Biotype

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RESEARCH UPDATE

Assessment of Coning Cycles in Conifer Species across the UK

Elizabeth Poulsom

Information on annual cone production is important for forest managers concerned with providing sustainable food sources for birds and mammals. However, very little information is available as to

- Frequency of good cone crops for various conifer species
- If such crops are produced cyclically
- Whether this occurs throughout the country

Forest Research has undertaken assessment of coning density as part of its annual Forest Condition Survey for the last 15 years, but this method only classifies coning in four categories ranging from 0 (cones absent) up to 3 (cones abundant). For the past three years, further assessments have been carried out on a subset of these plots to determine density of cones per m^2 of canopy. The aim of this experiment was to

- Try and obtain discreet ranges of cone density per cone score
- Extrapolate this data to the cone scores for the whole country
- Compare national coning rates across the country and over the years.

The assessment was conducted by a surveyor using the following method:

1. The surveyor finds a vantage point beneath the selected tree with the best view of the canopy
2. The distance from the surveyor to a point on the canopy was measured using a hand held laser
3. Using a pair of pre-calibrated binoculars, the number of cones on the canopy at that point was counted with the binoculars held stationary.

The calibration process allows the surveyor to calculate the field of view of the binoculars based on the distance between themselves and the canopy. From the width of the field of view, the area of the field of view can then be calculated and the number of cones per m^2 derived.

This method has been used to assess coning rates on existing sites of Scots pine, Norway spruce and Sitka spruce. An attempt was made to assess trees in all four cone scores, but very low coning in Norway spruce in the last 3 years and in Sitka spruce in the last 2 years has meant a representative sample per cone score per species has not always been possible each year. The location of sample sites has ranged from Dornoch to north Yorkshire with the majority of sites located in north/central Scotland. With a scarcity of high coning Norway and Sitka spruce trees, assessments were carried out at whatever sites high scoring trees were found, so sites were not always sampled in consecutive years.

Results

The results from three years assessment have given an indication of the range of coning densities per coning score and these have then been applied to the cone scores results from across Britain. From initial analysis, Norway spruce and to a lesser extent Sitka spruce have shown a cyclical nature to their coning, with peak coning occurring at around a 5 yearly interval. However, peak years appear to

occur at different times in different parts of the country. The results from the Norway spruce assessment were more conclusive than those of Sitka spruce, with more discreet density classes obtained for each cone score, particularly when scores of 0 and 1, and 2 and 3 were grouped together. The results from the Scots pine indicate that coning was consistently high, with no discernible peaks and troughs in production. This may reflect the longer pollination and cone development cycle of Scots pine which may not be as adversely affected by weather conditions in the previous summer to cone production as Norway and Sitka spruce with their shorter reproductive cycles.

Larch Assessment

The assessments carried out on Norway and Sitka spruce and Scots pine are on established plots, but no such plots exist for Hybrid and Japanese larch. Little is known about the coning cycles of these two species and the extent to which the cones are being utilised by wildlife. Anecdotal evidence from woodlands in Scotland and north Wales suggests that Red squirrels use larch as part of their habitat but to what extent they eat the seeds is unknown. To determine the density of coning on Japanese and Hybrid larch, a network of 19 survey plots have been established across Britain, in the four climatic zones in which the two species of larch typically appear. Using the same methodology as outlined above, the density of larch cones per m^2 has been calculated. With only two years worth of data, no clear trends can be identified as yet, although at several sites it has been observed that one or two trees at a site may be heavily coning, whilst the remainder have produced little or no cones. Such a result may indicate that the heavily coning trees are under some kind of stress and may be responding in a similar manner to fruit trees, which produce large crops in times of drought.

The results from both these experiments should give a clearer insight into cone production by the main conifer species. With this information, managers can plan the timing and location of future planting to ensure that wildlife will benefit from a consistent food source.

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Trial of Cattle Grazing to Improve Black Grouse Habitat

Russell Anderson

Enclaves of open moorland in forests usually develop coarse, woody heather because of the lack of disturbance by burning and grazing. Their quality as black grouse habitat is reduced and in many cases the birds have deserted these areas. By managing these sites to improve the habitat, blackgame from neighbouring populations may be enticed to return. The challenge is to find cost-effective management methods to encourage the correct vegetation structures. Flailing has been used but it requires annual expenditure and has shown limited success in restoring blackgame. Cattle grazing by breeds adapted to poor upland sites has been suggested as a promising alternative.

Russell Anderson is collaborating with Ross Preston (Forest Enterprise and SNH) and farmers in West Argyll to set up a trial of cattle grazing as a means of improving black grouse habitat on unplanted hill areas in forests. Sites near Campbeltown, and Minard have been earmarked and a third site near Tarbert is being investigated. All have populations of the birds nearby and are within the area covered by the Argyll and Bute Black Grouse Project.

The trial will involve monitoring the availability of the following black grouse habitat requirements:

- Heather and blaeberry shoots during winter and spring (food)
- Cottongrass buds in late winter and early spring (food)
- Tall heather (roosting and nesting)
- Invertebrate-rich areas in mid-June to mid-July (chick food)

Each site will include fenced-off ungrazed areas for comparison. Ideally we will compare the cattle stocking rate currently believed to be the optimum with lower and higher rates. We hope to install the stock fence, marked to reduce grouse collisions, some distance inside the forest edge so that an outer

strip of forest will also be accessible to the cattle.

Starting in 2005 and potentially continuing for 12 years, the trial should provide opportunities for assessing how cattle grazing affects habitat value for other moorland flora and fauna. We would welcome enquiries from anyone interested in using the trial to study other aspects of moorland ecology.

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Grey Squirrels: Effects on Biodiversity & Effective Trapping Techniques

Two recent articles, co-authored by Brenda Mayle on Grey squirrels may be of interest to Biotype readers. British Wildlife, February 2004, reviewed the effects Grey squirrels can have on the conservation of rare woodland species and habitats. Although research into squirrel damage on trees has been going on for a number of years, very little work has been carried out on the way squirrel predation affects other species such as birds and mammals. A recent decline in the numbers of some woodland birds has focussed more attention on this area, although there is very little empirical evidence on the impact of squirrels available at the moment.

An article in the April 2004 issue of Forestry & British Timber on 'Squirrel Control in Conifers'. gave the latest recommendations for increasing efficiency when trapping grey squirrels in conifer woodlands. This was based on a large scale study recently carried out in Thetford Forest (East Anglia Forest District).

References:
Hewson, C., Fuller, R., Mayle, B. & Smith, K. **Possible impacts of Grey Squirrels on birds and other wildlife** (Feb, 2004) British Wildlife, Vol. 15, No. 3.
Mayle, B. & Gurnell, J. **Squirrel control in conifers**, Forestry & British Timber (April, 2004)

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TRAINING

Butterfly Guardian Training Workshops 2004

Kelly Thomas, Butterfly Conservation

Butterfly Guardian workshops offer the opportunity for anyone with an interest in butterflies or moths to come along for free training. There is a range of workshops to choose from, including general introductory workshops or more focused workshops for example looking for rare moths or threatened fritillaries. All workshops include a field session to try out your new skills.

Workshop 1: Introduction to Butterfly Recording and Identification
Date: Wednesday 28th April
Time: 10:00 am-4:00 pm
Group: Butterfly Conservation (Wales)
Location: Wentwood Forest & Penhow Village Hall, Gwent
Special conditions: Booking Essential

Workshop 2: **Threatened Fritillaries**
Date: Saturday 15th May
Time: 10:00 am-4:00 pm
Group: Butterfly Conservation (Wales)
Location: Breidden Forest. Powys & Preston Montford Field Studies Centre, Shrewsbury
Special conditions: Booking Essential

Workshop 3: **Waved Carpet / Argent & Sable / Buttoned Snout**
Date: Friday 28th May
Time: 10:00 am–4:00 pm
Group: Butterfly Conservation (Wales)
Location: Hendre woods & Penhow Village Hall, Gwent
Special conditions: Booking Essential

Workshop 4: **Introduction to Moth Recording and Identification**
Date: Friday 11th June
Time: 7:00 pm–11:00 pm
Group: Butterfly Conservation (Wales)
Location: Breidden Forest, Powys & Preston Montford Field Studies Centre, Shrewsbury
Special conditions: Booking Essential

Workshop 5: **Introduction to Butterfly Recording and Identification**
Date: Wednesday 7th July
Time: 10:00 am– 4:00 pm
Group: Butterfly Conservation (Wales)
Location: Nash Wood & Offa's Dyke Centre, Knighton, Powys
Special conditions: Booking Essential.

Workshop 6: **Introduction to Moth Recording and Identification**
Date: Friday 6th August
Time: 7:00 pm– 11:00 pm
Group: Butterfly Conservation (Wales)
Location: Nash Wood & Offa's Dyke Centre, Knighton, Powys
Special conditions: Booking Essential

Workshop 7: **Leaf Miner Recording and Identification for Beginners**
Date: October 30th
Time: 10:00am– 4:00pm
Group: Butterfly Conservation (Wales)
Location: Wentwood Forest & Penhow Village Hall, Gwent
Special conditions: Booking Essential

For further details about the workshops or to book a place please contact:
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Identification Workshops for Lower Plants

Joe Hope

The Native Woodland Discussion Group are holding three workshops focussing on identification of lower plants, and one information seminar on mycorrhizal fungi. The titles of these events are:

Mycorrhizae - secret underground agents?
A one-day introduction to the ecological role of mycorrhizae in woodlands
Barony College, Parkgate, Dumfries: Thursday 1st July
Speakers: Dr Philip Mason, Professor Fred Last and Mark Mackie

Woodland Lichens
Applecross, Wester Ross: 23rd - 25th September
Tutors: Brian and Sandy Coppins

Woodland Fungi
Glenmore Forest, Speyside: 7th - 9 October
Tutors: Ernest and Valerie Emmett

Woodland Bryophytes
Blair Atholl, Perthshire: 28th - 30th October
Tutor: Ben Averis

For more information on the above workshops, visit www.nwdg.org.uk , or contact:

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From Woodland Ecology Branch to Ecology Division

Chris Quine

The eagle-eyed reader will have noticed some small changes to the wording of our strapline and address which heralds rather more substantial changes. On the 1st June a new organisational structure was installed in Forest Research - with the establishment of five Divisions to replace the previously more numerous branches. The Divisions are –

- Ecology
- Forest Management
- Environmental and Human Sciences
- Tree Health
- Biometrics and Statistics

The Ecology Division integrates the work done by the former Woodland Ecology Branch with work on native woodlands (lowlands and uplands) and genetic conservation previously residing elsewhere in Forest Research. The next issue of our newsletter will provide further details on the activities and staff of the new Ecology Division. In the meantime, information can be obtained from Chris Quine - contact details at end of newsletter.

CONTACT DETAILS

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