Status and Value of Native Broadleaved Woodland

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INTRODUCTION

The title of this symposium "Broadleaves — have they a future in Ireland" prompts questions as to their past and present status. Travelling around Ireland the impression gained is of a country well stocked with broadleaved trees and woodland, but this is a false impression obtained from the dense network of hedges combined with small patches of young woodland and scrub on pockets of poor soil or steep slopes. With less than 6% of Ireland under woodland it is the least wooded part of Europe (excluding Iceland), and the area of broadleaved woodland is only 1% of the land area. In order to understand the reasons for this, and to understand the significance of our broadleaved woodlands, it is necessary to examine briefly how the present situation evolved.

The Rise and Fall of Ireland's Woodlands

The post-glacial development of our forests to their maximum extent c 5000 BC, when they covered almost the entire island, and their subsequent decline as a result of the combination of climatic change and human activity is well documented (e.g. Watts 1986). Man first began to have a major impact on the forests in neolithic times c 3500 BC, and Edwards (1986) suggests that the relatively tree-less nature of the landscape dates back to the Bronze Age. Certainly by the Middle Ages very little of the original forest remained. McCracken (1971) estimated that there were only one million hectares of woodland in 1600 AD, but Rackham (1960) concluded from the Civil Survey of 1654-56 that only 170,000 ha remained, and that by the 1830s there was only a tenth of that area. This very low figure is supported by evidence from entomological research which shows that there is a marked absence of insects associated with ancient woodland (M. Speight. pers. comm). Plantations in the 18th and 19th century saw a temporary reversal

in the downward trend but today only 84,000 ha of native broadleaved woodlands remain (Purcell 1979, Clinch. pers. comm.) of which perhaps less than 20,000 ha (0.2% of the land area) represents ancient woodland.

Thus in the 5,500 years since the beginning of the Neolithic period the original forest cover has declined from nearly 100% cover to only 0.2% of the land area, and with this demise have gone the traditions and woodmanship associated with them, a factor which is important to an understanding of present-day attitudes to woodlands and trees.

The Present Day Resource

Our present-day broadleaved woodlands may be grouped into three categories:

1. Remnants of the wildwood (Peterken 1981) largely confined to the poorest sites, greatly modified, abandoned sylviculturally 100-180 years ago, and with trees of mostly fire-wood quality.
2. Plantations, most of which are 150-200 years old, (but with some younger stands) on better sites, with some good quality timber but much of it over-mature. Exotic species, such as beech, are common and the native species may be of foreign provenance.
3. Secondary woodland on abandoned farmland, usually scrub-like with the better quality timber often selectively removed.

Few woodlands exceed 100 ha in extent and many are only a fraction of this size. Most are damaged to various degrees by overgrazing, the spread of introduced species such as *Rhododendron ponticum,* and the selective removal of good quality trees. The generally poor conditions of the trees and woodlands, due to a combination of the often poor site type and sylvicultural neglect, has given rise to the widely held view that good quality hardwood timber cannot be grown in Ireland.

What did the wildwood look like to the first Neolithic people? The popular concept of forests dominated by oak is certainly incorrect for this is largely a product of 18th and 19th century management. Oak (probably mostly *Quercus robur*) would have been present mixed with elm, ash and hazel on the more fertile soils. On sandy soils and acidic sites there would have been a mixture of pine, birch and *Q. petraea,* while soils with impeded drainage would have carried alder, ash, sally and probably *Q. robur*. Structurally these woodland types were probably very varied with gaps caused by windthrow or death and many of the trees would have been much larger than any we can find today (Mitchell 1976).

The present-day distribution of woodland types according to soil type broadly reflects that described above and, except for the loss of Scots Pine, the species composition is the same although the relative proportions have changed, largely as a result of human activity. Ash, for example, has largely replaced elm as the principal tree of more fertile soils, while the selection of oak (mostly *Q. petraea*) for the charcoal and tannery industries has resulted in a virtual monoculture of this species to the detriment of others.

The four principal types of present-day native woodland are summarised in Table 1. Within these woods are found most of our 25 native tree species, including hazel and yew (Table 2), and a few introduced species of some importance, e.g. beech and sycamore. Certain species such as ash, elm and hawthorn are often abundant in hedgegrows.

Value and Uses of Broadleaved Trees

With the very small area of broadleaved woodland left in the country, and the present overwhelming importance of plastics, metals and concrete, it is very easy to forget how important timber was in the everyday life of our ancestors, even up to the present century. This is something of a paradox given the degree of destruction of our woodlands. Timber was used for almost every aspect of daily life, e.g. housing, furniture, domestic utensils, vessels, agricultural implements, fencing, and in more recent times for industrial purposes such as charcoal production, and of course for firewood. Each timber type has specific as well as general uses, (Jones 1986), for example — oak was the principal timber for construction, elm for carts, ash for tool handles and yew and fruit tree timber was highly prized for vessels (Table 2).

Many of these uses have fallen out of fashion as timber has been replaced by other materials, but oak, ash and beech are still in demand, especially for furniture. Some other species have potential value for general and specialised purposes, e.g. cherry (Pryor 1985) and yew for veneer and turnery (Table 2). Several species are of value for non-timber uses. Holly for example is important for decorative purposes at Christmas and commands high prices. Wild apple and cherry represents an important genetic reservoir for improving cultivated varieties for both fruit production and horticultural purposes. The FAO, for example, is compiling a list of stands of *Prunus* spp. in Europe as a source of genetic material. Strawberry tree, rowan and whitebeam are of horticultural significance. All species have a value for amenity and landscape purposes and most are important for firewood, which at present is the principal use of this resource. Last, but by no means least, all

Table 1: Principal Native Woodland Types in Ireland

Dominant Tree Species	Shrub Layer	Other Flora	Soil	Tree Characteristics
1. *Quercus petraea* E.g. Wicklow Woods	Holly Occasionally hazel	Herb layer poor Bryophytes & lichen flora rich especially in west	Acidic, usually poor sandy soils but occasionally on deeper loams	Mostly coppice 120-180 years old. Height 14m occasionally 25m, DBH 0.6m
2. (a) *Q. robur*/ash E.g. Charleville Estate, Co. Offaly	Hazel	Tree and herb flora species — rich. Bryophyte & lichen flora well developed in the west but less so in drier sites	Deep calcareous clays	Standards, sometimes with coppice. Trees up to 200 yrs old, some over 400 years. Height 25m DBH up to 1.5m
2. (b) Ash/Hazel E.g. Burren scrub	Hazel blackthorn	As for 2a	Shallow soils over limestone	Scrub or low woodland. Rarely greater than 10m. Usually secondary woodland.
This is a variant of the *Q. robur*/ash woods, largely confined to shallow soils.				
3. Alder/willow/ash E.g. Fiddown Marsh, Co. Kilkenny	Willow	Sedges and moisture-loving species	Alluvium, clays & fen peats subject to waterlogging	Scrub or low woodland. Rarely greater than 10m.
4. Birch E.g. Widespread Raised bog type — All Saint's Bog, Co. Offaly.	Various depending on soil		Various, but usually acidic. Occasionally raised bog peat.	Usually secondary woodland except on raised bogs. Up to 12m in height

Table 2: Native Irish Trees and their principal uses past and present.

Alnus glutinosa	Alder	Charcoal, turnery, clogs
Arbutus unedo	Strawberry tree	Carving, cabinet making
Betula pendula		
B. pubescens	Birch	Turnery
Corylus avellana	Hazel	Pea sticks, wattle
Crataegus monogyna	Whitethorn	Hedges, horticulture
Euonymus europaeus	Spindle	Furniture
Fraxinus excelsior	Ash	Hurleys, turnery, furniture, veneer
Ilex aquifolium	Holly	Turnery, decorative purposes
Malus sylvestris	Crab apple	Turnery, vessels, carving, horticulture
Populus tremula	Aspen	
Prunus avium	Gean, wild cherry }	Turnery, vessels, cabinet
P. padus	bird cherry }	making, horticulture
Quercus petraea	Oak	Construction, furniture,
Q. robur		joinery, veneer, charcoal
Rhamnus catharticus	Purging buckthorn	
Salix alba*	White willow	Basket work
S. atrocinerea	Sally	
S. caprea		
S. pentandran	Bay-leaved willow	
Sambucus nigra	Elder	
Sorbus aucuparia	Rowan	
S. hibernica	Whitebeam	Horticulture
Taxus baccata	Yew	Veneer, turnery, vessels
Ulmus glabra	Elm	Furniture, turnery, piles for under-water uses, coffins

(*Possibly introduced)

our native species are important for conservation purposes as many species of flora and fauna are directly or indirectly dependent on them for their survival. Approximately 20% of our plant life (excluding algae), 28% of breeding birds and 50% of our invertebrates (i.e. about 6,000 species) are woodland species in the broadest sense. Further loss of our remaining woodland fragments would almost certainly lead to the extinction of some of these species.

Conservation of our Native Resource

The principal attempts to conserve our native broadleaved woodlands so far have been taken in the context of establishing nature reserves under the 1976 Wildlife Act. The Office of Public Works is also conserving broadleaved woodlands in the National Parks, including the extensive Killarney Woods. The underlying philosophy is to conserve the woodland ecosystem, rather than the trees per se, in order to maintain the genetic resource as represented by the flora and fauna, for future use by man (Neff 1974).

At present 24 woodland nature reserves totalling c 1700 ha have been established under the Wildlife Act and approximately 100 ha are protected in National Parks. Another 20 sites are scheduled as reserves and our aim is to conserve at least 60 sites covering 5000 ha (Neff 1984). Legally, these reserves must be managed to maintain their scientific interest. The principal management objectives have been discussed by Neff (1974) and may be summarised as follows:

1. To maintain the woodland ecosystem.
2. To maintain, and where necessary, increase the diversity of native species and habitats. This will require unconventional sylvicultural treatment such as creating a range of age classes, allowing trees to become overmature and leaving dead and rotting timber.
3. To remove, or contain, harmful influences such as overgrazing, invasive exotic species and inter-planted conifers.

It is important here to note the distinction between nature reserves and broadleaved plantations. In the former, timber production, while not being totally excluded, will play very much a secondary role to the conservation of the totality of organisms, while the latter should be managed primarily for timber production and any conservation and wildlife value will be a happy corollary.

So what role then have woodland nature reserves in the context of a future for broadleaved trees in Ireland? Nature reserves are not

wastelands but a valuable resource. They are, among other things, the cheapest and easiest means of conserving genetic material which can continue to evolve subject to the physical and biological pressures of the environment. This repository can be tapped for human use as required, without destroying the resource. It includes not only the trees, which may be used to improve timber quality, but all other organisms such as lichens, which may be of value for monitoring air pollution, or predatory insects which may be used for pest control. It is encouraging therefore to see the first steps being taken to tap this resource with the establishment of trials to test the susceptibility of Irish provenances of oak to oak wilt disease (*Ceratocystis fagacearum* (Bretz) Hunt.) and the establishment of provenance trials of oak and ash. Results from these trials will be of value in assessing the potential of native material for use in plantations.

Conclusion

Have broadleaved trees a future in Ireland? In as far as there are now c 2700 ha. of broadleaves protected in nature reserves or National Parks our native broadleaved trees are assured of a place in the future, albeit a very small place. Given the likely decline of agriculture on marginal land it is almost certain that scrub and eventually broadleaved woodland will re-establish to some extent (grants for planting conifers notwithstanding) just as it has in the past.

The crux of the matter however depends on whether it is considered economically worthwhile to grow broadleaves as a substitute for conifers on some of the better soils. At present the price of hardwood timber is kept artificially low by the supply of cheap imports from N. America and the tropics. However the supply of this timber is likely to decline in the foreseeable future as the forested areas are reduced and as the environmental consequences of clearfelling tropical forests become more apparent (Keogh 1986). There is therefore a strong argument in favour of planting at least a proportion of our land with broadleaved trees.

Broadleaved trees have received a bad press in Ireland, largely because of the poor quality of the old stands, but given the right conditions I believe they have potential to produce good quality timber. It is therefore encouraging to see the reawakening of interest in their cultivation (Fitzsimons & Luddy 1986). In the final analyses however it is up to the foresters of the country to decide whether there is a commercial future for broadleaves in Ireland, and whether the resource that is being conserved in nature reserves and National Parks can be utilised more fully for future generations.

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