

**THE ASSESSMENT, MANAGEMENT AND ECOLOGICAL  
SIGNIFICANCE OF IRISH HEDGEROWS.**

Presented for the Degree of Master in Science in  
Sligo Regional Technical College.

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Submitted to the National Council for Educational Awards  
June 1994

## ABSTRACT

The vast network of hedges in Ireland provide habitats of great importance to the wildlife of the country, yet surprisingly enough, only very limited survey work has been carried out on our hedgerows in the past.

Now with the implementation of the new Rural Environmental Protection Scheme, farmers will be paid to manage their hedgerows in such a way as to make them into increasingly attractive wildlife habitats. However, hedgerow management expertise seems to be somewhat lacking in Ireland and we must draw upon the knowledge of our neighbours in the E.U. where quite an amount of research has been carried out on this subject.

The aim of this study is to present the relevant aspects of the research for the benefit of the people who will be involved in the administration of the Rural Environmental Protection Scheme and to anyone else involved in hedgerow management.

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## Introduction

The hedgerows of Ireland are only a relatively recent addition to the Irish landscape. Most of the hedges were planted after the 1667 Cattle Act and subsequent Enclosures Acts, where their primary purpose was the enclosure of fields as a means agricultural improvement. Now however, the patchwork landscape pattern is seen as a traditional feature of the Irish countryside. In some work carried out by (Webb 1985) it was estimated that 1,078 kilometres squared of the country consisted of hedgerows and as this is approximately 1.5% of the total area of the country, the importance of hedgerows as wildlife habitats needs serious consideration.

It is Irish farmers who are the custodians of the great majority of these hedgerows and therefore they are the people responsible for the correct management and continued existence of these important habitats.

## History of Study

Various aspects of hedges and their wildlife have been investigated in Britain and indeed much of our knowledge of the ecological value of hedges arises from the work of Hooper Pollard and Moore carried out at the Monks Wood Experimental Station of the Natural Environment Research Council in Cambridge. A study carried out by the above and published in 1974 as part of the New Naturalist series looked into many aspects of hedgerows from their history to their management.

In Ireland however, fewer studies have been carried out with some of the more important ones being as follows.

(i) O'Sullivan and Moore (1979) mapped the composition of Irish field boundaries in 1974 from 2000 site records.

(ii) Feehan (1983) studied field patterns in County Laois.

(iii) Macroom District Environmental group. This study examined 30 kilometres squared for landscape change and hedgerow loss.

(iv) Cabot (1985) - An Foras Forbatha carried out an investigation into hedgerow removal and hedgerow trees.

(v) The Irish Wildlife Federation (IWF) 1987 - National Survey of Irish Hedgerows.

All of these studies produced relevant information on the status of Irish hedgerows, but in view of recent occurrences in the EU it may be deemed necessary for further and more intensive research to be carried out.

## R.E.P.S.

This recent development is one of the accompanying measures of the C.A.P. (Common Agricultural Policy) reform and is known as The Rural Environmental Protection Scheme (R.E.P.S.). The R.E.P.S. is being implemented pursuant to Council Regulation (EEC) Number 2078/92 of 30 June 1992.

This scheme should have a major effect on hedgerow management in Ireland. The objectives of the scheme are as follows.

(i) To establish farming practices and controlled production methods which reflect the increasing public concern for conservation, landscape protection and wider environmental problems.

(ii) To protect wildlife habitats and endangered species of flora and fauna.

(iii) To provide quality food in an extensive and environmentally friendly manner.

Within R.E.P.S. there are measures which farmers must undertake in order to comply with the scheme. All of these measures should have a beneficial effect on the environment but two in particular apply to hedgerows. They are as follows.

(i) Retain wildlife habitats such as hedgerows, woodlands and wetlands. Farmers who do so will be paid 13 ECUs per hectare, up to certain limits.

(ii) Maintain boundary and roadside fences, stone walls and hedgerows in the interest of stock control, wildlife and the scenic appearance of the area. This is worth 33 ECUs per hectare to the farmer.

Other aspects of the R.E.P.s are designed to encourage wildlife, for example, farmers in the production of tillage crops will leave a field margin of at least 1 metre uncultivated, ensuring no nutrients or sprays are applied to it.

A copy of the provisional draft of the Department of Agriculture, Food and Forestry's Rural Environmental Protection Scheme is included in the Appendix 1.

Hopefully the scheme will bring about improvements in the management of hedgerows as the hedge now becomes as source of income to the farmer. Farmers in the scheme will be paid a premium of 125 ecu (£122.00) per hectare up to a maximum of 40 hectares. This amounts to £4,880.00. One can only surmise on the uptake of the scheme, but the Irish Farmers Journal Magazine and the Irish Farmers Association claim that up to 40,000 farmers will be involved in the scheme. At a recent open day on the R.E.P.S., held on 12 May 1994 in Johnstown Castle Co Wexford by Teagasc over 10,000 interested farmers attended.

A slight problem may arise in that the scheme requires a 5 year plan to be drawn up for each farm by Teagasc or any other Department of Agriculture approved agency. It may be difficult for the personnel involved to change in that the farming advisory agencies have for years been advocating many practices which would be deemed to be very much non-environmentally friendly such as hedgerow removal, higher stocking rates, greater use of pesticides, fertilizers and other intensive agricultural measures. These same personnel must now realign their thinking and advise and move in a different direction.



## Definition of a Hedgerow

In order to begin to draw up a management regime for hedges we must first define what a hedge is. There are many and varied definitions on what constitutes a hedge but for our purposes a hedge may be defined as follows;

"A line or narrow belt of closely spaced woody shrubs, retained and or managed so as to form a more or less continuous barrier."

(Clements and Tofts 1992)

This is a fairly broad definition intended to include all those structures which have been planted or otherwise managed so as to create stock-proof barriers or land boundaries, as well as spontaneous hedges which have sprung up along fencelines, walls and streamsides. It also includes garden and ornamental hedges.

Many of the fields of the western counties of Ireland are surrounded by traditional stone walls and although these perform many of the functions of hedges and they are important wildlife habitats in themselves, they require different management practices than hedges and will not be considered here. Also I make no distinction between the term hedge and hedgerow.

Even though we have a broad definition of what a hedge is I have not put any exact measurements into the definition. Is there a width greater than which a hedge is no longer a hedge and becomes a shelterbelt or a strip of woodland? A hedge left unmanaged will spread, grow tall and become gappy. If this continues for long enough there is a point at which it can no longer be described as a hedge but this point is very difficult to define. We may also ask the question, how long is a hedge? In a square field surrounded on all sides by a hedge, do we have four

individual hedges or one long hedge? If a gap occurs in a hedge does this signify the end of one hedge and the beginning of another?

Much work has been carried out in Britain on the quality and quantity of British hedgerows. In Ireland we really only have had two somewhat limited nationwide hedgerow surveys. Firstly, a study was carried out as part of a report into the state of the environment, (An Foras Forbatha, Cabot, 1985) involving a preliminary investigation of hedgerow removal and hedgerow trees. Secondly, the Irish Wildlife Federation launched a national survey of Irish hedgerows with the specific aim of collecting more information on this important habitat. The surveys covered hedges in 23 counties showing the majority of hedges to consist of thorny shrubs and trees on an earth and stone bank with a ditch or drain running alongside. Variation of hedge width and height was mainly a reflection of management practices. Hedges which had been mechanically trimmed were generally less than 2 metres in height but overgrown hedges reached heights of up to 5 metres. On average Irish hedges reached about 3 metres in height.

The width of the hedge varied from 1 metre to 4 metres with most under 2 metres, the average being 1.8 metres. Bank height was less variable ranging from 0.3 to 2.5 metres with an average of 0.9 metres

## HEDGEROW FLORA

The factors which influence the species composition of hedges include soil type (O'Sullivan and Moore 1979), drainage, climate, shade, management and planting policy. The survey recorded 37 species of shrubs and trees with thorny bushes being the usual components of hedges. In particular hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*), with the blackthorn present due to its success as a coloniser rather than through planting. On infertile upland soils, gorse (*Ulex*, sp) is dominant especially in parts of Wicklow, Donegal and Kerry. On poorly drained soils you will find willow (*Salix* sp.) and alder (*Alnus glutinosa*). *Fuschia*, which is not an indigenous shrub is characteristic of hedges in Kerry and West Cork. Beech, (*Fagus sylvatica*) is common in the East and the Midlands while holly (*Ilex aquifolium*) is found throughout the whole country.

A total of 105 wild flowers were recorded in the surveyed hedges with the most common being;

primrose (*Primula vulgaris*)  
violet (*Viola riviniana*)  
nettle (*Urtica dioica*)  
foxglove (*Digitalis purpurea*)  
Herb robert (*Geranium robertianum*)  
bluebell (*Endymion nonscriptus*)  
Dog's mercury (*Mercurialis perennis*)

## HEDGEROW TREES

A study involving an examination of the hedgerow trees in thirty kilometre squares was carried out (R Webb 1984). Webb looked at both the species present and the age structure of the hedgerow trees. The results of the study are tabulated below.

Species	AGE CLASS				%
	Sapling	Young	Mature	Over Mature	occurrence From total Number Sampled
Fraxinus	312	216	99	3	53%
Fagus	30	53	101	1	15%
Ulnus	40	38	42	6	10%
Acer pseudoplatanus	10	63	25	1	8%
Quercus	8	17	17	3	5%
Others*	41	36	12	1	76%
Total	441	423	306	15	1,185

Source R. Webb Field Survey, 1984

\* *Prunus, Salix, Sorbus, Ilex, Aesculus*

Looking at the table it can be seen that ash (*Fraxinus*) appears to have complete dominance in all age classes, also there is a serious lack of saplings in all the other species.

The elm (*Ulmus* sp.) has almost disappeared as a tree from Irish hedges. This results from the introduction of the aggressive strain of Dutch elm disease (*Ceratocystis ulmi*) around 1976. The disease caused major destruction of elms in Counties Limerick and Dublin where elm was a major constituent of hedges. Even though most elms surveyed showed signs of disease, the species will

continue to be present in Irish hedgerows but as saplings only. Beech (*Fagus*) was a popular tree to plant in the last century but there are very few sapling trees to replace the mature beech which are dying of old age. The sycamore (*Acer pseudoplatanus*) is a tree which appears to be on the increase as a hedgerow tree particularly in areas where oak (*quercus*) once predominated. This has serious repercussions for wildlife as *Quercus* is known to support a far greater variety of wildlife than *Acer* (Southwood 1961).

### HEDGEROW REMOVAL

From the 1985 and Foras Forbatha study it is suggested that Ireland has suffered an averaged hedgerow loss of around 16% since 1938, compared to 30% in Britain (O'Connor and Shrubbs, 1986). In some areas there seems to have been a net gain in hedgerows due to land reorganisation. The hedgerow removal seems to have been localised with greater removal occurring on the bigger farms irrespective of whether they are tillage or grazing enterprises. In particular South Laois and South Kildare suffered about a 30% loss of their hedgerows.

All of the above information is useful in informing us of the amount and composition of the Irish Hedgerow but if the Irish Farmers are to carry out their obligations under the new R.E.P.S. programme, and indeed their moral obligations to protect the environment, they must begin to understand the value of the hedgerow as a vital habitat for the wild flora and fauna of Ireland.

## HEDGEROW BIRDS

Nearly all the common landbirds of Ireland are forest dwellers despite the fact that today woodland covers only 5% of the land area of the country with broad leaved forest constituting 0.5%. The familiar birds, the blackbirds, thrushes, robins, tits, warblers and pigeons are all dependent for survival on trees and bushes for food and shelter or both. Of course many of the woodland species have come to make use of open agricultural land for feeding but they are still wholly dependent on trees and bushes for nesting or song posts or for cover. The vast network of hedges which covers much of Ireland provides birds with a substitute woodland, so that what man has taken away by felling the forests he has to some extent restored by planting hedges. In parts of the country where there are still large areas of deciduous woodland hedges are less important as habitats for birds.

A hedge is not a complete substitute for a piece of woodland. It is most valuable for species like blackbirds which can feed in the field outside of the hedge and use the hedge primarily as a nesting site. A very large number of our common species would not exist on many farms were it not for the hedgerows.

A research project operated by the British Ministry of Agriculture operates a farm on the medieval three field system. On the farmland there are no trees or bushes. A bird survey carried out showed that the habitat supported only open-field species of bird such as skylarks and partridge. The extent to which some species are found in hedges and others not, depends on differences in the basic requirements of different birds and

the character of the hedges. All birds need places in which to feed and roost and hide, in which to nest and from where males can advertise their presences to females and rival males. Most species roost in trees and hedges where they are safe from ground predators.

Hedges provide a wide range of food for birds of widely differing feeding habits, grass seeds for linnets, caterpillars for cuckoos, hawthorn berries for fieldfares, thistles for goldfinches, ashkeys for bullfinches, snails for thrushes, earthworms for blackbirds, mice for owls and small birds for sparrow hawks.

Many common hedgerow shrubs provide excellent sources of food for birds. These would include the large edible fruits, such as haws, sloes and rose-hips. Blackbirds and the various thrushes feed extensively on berries in the autumn and their numbers are augmented by the arrival of the fieldfare and redwing from Northern Europe. These hedgerow fruits are important for the survival of the thrushes over the winter, but in turn the thrushes act as dispersal agents for the hedgerow shrubs taking the seed from one hedge and releasing them in their droppings in another. The commonest breeding birds in hedges feed extensively on the crops adjoining them with most of the feeding being carried out in close proximity to the hedge.

All Irish landbirds are territorial, in that they defend an area against other members of their own species. In each case the male will advertise himself in his territory by appearance or song or by both. This requires a song post above the level of most of his territory. Birds also require cover for their nests to be successful.

Hedge structure is very important to birds. A hedge which does not contain older trees will not support hole nesting species such as jackdaws or greytits which nest in holes. Hedges which are not thick at the bottom do not provide good ground cover and therefore will not be likely to hold a population of robins, hedge sparrows or wrens. Hedges which are variable in structure and species have different bird faunas inhabiting different parts of the hedge.

The bird fauna of a hedge depends on both the species of shrub and tree present and on the way they are managed by the farmer. For example a hedge consisting of hawthorn bushes cannot support hole-nesting species nor could a beech hedge unless some plants were allowed grow into hedgerow trees.

From studies conducted at Monkswood experimental station, Pollard, Hooper and Moore concluded that while hedges are essential for the survival of many species of birds on many individual farms and in larger areas of countryside without woods, they are not essential for the survival of the species as a whole. However, they would become much more important from the conservation point of view if the total acreage of deciduous woods and scrub were greatly reduced.



# THE ECOLOGICAL SIGNIFICANCE OF DITCHES, VERGES AND BANKS ASSOCIATED WITH HEDGEROWS

The 1985 Irish Wildlife Federation hedgerow study indicated that 68% of Irish Hedge incorporated some type of associated ditch, drain or bank.

## Ditches

Ditches associated with hedges are of value to a variety of organisms particularly amphibians, and may also clearly add significantly to the suite of habitats offered by an individual hedge. Research into the relationship between hedges and associated ditches is limited although a study of the wren in farmland showed that it preferred hedges associated with ditches and streams. (Williamson 1969). Arandel (1983) found that ditches alone were of relatively little value to bird species, but that where ditches occur in association with a hedge the number of species holding territories doubles.

## Verges

As with ditches, the relative value of hedges with a grassy verge adjacent, compared with hedges lacking verges is a subject which appears to have had very little research carried out on it. Grass verges are known to be of ecological value in themselves, for example, supporting populations of small mammals which in turn support predators such as barn owls.

Verges supporting flowering plant species will provide a valuable nectar source for many insects such as butterflies. Hedges which have herb-rich verges may therefore be expected to support a more diverse butterfly fauna than hedges lacking any verge. (See example Wiklund and Karlsson 1984, Boatman et al 1989). Such hedges may also be expected to support higher densities of polyphagous predators such as ground beetles (Coleoptera: Carabidae), rove beetles (Col. Staphylinidae) and spiders. (Boatman et al 1989)

Hedges, as typical features of the Irish agricultural landscape, often suffer adverse impacts such as spray drift during agricultural operations. This problem is now being addressed under the new R.E.P.S. scheme. In addition to providing potentially valuable additional habitat, verges adjacent to hedges may act as a "buffer zone", reducing the impact of deleterious agricultural activities on the hedge itself. Tittensor and Tittensor (1986) regarded a boundary of 1 metre to be the absolute minimum between a hedge and an arable crop, if any significant wildlife benefit is to occur.

One of the regulations involved in the new Rural Environmental Protection Scheme is that farmers must "cease using herbicides, pesticides and fertilisers on hedgerows." One further regulation, which only applies to the production of tillage crops, is that farmers in the scheme must "leave a field margin of at least one metre uncultivated, ensuring no nutrients or sprays are applied to it".

## Conservation Headlands

This will amount to the development of "conservation headlands" which is a concept on which much work has been carried out by the Game Conservancy in Britain. This project known as the "Cereals and Game birds research project" involved a slight reduction in the use of agrochemicals on cereals. By leaving small areas of the crop free from pesticides (herbicides, fungicides, insecticides and aphicides) the research team aimed to provide a food supply that would not otherwise exist for gamebirds and other wildlife. Most of the work was carried out using the survival rate of grey partridge chicks as the measure of success. The use of conservation headlands over a six year period (1980 to 1986) increased partridge density from one breeding pair per 50 acres to one breeding pair per 14 acres. The research has shown that the altered use of pesticides at the crop edge close to hedgerows has provided some of the resources (weeds and insects) necessary for the support of wild game bird chicks. However, the benefit is equally liable to accrue to other types of farmland wildlife. This includes trebling of butterfly numbers, increases in the numbers of small mammals using the conservation headland and the number of unusual or uncommon species of arable weeds growing. (Country Life, July 1987)

## **Hedgerow Mammals**

Mammals are among the least conspicuous of the animals which frequent hedges. The mammals are usually elusive or nocturnal or both. Most wild mammals in Ireland make use of hedges including badgers, foxes, rabbits, rats, pinemartins, mice, shrews, hedgehogs etc but their presence is usually only noted because of characteristic runs through the hedge bottoms.

## **Hedgerow Invertebrates**

Some hundreds of species of invertebrates can be found in just a few yards of any hedge but only the more conspicuous are likely to be seen because of the fact that many of the invertebrates are nocturnal or adopt the colouration of their habitat using elaborative camouflage colouring. Hedges provide sheltered sunny positions for day-flying insects such as hoverflies, bees and butterflies.

The growing leaves of the hedgerow plant provide food for many invertebrate species in the spring and summer, and then when they fall in the autumn provide the basis for the litter dwelling communities to exist. Other invertebrates feed on lichens and fungi on stones, dead wood and fruits. One other important group of insects are the transient visitors feeding on the nectar and pollen of the hedgerow flowers, and still others use the hedge as an overwintering site, hibernating under bark or in the litter of the hedge bottom.

Most hedgerow shrubs come into leaf early in the year followed by flowering. Within these rapidly growing plants nutrients are being mobilised, making the leaves particularly palatable to the leaf feeding insects, while the abundance of flowers will attract many others. The insects are in turn food for insectivorous birds such as wrens and hedgesparrows. Also associated with the insects will be a large number of predators, with ladybirds, their larvae and the larvae of hoverflies being very numerous.

### **EVALUATION OF THE QUALITY OF HEDGEROWS**

Under the Rural Environmental Protection Scheme, Teagasc advisors and other appointed agents of the Department of Agriculture will be required to go out into farmers fields and evaluate the quality of the hedgerows in order to advise on the necessary management practices required. At present, there are no clearly defined and universal criteria for the ecological surveying and evaluation of individual hedges. Nevertheless decisions are taken on a daily basis by surveyors, planners, developers and landowners about which hedges will be retained and which will be lost in connection with development proposals or other changes to land use. A need for a more rational and standardised approach to the ecological evaluation of hedges as a habitat resource led to the development by D K Clemence and R J Tofts in September 1992 of a hedgerow evaluation and grading system (HEGS). HEGS outlines a methodology for the ecological survey, evaluation and grading of hedges.

HEGS was created in Britain in response to some of the following studies;

(Biber 1988) Biber maintained that the ecological importance of the hedged landscape has come to be recognised throughout its European range and beyond, and the rate of decline is now a matter for international concern.

(Barr et al 1986) In the period 1977 to 1984 hedgerow loss in Britain was in the region of 28,200km.

(Barr et al 1991) This study indicated that the rate of removal had risen sharply in the period 1984 to 1990 and that this was coupled with a greater incidence of neglect in hedgerow management.

Within Ireland, hedgerow removal does not appear to be currently of great concern to ecologists and environmentalists. However, the opportunity afforded to us by the introduction of the R.E.P.S. to greatly improve the ecological quality of our hedgerows needs to be taken up, and the hedgerow evaluation and grading system of Clements and Tofts has a useful role to play as a management tool.

H.E.G.S. could be used to give an objective measure of the ecological value of hedges which prior to this have only been subjectively assessed. Practitioners in the field are going to need a standardised and relatively simple process of data collection and evaluation.

The evaluation of a hedge is a complex matter involving numerous parameters, many of which have never been subjected to comprehensive investigation. The rational approach in the

H.E.G.S method of grading and evaluating hedges standardises the method in which the surveyor gathers the data, ensuring as far as possible the inclusion of all of the factors which are known to be of particular significance. The collected data can then be assessed by using reasoned criteria. The result may still involve some subjective assessment but it will eliminate wherever possible the effects of individual bias.

H.E.G.S aims to achieve the following goals;

- Rapid recording of field data.
- Simply judged criteria.
- Data collection to a fixed minimum standard.
- Inclusion of all factors known to be of particular significance to wildlife as far as possible.
- Evaluation using a common set of criteria and assumptions following a defined decision-making route.
- Elimination of individual bias.

Living systems being dynamic and complex, there will always be a need for discretion on the part of the surveyor/evaluator, particularly in unusual cases where the scheme may give rise to unsatisfactory results. However, H.E.G.S is a systematic means of evaluation of hedgerows by focusing attention on those variables which are most likely to affect the hedges value for wildlife.

### **HEDGEROW FEATURES OF VALUE TO WILDLIFE**

The ecological attributes of hedgerows may be separated into three principal categories:

- Attributes which are intrinsic to the hedge itself, such as the structure and species composition.

- Attributes derived from associated habitat features, such as verges, banks and ditches.
- Attributes arising from the function of the hedgerow as part of the wider landscape.

## DIVERSITY OF HEDGEROW PLANT SPECIES

Plant species diversity is likely to be a key factor in determining the botanical interest of a given hedge. Also the presence or absence of rare or notable species is worth noting. Ecologists assume that high plant diversity will correlate positively with higher diversities of associated organisms, and can therefore be considered a desirable feature in evaluating hedges. A number of studies were carried out on this assumption. Osborne (1984) found that tree species diversity contributed significantly to the overall number of bird species present. However, while tree species diversity positively influenced the numbers of certain species, such as robins and great tit, others such as the wren and chaffinch were positively influenced by actual number of tree species present. Carter (1993) makes a general statement that research has shown the number of bird species and individuals present in a hedge increases as the variety of shrubs increases.

It is apparent from these and other studies that the influence of hedge plant species diversity on the associated bird community is significant and complex and that no single condition will be ideal for all species. It does appear possible however, to identify a "general trend" indicating that the number of bird species and individuals present in a hedge increases along side increasing diversity of plant species (O'Connor 1984).



With regard to fauna groups other than birds, a French study by Ehanno (1976) showed a direct correlation between the number of plant bug species (Heteroptera; Minidae) and the number of hedge plant species present. Pollard et al (1974) attributed the high invertebrate diversity of a hedge studied in Huntingdonshire, the famous "Judith's hedge", at least in part to the diversity of plant species present. Due to the strong associations many phytophagous invertebrates have with particular host plants, it follows that if the host plants are not present the dependent phytophagous species will be absent. Greater plant diversity therefore increases the potential range of host-specific invertebrates which can be present in a given hedge.

In general, native tree and shrub species will support a greater diversity of invertebrates than an introduced species, although this distinction is less pronounced if the introduced species is congeneric with a native species, or belongs to a family which is already well-represented in the native flora such as the Rosaceae (Kennedy and Southwood 1984). Some native trees such as oaks (*Quercus*) may support over 400 insect species whilst holly (*Ilex aquifolium*) only supports about 10 (Kennedy and Southwood 1984).

A hedge containing a wide diversity of tree and shrub species is likely to have a more extended flowering season than a species poor hedge, since not all species flower at the same time. Some common hedgerow species such as hawthorn and dog-rose are also of particular value as fruit bearers providing food over the difficult months of winter.

## HEDGEROW STRUCTURE

Individual aspects of structure which can be looked at include the hedge length, width, height, density of growth, and the vertical stratification of vegetation, for example whether or not standard trees are present in addition to shrubs. When we look at the length of a hedge we run into particular difficulties. Except for an isolated and unconnected hedge it is difficult to establish where any one hedge begins and ends. Length cannot be readily identified as a fixed quantity as can hedgerow width and height. Studies such as Arnold (1983) and Osborne (1984) appear to disregard length as a significant prediction of bird abundance in hedges, when compared to other factors such as hedge area.

An American study by (Burel and Bawdry 1990) found that the frequency of occurrence of forest-plant species (i.e. plants characteristic of woodland situations) in hedges was generally found to increase markedly with increasing hedgerow width. Moore et al (1967) concluded that tall thick hedges with woody outgrowths were found to be of greatest value to breeding birds. Arnold (1983) found that tall hedges attracted more bird species than short hedges in winter. Dense hedge cover in the lowest 1 metre from the ground was also found to be beneficial in promoting numbers of nesting territories and individuals from several species. Parslow (1969) found that hedge height positively influenced diversity of bird species and numbers of nesting pairs, and suggested that reduced nest predation in taller hedges might be the cause.

O'Connor (1984) concluded that each bird species has its own spectrum of preferred habitat features, and that there is therefore no ideal hedgerow structure which would be optimal for all species. Nonetheless certain attributes can be identified to contributing generally to a greater diversity and abundance of birds, and these include increasing width and height, the presence of woody outgrowths and vegetation density at the base of the hedge. The herbaceous field layer appears to be an important structural element for many invertebrates, as well as for vertebrates such as small mammals and some birds such as grey partridge (Rands 1986).

Standard trees and hedges are invaluable to many groups of organisms and old trees are especially important, for example in providing nesting sites for birds (particularly hole-nesting species) as well as roost sites for bats, nest holes for bees and wasps and a substrate for epiphytic mosses and lichens. Standard trees are an important behavioural habitat element for many birds, being used as song posts and territory markers.

Oak (*Quercus*) and willow (*Salix* spp.) are widespread as hedgerow trees and support exceptionally large numbers of phytophagous insects and mites (over 400 species each). Other native trees occurring in hedges, such as elm (*Ulmus*), beech (*Fagus sylvatica*) and ash (*Fraxinus excelsior*), support decreasing diverse invertebrate faunas, but are nevertheless of some significance in this regard. (Kennedy and Southwood 1984)

As with other factors however, the studies by (Arnold 1983) and others indicate that the relationship between bird and hedgerow trees is not always straightforward. For example increased numbers of standard trees correlates positively with the abundance of tree sparrows, but negatively with the numbers of thrush nests.

#### **HABITAT CONNECTEDNESS, CONTINUITY AND NETWORK FUNCTIONS**

Several studies have shown the effect of connectedness to be significant, not only between hedges, but also between hedges and other habitat elements such as woodland. Forman and Baudry (1984) conclude that it is probably unrealistic to consider the ecology of any given hedge in isolation.

The effects of these interrelationships can be considered under the following headings.

- The use of hedges as corridors for movement and/or colonisation by species of both flora and fauna.
- The effects of hedge intersections.
- The effects of the hedgerow network as a whole.
- The relationship with other habitat elements.

Hedges form linear habitat corridors where movement of plants and animals through the landscape is facilitated. A distinction may be drawn however, between species which use the hedge as cover while foraging or passing through the landscape and the progressive colonisation by a species longitudinally through a hedgerow from a point source at one end. There are a number of studies which either demonstrate or indicate movement of fauna species from woodlands along attached hedges.

Many mammal species have been observed to show a marked preference for hedgerows as cover for movement through agricultural landscapes, and mammal trails alongside hedges are a commonly observed phenomenon. Several small mammal species have been shown to utilise hedges as foraging corridors, particularly during the winter, and the movement of some species may be more or less confined to hedges in farmland situations. Several predatory mammal species have been shown to concentrate their foraging activity alongside linear features such as hedges, where prey concentrations are probably higher. (Harris and Wooland 1990). The balance of evidence suggests that hedges perform a corridor function for movement of fauna, and that this function is likely to be enhanced by the continuity of hedgerow habitats and the absence of brakes or gaps in cover.

Burel and Baudry (1990) show that the possible occurrence of selected species in a hedge of given width is greatly increased if that hedge is connected to another hedge containing the study species.

A study by Lack (1988) revealed that many hedgerow birds have a preference for lengths of hedge near intersections with other hedges. Constant et al (1976) also reported the occurrence of more bird species at hedgerow intersection points than in the sections in between. The reasons for this pattern are unclear it has been suggested that intersection territories are more compact than linear hedgerow territories and are possibly easier to defend and/or may enable birds to feed more efficiently.

Individual hedges are known to exert a range of influences over adjacent habitats, modifying microclimatic factors such as wind speed and direction, humidity and temperature. The flow of water and nutrients, and factors such as soil erosion may also be profoundly influenced by the presence of hedges.

#### DATING HEDGES

Much work has been carried out on the dating of hedges. In particular, Dr. Max Hooper carried out research on dating of hedges leading to "Hooper's Hypothesis" or Hoopers Rule. Hooper based his hypothesis on the assumption that when a new hedge was planted, often only one or two chosen species of hedging shrub were used, typically common hawthorn (*Crataegus monogyna*) or blackthorn (*Prunus spinosa*). As the hedge ages however, additional species naturally colonise into it, such that an older hedge will have a greater number of species of woody shrubs present than a more recently planted hedge. Hooper's rule stated that "the number of woody species present in a thirty metre length of a given hedge is roughly equivalent to the age of the hedge in centuries". However, following on from more recent studies Cameron and Ponnett (1980) and Willmot (1980) it became clear that the species/date-of-origin relationship postulated for Hoopers's original samples could not be universally applied due to numerous variations and hedge planting traditions which could give rise to conceptions and anomalies. It is clear though that Hooper's rule describes a real trend, hedges tend to acquire additional species as they age and as a result old hedges tend to be more species-diverse than recent hedges. Older hedges which mark parish or townland boundaries would be of particular interest to historians and conservationists.

## MODE OF ORIGIN OF HEDGES

There are generally believed to be three principal modes of origin for hedges.

### SPONTANEOUS HEDGES

Hedges may arise spontaneously alongside linear features such as fences. Grazing and cultivation pressure may be lessened along the base of a fence, and the fence itself provides a perching place for birds, whose droppings may contain viable shrub seeds. Over a relatively short period of time, a substantial and diverse growth of woody species can arise which may subsequently come to be managed as a barrier, replacing the original fence.

### "GHOST" OR WOODLAND RELIC HEDGES

Many of the hedges seen in open fields today may in fact represent the edges of woodlands which have long since been grubbed out. Such woodland relic hedges are usually recognisable by the presence of characteristic woodland species which are not normally recorded in hedges, and maybe of considerable ecological diversity. A well known example is "Judith's hedge" documented by Pollard 1973.

### PLANTED HEDGES

These account for the majority of the hedges seen today. Much of this planting was carried because of the 1667 Cattle Act and subsequent Enclosure Acts. But there are many examples of hedges today which can be shown by maps and documents to have existed before this period.



## CONCLUSIONS

Research has shown that many factors may have a significant impact on the ecology of a given hedge. In general terms the following broad conclusions can be supported.

- High diversity of plant species and/or the occurrence of rare species is of botanical interest in its own right.
- High diversity of plant species generally correlates positively with higher diversities of associated organisms such as invertebrates and birds.
- Predominance of native tree and shrub species is beneficial in supporting greater diversities of associated invertebrates.
- Increasing hedge width and height generally correlates positively with increased diversities and abundance of birds and invertebrates.
- The presence of dense vegetation at the hedge base (i.e. in the lowest 1 metre) is critical for the occurrence of a wide range of fauna.
- The presence of standard trees is beneficial for many fauna species including birds bats and invertebrates. Larger, older trees are especially valuable.
- The extent to which a hedge is connected to other hedges or wooded habitats is positively correlated with its significance for a range of flora and fauna species.
- Intersection zones between hedges are especially valuable and tend to be characterised by greater diversities of fauna and flora species.
- Hedges provide important corridors for movement through the landscape for a wide range of fauna, and it is likely that this function will be enhanced by the absence of breaks or



gaps in the canopy.

- The presence of a bank at the foot of a hedge provides increased microclimatic diversity and is beneficial to a range of flora and fauna.
- The presence of a ditch at the foot of a hedge provides increased habitat diversity and is beneficial to a range of flora and fauna.
- The presence of grass verges or other uncultivated habitats at the foot of a hedge provides increased habitat diversity and is likely to be beneficial for a range of fauna.

All of the above points are broad trends in both the composition and structure of hedges which can be identified as being of particular value to wildlife and which are relatively easy to record and assess.

A manual for the survey and analysis of hedgerows which allows rapid recording and ecological appraisal has been drawn up by D K Clements and R J Tofts. The process is split up into two principal stages. Firstly, the Field Survey Stage, the aim of which is to record the necessary field characteristics for each hedge using the standard Hedge Record and Evaluation Sheet. (see appendix 2)

The data required from the field survey is highlighted on the sheet. This is then followed by a desk based Analysis Stage, in which the field data is used to calculate individual hedge grades. This grade represents an overall estimation of the ecological significance of the hedge on a scale of 1+ to 4-.

This hedge grading system is very suitable for use in evaluation of hedges in situations where a proposal for removal of hedges has occurred, for example in connection with development proposals. Within Ireland and under the new Rural Environmental Protection Scheme the standard Hedge Record and Evaluation Sheet could be used to pin point the optimal hedgerow management practices to be advocated by those administering the scheme.

## HEDGEROW MANAGEMENT

From the wildlife viewpoint the method of hedge management is a secondary consideration providing there is some form of management. Lack of management provides, temporarily a fine hedge for wildlife but afterwards the hedge may have to be removed.

Results of the 1985 Irish Wildlife Federation survey indicated that only 2 per cent of surveyed hedges were hand-clipped, while one hedge in County Louth was reported to have been laid in the traditional manner. Lack of maintenance had resulted in 34 per cent of hedges becoming "leggy" and requiring wire as reinforcement. Approximately 20 per cent of hedges were described as being reasonably stock-proof, 40 per cent good, while only 6 per cent were very good.

On the 4th May 1994 the Department of Agriculture sent out a more detailed provisional outline of the R.E.P.S. to the Teagasc staff and independent consultants who will be involved in the administration of the scheme. Measure 5 refers to the maintenance of hedgerows in the interest of stock control, wildlife and the scenic appearance of the area. Measure 6 refers to the cessation of use of pesticides and fertilizers in and around hedgerows both are included in appendix 2. Measure 5 states that "hedgerows shall be managed on a phased basis to encourage their development with a diversity of height, stages of growth and form. This is in the interest of stock-proofing wildlife and scenic value."

The measure then goes on to give basic guidelines to maintenance and to the methods of hedge management. Unfortunately it is very brief in its management guidelines which makes it necessary to give a fuller account of suitable hedgerow management practices here.

There are four basic methods of controlling the growth of hedges.

- Laying
- Trimming (flail or cutter bar)
- Coppicing
- Brushing, or siding up.

#### LAYING

The Department of Agriculture is recommending laying as a hedge management option for farmers. Unfortunately there is not a tradition of hedge-laying in this country and I am only aware of one such laid hedge. However, it is a very popular practice in Britain and its popularity has coincided with the rise in interest in dry-stone walling and other conservation activities.

The British Association for Conservation Volunteers have produced a handbook which outlines the methods for laying hedges. It is regarded as the only sure way to keep a hedge impenetrable to cattle and sheep. Laying is a particularly suitable practice for the management of new hedges but can also be carried out following a very severe cutting of an older hedge.

At the end of the first growing season of a new hedge or following the severe cutting of an older one, clippers or secateurs may be used to trim back the leaders of any vigorous shoots but leave weak growing stems untouched. This gives a low level top to the hedge. Trim off any excess side shoots to keep

a box shape, so keeping the hedge compact. In the second and third years repeat the process which could be carried out with a flail trimmer if the new growth has been sufficiently vigorous. The trimming will continue the process of maintaining compact growth.

Thereafter do not cut the hedge but allow it to grow up untrimmed until the seventh to tenth year. By that time the hedge should be at least twelve feet tall with stout stems ready for laying. Straight stems with good bushy tops are selected at even spacings. These selected stems are then known as pleachers. These pleachers are then cut three quarters way through close to the base followed by a downward cut from about 30cm leaving the remaining stem very pliable at the cut point and easy to bend over to the required angle. See below;

Bend the pleachers over in succession taking care not to break the thin pliable "hinge" of stem tissue in bark once a number of pleachers have been laid the staking can begin. Stakes of 1.5 metres possibly cut out of the hedge can be used. These stakes are driven in at 60cm intervals along the centre line of the hedge, weaving the pleachers with their bushy tops in between the stakes. Finally, thin pliable shoots of willow, hazel or briar each three metres long are woven along the top of the staked hedge to bind the stakes to each other in a basket weave fashion. This is a synopsis of the traditional method of laying a hedge. However, I find it hard to believe that Irish farmers would be willing to adopt this practice onto their farms. It is a labour intensive method of hedge maintenance and while it produces excellent hedges would require radical changes to our current hedge management practices. Hedge-laying will perhaps have an application in Ireland in the future but this would probably occur on areas used as stud farms, golf clubs, nature conservation areas etc.. Farmers will, I believe, continue to use mechanical methods of hedge management.

#### HEDGE TRIMMING

Hedge trimming is the more popular hedge management option adopted by Irish farmers. In the last ten years hydraulically operated flail-trimmers have almost completely taken over from earlier cutter bar machines. Circular saw type trimmers are still used for coppicing a hedge or for cutting back an overgrown hedge which can then be flail-trimmed.

New hedges containing a high proportion of hawthorn (*Crataegus monogyna*) and/or blackthorn (*Prunus spinosa*) are suitable for regular flail cutting, producing fresh bushy growth following each annual or biennial cut. Hedges containing a significant proportion of slow-growing species such as holly (*Ilex aquifolium*) or wild roses should not be flail trimmed regularly.

Annual machine trimming of hedges produces a neat, tidy, cultivated looking landscape and provides a dense hedge suitable for the nesting of many bird species if not too low i.e. less than one metre. However, all of the hedges would be rather uniform and so too would there flora and fauna. The shrubs of a hedge trimmed every year will not flower and fruit at all freely, as most flowers are produced on two to three year old wood. These are the flowers which are very attractive to many species of invertebrate and the fruits to many birds and small mammals. Hedges trimmed to heights of 1.5 to 2.5 metres, preferably, some to one height, some to another, every two to three years will produce a much more interesting result than annual trimming to uniform height. Further diversity is produced by cutting a proportion of the hedges on the farm each year. The trimming is best done towards the end of the winter after the berries have been eaten.

One of the reasons for the poor rate of replacement of hedgerow trees by saplings is the difficulty, when trimming mechanically, of leaving a suitable shoot to grow up from the hedge. Saplings to be left to grow to trees should have vegetation around them cleared by handtools prior to mechanical cutting of a hedge. These young trees should then be clearly marked to alert the

hedge cutting operator. One other factor contributing to the poor replacement of hedgerow trees by saplings is the shading of shrubs by the trees causing gaps in the hedge. There is no obvious solution to this problem. "Stock-proof hedges and trees are probable not really compatible". (Pollard et al 1974)

#### COPPICING

Coppicing is a very severe, yet sometimes necessary resort to control the growth of an overgrown hedge which has been neglected for many years. The complete hedge is cut down to ground level. In some cases selected saplings are left in place to grow on into hedgerow trees. A circular saw is most suitable for this activity. The vigorous regrowth following coppicing can be trimmed to form a new hedge as it grows.

Hedge gaps which cannot be closed by laying stems should where possible, be replanted. Digging in of rotted manure and the planting of hawthorns quicks, blackthorn or beech plants at about 45cm spacings with young plants being weeded and protected from stock is the new R.E.P.S. method being advocated by the Department of Agriculture May 1994.

#### BRUSHING OR SIDING UP

New hedges which contain a wide selection of species and are more than 50 per cent non-hawthorn or blackthorn, will not respond so well to mechanical trimming as they will contain a high proportion of slow growing species. Mixed species hedges should be allowed to grow up with less formal maintenance. A quick trim with a long handled slashhook will keep the branches from

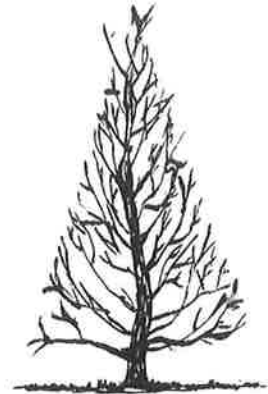


drooping too much. It may be necessary to thin out some larger stems to keep the hedge young and prevent it from becoming more like a miniature woodland strip. Any species which becomes too dominant at the expense of its slower growing neighbours will need more severe pruning or thinning to keep its growth in balance with the other hedgerow plants.

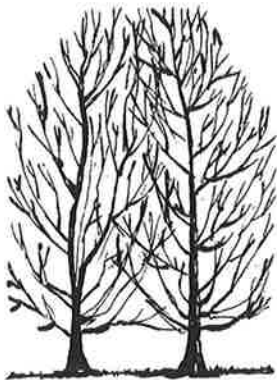
## Hedgerow Shapes :



Rectangular or box shaped



A-shaped



Chamfered



Topped A-shaped



Rounded for hand trimming

### Rectangular

This is the most common shape it produces a thick hedge if trimmed annually from early in the hedges life. The drawback of the rectangular shaped hedges is that trimmings lodging in the top will drop through to the bottom of the hedge over a number of years causing a build up of ever-thickening mulch in the hedge bottom. This will deprive wildlife of a safe area to search for food and instead produces a sterile environment which may only harbour a few mice and rats.

### Chamfered

The chamfered top is a variation of the rectangular hedge normally used to give a tidier finish to a tall hedge. A tall hedge will allow birds to have nests at a higher level in order to avoid predators. The chamfered shaping also helps to deflect hedge trimmings away from the centre of the hedge. The chamfered top will also improve the flow of air over the hedge reducing the vortex effect on the leeward side.

### A-Shaped

The A shaped hedge exposes both hedge faces to more sunlight, improves the fall away of trimmings and the slip-off of snow falls. It provides a thicker bottom and better regrowth in the hedge generally, particularly if the hedge is aligned north-south. Care must be taken when trimming an A-shaped hedge. The north (shaded side) should be trimmed lightly and the south (sunny side) trimmed harder, otherwise in time the hedge will slowly lean towards the sunlight.

## MANAGEMENT OF ROADSIDE HEDGES IN IRELAND

Environmental awareness is slowly on the increase in Ireland, and one of the consequences of this has been public disquiet over the poor quality of management of roadside hedges throughout the country. It is the duty of the statutory bodies such as the local authority's road maintenance divisions, Bord Telecom and the ESB to maintain and manage roadside hedges. The standard of hedge management varies widely between different counties reflecting different attitudes, awareness and priorities.

An Taisce, The National Trust for Ireland is currently preparing a set of guidelines covering the wider issue of roadside verge management which of course includes hedgerow maintenance. These guidelines cover such aspects as, timing of cutting, frequency of cutting, method of cutting and what to cut. More importantly perhaps, An Taisce calls for the registration of hedge cutting contractors which would allow for the stipulation of conditions to be met, with the registration being revoked if the conditions were not complied with.

Other recommendations by An Taisce include the planting of new hedges following road widening operations rather than the erection of unsightly concrete fencing and the preservation of older roadside hedges which may have historical value.

The adoption of the An Taisce guidelines by local authorities and road engineers may take some time yet, but in my discussions with hedge cutting machinery operators I have found that many of them are aware of an environmental consideration in their work.

## CONCLUSION

The reform of the Common Agricultural Policy, the effects of which are currently being felt in Irish agriculture, has brought about a change of direction in relation to Irish land use policies. The E.U. is determined to move away from a heavily subsidised, over-producing and environmentally damaging agricultural policy and move towards the objectives of the World Conservation Strategy (WCS). These objectives are ecologically sustainable land use, resource and nature conservation.

In an effort to begin to meet these objectives the E.U. has introduced the Rural Environmental Protection Scheme to the farms of Ireland. It is definitely the beginning of a change in direction for agriculture even though it fails to address other serious Irish countryside environmental problems such as arterial drainage, turf production and the development of large scale coniferous forest plantations.

Much controversy has occurred in Ireland in the past over the issues of water pollution, the wholesale destruction of bogland habitats by Bord na Mona and the current sea-trout decline debate among others. However, very little emphasis has been placed on the less dramatic but otherwise equally environmentally important issues, such as the retention of ecologically significant features like the hedgerows, the wetlands and other wildlife habitats.

In the study the great importance of the hedgerow to our wildlife populations, with a guide to their assessment being advocated and good management practices being outlined.

It appears that Irish hedgerows overall could be greatly improved, both as stock-proof barriers and as wildlife habitats, with careful management and planning. This will require increased awareness throughout the country of the issues involved and a willingness on the part of farmers to co-operate. It is hoped that this study will help to increase the awareness and interest in the hedgerows of Ireland and that the wildlife of Ireland may benefit as a result.

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Appendix 1

Draft of the Rural  
Envoirmental Protection Scheme

## **INFORMATION NOTE RURAL ENVIRONMENT PROTECTION SCHEME (REPS)**

This draft scheme is one of the accompany's measures of the CAP reform

1. The main objective of the REPS are

- to establish farming practices and controlled production methods which reflect the increasing public concern for conservation, landscape protection and wider environmental problems;
- to protect wildlife habitats and endangered species of flora and fauna.

The scheme will be available to any farmer in the country who wishes to implement the measures in it.

2. Among the measures which farmers will have to implement are to:

- i) draw up a waste storage, management, liming and fertilisation plan for his/her farm;
- ii) draw up a grassland management plan for his farm which avoids over-grazing and poaching;
- iii) retain features such as wetlands, wildlife habitats, hedgerows, stone walls;
- iv) maintain the features mentioned in (iii) in the interests of stock control, wildlife and the scenic appearance of the area;
- v) protect any feature of historical or archaeological interest;
- vi) maintain farmyards in a tidy fashion by among other things:
  - retaining quality farm buildings, traditional stone buildings in a good state of repair
  - use of appropriate roof and wall colours
  - removing worn out and unsightly equipment;
- vii) cease using herbicides or pesticides and fertilisers on hedgerows, fringe vegetation of ponds and streams;
- viii) fence off all watercourses and wells;

- ix) produce tillage crops in accordance with agreed procedures, maintain uncultivated field margins and ensure no nutrients or sprays are applied to such margins;
- x) familiarise him/herself with environmentally friendly farming practices;
- xi) keep prescribed farm records.

3. The plans required for this scheme will have to be drawn up to Teagasc or any other approved agency. Farmers in REPS will be paid a premium of 125 ecu (£122) per hectare up to a maximum of 40 hectares. Farmers with land in excess of this amount will have to implement the REPS measures on all their land. Farmers with the average farm size of 24 hectares would be entitled to £2,928 per annum for five years.

4. The proposals also envisage extra payments, of up to 20%, on top of the basic REPS premium for farmers who undertake additional environmentally friendly farming practices such as:

- i) avoiding degradation of land (commonage, hill areas);
- ii) preserving natural heritage areas/areas of scientific interest;
- iii) long term set aside (for 20 years) - riparian zone;
- iv) public access and leisure activities;
- v) Organic Farming; the extra premium for organic farming will be up to 150 ECU (146) per hectare for those in conversion and 75 ECU (£73) per hectare thereafter. For organic horticulture under 3 hectares the rate is 200 ECU (£195) per hectare in conversion and 100 ECU (£98) per hectare thereafter.
- vi) rearing animals of local breeds in danger of extinction; the breeds eligible are:

Cattle:	Kerry, Dexter, Irish Maol
Goat:	Irish Feral,
Horses:	Irish Draught

The extra premium will be up to 100 ECU (£98) per livestock unit.

5. Some of the above measures will only be available in areas designated by other State agencies e.g. Office of Public Works for N.H.A. sites. Other measures e.g. Organic farming will be optional for farmers.

6. Training and education courses in environmentally friendly farming practices will be available through Teagasc and other agencies as part of the scheme. Farmers will be paid £100 on completion of a 20 hour training course.

**APPENDIX 2**  
**STANDARD HEDGE RECORD AND EVALUATION SHEET**

Recently laid or coppiced  YES  NO (if yes, score 7 and ignore criteria 2 to 4 below)

SCORE -> 1 2 3 4

Height (exclude bank)	0-1m	1-2m	2-4m	4m+
Width	0-1m	1-2m	2-3m	3m+
Average Cross-Section				

**STANDARD TREES**  
 Species present: \_\_\_\_\_  
 No. of mature trees/pollards:   
 No. of young trees:

Length:  m

Mature Standards/100m	<input type="checkbox"/> nil	≤1	1 ≤ 3	3 ≤ 5	>5
Young Standards/100m	<input type="checkbox"/> nil	≤1	1 ≤ 3	3 ≤ 5	>5

STRUCTURAL SCORE

Percentage Gaps	<input type="checkbox"/> nil	30%+	30-10%	10-0%	no gaps
No. of End Connections	<input type="checkbox"/> nil	1	2	3	4+

CONNECTIVITY SCORE

**HEDGE CANOPY SPECIES**  
 Species present: \_\_\_\_\_  
 Combined total of tree and shrub species:

Native Species Dominant	<input type="checkbox"/> nil	1-2 spp	mixed		
Exotic spp dominant - score nil					
Total No. of Tree & Shrub Spp.		1-4	5-7	8-9	10+

DIVERSITY SCORE

Hedgebank/Lynchet	<input type="checkbox"/> nil	0-½m	½-1m	1m+
Ditch	<input type="checkbox"/> nil			
Grass Verge (2m+ wide)	<input type="checkbox"/> nil	on 1 side	on 2 sides	

ASSOCIATED FEATURES SCORE

**NOTES**  
 Ground flora & Climbers:  
 \_\_\_\_\_

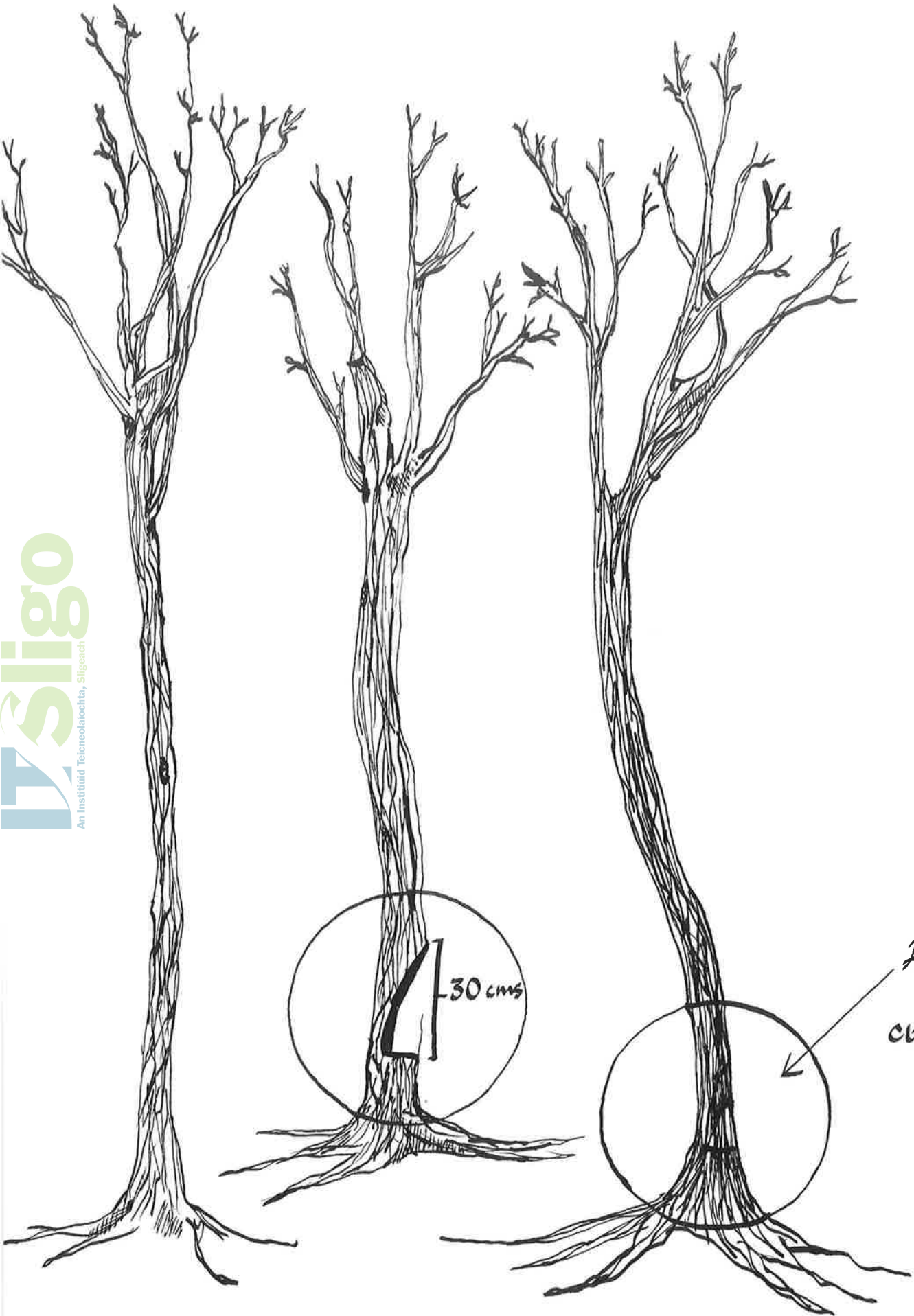
Notable Species present 

Pop nig	Til cor	Pyr cor
Sor tor	Til pla	other

 -----> Yes  (NS)   
 No

new hedge track/roadside      old laid fence/wall      unmanaged parish boundary      cut/trimmed garden boundary

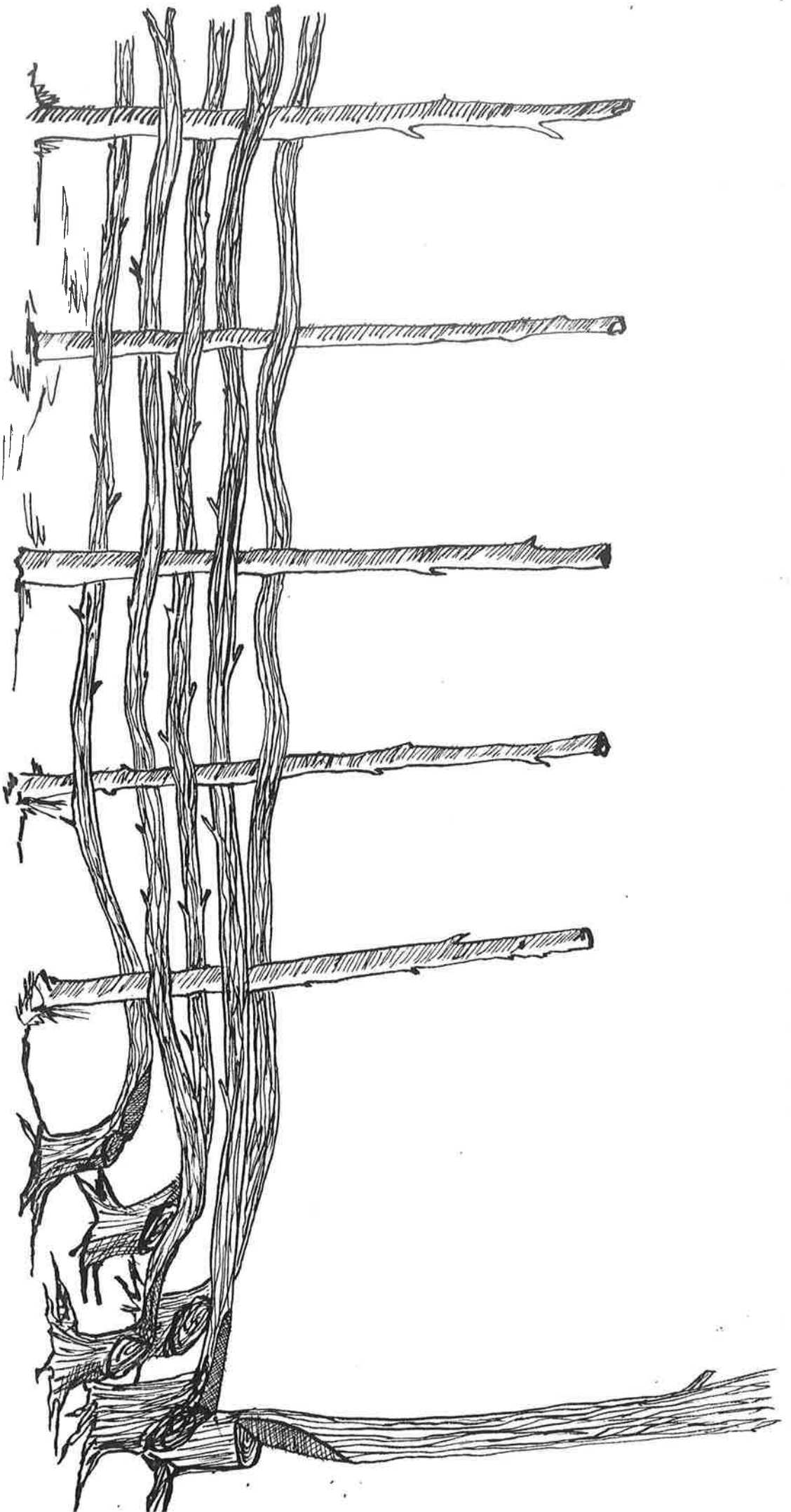
Site: \_\_\_\_\_ Date: \_\_\_\_\_ Surveyor: \_\_\_\_\_



Preparation of Pleachers~



Pleacher laid and interwoven through driven stakes.





BIRDS

<i>Part of hedgerow</i>	<i>Nest only</i>	<i>Nest and feed</i>	<i>Feed only</i>
<i>Upper branches of hedgerow trees</i>	<b>Carrion crow</b> <b>Rook</b> Buzzard Kestrel Mistle thrush	<b>Wood pigeon</b> <b>Greenfinch</b>	<b>Blue tit</b> <b>Chaffinch</b> and other tree and shrub species Trecreeper Lesser spotted woodpecker
<i>Trunk and holes</i>	<b>Barn owl</b> <b>Little owl</b> <b>Stock dove</b> <b>Jackdaw</b> <b>Great tit</b> <b>Blue tit</b> <b>Starling</b> <b>Tree sparrow</b> Kestrel Tawny owl	<b>Wren</b> (in ivy) Green woodpecker Greater spotted woodpecker Nuthatch	<b>Trecreeper</b>
<i>Shrubs</i>	<b>Turtle dove</b> <b>Magpie</b> Collared dove	<b>Wood pigeon</b> Cuckoo (lays in hedge sparrows' nests, etc.) <b>Long-tailed tit</b> <b>Song thrush</b> <b>Blackbird</b> <b>Lesser whitethroat</b> <b>Hedge sparrow</b> <b>Wren Goldfinch</b> <b>Linnet</b> <b>Lesser redpoll</b> <b>Bullfinch Chaffinch</b> <b>Greenfinch</b> <b>House sparrow</b> Moorhen (especially over ditches) Blackcap Garden warbler Red-backed shrike Cirl bunting Tree sparrow	<b>Fieldfare</b> <b>Redwing</b> <b>Mistle thrush</b> <b>Robin</b> <b>Great tit</b> <b>Marsh tit</b> <b>Blue tit</b> <b>Whitethroat</b> Willow tit Coal tit Willow warbler Chiffchaff + Pied flycatcher, redstart and other species on migration
<i>Herbs, low brambles</i>		<b>Whitethroat</b> <b>Yellow-hammer</b> <b>Reed bunting</b> Nightingale Chiffchaff Grasshopper warbler Sedge warbler Stonechat	<b>Goldfinch</b> <b>Greenfinch</b> and other shrub and ground species
<i>Ground</i>	<b>Skylark</b>	<b>Robin</b> <b>Corn bunting</b> <b>Pheasant</b> <b>Partridge</b> <b>Red-legged partridge</b> Willow warbler	<b>Hedge sparrow</b> <b>Blackbird</b> <b>Song thrush</b> <b>Wren</b> and many other shrub and herb species

The hedge and hedgerow trees as a habitat for birds.

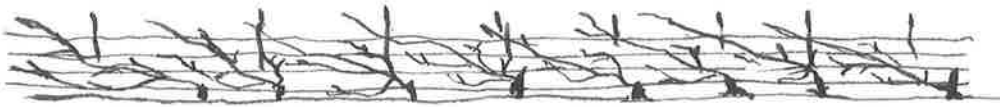
# Hedge Types:

side view

cross section



(a) remnant



(b) laid



(c) mechanically pollarded



(d) clipped



(e) overgrown, undergrowth removed by heavy grazing pressure



(f) unclipped stockproof



(g) overgrown with outgrowths of blackthorn

and species and numbers tend to increase from (a) to (g)





*Shading cast by trees can cause gaps to develop.*



*Old trees provide an ideal habitat for hole nesting species.*





*An overgrown upland gorse hedge in need of management.*



*Poor timing of cutting operations produces an unsightly hedge.*





The popular McConnell type flail cutter.



Poor hedge management leading to the development of gaps in the hedge.





*Poor management, coupled with over-grazing leads to a need for wire fencing.*



*Gaps can be repaired with suitable hedge replacements.*





*A row of standard hedgerow trees.*



*A sapling and a more mature Ash in a well managed hedgerow.*



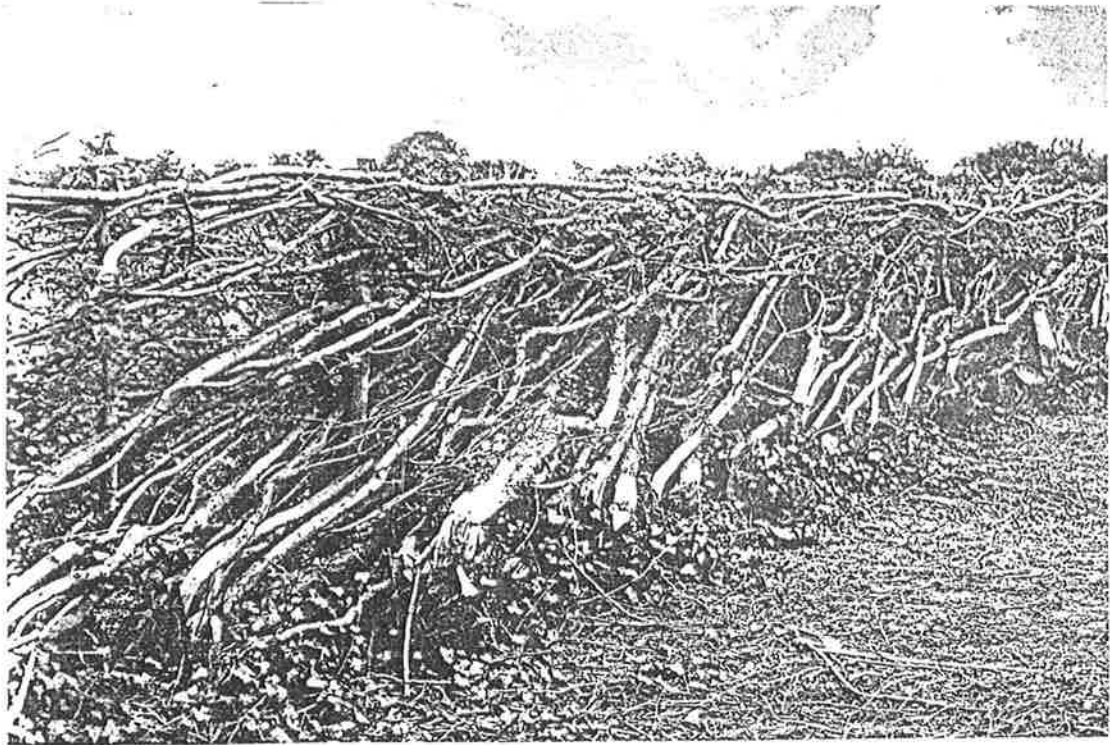


*Recently planted, thriving young hawthorn hedge.*

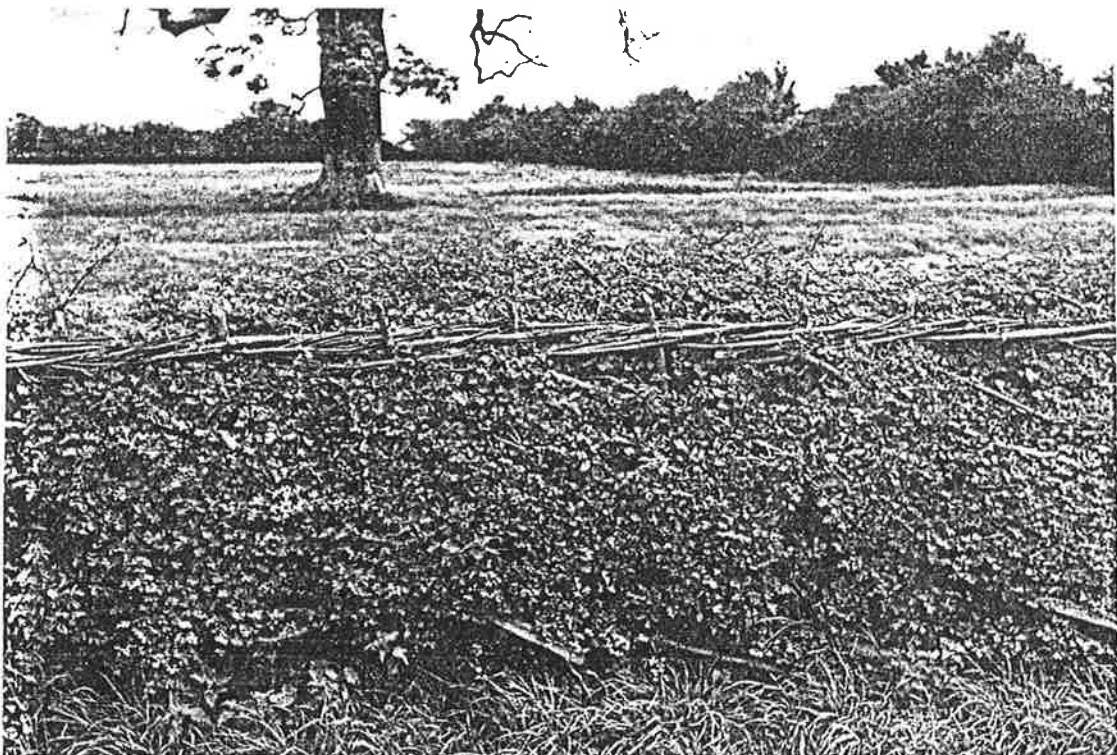


*Well managed, stock proofed hedge with associated verge.*





*Above: A recently laid hedge, providing a temporary barrier until new growth starts from the base. Below: A recently laid hedge in summer.*







Above: *Crataegus monogyna*, the hedging hawthorn.



Traditional management: laying a young hedge.