Return of the Native

The question: 'Resilience for native planting in south Scotland in a changing climate now that ash and elm are endangered; could Scots pine be included on suitable soil types?' formed the basis for an event organised by the Royal Scottish Forestry Society and the Institute of Chartered Foresters, which took place at Edinburgh's Royal Botanic Garden on October 15.

James Ogilvie, Social and Planning Policy Advisor at Forestry Commission Scotland, chaired the debate. Before introducing the speakers, he remarked: "Why are we having this discussion? To feed back to the forestry bodies, including the FC, our views concerning issues for future planting policies and grant aid."

Duncan Stone of Scottish National Heritage (SNH) pointed out to the floor that things are changing and that his organisation – along with others in the forestry industry – was becoming involved in the discussion. As yet, however, there have been no definitive answers and no policy changes. In Duncan's view, the ICF and the RSFS have an important role to play. He expressed confidence in three points: firstly, that older trees aged between 200 and 500 years are important for biodiversity and that their survival forms a significant part of land managers' and foresters' responsibilities. Secondly, that we now have to be growing trees that will thrive for fifty years and, hopefully, survive for a couple more centuries thereafter in a changing environment. Lastly, that we can be very sure that we do not know exactly what is happening in terms of pathogens, average climate and extremes of climate. As the environment moves away from that to which our trees are adapted, it will become more difficult to predict how long their tolerance may continue.

'Resilience' is a word that Duncan Stone is wary of using – it is a relative term. That said, he emphasised that, if we are to ensure the continuity of older trees in our forests, we cannot wait for the best part of a century to see how things turn out. "We must try to select the right specimens and start growing them immediately."

(Left to right) Bill Rayner (Forest Research), Roy Barlow (Woodland Trust), James Ogilvie (FC Scotland), Philip Ashmole (Borders Forest Trust) and Chris Badenoch (An Torc Ecology & Land-Use Advice).

Profuse coning of the Lilswood Burn pines has not resulted in any recent regeneration. This may be because the area is heavily grazed and the sheep often use the stand for shelter. Seed has been propagated from the William's Cleugh pines at Kielder, but germination was reported to be erratic.

When faced with adversity it is not wise to put all of one's eggs in the same basket. Duncan Stone admitted that, from an SNH perspective, woodlands had been traditionally managed for uniformity. Simple protection of ancient woodlands does not necessarily ensure that they will survive; the Alladale pinewoods in Sutherland and the Rassal ashwoods in Wester Ross, for example, still manifest a worrying lack of diversity, with an over-abundance of veteran specimens.

Duncan Stone encouraged those present to take a wider view of woodlands, stimulating their imaginations with Dr George Peterken's theory of 'future-natural' ecological forest systems. The views of Mark Anderson, of Nature Conservancy's Eastern US division, were also brought to the attention of the meeting. "This is a stage, and we are concerned with maintaining the setting and continuing the play without worrying who the actors may be."

Commenting: "My ideas aren't always necessarily establishment ideas," Chris Badenoch (An Torc Ecology & Land-Use Advice), defined native species as 'those which arrived on these islands before the hand of man'. "The upshot of our glacial history and subsequent isolation has meant a remarkably poor tree flora. With changing climate and the, not always associated, onset of pests and diseases, foresters and our grant-masters have some serious decisions to make with regard to the future planting of 'native woods'."

A woodland is not, Chris explained, merely a stand of trees, but the sum of all the component species – plants, invertebrates, birds and mammals. "'Native woodlands' are usually assemblages which are attuned to one another and highly integrated. Such assemblages are not necessarily static; one woodland community or even woodland may succeed another given time. Sycamore, for example, has proven to be an aggressive colonising species, so it may be surprising that it did not arrive before Great Britain became an island."

Scots pine, on the other hand, seems to have declined rapidly in southern Scotland 6,500 years ago. The tree reappeared in the Iron Age, but it was not until the late medieval period that any significant presence was noted. Having gone, Scots pine seemed to have difficulty returning to its former haunts; a view corroborated by Chris's colleague Richard Tipping, who confirms that the species has a certain 'competitive frailty'. "Given the wide spread of the species across the northern hemisphere," commented Chris Badenoch, "it seems extraordinary that it did not survive at least as a few isolated specimens."

The work of Adrian Manning, a Northumbrian by birth, but now based at the National University of Australia, Canberra, was brought to the attention of the meeting. An isolated group of pines just south of the border was the focus of his study. Were the few pines standing at William's Cleugh, Kielder, progeny of conifers that had followed the tundra vegetation north as the ice retreated?

"Let us not close our minds over the next 400 years," concluded Chris Badenoch. "We must take extreme care to guard against narrow thinking and focus on species diversity that will allow our flora and fauna to survive."

Bill Rayner, Forest Research, Forester Site Surveyor, who has been digging holes and examining soil samples since 1990, stressed the fact that foresters need to start with the basics; climate and soils. "You can have all sorts of florid ideas about what to plant, but knowing your soil thoroughly will eliminate the likelihood of making incorrect species choices."

Bill explained that the soils of south Scotland show great variation. Whilst much of the area is overlaid with fine, silty deposits from the Silurian period, to the west, Galloway has coarser textured – albeit fertile – soil. The carboniferous soils found on the area's northern border tend to be clay-rich and waterlogged. On the east coast the upper old red sandstone soil is poor in fertility, while the lower old red sandstone forms richer soils. Here too are found the basaltic laval soils that hold on to nutrients by electric charge. These can appear fertile, but there may be mineral deficiencies.

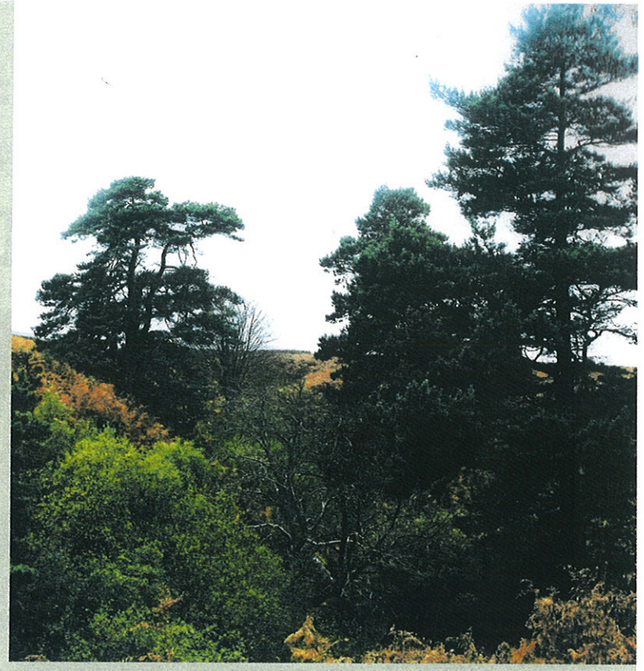
It is worth remembering that 5°C is the temperature at which plants start to grow. Scots pine will, Bill pointed out, tolerate a shorter growing season than many other species. "Genetic changes may enhance its suitability, but to optimise these we need to have a turnover of generations.

"Climate models would suggest that there is potential for the establishment of many more species, but lack of resistance to exposure can be a limiting factor. In the Drax eucalyptus experiment, saplings experienced two very hard winters, with large areas of the country down to -20°C. The species was well tested and found wanting."

While Scots pine should be able to resist such low temperatures, the conifer is, nevertheless, very sensitive to exposure. Bill Rayner cited the example of Glenfeshie in the Cairngorm Mountains, where pines regenerate and grow, but struggle to rise above the heather. Without group shelter the species is unlikely to thrive. Anaerobic (waterlogged) soils are unsuitable, and it is also wrong to assume that establishment will be successful on the poorest of soils. Growth will almost certainly be best on average/poor sites. Nutrient-rich soils over-accelerate growth, producing very poor form. The classic heather/bilberry shrub layer will be less easily achieved in southern Scottish pinewoods, as the land is generally better than in the Highlands.

Philip Ashmole, Borders Forest Trust (BFT), asked, "Why haven't we been planting Scots pine over the last century? Because we have no validated native stands of the tree in southern Scotland. South Scotland has been subjected to much more intensive grazing than the Highlands. Scots pine may have been totally unable to regenerate on the higher parts of the southern Scottish uplands. If it were to survive anywhere, this would be expected to be on steep north- and east-facing slopes such as Talla and Gameshope – an area recently acquired by the BFT for reforestation."

The Trust is keen to establish a variety of habitats in the woodlands; oak/birch, pine/birch, and including *Salix* spp, but it would, Philip said, be prepared to consider more targeted species. "We already have some trees on BFT land that can produce viable seed. We're keen to produce our own plants to speed up local adaptation and maintain provenance parameters."



The Lilswood Burn pines south of Hexham in Northumberland have been mooted as a possible relict native Scots pine stand. However, in the nineteenth century quarrying was carried out a few hundred metres to the east, and a large plantation – probably of Scots pines – stood a few hundred metres to the west. The eleven trees present today may well be the progeny of trees cleared between the two World Wars.

Philip Ashmole returned to south of the border, to the Scaup Burn at Kielder. Progeny from the William's Cleugh pines is now growing at the Trust's Carrifran woodlands, but it was the discovery of a fossilised pine that had aroused expectations. Dating of the fossil revealed an age of 7,000 years, which was a disappointment. If the find had been only 1,000 to 2,000 years old, it would have been a great support to the theory that the pines at Kielder were a native relict community.

The establishment of a pine-based wildwood down at Kielder was encouraging, but montane scrub is an essential vegetation zone often missing from British upland woodlands. Unfortunately, it has been concluded that the habitat cannot be grant aided under present schemes. Philip Ashmole appraised the meeting of the Scandinavian practice, whereby these sorts of ecosystems are encouraged.

Speaking on behalf of the Woodland Trust, Roy Barlow said: "The Woodland Trust aims to broaden the genetic base of the woodlands we manage. Our site managers are so much more in tune with their woodlands than the conservation management teams were. A few years ago we were very keen on preserving local provenance purity, but we are now prepared to include material from neighbouring zones. More minority species are being included to balance the distribution out a little more. From an ecosystem point of view it does not matter which species becomes dominant. We haven't yet looked at non-UK provenance of material, but, although we will proceed with great caution, it will be taken into account."

There is a theory, Roy Barlow explained, that if used correctly there are enough genetically adapted native trees to cope with climate change. The WT will not plant sycamore or beech in northern Britain, but it has moved away from its purist position. Planting Scots pine in new native woodland in southern Scotland would not be a problem.

There is a lot of debate within the WT, but not, the meeting was assured, along the old dogmatic lines. Contractors are now undertaking seed collections for the WT, and plants are being grown on by commercial nurseries. New stock will be available in a couple of years, and current thinking in the organisation is, it seems, less about pure 'nativeness' than about putting 'the right tree in the right place'.

Susan Burke