

**ALIENS AT KILMUN:
A FUTURE FOR ECOSYSTEM MANAGEMENT?**

**R GRAY
c/o GNHS, Zoology Museum, Graham Kerr Building,
University of Glasgow G12 8QQ**

The 120 acres of Kilmun Forest Garden comprises part of Argyll Forest Park, in 1935 the first such park to be established in the UK. It now forms part of Loch Lomond & the Trossachs National Park, located in the far southwest corner of the recently established entity. The Garden itself was established in 1930 as a site for experimental tree planting by the Forestry Commission. Among the factors that encouraged this choice were the mild oceanic climate, the annual rainfall of c. 200 cm. (80") and very rare frosts.

The existence of the Kilmun plots has been one of the Forestry Commission's best-kept secrets. In 1960 an Edinburgh University forestry department silvicultural tour of the UK included a visit to nearby Benmore but no reference was made to Kilmun. Perhaps this was not entirely surprising in view of the fact that most of the lessons to be learned about silvicultural practice came from the early introductions and experimental plantings carried out during the 19th and earlier centuries by various Scottish landowners. The Forestry Commission had been set up in 1919. Kilmun Arboretum was planted in groups to test a variety of trees under forest conditions. However the demand for forest expansion could not wait the 40 or so years necessary for the research results. However as an educational and recreational site the area is hard to beat.

The site has a southwesterly aspect and the trees were planted in groups from 20 to 300 metres a.s.l. The underlying bedrock comprise Dalradian quartzose mica schists giving rise to free draining brown earths on slopes and gleying where the ground levels out. Open spaces are rapidly colonised by native bracken, which reduces floral diversity. Group planting (plots) is what distinguishes Kilmun from arboreta where tree species tend to be planted singly or woods where large numbers are planted together. Native species were not planted since until recently their potential for timber production in Scotland was not taken seriously.

260 species from 50 different genera and of different provenance were planted between 1930 and 1985. Conifer genera adapted to the moist oceanic climate have done best whereas genera such as pines have done less well. High growth rates have been shown by silver firs, especially *Abies amabilis*, *A. grandis* and *A. procera*, as well as Japanese cedar (*Cryptomeria japonica*), Leyland cypress (*Cupressocyparis leylandii*), coastal redwood (*Sequoia sempervirens*) and giant sequoia (*Sequoiadendron giganteum*). Broadleaved survival and performance have been poorer than that of conifers but exceptions include Oregon maple (*Acer macrophyllum*) and Chilean southern beech (*Nothofagus procera*). These species, especially where shade bearing, could be used to convert single species forests to mixed forests where appropriate.

Next door to Kilmun and linked to it by means of a track is Benmore forest. Opposite the entrance to the arboretum the society members climbed a steep path that took us high into the canopy of the developing woodland that comprised coastal redwoods, giant sequoia, grand firs, western hemlocks (*Tsuga heterophylla*), western red cedars (*Thuja plicata*), Douglas firs (*Pseudotsuga taxifolia*) and others. Beneath these towering giants pirri-pirri burr (*Acaena novae-zelandiae*) was growing. Towards the top of the path a massive windblown European silver fir (*A. alba*) had fallen over the track and a footbridge has been built over it providing a good view of natural regeneration of Douglas fir in particular. This emphasises how well adapted many alien trees are to climatic and soil conditions in this country.

Factors such as continental drift, east-west mountain ranges and the ice ages have deprived Britain of all but a fraction of an impoverished North European flora. Our latitude provides long light in the growing season and the gulf stream provides higher temperatures at these latitudes than elsewhere in the world and so not only is a large number of exotic trees available for planting here but also many trees grow better here than they do in their native habitats. (Hence the existence of the International

Conifer Conservation Programme, planting groups of endangered species on 130 sites throughout the UK, including 12 such conifer species at Kilmun). This is not to denigrate the outstanding work being done by Forestry Commission Scotland, the Royal Scottish Forestry Society, the RSPB and others on the eastern shore of Loch Lomond, in the re-establishment of indigenous oak woodland, but to draw attention to the eminent suitability of many exotic conifers to British environmental conditions. Increasing the number of exotic plantings will increase the biodiversity of the British countryside and the number of ecological niches available for the success of increasing numbers of plants and animals.

The spectacular Chilean fire bush (*Embothrium coccineum*) at the entrance to Benmore demonstrates how alien species can add to our enjoyment of the environment. It is worth bearing in mind that the giant sequoias forming the avenue are mere juveniles, planted in 1863. Already there are twice as many of these trees having a girth greater than 20' than oak trees of such a girth in the country. If this continues the biggest trees in the British Isles will be completely dominated by this species. We've come a long way since Dr. Samuel Johnson wrote in 1773 that 'a tree in Scotland is as rare as a horse in Venice'.

This year as it happened FC Scotland has commissioned a feasibility study to look at the future development of the arboretum. The proposals fit in with the likely policy framework of the first Park Plan. Amongst these proposals is the promotion of the arboretum's scientific record and its potential as a tree collection of international note to a local and international audience. The Society's visit to Kilmun was indeed a timely one.

Photos: Joyce Alexander



1. Soil parent material. The bedrock comprises quartzose mica schist producing a free-draining brown earth



2. Rauli (*Nothofagus procera=nervosa*). A southern beech from the south central Andes. Note the typical dense pendulous crown. The fine timber is beech-like



3. 'Big tree walk' opposite Benmore gardens



4. Western hemlock (*Tsuga heterophylla*) growing through *Rhododendron ponticum* (Chile pine in background). The dense shade cast by *Tsuga* eventually prevents growth of rhododendron and produces a viable stand of timber



5. Pirri-pirri burr (*Acaena novae-zelandiae*) growing on woodland floor



6. Footbridge over a magnificent European silver fir (*Abies alba*), planted in 1870 and blown down in 1998. The space created provides an ideal location for seed germination. (Note in the background an old small-leaved lime, *Tilia cordata*, growing near the northern limit of its natural regeneration in Britain)



7. Natural regeneration. The abundance of alien tree seedlings both at Kilmun and other parts of Scotland demonstrates how well adapted are many introduced tree species to the Scottish environment



8. The Chilean fire bush (*Embothrium coccineum*), native to Chile and southwest Argentina where it grows at low altitudes in open woodland, was introduced in 1846. It is hardy to c. -150C in sheltered areas



9. Giant sequoias (*Sequoiadendron giganteum*) form the avenue at the entrance to Benmore botanic garden. They were planted in 1863 and are >130 feet tall

Alien vs. Native Trees

Natives

Britain:	c. 35 species of which 32 broadleaves, 3 conifers
Scotland:	c. 27 species 24 broadleaves, 3 conifers (including Yew, status debatable)

Aliens

Naturalised in Britain	c. 82 broadleaves, c. 180 conifers (Clement & Foster)
Kilmun plantings	260 species, 45% broadleaves, 55% conifers (1930 – 1985)
Kilmun survivors	154 species, 27% broadleaves, 73% conifers (Mason <i>et al</i>)
Having potential to grow in Britain	2,500 species (Mitchell)

Highest Growth Rates at Kilmun

Conifers	Silver firs (<i>Abies amabilis</i> , <i>A. grandis</i> , <i>A. procera</i>)
	Japanese cedar (<i>Cryptomeria japonica</i>)
	Leyland cypress (<i>Cupressocyparis leylandii</i>)
	Coast redwood (<i>Sequoia sempervirens</i>)
	Giant sequoia (<i>Sequoiadendron giganteum</i>)
Broadleaves	Oregon maple (<i>Acer macrophyllum</i>)
	Rauli, Chilean southern beech (<i>Nothofagus procera</i>)