
- To distinguish short-term fluctuations from long-term trends, and predict future changes.
- To provide, for research purposes, a range of representative sites with good instrumentation and reliable environmental information. (ECN, 2006)

Wytham Woods has the longest running weather/climate data in Europe and has records dating back to 1840s (Taylor, 2006). Weather/climate measurements must be made out in the open and staff at Wytham monitor the measurements from an Automatic Weather Centre, powered by solar panel, which measures solar radiation, net radiation (intercepted solar radiation and radiation reflected back out), air temperature, soil temperature, wind speed (and direction) and rainfall (about 640mm per annum) (Taylor, 2006). The new weather station will be run parallel for 12 months (to check figures comparable to older station) and the automated readings are checked against manual readings on a weekly basis (as there is no control). Rainwater is collected and measured for pH and conductivity.

Key Research at Wytham Woods and WildCRU

- **Badgers, *Meles meles*** (Sterry 2005) The Badger population at Wytham Woods is one of the most studied populations. The Badgers are tagged, blood samples are taken, tested for bovine TB and parasites also monitored (Taylor, 2006).
- **Blue tits, *Parus caeruleus* and Great tits, *Parus major*** (Hume 2002) Tits have been studied at Wytham for 40 years. Research has found

that since 1970s blue tits are laying and hatching dates 2 weeks earlier, which may be due to climate change (Taylor, 2006).

- **Water voles, *Arvicola terrestris* (Sterry 2005) and European Mink, *Mustela lutreola* (The Catalogue of Life, 2006)** The introduced American Mink, *Mustela vison* (Sterry 2005) has affected both the water vole population in the UK and the European mink population in Europe. Water vole populations show some signs of recovery in Sussex due to habitat restoration and reduced predation by American Mink. The recovering Otter *Lutra lutra* (Sterry 2005) population competes with American Mink. Captive bred European Mink have been introduced to an Island in Baltic as they have also been threatened by introduced American Mink. WildCRU have been involved in both these projects (Oxford University, 2006).
- **Wildlife in conflict** WildCRU also have projects on tigers in India, cheetahs in Namibia and lions in Botswana (Oxford University Biology Dept. 2006).

Conclusion

WildCRU at Oxford University and Wytham Woods are important resources for scientific studies into topics which range from farming, wildlife and disease in the UK, include the impact of climate change and extend beyond the UK and Europe to 'wildlife in conflict': Tigers in India and Cheetahs in Namibia. Wytham Woods is also used to train and develop conservation scientists and volunteers. Scientists at Wytham Woods work closely with and are supported by a large number of both government and non-government organizations. The co-operation between the University, the scientists, the volunteers and the organisations supporting the research is one of the strengths of the project. Perhaps the greatest strength of WildCRU is their key objective to find practical, workable solutions based on 'solid science' (WildCRU, 2006).

Reference List

The WildCRU Wytham Woods website

<http://www.wildcru.org/links/wytham/wytham.htm> (accessed 20Nov06)

The Environmental Change Network Wytham Woods website

<http://www.ecn.ac.uk/sites/wytha.html> (accessed 20Nov06)

The Earthwatch Institute website

<http://www.earthwatch.org> (accessed 20Nov06)

Oxford University website

<http://www.ox.ac.uk/wildcru> (accessed 23Nov06)

Biological Sciences at Oxford website

<http://www.biology.ox.ac.uk> (accessed 23Nov06)

Hume, R. (2002) *RSPB Birds of Britain and Europe*, Dorling Kindersley, London

Sterry, P. (2005) *Complete British Animals*, Collins, London

The Catalogue of Life website

<http://www.catalogueoflife.org> (accessed 14Dec06)

English Nature website

<http://www.english-nature.org.uk> (accessed 14Dec06)