

PROGRAMME GROUP RESEARCH UPDATE: Conservation & management of species & genetic resources

The use of microsatellites to assess the degree of clonal duplication of black poplar in Ireland Joan Cottrell & Stuart A'Hara



Black poplar (*Populus nigra* L.) is a rare tree in Ireland where it reaches the most north-westerly limit of its distribution. Although its native status has long been the subject of controversy there is currently considerable interest in its conservation in Ireland.

Surveys in the early 90's claimed to have located a total of 373 black poplar trees in southern and central Ireland. However, it is difficult on the basis of morphology to distinguish *P. nigra* from its introduced hybrid *P. x euramericana* and therefore, these surveys may have overestimated the incidence of this rare tree. Furthermore, in view of the ease with which black poplar cuttings root, it is likely that many of the

trees are representatives of the same clone. The number of genotypes present in Ireland may therefore be considerably less than the number of trees that have been located.

DNA based techniques now offer a reliable method to distinguish black poplar from the hybrids. There are also molecular markers available, which enable trees to be fingerprinted so that individual genotypes can be identified. Such information is valuable in the development of informed conservation policies for this endangered species in Ireland.

Ecology Division staff have used:

- A species-specific marker to distinguish between black poplar and the introduced hybrid poplars
- Microsatellite markers to provide genetic fingerprints of black poplar trees sampled in Ireland.

The molecular work was conducted on a sample of 117 putative black poplar trees and revealed that:

- Almost one third of the sample had been misidentified and were in fact *P. x euramericana*

- Genetic fingerprinting showed that within the 80 true *P. nigra* samples there were only nine distinct genotypes.

This demonstrates that the situation is similar to that in England and Wales where there has been a great deal of human mediated vegetative propagation resulting in movement of clonal material over relatively long distances. The work demonstrated that the genetic diversity present in Ireland is even lower than the number of trees present would suggest.

For a full account of these studies refer to Cottrell (2004) and Keary *et al.* (2006).

References

Cottrell, J. 2004. Conservation of Black Poplar. Forestry Commission Information Note (FCIN57).

Keary, K., A'Hara, S., Whitaker, H. & Cottrell, J. 2006. Assessment of genetic variation in black poplar in Ireland using microsatellites. *Irish Forestry* 62:6-18.

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Climate change and forest genetic diversity: implications to sustainable forest management

Jason Hubert

Paris, 15-16 March 2006

This workshop brought together nearly 80 participants from 25 countries to discuss the role of forest genetic diversity in:

- Mitigating the effects of climate change
- Maintaining sustainable forest management in Europe.

It was organised as a result of Vienna Resolution 5 (Climate change and sustainable forest management in Europe) of the MCPFE process (Ministerial Conferences on the Protection of Forests in Europe).

The workshop objectives were to:

1. Present reviews of the current understanding of how forest trees will cope with and adapt to climate change
2. Discuss the implications for practising sustainable forest management in Europe
3. Provide inputs and recommendations to the MCPFE process for further action.

The workshop presentations and other background documents are available online at www.euforgen.org.

The first day was spent listening to presentations providing a technical overview of the issue surrounding the use of forest genetic resources in the

context of climate change. Summaries can be found on the EUFORGEN website and they provide a good overview of the “state of the art” and concerns at the European level.

For the second day the workshop was split into three working groups and asked to develop recommendations to feed back into the MCPFE process. The following four recommendations were adopted by the workshop:

Recommendation 1

- Policy makers in Europe should recognise the importance of forest genetic diversity in mitigating the impacts of climate change on the forest sector
- Management of this diversity should be incorporated into national forest programmes and other relevant policies, programmes and strategies
- This should be done at the pan-European level.

Recommendation 2

- Policy makers in Europe should promote forest management practices that maintain evolutionary processes of forest trees and support natural regeneration of forests, especially in areas where long-term natural regeneration is self-sustainable despite climate change.

Recommendation 3

- Policy makers in Europe should take into account the potential for accelerating adaptation of forest trees to climate change through tree breeding and transfer of potentially suitable forest reproductive material
- This should be done by endorsing the development of pan-European guidelines for the transfer of forest reproductive material in Europe on the basis of scientific knowledge.

Recommendation 4

- The European forest research community should carry out more interdisciplinary studies (e.g. tree physiology, forest genetics, pests and diseases, forest management and economics and modelling) on the impacts of climate change to forests with the support of policy makers.

Native rowan experiment established

Jason Hubert

An experiment examining adaptive variation in GB native rowan (*Sorbus aucuparia*) populations has just been planted. Seed was collected from 42 populations of rowan spread across GB in the autumn of 2004. It has been grown for one year at the Northern Research Station nursery and now the seedlings have been planted out at four field trials this spring. The field trials are located at four contrasting sites within the native range of rowan:

- The north of Scotland
- The edge of the North York Moors
- Near Llandovery in Wales
- Near Alice Holt, Farnham.

The aim of the field trials will be to investigate the level of adaptive variation with the native population and also the adaptability of provenances to contrasting sites. Unlike standard forestry provenance tests these will focus on assessing traits that confer reproductive fitness as well as growth.

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Red squirrel conservation in Scotland

Liz Poulson

The Scottish Executive has asked Scottish Natural Heritage and the Forestry Commission to develop a costed action plan for red squirrel conservation in Scotland. The call for the plan came from Rhona Brankin (Scotland's Deputy Minister for Environment and Rural Affairs), who said there was "no time to lose", and that failure to act could result in the loss of this "iconic species" within 50 years.



The Minister's request came at the end of a one-day conference on red squirrel conservation at Edinburgh University on February 27th, attended by 120 delegates. The need for immediate action was highlighted when the conference heard about the danger posed by the continued spread of grey squirrels carrying the squirrelpox virus from northern England into the Scottish borders (see next article).

Forest Research presented the results of their work to identify priority woodlands for red squirrel conservation in northern and central Scotland and the work of the Red Squirrel South Scotland Project, which identified priority woodlands in the Borders and Dumfries and Galloway.

Other talks covered:

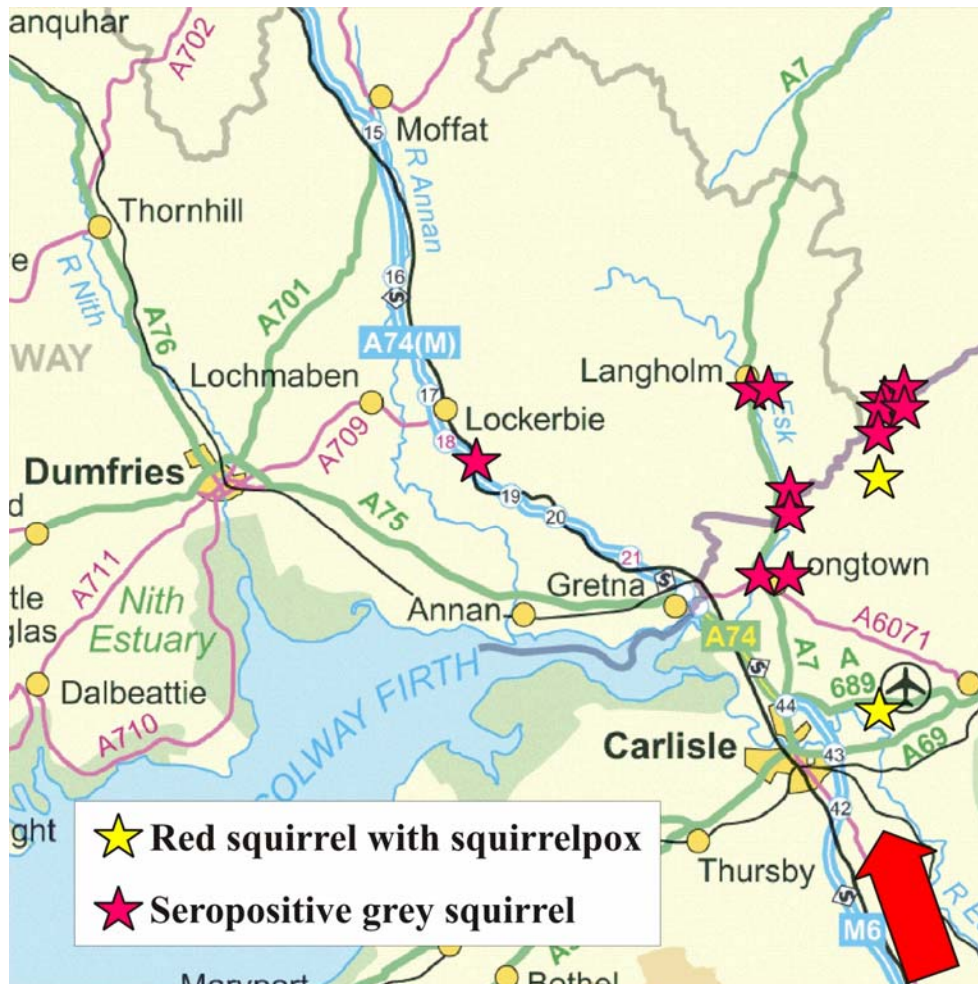
- Squirrel population modelling
- Habitat management
- Grey squirrel introductions to Italy
- Red squirrel conservation policies
- Grey squirrel control.

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Update on the spread of squirrelpox virus

Elly Hamilton

Grey squirrels in North England and South Scotland are continuing to spread, with an increasing risk that the two populations will meet up in the Scottish Borders somewhere between Newcastleton and Hawick within a short time.



The most northerly cases of squirrelpox virus in red squirrels in England are shown on the map. Most alarmingly there have been 10 confirmed cases of greys in South Scotland to date testing positive for antibodies to the virus. Control of greys in this area and south of the border is an urgent priority to prevent spread of the disease. Landowners and managers within this area are being urged to intensify efforts to control greys.

Control to prevent the continuing spread of greys into potential priority areas for red squirrels will be one of the items identified within the action plan for Red squirrels in Scotland (see previous article for more information). The city of Aberdeen has already been identified as a priority area for control. The City Council proposes controlling greys on land at the edges of the city, particularly along the rivers Dee and Don and other wooded areas.

Ecology Division are supporting the development of the action plan by collating information from other areas involved with grey squirrel control and providing detailed maps for priority areas showing known grey presence. Maps showing squirrel distribution can be downloaded from National Biodiversity Network website at www.searchnbn.net, but be aware that these maps rely on information sent to the site, so gaps in presence may actually indicate lack of information rather than species absence.

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Survey of Welsh small-leaved lime woods for the scarce lime bark beetle *Ernoporus tiliae*

Alice Broome



The scarce lime bark beetle *Ernoporus tiliae* is classed as a Red Data Book category 1 species, and is listed as a Priority species in the UK Biodiversity Action Plan due to its apparent decline in post war years. The objectives of the Species Action Plan for *Ernoporus tiliae*, for which the Forestry Commission is the Lead Partner, set out to learn more about the distribution and habitat

requirements of the species. The survey in Wales carried out in the autumn of 2005 complements work carried out in England in 2001-2, and together provide for the first time, a countrywide distribution for the species. The survey has been funded by the Countryside Commission for Wales and the Forestry Commission.

Ernoporus tiliae like the rest of the members of the Scolytid family, is a wood-boring insect. However, unlike its well known relatives such as the great spruce bark beetle (*Dendroctonus micans*), this species is not a pest but a deadwood specialist. It feeds on small-leaved lime (*Tilia cordata*), boring through the bark to reach the phloem/bast layer beneath. It is dependent on small-leaved lime and prefers limes that have been coppiced. Specific site requirements appear to be lime poles or branches 1cm to approximately 10cm in diameter, which are showing signs of becoming moribund and of the correct water content (they should not be completely dry nor waterlogged). More specific still is the preference for warmer spots within woodlands, tending to colonise trees on glade margins and edges of rides where the branches are warmed by the sun, rather than deep within shady, woodland interiors.

There is only one secure historical record of *E. tiliae* for Wales (from near Dolgellau). However, the abundance of the species in the Forest of Dean and in the Wye and Golden Valleys of Herefordshire, and the discovery of new sites along the Welsh border in 2002, confirmed the proximity of the species and the need for a survey in Wales. Indeed the survey in England showed that *E. tiliae* occurs at a low density throughout most of the small-leaved limewood areas, with significant strongholds in Lincolnshire, Essex and the southern Welsh border area.

Survey effort was focused on woodland containing a concentration of small-leaved lime. Fifty-two sites were searched for *E. tiliae*, in the following vice counties: Merionethshire (12 sites), Cardiganshire (6), Montgomeryshire (4) Radnorshire (2), Monmouthshire (16), Glamorgan (3), Breconshire (4), Denbighshire (2) and Pembrokeshire (1). *E. tiliae* was found at only one site and this was at Wyndcliff, near Tintern, Monmouthshire where extensive colonies were found in the boughs that had fallen from a mature *T. cordata* growing in the centre of a car park.

In Wales, *E. tiliae* is a rare beetle, seemingly confined to sunny and sheltered sites in the Wye Valley woodlands. Small leaved limewoods in Wales tend to be associated with steep riverine ravines where they cling to rocky outcrops, usually scattered among other trees such as birch, oak and ash, or growing out of rocky scarps, often fairly inaccessible. Unlike the Wyndcliff, site, many of the Welsh habitats surveyed were heavily shaded and this may account for the paucity of *E. tiliae* records, given its thermophilic requirements. However it is anticipated more colonies of *E. tiliae* could be discovered in the Wye valley. The strength of the colony found at Wyndcliff supports the prediction that the Welsh Marches from Shropshire south to Chepstow, Monmouthshire are one of Britain's key refugia for this very localised species.

From Drane, A.B. (2005). The current status, distribution and conservation of the scarce lime bark beetle, *Ernoporus tiliae* (Panzer), including a review of *Ernoporicus caucasicus* (Lindemann), in Wales, implementing the UK Biodiversity Action Plan. Forestry Commission, Edinburgh. Unpublished.

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Woodland birds - their ecology & management

This was the British Ornithologists' Union (BOU) annual spring conference, and took place at Leicester University from 1-3rd April 2006. The two days of presentations brought together the needs and plight of our woodland birds both resident and migrant, covering issues of woodland and open ground quality, provision of habitat at the landscape scale and climate change impacts.

Context was provided by presentations from North American and European speakers who discussed habitat availability and predator pressure in large scale and near-natural ecosystems.

Forest Research contributed papers on Britain's current and future forest resource and the choices and implications for this of forest management policy and practice. The conference also saw presentation of the results of the Repeat Woodland Bird Survey (for further information and a copy of the report, see www.forestry.gov.uk/forestry/INFD-6MWL96). Conference proceedings will appear later this year in the IBIS online journal of the BOU.

PUBLICATIONS

Forest Fencing Technical Guide - 2006

Roger Trout & Harry Pepper

This publication replaces Forestry Commission Bulletin 102 (Forest fencing), published 14 years ago (Pepper, 1992). It covers:

- Best practice principles for managers and practitioners in choosing the fence design appropriate for the target species
- Electric fencing
- Temporary fences
- Marking fences in areas with woodland grouse.



It assists in identifying the normal specifications of components needed for typical situations, and also those for special local circumstances.

Forest fencing has advanced considerably in recent years and this new publication covers a number of issues previously unaddressed or considered elsewhere. The new Technical Guide shows the key practical steps in fence construction, and looks at how machinery can be used for fencing purposes, assisting in speeding up fence installation times, clearing

paths for new fences, unreeling netting rolls and safely removing old fences.

We have tried to show the minimum specifications needed to be fit for purpose, and suggested where managers may consider alternatives to achieve the objective within local constraints.

The new Guide can be downloaded from the Forest Research website at: www.forestryresearch.gov.uk/website/forestryresearch.nsf/ByUnique/INFD-6LKBB3.

Or paper copies can be bought from:
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