

# Woodland History in Ireland: An Overview

**Authors:** Emmet Byrnes, Senior Archaeologist Forest Service (Department of Agriculture, Food and the Marine); and

Séamus Ó'Murchú, Archaeologist, Forest Service, (Department of Agriculture, Food and the Marine)

**Edited by:** Declan Little and Richard Nairn, Woodlands of Ireland



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The preparation of a management plan aimed at conserving and restoring an existing native woodland must take full account all of the factors contributing to its current status and condition, as well as the objectives. Factors and attributes include soil, elevation and climate, the woodland's ecology and natural dynamics, threats such as invasive exotic species and excessive deer numbers, and also the aspirations of the owner regarding, for example, wood production. Another key factor that cannot be ignored is the previous management of the woodland, not only in recent times, but also down through the centuries. This is due to the fact that the historical management of a wood has a major impact on its current species composition, age structure and other key attributes.

This Native Woodland Information Note offers an overview of woodland history in Ireland, from the

arrival of people to this island up until the early 20<sup>th</sup> century. It describes how and for what purpose woodlands were managed, and also how woodlands were mismanaged and exploited. It describes the historical decline of Ireland's native woodland cover, and the primary causes. It also highlights clues still present in the Irish landscape, such as archaeological features and placenames, that can give us an insight into how woodlands were managed in centuries passed. This note strongly complements Native Woodland Information Note No. 1: *Cartographic and Historical Sources for Native Woodlands* (Byrnes & Ó'Murchú, 2007, reprinted, 2019), helping those involved in developing plans for both existing and new native woodlands under the Native Woodland Scheme (NWS), to take full account of key historical information.

## INTRODUCTION

From the time of the first human presence in Ireland, native woodlands on this island were exploited for wood and for food, for both humans and their livestock. Overall, the factor having the greatest impact on forest cover was the removal of trees for agricultural land, which began in the Neolithic Period and continued down

through the centuries to the present. As a result of these activities, the range of species and the age structure of most of the surviving ancient woodland fragments left on the island are as much a product of successive episodes of human management as they are of soils, aspect and climate (Aalen et al., 2011). The

interruption of woodland continuity has also had a significant impact on woodland ecology and succession (Garrett & O'Sullivan, 2001). When all of these factors are considered, an assessment of past exploitation and management should inform future management decisions.



**Fig. 1: Bowl barrows that date to the Bronze Age may be encountered in old woodlands and the appropriate measures should be adopted to ensure that they are not damaged during forest operations. This barrow is located at Carrowreagh, Co. Laois. (Image courtesy of the National Monument Service, Department of Culture, Heritage and the Gaeltacht).**



## WOODLAND DEVELOPMENT AND HUMAN IMPACT

### The end of the Ice Age and the dawn of the Post-Glacial Period

As has been discussed in much greater detail elsewhere (Mitchell & Ryan, 1997), the environment which the earliest humans in Ireland encountered was one of marked difference from that of the preceding Pleistocene Era. The extreme cold at the end of the Ice Age, ca 10,000 BC, effectively killed off much of the Pleistocene flora and fauna. The post-glacial landscape gradually changed from open tundra to one dominated by forests of Scots pine (*Pinus sylvestris*), hazel (*Coryllus avellana*) and birch (*Betula pubescens* & *B. pendula*), with breaks in the canopy in forest glades, along the banks of rivers and on the edges of the intervening expanses of lake and bog (Smith, 1992; Cooney & Grogan, 1994).

### The Mesolithic (7,000 – 4,000 BC) and Neolithic (4,000 – 2,300 BC) Periods

Over the next three millennia, the improving climate resulted in a change in the composition of these forests. By around 6,500 BC, oak *Quercus petraea* & *Q. robur* and elm (*Ulmus glabra*) had begun to overshadow Scots pine and hazel, with the former pushed onto the drier and sandier soils. Alder (*Alnus glutinosa*), ash (*Fraxinus excelsior*) and yew (*Taxus baccata*) were also present, but not in significant quantities. The activities of the first humans, who arrived ca 7,000 BC, are believed to have had a minimal effect on tree cover, as these hunter-gatherer's preferred to avail of the shelter and the wide range of plant and animal food resources of these primeval woodlands (Aalen et al., 2011). However, some larger timbers were undoubtedly felled and utilised. For example, it has been speculated that a large concave wooden plank of aspen (*Populus tremululus*) or poplar (*Populus spp.*), discovered in the mudflats of the Shannon estuary and

dating from 4,779 – 4,551 BC (i.e. the Late Mesolithic Period) is from a dug-out canoe, although a natural origin has not been ruled out (O'Sullivan, 1997; O'Sullivan, 2001).

From 5,000 to 4,000 BC, the percentage area of the Irish landscape under tree cover continued to rise. The taller deciduous species – particularly oak – became increasingly dominant, but the proportion of alder also rose significantly as Scots pine went into decline. Alder was especially suited to periodically or permanently flooded areas, such as the fringes of lower wetlands, where the wet conditions enabled the species to establish large colonies. Many of these colonies subsequently evolved into fen woodland (Mitchell & Ryan, 1997).

Between 5,000 and 4,000 BC, an increase in grass and herb pollen associated with disturbance is also evident in pollen cores taken from Ireland and across northwest Europe. This phenomenon was first recognised by the Danish scholar Johannes Iversen and is taken as an indicator for a major phase of forest clearance. He dubbed the process *landnam*, after the Old Norse word for 'settlement', and linked it to the gradual adoption of agriculture across the European continent.

As these changes also coincided with a major percentage drop in elm pollen, it was thought that this 'elm decline' was anthropogenic, i.e. brought about by human activity. The species is indicative of fertile soils and its dried leaves are also known to be nutritious for cattle, sheep and goat fodder. In fact, elm leaves continued to be put to this use well into the 19<sup>th</sup> century in Sweden (Hakan, 2003). More recently, however, it has been recognised that the picture is far more complex, and the model has been somewhat refined. It is now believed that a pandemic elm disease occurred throughout Europe around the same time as the beginning of farming, with early farmers capitalising on the pathogen-generated clearances rather





than being wholly responsible for them.

Either way, the pollen record indicates increasing forest clearance and decline in Ireland from 4,000 BC onwards, coinciding with the arrival of the first Neolithic farmers on the island. It is important to note that clearances weren't necessarily permanent – phases with forest regeneration often occurred, followed later on by further incidences of clearance. As on any pre-modern farm, the uses of the timber arising from clearance were many. Particularly good examples are the radially split oak timbers used in the construction of Early Neolithic palisade fences and rectangular houses recorded at Thornhill, Co. Derry, Corbally, Co. Kildare, and Tankardstown, Co. Limerick (Logue, 2003; Purcell, 2002; Gowen, 1988).

### The Bronze (2,300 – 600 BC) and Iron Ages (600 BC – 400 AD)

Throughout the Bronze Age and succeeding Iron Age, as the human population grew and settlement expanded, there was a corresponding demand for agricultural land and wood products. This led inevitably to increased forest clearance and a consequent decline in woodland cover. In addition to this, from ca. 3,000 BC onwards, the climate became increasingly wetter and cooler, and this stimulated the expansion of bogs, particularly upland blanket peats, with a consequent reduction in tree cover, most notably Scots pine forests along the Atlantic fringe (Mitchell & Ryan, 1997).

Examples of the wood used during these periods include a large dugout canoe made from a single oak tree. This canoe, recovered from a bog at Addergoole, Lurgan, Co. Galway, and radiocarbon dated to c.2,500 BC, is ca. 15 m in length, offering us a glimpse of the stature of trees in the landscape at that time. Finely worked large half-split oak timbers have also been recovered from the Middle Bronze Age (1,612 BC) together or plank trackway at Derrindiff, Co. Longford

(Maloney et al., 1993a), while a pair of intricately carved wooden paddles were recovered from the Late Bronze Age settlement at Clonfinlough, Co. Offaly (ca. 917 - 899 BC) (Maloney et al., 1993b).

Coppiced hazel rods, woven into hurdles, were also used in the construction of the Late Bronze Age trackway at Derryoghil, Co. Longford (Raftery, 1994). At Corlea, also in Co. Longford, an Iron Age trackway which extended for some 2 km across the bog and dendrochronologically dated to 148 BC, is estimated to have required the felling of between 200 and 300 large oak trees for the transverse sleepers and a similar number of trimmed birch logs, some more than 10 m in length, for the longitudinal runners beneath. Over 5,000 wooden obtusely-angled pegs were also used to anchor the trackway in place. The oak timbers were, for the most part, radially split planks, on average 3-4 m in length, up to 65 cm in width and as much as 20 cm in thickness (Raftery, 1994).

An even larger oak post was erected at the very centre of the Iron Age ceremonial structure at Emain Macha (Navan Fort), Co. Armagh. The post was so large that a sloping ramp, 6 m long, had to be cut into the edge of the pre-dug posthole, which was 2.8 m deep, so that it could be manoeuvred into its upright position. The post is estimated to have been 55 cm in diameter and up to 13 m in height (Raftery, 1994).

Finely worked wooden objects are also known from the Iron Age. These include a deer trap recovered from an eroding peat hag on the summit of Blackstairs Mountain on the Carlow/Wexford border, which was radiocarbon dated to 336–42 BC\*. The object appeared to have been broken prior to its deposition, mirroring similar practices common throughout Iron Age Europe where metal objects were placed in wet environments such as bogs, watercourses and lakes, likely

\* <https://excavations.ie/report/2011/Carlow/0022128/>

representing votive offerings (Johnston & Wailes 2011, 89).

### The Early Historic (Early Christian) and Hiberno-Norse (Viking) Periods

Forest exploitation and clearance further accelerated in the Early Historic and Hiberno-Norse Periods, a time during which many of the topographically descriptive townland names and placenames in use today originated. Irish placenames indicating woodland are particularly common (MacCoitir, 2003).

Written sources dating from the period give us an even greater insight into timber use and management, especially the 8<sup>th</sup> century law tract *Bretha Comaithchesca* or 'Laws of the Neighbourhood', which regulated the use and graduated fines for damaging or cutting down trees without permission. The laws recognised a hierarchy among tree species, with four classes of tree or bush: the *airig fedo* or nobles of the wood; *aithig fedo* or commoners of the wood; *fodla fedo* or lower divisions of the wood; and *losa fedo* or bushes of the wood (MacCoitir, 2003).

Placenames directly referring to woodland clearances or settlement within woodland are less readily identified, but might be deduced from names such as Aghavea or *Achadh Bheithe* (birch field), Ballinderly or *Baile an Doire* (homestead of the oakwood), Boolycreeen or *An Bhuaile Chríon* (the booley site amongst the trees), Clonsilla or *Cluain Saileach* (meadow or pasture of the sally/willow), Gortnahoimna or *Gort na hOmna* (field of the oak), Lisacul or *Lios an Choill* (fort of the wood), Mayo or *Maigh Eo* (plain of the yews), Tawnyinah or *Tamhnaigh an Eich* (clearing of the horse), and Tinnakilla or *Tigh na Coille* (house of the wood). Also of note is the Old Norse word for meadow, *-low*. Viking rural settlements have also given rise to two town names in Co. Wicklow, one of the historically most densely wooded counties in Ireland – *Wicklow* (Viking meadow) and *Arklow*



(Arknell's meadow) (Flanagan & Flanagan, 2002). It is important to remember the role the Viking port of Dublin played in the export of timber and other commodities to the Norse settlements in Iceland and further afield.

Indigenous examples of timber use during these periods include large numbers of oak, birch and ash used in the construction of crannógs (Fig. 2) such as those at Ballinderry, Co. Offaly (Hencken, 1942) and Lagore, Co. Meath (Hencken, 1950). Wood also increased in importance for use in the manufacture of wooden vessels during this time, particularly as Early Historic society was largely aceramic (i.e. did not make pottery). A particularly fine example of a stave-built yew bucket (and fragments of a lathe-turned willow bowl) was recovered from the Early Historic crannóg at Ballinderry, Co. Westmeath (Edwards, 1990). The more recent excavation of a crannóg at Drumclay, Co. Fermanagh revealed a considerable assemblage of wooden remains. Successive phases of house construction dating from the 8<sup>th</sup>/9<sup>th</sup> century through to the 17<sup>th</sup> century were uncovered. The artefacts recovered included a fine wooden bowl with a cross carved in its base, wooden vessels with interlace decoration, parts of at least two log boats and a wooden oar (Bermingham & Moore 2015). Notably, a Viking warship, *Skuldelev 2*, excavated in Roskilde, Denmark was analysed using dendrochronological dating revealing that it had been built in Dublin ca. 1042 AD from Irish timber (Brink & Price, 2008).

### **The Medieval Period (1169 AD – 1300 AD)**

In both Ireland and Britain, woodland exploitation continued apace in the Medieval Period following the respective Norman invasions (i.e. 1066 AD and 1169 AD). However, it was during this period that many of the techniques of woodland management still evident in 'ancient woodlands' and 'long established

woodlands' in both Britain and Ireland today were first developed and formalised.

There is a view held by some that, whereas the Norman lordship in England oversaw the continuation of structured woodland management, their contribution in Ireland was much more exploitative, in that timber was valued primarily as a supply of raw lumber for the English market. There is some basis for this argument. For example, there is a record that the forest of Glendalough was deforested in 1229 AD (Neeson, 1995).

Also, recent dendrochronology dating research undertaken by English Heritage on the oak timbers used in the two exceptionally fine roofs of the eastern chapels of Salisbury Cathedral has confirmed that the trees were felled in the spring of 1222 AD in the Dublin area. This precise dating supports 1224 AD records of the importation of wood from Ireland by a man called William of Dublin. It has been surmised that the Cathedral's original 13<sup>th</sup> century carpenters may have run out of home-grown timber for the roof because of a dispute between the chief carpenter Godardus and the warden of nearby Clarendon Forest, which threatened wood supplies. The cathedral then had to import trees from Ireland in order to keep pace with stonemasons building walls to support the vaults (English Heritage pers. comm., 2003).

While such felling was undoubtedly detrimental to Irish woodlands, the issue cannot be dismissed simply as exploitative felling. Despite at least one attempt to impose English Forest Law in 1219 AD, with its system of title, leases, courts, fines and use prescriptions, it was never effective in Ireland. Instead, like the country in general, Irish forests outside of those areas where Norman control was sufficiently strong to effect local changes

related to Forest Law, remained much as they were before the arrival of the Normans.

There was already a long-established indigenous pattern of woodland use, and the increasing native population would have resulted in increasing demands for timber anyway. The pasturing of cattle, pigs and sheep undoubtedly continued, but was probably more closely regulated than before, particularly on Norman lands. Coppice and pollards already had a long history of use, but almost certainly became increasingly important. In addition to this, small-scale indigenous industrial uses required woodland products. Over 80 charcoal burner mounds have been discovered around the monastic settlement of Glendalough, and an area of iron-working near the site has been dated on the basis of pottery finds to the 13<sup>th</sup> and 14<sup>th</sup> centuries AD (Eogan & Kilfeather, 1997).

Significant characteristic features of medieval woodlands in Britain are the original earthen banks, called 'wood banks'. Woods, especially coppice woods, were intensively and conservatively managed during the Medieval Period. Wood banks were necessary to prevent the browsing of young coppice shoots by domestic animals and deer, or other forms of trespass such as the collecting of nuts (nutting) or firewood, both of which had a significant economic value in their own right.

The earliest of these earthworks comprised a wide bank surmounted either by a sturdy hedge or fence with an external ditch. Walls were built on some later examples. In other cases, the exterior face of the bank was sharply revetted with dry-stone walling. Some woodlands also had an internal arrangement of banks and ditches, which either indicated compartmented ownership or were used





**Fig. 2: This crannóg at Loughtown Lough, Co. Leitrim, recolonised with woodland vegetation after it was abandoned. In Ireland, crannógs were common during the Early Christian Period. (Image courtesy of the National Monument Service, Department of Culture, Heritage and the Gaeltacht).**



as a means of fencing off coppices at particularly vulnerable stages in their regeneration cycle.

Deer park boundaries are another feature commonly found in association with ancient woodlands, enclosing, contiguous or completely external to them. They were similarly constructed, but with one major difference – the ditch was on the interior to keep the deer from getting out. They also required much sturdier ‘pale’ fences, which were usually made from large oak staves or ‘pales’ driven into the ground and nailed to a perpendicular rail (Rackham, 2001; Beglane, 2015).

The more mundane activity of ‘grubbing-out’ or removing trees to make new clearings for settlement or farming is also well documented in Britain from the Anglo-Saxon Period onwards, falling under the generic term for the making of

new arable land, *assarting*. While many of these clearings remained open and were gradually expanded over time, others did not. In the latter case, after periods of cultivation (often indicated by lines of ridge-and-furrow), they were re-colonised by trees and eventually re-absorbed into the woodland (Rackham, 1995).

Although significant research on medieval field systems and ridge-and-furrow within modern agricultural land in Ireland has been undertaken, the study of woodland ‘assarting’ is at a much less advanced stage, and there are literally no published references in the main textbooks on medieval rural settlement. At least one example of the practice is documented in 1280-81 on the Bigod Manor at Fenagh, Co. Carlow when “*there was expenditure on four new ploughs and two harrows for the oxen for new land made and on*

*assarting land before the plough”* (Cosgrave & Vaughan, 1987). Similarly, there are several recorded deer parks and associated boundaries in Ireland (at least 46 known deer parks established prior to 1400 AD), the most famous of which is probably the Phoenix Park, Dublin (Beglane, 2015). but little work other than Rackham’s research in Offaly and Waterford (Rackham, 1995) has been done on fully documenting woodland boundaries, coppice stands or pollard trees.

Similar woodland clearance and management undoubtedly took place widely elsewhere in Ireland. Substantial volumes of wood from coppice ‘stools’ and pollard ‘bollings’ were used for wattle-and-daub houses in both native Irish and English medieval hamlets, villages and towns, as well as for more mundane uses such as firewood. In parts of England, the wood that sprung from these stools was called ‘poles’ and collectively they were known as ‘coppice’, ‘underwood’ or simply ‘wood’. The use of similar terminology in Ireland is testified to in the Civil Survey (1654-6) (Aalen et al., 2011). Likely areas for the survival of coppice stands, woodland banks and associated earthworks which could be studied in the future are the woodlands adjacent to deserted medieval villages (such as Kiltinan, Co. Tipperary, and Newtown Jerpoint, Co. Kilkenny) or on the numerous demesnes and parklands, which evolved from Anglo-Norman manors.

In England, another feature of woodland management were holly woods, or what were called ‘holly hags’, ‘holly holts’ or ‘hollins’. These were carefully managed as a source of winter fodder for farm stock and were undoubtedly exploited in a similar fashion in Ireland. Although certain Irish scholars have cautioned against the mistranslation of the word *cuilleann* (meaning a steep unbroken slope) and *cuileann* (holly), holly does



appear in placenames such as Moycullen or Maigh Cuilinn (Plain of Holly), Co. Galway (Flanagan & Flanagan, 2002; MacCoitir, 2003).

### **The Late Medieval Period (1300 AD – 1600 AD) and post-Medieval Periods**

A further significant development in the Late Medieval Period in both Britain and Ireland was the increase in iron-working. The process took a major leap forward in the mid 16<sup>th</sup> century across Europe with the invention of the blast furnace (McNeill, 1990; Trinder, 1992). By the mid 17<sup>th</sup> century, ironworks were recorded at over 150 locations around Ireland, some of which were industrial in scale. Very large works are recorded at Draperstown, Co. Derry, Mountrath, Co. Laois, Drumshanbo, Co. Leitrim, and Enniscorthy, Co. Wexford, all of which were areas relatively close in proximity to major outcrops of iron ores as well as major woodlands (Neeson, 1995; Rackham, 2001). The whole of north Antrim has significant deposits of interbasaltic laterite ores, while both the Lough Allen area and the whole of metalliferous Wicklow is rich in haematite, siderite and pyrite ores (Scott, 1991).

The smelting of the iron ores required significant volumes of charcoal, produced by the controlled burning of coppiced wood. The latter, when first cut, was stacked in piles known as 'cords' eight feet long and four feet wide. This is the source of the term 'cordwood'. The charcoal burning process involved clearing an area and creating a shallow depression, usually about 5 m in diameter. A central flue was then constructed, built from either a single coppice pole or by means of a triangular framework of poles. The remaining cordwood was then carefully arranged around this, until a stack approximately 5 m in diameter and 2 m high was built. Subsequently, the stack was covered with straw, grass, bracken and turfs, followed by dust and ashes left

over from previous burns. Finally, red-hot coals were dropped down the flue, and once the stack was alight the flue was sealed. To ensure the stack burned consistently, the 'colliers' remained in constant attendance, sealing up any holes that appeared in the turf covering or moving wind breaks to prevent excessive burn on the side of the prevailing wind (Jones, 2003).

In addition to the use of coppiced wood in ironworks, other demands on native forests in the late 16<sup>th</sup> and early 17<sup>th</sup> century included the glass-working and cooperage industries, and shipbuilding. It is thought that glass-working was less dependent on fuel wood as ironworks, but ash trees were especially important for the alkali. Major glassworks were built at Birr, Co. Offaly, and there are other townlands in the county whose names are derived from 'glasshouses'. There is extensive documentary evidence for cooperage in Derry, Cork and Wexford. This industry required large numbers of wooden staves to manufacture wine casks and other barrels, and in tandem with iron-working, has been cited by both contemporary and later sources as one of the major contributing factors in the decline of native Irish woodland in the early 17<sup>th</sup> century (McCracken, 1971).

By the time of the death of Elizabeth I in 1603 AD, tree cover in Ireland was diminished to the extent that, according to estimates, woodland cover accounted for no more than 12.5%, and as low as 2%, of the land area (Rackham, 2001). At the same time, both merchant and naval shipbuilding, although never practiced on the scale it was in Britain, also increased in Ireland. Timber for ships was exported to England from Waterford in 1608 AD, and the East India Company is known to have established a yard at Dundaniel in Cork some time before 1613 AD (Neeson, 1995).

However, despite the large scale felling involved in all of these industries, legal prohibitions on cage-work houses and

wattling to preserve the remaining timber and coppice sources, and the encouragement of replanting, Rackham (2001) argues against the idea that large scale felling was the main cause of deforestation. He notes that, despite the proximity of many ironworks to major woodlands, these woodlands do not appear to have been substantially diminished throughout the 17<sup>th</sup> and 18<sup>th</sup> centuries. Rather, the careful management of the resource seems to have been the norm and in many cases, it appears as if it was the very presence of the iron-working industry that ensured the retention of the woodland. Furthermore, he suggests that the real destroyer of woods was agriculture and the four-fold increase in population on the island between 1700 and 1840 AD.

The full story probably lies between both hypotheses, and simplistic models will not suffice. In any case, any appreciable areas of forest extant in Ireland in 1600 AD were gone by 1800 AD (Neeson, 1995). From the mid 18<sup>th</sup> century onward, many large landowners, especially those on estates and demesnes, were encouraged to improve their lands by planting trees, and did so hoping also to gain a long-term economic benefit from silviculturally managed exploitation. The change in aesthetic tastes away from manicured gardens to 'landscape parks' also resulted in the planting of many small woods and copses. From 1740 AD onwards, the Royal Dublin Society awarded prizes and medals for planting trees, and also nominated suitable species. In total, an estimated 53,000 ha were planted in private woodlands in the 18<sup>th</sup> century.

Initially, the bulk of the trees planted were broadleaves, particularly oak. However, as the century wore on, an increasing proportion of coniferous trees were planted. By 1841 AD, some 140,000 ha had been planted, with conifers representing some 7% and mixed plantations



80%. This process of 'coniferisation' of woodlands continued into the early 20<sup>th</sup> century, and many of the remaining demesne woodlands were either extended or replaced with what was regarded at the time as being more desirable exotic species (Aalen et al., 2011).

## CONCLUSIONS

It is evident that woodland development and composition have been radically altered through the ages by human impact, particularly with the advent of agriculture some 6,000 years ago. Surviving woodland today almost certainly bears little resemblance to primeval woodland in terms of their structural and species diversity. The course of woodland development has been changed through activities such as clearance followed by recolonisation of secondary woodland, the imposition of silvicultural management systems, periodic felling and latterly, the cessation of management in recent centuries. Even woodlands of uninterrupted continuity, i.e. ancient woodlands, have been impacted significantly to the extent that future ecological successional patterns will be greatly affected.

When determining current and future management requirements of individual woodlands, it is important to ascertain, as far as possible, the woodland history, as this will have a bearing on future woodland development and hence, on the detailed management plan. A good example of the application of historical research on woodland management is Brackloon Wood, Co. Mayo (Little, 2018). Although it is not feasible to account for many of the most

important historical activities to have impacted on any particular woodland, any evidence of human impact (such as management, felling, coppicing, the construction of ditches, etc.) should be noted and used to determine the most appropriate management prescription.

In addition, management should not interfere with archaeological remains (Fig. 3). These should be clearly mapped, and management must incorporate the requirements set out in the Forest Service Forestry and Archaeology Guidelines and Forest Harvesting and the Environment Guidelines (Forest Service, 2000), as well as any other specific conditions attached to a letter of approval for grant aid, consent to afforest and felling licences.

**Fig. 3: This stone row (Brockagh Lower, Co. Leitrim) may appear to be insignificant to the casual observer. Archaeological expertise should be employed whenever unusual artefacts are encountered during woodland management surveys and/or operations. (Image courtesy of the National Monument Service, Department of Culture, Heritage and the Gaeltacht).**



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