The Tree Register of Ireland

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Abstract

The Tree Council of Ireland and The Irish Tree Society initiated the Tree Register of Ireland (TROI) project in 1999 with the aim of compiling a database of trees in Ireland. Five thousand two hundred trees were measured and recorded over the period 1999 to 2001. Of these some 3000 had previously been recorded by Alan Mitchell on behalf of the Tree Register of the British Isles (TROBI).

Mitchell covered many of the large estates, public parks and gardens throughout Ireland. Many of Ireland's finest trees however, are found on private farmland and in gardens. TROI endeavoured to both update the tree measurements taken by Mitchell, and to locate and record new trees which were growing in less conspicuous locations.

The tallest tree measured was a Douglas fir at Powerscourt, Co Wicklow standing at 57.5 m. The largest girth tree was a Monterey cypress at Killyleigh, Co Down, measuring 12.09 m. The oldest tree recorded was a yew in Co Wexford, which was estimated to be between 800 and 1200 years old.

Differential Global Positioning System (DGPS) technology was used to accurately determine tree location and to facilitate subsequent relocation.

The Tree Register can be viewed at the National Botanic Gardens at Glasnevin, Dublin and provides the most comprehensive database of outstanding tree specimens in Ireland.

Keywords

Differential global positioning system, champion trees, Tree Register of Ireland, TROI, Tree Register of the British Isles, TROBI.

Tree recording in Ireland

The Dublin Society, founded in 1732, began, in the mid eighteenth century, to encourage the creation of woodlands and forests by awarding premiums (grants) to landowners who planted trees. This led to several landowners writing about their tree-planting endeavours. As a result five books on arboriculture were published in the last half of the eighteenth century; one such was on methods of raising Scotch Fir (sic), written by the Earl of Clanbrassil, James Hamilton and published at Newry in 1783 (Hamilton 1783). These books advised fellow landowners on growing trees and were based on the authors' own personal experiences. Hayes (1794) commented on fine, mature exotic trees, some of which must have been planted in the preceding century.

However, the history of the early planting of exotic trees in Ireland can principally be derived from Loudon's writings of 1838 in which 18 Irish estates and their trees were described.

Notwithstanding this earlier work, it was Elwes and Henry who laid the foundation for modern tree measurement in Ireland. In the introduction to their seven-volume *The Trees of Great Britain and Ireland* (Elwes and Henry 1906), they state that although the historic trees of parts England and Scotland had been described in various publications, those in

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Ireland were in need of more detailed study. They go on to say that Henry paid special attention to many interesting tree locations in Ireland. Throughout the seven volumes, the authors refer to both native and exotic trees, measured in Ireland, from Fota in Co Cork in the south, to Castlewellan in Co Down in the north.

Lowe (1897) focused on yew, and published a comprehensive listing of outstanding trees of the species in Great Britain and Ireland. He gives measurements at 20 locations in Ireland, including the famous Silken Thomas yew at Maynooth and the yew-lined avenues at Strokestown, Co Roscommon, Glencormac, Co Wicklow and Gormanstown, Co Meath (subsequently re-measured by the Tree Register of Ireland (TROI)).

Fitzpatrick (1933) continued the work of Elwes and Henry by recording native and introduced trees in Ireland at 72 estates in Ireland.

Alan Mitchell, a dendrologist from Essex, followed on from the work of Fitzpatrick. Having read forestry at Dublin, he was appointed dendrologist with the Forestry Commission in 1970. This allowed him to travel Britain and Ireland, collecting measurements of outstanding trees. He located and re-measured trees recorded by Loudon in the 1820s and 30s, Elwes and Henry in the period 1906-1913 and those included in the 1890 and 1930 Conifer Conference reports by the Royal Horticultural Society. He was himself closely involved in the work of the 1970 Conifer Conference. Much of his data was included in the publication *Conifers in the British Isles, A Descriptive Handbook* (Mitchell 1972). He also made an important contribution to W.J. Bean's *Trees and Shrubs Hardy in the British Isles* (Bean 1976).

In 1988 Mitchell and Victoria Schilling founded the Tree Register of the British Isles (TROBI). The aim of TROBI was to protect Mitchell's register of trees and ensure its future updating.

Mitchell's continuing search for rare and exceptional trees enabled the Forestry Commission to publish the first comprehensive list of champion trees in *Champion Trees in the British Isles* (Mitchell 1985). This publication continued to be updated until 1994 (Mitchell et al. 1994). It set out the location and dimensions of trees of outstanding size, vigour, and quality in Britain and Ireland. The 1994 report includes 1065 species (802 broadleaved and 263 coniferous, with 495 cultivars and varieties). By the time of his death in 1995 Mitchell had measured and recorded over 100,000 trees on a hand-written card index.

In 1979 the Heritage Gardens Committee of *An Taisce* (The National Trust for Ireland) began an inventory of trees and shrubs in major Irish gardens. It was based on collections in twenty privately owned gardens and a further eight in public ownership. Approximately 117,500 woody plants were recorded, which represented 7000 different species, subspecies, varieties, forms and cultivars (Forrest 1988).

The Tree Register of Ireland

The Tree Council of Ireland and The Irish Tree Society initiated the Tree Register of Ireland (TROI) project in 1999 with the aim of compiling a database of champion trees in Ireland.

Mitchell, during his limited time in Ireland, covered many of the large estates and public parks and gardens throughout the country. Many of Ireland's finest trees are, however, found on private farmland and in gardens. TROI endeavoured to both update the tree measurements taken by Mitchell, and to locate and record (with the help of a network of enthusiastic volunteers) new trees which were growing at less conspicuous locations.

Inclusion criteria for the register

When a tree register is begun it is imperative that structures and guidelines are put in place to ensure that the register contains the best trees. Mitchell's (1994) criteria for choosing outstanding trees were used in establishing the register:

1. trees of known planting date previously measured over a long period,
2. old and venerable specimens that probably represent an ultimate size appropriate to the local site conditions,
3. trees exhibiting good growth, horticultural or genetic value, disease or exposure resistance,
4. any tree that occurs in a unique location or context and so provides a contribution to the landscape, including remnant native vegetation, and trees that form part of a historic landscape, park, garden or urban planting,
5. rare or locally distributed taxa for which little data exist already.

Tree recording

Recording took place over the period 1999-2001.

Locating trees from descriptive annotation and as recorded in all previous listings amounted to a considerable task. Quite a number of the trees were rarities, requiring taxonomic assistance from the National Botanic Gardens.

To enable subsequent relocation of the trees measured, and to enable accurate mapping of trees that were in close proximity to each other, Differential Global Positioning System (DGPS) technology was used. This had an accuracy of ± 1 m. A data logger attached to the GPS allowed all measurements to be recorded with an associated accurate point location.

Apart from the ability to accurately map and relocate specimen trees, the georeferenced data could be added as a layer in a Geographic Information System (GIS) and be analysed in combination with other georeferenced data (Figure 1).

The use of a data logger also allowed for easy uploading of all field data. The measurements recorded for each tree included location, species, girth, height above ground level at which the girth was measured, tree height, tree health and condition, landscape setting and ownership. A number of select trees were photographed. An important part of the information gathering process was to record any cultural significance associated with individual trees, in either a local or national context.

Measurement conventions

In setting up the register it was important to standardise tree measurement. Tree growth can be measured using height, girth, canopy spread, weight, volume and dry matter. Girth and height were the two measurements used, as they are the easiest to take and most commonly used.

Girth was measured at 1.5 m above ground level, or in other cases below that height:

1. Single clean stem (including buttressed and/or fluted stems). Girth was measured at 1.5 m above ground level. (This had been the height used in all previous measurements made by TROBI, and therefore provided a standard reference point for the comparison of measurements.)

Figure 1. *Tree location data overlain on 6-inch map, Powerscourt Demesne, Co Wicklow.*

2. Single, clearly defined stem with stem irregularities and swelling between ground level and 1.5 m. Girth was measured at 1.5 m above ground level or if the girth was increased by an irregularity at 1.5 m, the girth was measured at the narrowest point between ground level and 1.5 m.

3. Twin or multi-stemmed trees with a fork between ground level and 1.5 m. The girth was measured at the narrowest point of the main stem below the fork. In the case of coppiced trees with stems originating at ground level, the stem group was measured at its narrowest point between ground level and 1.5 m.

Results

Five thousand two hundred trees were measured and recorded over the period 1999 to 2001. Of these, some 3000 had previously been recorded by Alan Mitchell on behalf of TROBI. Some 5000 entries occur on that database but many are repeat measurements of Mitchell's earlier specimens. In compiling the register all of these trees were sought, but many were no longer extant, either due to windthrow or having been felled. Owners, foresters and the public brought the remaining trees recorded in the register to the attention of the recorders. Many trees, previously recorded by one of the authors (Aubrey Fennell), were also included. Other sources of information included Loudon (1838), Lowe (1897) and Fitzpatrick (1932).

All of the ten tallest trees were conifers, comprising three species: Douglas fir, Sitka spruce and wellingtonia (Table 1).

Table 1. *Ten tallest trees in the Tree Register of Ireland (TROI).*

Species	*Location*	*Height*	*Girth*
		m	
Douglas fir	*Powerscourt Gardens, Enniskerry, Co Wicklow*	57.5	4.86
Sitka spruce	*Curraghmore, Portlaw, Co Waterford*	55.0	6.70
Sitka spruce	*Powerscourt Gardens, Enniskerry, Co Wicklow*	55.0	6.40
Sitka spruce	*Caledon Estate, Caledon, Co Tyrone*	55.0	5.77
Sitka spruce	*Shelton Abbey, Arklow, Co Wicklow*	54.5	6.61
Douglas fir	*Avondale Forest Park, Rathdrum, Co Wicklow*	54.0	3.44
Wellingtonia	*Luttrelstown Castle, Castleknock, Co Dublin*	54.0	6.55
Sitka spruce	*Tempo Manor, Tempo, Co Fermanagh*	54.0	5.20
Wellingtonia	*Caledon Estate, Caledon, Co Tyrone*	53.5	6.35
Douglas fir	*Avondale Forest Park, Rathdrum, Co Wicklow*	53.5	3.34

The tallest tree recorded, at 57.5 m, was a Douglas fir at Powerscourt in Co Wicklow (Figure 2). The four next tallest trees were all Sitka spruce.

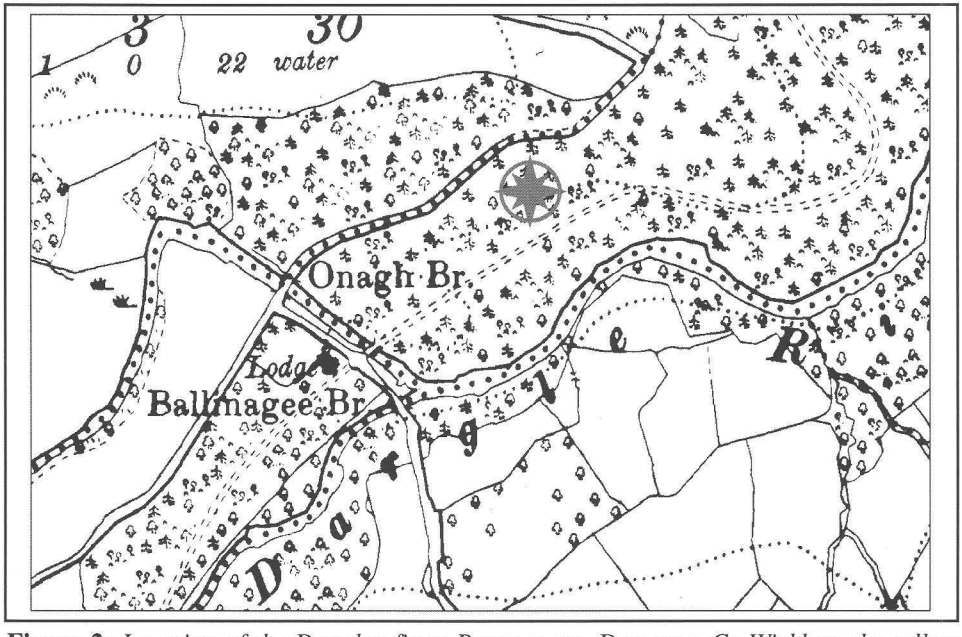

Figure 2: *Location of the Douglas fir at Powerscourt Demesne, Co Wicklow, the tallest tree in the Tree Register of Ireland.*

The specimens continue to grow at respectable rates. The Douglas fir at Powerscourt, was 42.5 m in 1966; when re-measured in 1999 m it was 57.5 m – a growth rate of close on a half metre/year. The Sitka spruce at Caledon, Co Tyrone was 44 m when measured by Mitchell in 1984, and 57 m in 1999 – a growth rate of about 0.9 m/year over the period. Some of these trees are therefore likely, within the coming decade, to be the first recorded trees in Ireland to reach to over 60 m.

Almost all of the tallest conifers were found on acid or near neutral soils. Notable exceptions were at Caledon and at Birr Castle, Co Offaly.

Monterey cypress was the largest girth tree recorded; comprising the first six of the ten largest trees (see Table 2). While the trees had a bushy form their size is nevertheless remarkable, considering they were first introduced to Ireland from California only in the 1840s (Figure 3).

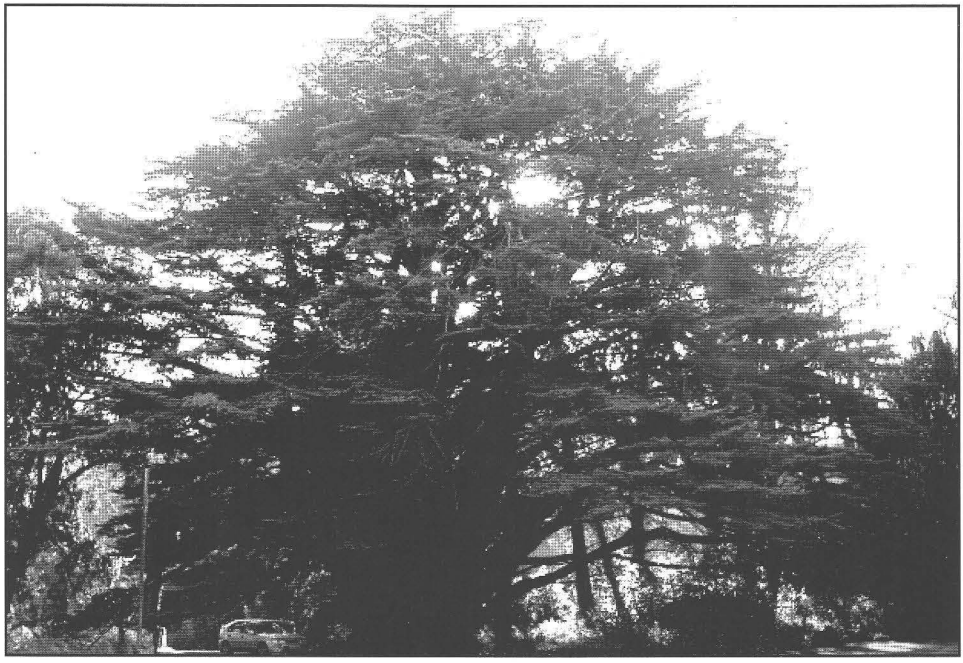

Figure 3: *Monterey cypress at Innishannon, Co Cork.*

Other new champions include a 4.24 m girth monkey puzzle at Carrickmacross, Co Monaghan, a 6 m girth incense cedar at Glenart, Co Wicklow, a 7 m girth Japanese cedar at Caher, Co Clare and a 3.8 m girth maidenhair tree (Ginkgo) at Lucan, Co Dublin.

Only one yew had been previously recorded over 5 m in girth. There are now 20 such trees. The most celebrated aspect of yew is its long life. The largest and oldest tend to be hollowed by decay. Therefore, counting of rings or carbon dating of the centre point heartwood does not tell the full story. Current estimates (Mitchell 1996) give a 5 m girth yew an age of 400 years, therefore the four trees over 6 m in question which were recorded at Bunclody, Co Wexford, Avoca Hand Weavers, Glencormac, Co Wicklow, Doneraile Court, Doneraile, Co Cork and St Patrick's College, Maynooth, Co Kildare are possibly between 700 and 1200 years old.

Table 2. *Ten largest girth conifers in the Tree Register of Ireland TROI.*

Species	*Location*	*Girth*	*Girth height m*	*Height*
Monterey cypress	*Ringdufferin House, Killyleigh, Co Down*	12.09	0.2	31.7
Monterey cypress	*Innishannon, Co Cork*	12.05	0.3	27.5
Monterey cypress	*Franciscan Priory, Ards, Creeslough, Co Donegal*	11.58	0.5	29.5
Monterey cypress	*Ballywalter Park, Co Down*	11.29	0.4	25.5
Monterey cypress	*Hockley Lodge, 11 Drumilly Road, Armagh*	10.78	0.9	27.7
Monterey cypress	*Seaforde Gardens, Seaforde, Co Down*	10.47	0.2	34.0
Wellingtonia	*Charleville Estate, Enniskerry, Co Wicklow*	10.38	1.5	27.5
Monterey cypress	*Timoleague Castle, Timoleague, Co Cork*	9.94	0.3	28.0
Monterey cypress	*Muckross House, Muckross, Co Kerry*	9.93	1.0	21.5
Cedar of Lebanon	*Adare Manor, Adare, Co Limerick*	9.90	1.0	19.0

The largest broadleaves such as ash, beech, oak and sycamore were mainly found in limestone river valleys of the midlands, east and south. Common lime, Spanish chestnut and ash were the largest girth trees – all well in excess of 10 m (Table 3).

Table 3. *Ten largest girth broadleaves in the Tree Register of Ireland (TROI).*

Species	*Location*	*Girth*	*Girth height m*	*Height*
Common lime	*Florencecourt, Enniskillen, Co Fermanagh*	10.71	0.5	22.0
Spanish chestnut	*Rossanna, Ashford, Co Wicklow*	10.59	1.3	19.0
Ash	*Thurles, Co Tipperary*	10.57	1.4	29.0
Pedunculate oak	*Stradbally, Co Laois*	9.90	1.0	20.2
Spanish chestnut	*Bunratty House, Bunratty, Co Clare*	9.30	1.5	16.0
Common lime	*Forenaughts, Naas, Co Kildare*	9.19	0.6	23.0
Spanish chestnut	*Clonbrook, Ballinasloe, Co Galway*	9.19	1.4	17.0
Pedunculate oak	*Charleville Forest, Tullamore, Co Offaly*	9.11	0.9	12.0
Common lime	*Strokestown Park, Co Roscommon*	9.10	1.1	25.5
Common lime	*Coolmore House, Thomastown, Co Kilkenny*	9.01	0.5	27.0

TROBI recorded just two oaks in Ireland as over 7.5 m in girth. TROI has now located and recorded 25 such trees. Three oaks of 9 m girth tie for the title of Ireland's largest oak. Two of them are located at Charleville Forest, Co Offaly; the other is at Stradbally, Co Laois.

The oldest oak is more difficult to determine. Oaks at Charleville have been ring counted as 450 years old, while the old oak at Abbeyleix Estate in Co Laois could be 600 years old. This is assuming it is the same tree mentioned by Evelyn in the 1660s and measured in 1794 by Samuel Hayes. Oaks 37 m high were recorded in Co Armagh while one near Clonmel, Co Tipperary was measured at 40 m and is probably the tallest native tree in Ireland.

Other notable new champion trees recorded were a sessile oak in Co Tyrone with a girth of 8.3 m, a beech of 7.9 m girth in Co Laois, a sycamore of 7.8 m in Co Meath, a horse chestnut of 6.3 m girth in Roscommon. A hornbeam with a girth of 5.7 m was recorded at Co Wicklow; the same tree was measured at 5.45 m in 1941 and must be all of 400 years old.

European and North American trees such as plane, turkey oak, tulip tree, red oak and black walnut grew best in south Leinster and east Munster. Southern hemisphere genera such as southern beech, eucalyptus and yellow-wood (*Podocarpus*) grew best in the frost-free coastal areas of those provinces.

Relevance to forestry

From a forestry viewpoint, the database contains measurements of all forest species currently grown in plantation forestry and of their potential size and longevity.

Access to the register

The Tree Register of Ireland can be viewed at the National Botanic Gardens of Ireland, at Glasnevin, Dublin.

Acknowledgements

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