

# Long term monitoring of sessile oak *Quercus robur* mortality in even-aged, non- intervention high forest at Blean Woods RSPB Reserve, Kent, England

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## SUMMARY

A long term monitoring scheme was established to examine the mortality rate of sessile oaks *Quercus robur* in an even aged forest. Of 1,835 marked trees, only 15 died in the six years of the study. It is suggested that large samples (2,000-5,000 individual trees) may be required to ensure meaningful results from such studies.

## BACKGROUND

At an ancient woodland nature reserve in southern England, Blean Woods, all the sessile oak *Quercus robur* high forest at the site is even-aged with trees around 150 years old. It is not known whether the woodland will perpetuate itself through gradual death and replacement, or whether mass deaths of oaks at maturity over a relatively short period might lead to colonisation by birch *Betula*, with then a very slow reversion back to oak. A third possibility is that beech *Fagus sylvatica*, a minor component of the high forest at present, could take over as the oaks die off and the canopy opens up. Depending on the renewal mechanism, some management intervention might be desirable in order to promote the perpetuation of oak woodland. A long-term monitoring project was therefore set up to test which was the most likely outcome.

## ACTION

**Study site:** Blean Woods Royal Society for the Protection of Birds (RSPB) Reserve, located in Kent, southeast England, is an ancient sessile oak *Quercus robur* dominated woodland with an understory of mixed coppice (including hazel *Corylus avellana*), and open areas of glades and rides. A long term monitoring project of the health of the larger trees in the woodland was begun in 1998.

**Long-term tree monitoring:** A total of 1,835

trees with a girth over 40 cm, mainly oak and beech, were labelled using metal tags fixed to the trunks with 50 mm nails. Nails were hammered in just far enough to secure the tag, leaving plenty of expansion room for the trunk in years to come. The following were recorded:

- tree species
- location (so that each tree could be mapped)
- girth at breast height
- estimation of health on a scale from 0 (dead) to 3 (healthy)
- presence of woodpecker holes (all three UK species are present i.e. green *Picus viridis*, great spotted *Dendrocopus major* and lesser spotted *D. minor* woodpeckers)
- presence of heart-rot (indicated by bracket fungi growing near the base of the trunk)
- tree windblown or leaning
- comments on e.g. extent of rot, thinning canopy, dieback

## CONSEQUENCES

At the start of the project in 1998, 139 of the 1,835 trees selected for monitoring were dead,

many as a result of a severe storm in 1987 when exceptionally strong, hurricane force winds hit the British Isles. In the six years since the storm, only a further 15 trees have died, and it is likely that no trends will be detectable for a further 20-50 years. The low mortality at this site means that it is important to have a large sample size (2,000-5,000 trees) in order to gain some meaningful results within a human lifetime. Due to the large scale of the monitoring programme, two main problems were encountered:

i) The time taken to carry out each survey (several days)

ii) Loss of metal tags as trees grow around them - even with nails jutting out 35 mm from the trunk, some trees have swallowed up tags in just six years. All will be replaced in Year 7 using 75 mm nails, which should double the effective life of the tags.

A simple estimate of rate of tree deaths could be achieved by counting the dead individuals and marking each one to prevent future double counting.