

# COUNTY LONGFORD HEDGEROW SURVEY REPORT

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September 14<sup>th</sup>, 2006



An  
Chomhairle  
Oidhreachta



The  
Heritage  
Council



**Hedgerow Landscape near Granard**

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## **ACKNOWLEDGEMENTS**

Many people have contributed their time and support to this project.

Thanks are primarily due to:

Longford County Council and the Heritage Council for funding this survey.

The Longford Heritage Office, with special thanks to Heritage Officer Lisa McDaniel and Acting Heritage Officer Shirley Markley for their hard work in initiating and supporting this project.

Members of the Longford Heritage Forum, in particular the members of the project working group, Sue Moles, Conservation Ranger with the National Parks and Wildlife Service (NPWS).

Marguerite Reilly, GIS Section of Longford County Council for her very prompt back-up support in providing maps and aerial photographs; and for inputting extent data into the GIS database.

My gratitude is also extended to all of the landowners who allowed access to their lands during this survey.

## 1.0 SUMMARY

Longford's hedgerow network is a huge asset to the county, being valuable in terms of agriculture, landscape, wild flora and fauna, water quality, carbon sequestration, and employment. Before this survey was carried out there was relatively little detailed information recorded about the resource.

In the late spring and summer of 2006 field recording of hedgerows was carried out employing a standard methodology in 12 no. sample 1 km squares distributed evenly around the county, covering approximately 1% of its total area. The aim of the survey was to record information on the extent, species composition, structure, condition, and management of hedgerows within County Longford.

Results from the County Longford survey were compared with those from similar hedgerow surveys conducted in Counties Laois, Offaly and East Galway in 2005, and Counties Roscommon and Westmeath during 2004.

The total length of hedgerow in County Longford is estimated at 9,903km based on results from the sample. The average figure for hedgerow density is 8.23 kilometres per square kilometre (km/km<sup>2</sup>). This is the highest density found in any of the five county hedgerow surveys that have had their extent recorded. The study also reveals that out of a total of six counties surveyed to date, County Longford contains a sample 1 km square with the most hedgerows so far recorded. This square located in proximity to Ballinalee village, contained 18.25 km of hedgerow.

A very wide range of shrub and tree species were found in County Longford hedges. A total of 25 shrub and tree species, including 16 native species, were found in the hedge layer of sampled hedges. 16 tree species, including 12 native species, were recorded growing as hedgerow trees. Whitethorn is the most frequently occurring shrub species found in 99% of the hedges, with ash the most common tree species, occurring in 75% of the hedges. Most hedges have young trees which is a positive feature for their long-term sustainability. Rowan (or mountain ash) was found more frequently in Longford hedgerows than in other county surveys. Approximately 15% of hedges recorded were classed as species rich; this is a higher percentage than in neighbouring Counties Westmeath and Roscommon, but lower than in the South Midlands (Counties Laois and Offaly). Roadside and townland boundary hedges were found to contain a higher diversity of native shrub species than other hedges.

Longford's hedgerows show good connectivity with other natural and semi-natural features which is beneficial for biodiversity and Longford compares well with other counties in this regard.

Most County Longford hedgerows are of a standard construction consisting of a single line of shrubs planted on the side of a hedge bank with an associated drain. Stone walls are not a common feature of the Counties hedgerows. Two thirds of the hedges form part of boundaries that were present at the time of the first Ordnance Survey in 1837. However, 19% of hedges would now be classed as redundant boundaries in terms of the field division on farms.

Over 10% of hedges have gaps for 25% or more of their length, and more than half display open, 'scrawny', or weak growth in the base of the hedge. These traits reduce the agricultural and wildlife value of hedges, and can be indicators in long term hedgerow decline.

There is a fairly even split between those hedges that are actively being managed, and those that can be considered to be long-term unmanaged. The use of the shape saw for hedgerow management is more common in Longford than in other counties, as is the use of hand tools. The survey revealed that the style and standards of current trimming practices could be improved. 17% of hedges are cut to less than 1.50m in height. In terms of agricultural and environmental best practice this proportion



of very low hedges in Longford should be reduced. There was a noticeable amount of cutting of hedgerows that had clearly occurred during the bird nesting season.

Just 6.4% of hedges met a series of ‘favourable condition’ criteria linked to structure and species composition. This figure rose to 17% when only species rich hedges were considered. Most of the criteria can be influenced by appropriate management, especially the 42% of species rich hedges that are maintained below 1.50m in height.

Overall County Longford has a varied, distinct, and interesting hedgerow resource, but appropriate efforts must be made by various bodies (and individuals) if the resource is to be improved and sustained into the future.

Recommendations have been made based on the Hedgerow Survey results, considered in the light of current conservation best practice. The relevance of the recommendations to each of the stakeholder groups, such as Longford County Council, farmers and landowners, the various state bodies, research institutions, and Teagasc, have been tabulated for easy reference.

### **Key Recommendations for Longford County Council**

Prioritisation of actions is important. The key recommendations (see section 9.0) most relevant to Longford County Council have been listed below for easy reference.

<b>No.</b>	<b>Recommendation</b>
1.10	As part of the County’s Biodiversity Action Plan, Longford County Council should draw up a Hedgerow Conservation Policy Document.
1.11	In the planning process, greater consideration should be paid to individual hedgerows in light of their particular qualities and characteristics. The concept of “Heritage Hedgerow” should be introduced for hedgerows which have notable historical, structural, or species composition characteristics.
1.12	Guidelines should be produced for planners and road engineers dealing with hedgerows in planning applications.
1.14	Hedgerow removal to facilitate development should be kept to an absolute minimum and, where unavoidable, a requirement for mitigation planting should be incorporated into the planning consent. This should consist of a hedge of similar length and species composition to the original, established as close as is practical to the original and where possible linking in to existing adjacent hedges. Native plants of a local provenance should be used for any such planting.
1.15	A study should be initiated to investigate the impact of development control in relation to hedgerows and to determine degrees of compliance with hedgerow related planning conditions by landowners in County Longford.
1.20	All of the relevant stakeholders (including Longford County Council) should commit to eliminating the cutting of hedges during the period indicated in the Wildlife Amendment Act (2001) (1 <sup>st</sup> March to 31 <sup>st</sup> August) except where absolutely necessary for safety reasons. They should also commit to implement forward planning in order to minimise the necessity for cutting for safety reasons.

1.24	Local Authorities jointly should set consistent standards for the interpretation and implementation of the section of the Air Pollution Act relevant to disposal of hedgerow waste. This interpretation should be communicated to farmers, landowners and contractors.
2.1	As a base line, in order to achieve management objectives, stakeholders (including Longford County Council) should commit to ensuring hedgerow management works carried out under their responsibility should conform to recognised, basic minimum standards.
3.1	A study should be conducted of nursery suppliers and garden centres to determine the availability of native planting stock (including provenance) for the range of hedge species found in County Longford. This information should be disseminated to interested parties.
4.1	Ensure all relevant staff (and any contractors used) have the necessary skills and data sources to implement or evaluate best practice hedgerow conservation.
4.2	Provide appropriate training for staff in aspects of hedgerow conservation relevant to their position.
4.3	A number of showcase sites of best practice covering different aspects of conservation and management should be developed around County Longford.
4.5	A pictorial information leaflet should be produced to show all of the species native to County Longford Hedgerows. This should be distributed to Teagasc offices, hedge-cutting contractors, marts, creameries, garden centres, etc.

## **2.0 INTRODUCTION**

Hedgerows are a valuable multi-functional resource in our countryside, benefiting agriculture, wildlife, the environment, tourism, and the general community. However there is only limited and localised data on the current extent, nature, variation and condition of Irish hedgerows.

The methodology for this survey defines hedgerows as

“Linear strips of woody plants with a shrubby growth form that cover more than 25% of the length of a field or property boundary. They often have associated banks, walls, ditches (drains), or trees”.

This sample study examines the extent, species composition, structure, condition and management of hedgerows in County Longford.

This information can then be used to further the objectives of the Longford County Heritage Plan 2004-2009 which contains a number of actions, directly or indirectly, interrelated to hedgerow conservation.

### **Objective 2: To promote interest and pride in the county’s culture**

- 2.3 Improve awareness of the role of agriculture, the canals, rivers, lakes, bogs and their associated industries in shaping the County and its culture.

### **Objective 3: Develop a heritage education and awareness programme**

- 3.5 Hold regular talks, seminars and exhibitions to highlight heritage issues including the unique culture and folklore of County Longford.
- 3.6 Promote and organise workshops and training in the area of traditional crafts and skills.
- 3.8 Run awareness programmes and competitions for schools which highlight our heritage.

### **Objective 4: Provide heritage information which is available to all**

- 4.9 Provide information for landowners regarding the care and maintenance of heritage.
- 4.10 Provide heritage information and guidance to tidy towns committees.
- 4.16 Undertake a heritage appraisal of all Longford County Council development plans.

### **Objective 5: To protect and enhance the natural heritage**

- 5.1 Prepare a Local Biodiversity Plan as set out in the National Biodiversity Plan.
- 5.4 Hold seminars and practical training workshops for Longford County Council staff, contractors, landowners, tidy towns committees and the general public on hedgerow management.
- 5.8 Provide guidelines for developers, Longford County Council staff and the public on integrating biodiversity conservation into the development process.
- 5.9 Assist the preparation of a landscape character assessment for the County.

### 3.0 BACKGROUND

#### 3.1 THE HISTORY OF HEDGEROWS IN COUNTY LONGFORD

Under the Gaelic system of joint land ownership there was little need for permanent enclosure or fencing. Instead tillage plots were protected with fencing for one season before being moved. There is, however, some evidence to suggest that some ring forts were set (planted) with blackthorn and whitethorn. Permanent banks with or without hedges on them may also have existed.

It was the Normans who introduced the concept of land ownership. As they spread throughout Ireland during the thirteenth century, they introduced the Feudal System, whereby tenants had to rent fixed plots of land from the landlord. The division of land and enclosure of commons was encouraged, even in some cases enforced by landlords. These changes were much resented by small stockowners.

By later medieval times (mid 14<sup>th</sup> to late 15<sup>th</sup> century), townlands had become the fundamental unit of land tenure. They were bounded by banks or ditches, which often had hedges too. The land within was largely unenclosed, though this was dependent on the landowner and their preferences. Townland boundary hedges thus tend to have larger banks and ditches than other hedges, and are often among the oldest hedges in the landscape. For these reasons they may also contain a more diverse flora than other, non townland boundary hedges.

The estate system also emerged in the seventeenth century, resulting in major agrarian landscape change and the associated establishment of fields in the more prosperous agricultural regions of Ireland including parts of County Longford (Aalen et al. 1997, 136).

Following on from the earlier plantation, the main period of land enclosure in Ireland was during the period 1740-1830. Agricultural improvement through land rotation programmes necessitated protection of crops by restricting the movement of livestock to particular fields. It was during this period that the familiar patchwork landscape of hedged fields largely came into being.

Current townland boundaries were regularised by the Ordnance Survey first carried out in Longford in 1837. An examination of the maps produced as a result of the survey show a degree of enclosure, particularly around the demesnes where the “new” ideas of agricultural improvement were being introduced. Many townlands have some enclosed land in their central area which is surrounded by larger areas of unenclosed land.

In 1721 the Irish Parliament passed an Act “*to oblige proprietors and tenants of neighbouring lands to make fences between their several lands and holdings ... at equal expense in making between such several lands and holdings good and sufficient ditches of six foot wide and five foot deep at least, where the same is practicable, well and sufficiently quicked in good husbandlike manner with white thorn, crab and other quicksets, where the same will grow, and, in ground where such quicksets will not grow, with furze*”.

*Note:* The term ‘quick’ or ‘quickset’ refers to young hedging plants, usually whitethorn (hawthorn).

This enclosure of land previously held in common was seen by some as another means of the rich exploiting the poor. Longford’s famous son, Oliver Goldsmith, alluded to this in his poem *The Deserted Village*:

“Where then, ah! where, shall poverty reside,  
To ‘scape the pressure of contiguous pride?  
If to some common’s fenceless limits strayed,

He drives his flock to pick the scanty blade,  
Those fenceless fields the sons of wealth divide,  
And e'en the bare-worn common is denied"

The Grand Juries, forerunners to the County Councils, were responsible for many road building programmes in the late eighteenth and early nineteenth centuries. A measure of funding was often provided for the provision of roadside hedges. Other hedgerows in the county may owe their origin to other transport routes. The development of the Grand Canal between 1753 and 1830, and the building of Railways (1847-1860s), would also have involved the planting of many miles of hedgerow.

Intensification of farming and the development of larger machinery resulted in hedgerow removal on many farms particularly during the 1960s and 1970s. The absence of any survey data means that it is not possible to quantify the extent of the loss, but a comparison of the current status of the resource with field boundary patterns from the second edition Ordnance Survey maps from the early part of the twentieth century would suggest that hedgerow loss is a fraction of what occurred in Britain during a similar period.

In the early 1990s increased emphasis on environmental conservation in connection with agriculture (largely driven by the EU) resulted in the Department of Agriculture and Food introducing the Rural Environmental Protection Scheme (REPS).

The objectives of the REPS are:

- To establish farming practices and production methods that reflect the increasing concern for conservation, landscape protection and wider environmental problems.
- To protect wildlife habitats and endangered species of flora and fauna.
- To produce quality food in an extensive and environmentally friendly manner.

Hedgerow Conservation is an intrinsic component of the Scheme. The design and operation of this scheme will set the tone for hedgerow conservation in Ireland for the foreseeable future.

### **3.2 THE VALUE OF HEDGEROWS FOR COUNTY LONGFORD**

The extent of the hedgerow/treerow network in Ireland was estimated to be approximately 382,000 km, based on the results of the *Badger and Habitats Survey of Ireland* (Smal, 1995). The estimated figure for County Longford was 7,132 km (1.9% of the national total). This is a huge asset to the county and the country.

#### **Landscape**

Perhaps more than any other landscape element, the patchwork of fields and hedgerows, along with stone walls, endow the countryside with a distinctive and attractive appearance. The flowering and fruiting of hedgerow shrubs give a colour and fragrance to the summer countryside that is unique. In particular, regional and local variations in hedgerows give character to a townland or county and lead to a sense of place. They frame the passage through much of the countryside by lining the roads and in certain areas give the impression of a wooded landscape.

#### **Agriculture**

Although the hedgerow network is largely a result of 18<sup>th</sup> and 19<sup>th</sup> century farming methods, hedges still have many benefits for the modern farmer. Apart from their basic function as cheap (Meyen, 1997) and environmentally friendly stock-proof boundaries, they provide vital shelter and protection to stock and crops across the county. By trapping airborne viruses they can prevent the spread of disease between farms and they can prevent animals from neighbouring farms coming

into direct nose to nose contact. Good hedgerows reduce wind speeds and thus protect against soil erosion.

### **Flora and Fauna**

Hedgerows are an essential wildlife habitat in the modern countryside, especially in the light of the low percentage of native woodland cover in County Longford (and Ireland as a whole). Hedgerows may be the only significant wildlife habitat on many farms. They are home to a range of wild flowers and flowering and fruiting trees and shrubs, all of which form the base of the food chain. They support invertebrates like butterflies, moths, ladybirds, beetles, bumblebees and hoverflies. In turn, two thirds of our bird species nest in hedgerows, finding essential food and shelter within. Birds of prey like kestrels, merlins, owls and sparrowhawks use hedgerows for hunting along. Bats depend on hedgerows for shelter, roosting, and most importantly for their insect food. Hedges can also support other mammals like woodmice, hedgehogs, and badgers.



**Insect on cowslip flower (Ballymahon square LD02)**

### **Hedges as habitat corridors**

The network of hedges across the country provides links between surviving fragments of other wildlife habitats, thereby allowing the movement and dispersal of species through agricultural landscapes. This network is thus vital to the conservation of much of our native flora and fauna, especially in parts of the county where intensive tillage and reseeded pasture are common. The quality of any particular hedge, in terms of its height, width, density, and general structure and condition (especially the amount and size of gaps), determines the extent to which it will act as a corridor for species movement and dispersal. However, even a relatively poor hedge may be important in an otherwise very intensive agricultural landscape.

## **Water Quality**

Hedges contribute a great deal to water quality. The root systems of hedgerow shrubs and trees regulate the movement of water through the landscape, absorbing and recycling nutrients, thus reducing the risk of pollution, whilst also reducing the potential for flooding. Hedges also stop sediment from moving down-slope, preventing excessive siltation in waterways. Siltation is the clogging up of river beds with fine grained particles like soil. It contributes much to the deterioration of aquatic habitats, preventing salmon and trout from spawning.

## **Carbon Sequestration**

Estimating an average hedgerow width of two metres, hedgerows cover an approximate area of 764 square km of the country and play a role in meeting Ireland's obligations under the Kyoto Protocol (see section 4.3).

## **Employment**

A number of people derive at least part of their income directly or indirectly from the management of hedges. No estimate has been made of the economic impact of the management of the hedgerow resource in Ireland.

## **A Material Resource**

In respect of native and naturalised species, a significant proportion of the country's broadleaf tree resource is contained within hedgerows. These provide the raw materials for a variety of crafts, and are also a source of carbon-neutral fuel.

## 4.0 SURVEY RATIONALE AND OBJECTIVES

### 4.1 THE NEED FOR A HEDGEROW SURVEY IN COUNTY LONGFORD

As will be seen from section 4.3, hedgerow conservation in Ireland is embraced through legislation, policy and incentive. Any attempts to promote hedgerow conservation need to be based on an accurate and meaningful assessment of the current resource. Up until now there has been no systematic record made of the extent, species composition, structure, condition and management of the hedgerows of County Longford.

The *Badger and Habitats Survey of Ireland* (Smal, 1985) produced statistics for hedgerow length in County Longford based on the same sample as this survey (see section 5.2 for sampling details). However, the definition of what constitutes a hedge is different in both surveys. There is a huge discrepancy in the results of the 'extent' of hedgerows between the County Roscommon Hedgerow Survey conducted by Foulkes & Murray in 2004 and *The Badger and Habitats Survey* completed in 1985. The estimated length of the hedgerow network in County Longford was 7,132km based on Smal's survey. Assuming an average hedgerow width of 2m; this would represent an area of almost 14.25 km<sup>2</sup>, which is approximately 1.4% of the area of the county. This is clearly a substantial cultural, agricultural, and environmental resource which deserves to be better understood.

There probably has never been a more appropriate time for a survey of this nature given the growing emphasis on ensuring environmental welfare, especially as part of agricultural programmes, in addition to increasing development pressure from housing, transport infrastructure and industrial development.

The Hedgerow Survey provides useful information in a variety of ways;

- It gives a snapshot of the quantity and character of the hedgerows in the county. This information serves as a benchmark for future surveys.
- Repeat surveys will provide a useful tool in monitoring environmental change.
- It is possible to identify current and potential future threats facing the resource by assessing the results in light of current conservation best practice.
- The survey identifies plant life local to the county.
- Comparisons can be drawn between hedgerows under different management regimes.
- Detailed information collated as part of the *County Longford Hedgerow Survey* can complement data collated from other habitat related studies, e.g. *The Badger and Habitats Survey of Ireland* (Smal 1985); *The Countryside Bird Survey* (Birdwatch Ireland, ongoing study).
- The *County Longford Hedgerow Survey* can be placed in its national context when viewed alongside other surveys based on the same methodology.
- Provides valuable baseline data which will be essential in planning and implementing a future Biodiversity Action Plan for County Longford.

The survey results and conclusions of this survey will also provide a useful tool for decision makers, advisory bodies and educational institutions including;

- Local Authority planners
- National Roads Authority
- Road Engineers
- Landscape Planners
- Environmental Consultants, particularly in drawing up Environmental Impact Statements



- Department of Agriculture and Food
- Teagasc
- Farmers, land owners and estate managers
- Foresters
- Schools, Colleges, and Universities
- State Bodies – National Parks and Wildlife Service, CIE, Waterways Ireland

## 4.2 THE AIMS AND OBJECTIVES OF THE COUNTY LONGFORD HEDGEROW SURVEY

1. To estimate the extent of hedgerows in County Longford based on extrapolating data from a known sample area.
2. To establish the species composition of the county's hedges.
3. To examine the general environmental and historical context of hedgerows in County Longford.
4. To record the general construction types of hedgerows in the county.
5. To record the structure and condition of hedgerows in the county based on a sample study.
6. To assess the data collected and produce recommendations that will promote the future conservation of the resource.

## 4.3 LEGISLATION AND POLICY

Various Legislative Acts, Directives, and Guidelines (International, European, and National) reflect the importance of the hedgerow resource and its management. These are listed below with a summary given for those having the most direct relevance.

### International

- The Kyoto Protocol (1997)  
This calls for the "*Protection and enhancement of sinks and reservoirs of greenhouse gases.*"

In the process of photosynthesis hedgerow trees and shrubs take in carbon dioxide and emit oxygen. Carbon Dioxide is a major greenhouse gas.

### European Union

- (EU) Habitats Directive (1992)  
Article 10 of the Directive states that, "*Member States shall endeavour in their land-use planning and development policies, to encourage the management of features of the landscape which are of major importance for wild flora and fauna.*"
- (EU) Birds Directive (1979)  
Article 3 of the Directive states that "*Member States shall take the requisite measures to preserve, maintain, or re-establish a sufficient diversity or area of habitats for all the species of birds referred to in Article 1*" - i.e. -all species of naturally occurring birds in the wild state.
- (EC) Council Regulations
  - 2078/1992 (Agri-Environmental Schemes)  
The Rural Environmental Protection Scheme (REPS) operates under this European Regulation. Specifications set down the conditions by which participant farmers in the Scheme must manage their hedgerows.
  - 1257/1999 (Good Farming Practice)
  - (EU) Nitrates Directive (1991)  
In order to reduce or prevent pollution of watercourses one of the objectives of the Directive is to limit the losses of nitrates linked to agricultural activities. To this end the Nitrates

Directive promotes the "Buffer" effect of non-fertilised grass strips and hedges along watercourses and ditches.

## National

- The Wildlife Act, (1976), as amended by the Wildlife (Amendment) Act, 2000  
The purpose of Section 40 of the original Act, as amended by Section 46 of the Amendment, is to protect breeding birds during the nesting season by establishing a prohibition on the cutting of hedges during the period from 1<sup>st</sup> March to 31<sup>st</sup> August (inclusive) each year.
- The Roads Act, (1993)  
Owners or occupiers of land are obliged to take all reasonable steps to ensure that any roadside hedge is  
*"not a hazard or potential hazard to persons using a public road and that it does not obstruct or interfere with the safe use of a public road or the maintenance of a public road"*.  
Also, under this Act, a road authority must prepare an Environmental Impact Statement (EIS) for motorways and dual carriageways over 8kms in rural areas.
- Planning and Development Act, (2000)  
There is scope within this legislation for Local Authorities to give some measure of protection to hedgerows in specific circumstances. They can designate Special Amenity Area Orders (SAAO's) within which certain activities can be controlled. Once SAAO's are confirmed, Conservation Orders can be put in place. SAAO's are very seldom invoked, with only three designations (all in the Dublin region) as of April 2005 (Crangle, 2005). No Conservation Orders have been designated (Birdwatch Ireland, 2005).  
Local Authorities can also make Tree Preservation Orders (TPO's), but currently there are no TPO's designated in respect of hedgerows (Hickie, 2004).
- National Biodiversity Plan (2002)  
Produced in response to the Convention on Biological Diversity (CBD, Rio de Janeiro, 1992), the plan has a number of Actions that are relevant to Hedgerow Conservation. These include; Action 32: *"Review options on Regulation of Hedgerow Removal and Produce guidelines on Hedgerows and Biodiversity."*  
This should be taken in the context of paragraph 2.27 of the plan which states:  
*"Field boundaries, mainly hedgerows, are a particularly prominent feature of the Irish countryside and provide important habitats for a variety of species. Hedgerows have suffered significant losses. Current legal controls for their protection are limited. For the future, the overall goal should be to have no net loss of the hedgerow resource."*  
Action 10 states, under *"Integrating Biodiversity into Sectors"*,  
*"Each Local Authority to prepare a Local Biodiversity Plan in consultation with relevant stakeholders."*
- National Heritage Plan (2002)  
The National Heritage Plan recognises hedgerows as prominent and important features in terms of their ecological, archaeological and landscape values. Action 32 (Heritage in the Countryside) ensures the  
*"protection and enhancement of hedgerows as a natural and archaeological heritage resource through the use of regulatory, educational and financial measures, as appropriate."*
- Electricity Supply Act, (1927)  
Article 98 of the above Acts permits any "authorised operator" to "lop or cut any tree, shrub or hedge which obstructs or interferes" with electric wires.
- Communications Regulations Act, (2002)  
Article 58 of the above Acts permit any "authorised operator" to "lop or cut any tree, shrub or hedge which obstructs or interferes" with the physical infrastructure of the network.
- The Forestry Act, (1946)
- Sustainable Rural Housing Guidelines (2005)

## 5.0 METHODOLOGY AND FIELD SURVEY

The initial methodology developed for county wide hedgerow surveys in Ireland was produced by Murray (2003). This methodology was refined in 2004 by Foulkes and Murray in the course of hedgerow surveys carried out in Counties Westmeath and Roscommon (Foulkes and Murray, 2005b, 2005c). The initial methodology and any adaptations made during the field surveys were thoroughly reviewed and a new paper, “*A Methodology for the recording of hedgerow extent, species composition, structure, and condition in Ireland*” (Foulkes and Murray, 2005) was produced in the spring of 2005. The *County Longford Hedgerow Survey* was carried out to the methodology described in this paper.

### 5.1 DEFINING HEDGES

For the purpose of this survey hedges are defined as:

**“Linear strips of woody plants with a shrubby growth form that cover more than 25% of the length of a field or property boundary. They often have associated banks, walls, ditches (drains), or trees.”**

This definition is based on previous definitions made by Cooper & McCann (1997), Fossitt (2000), and Murray (2003).

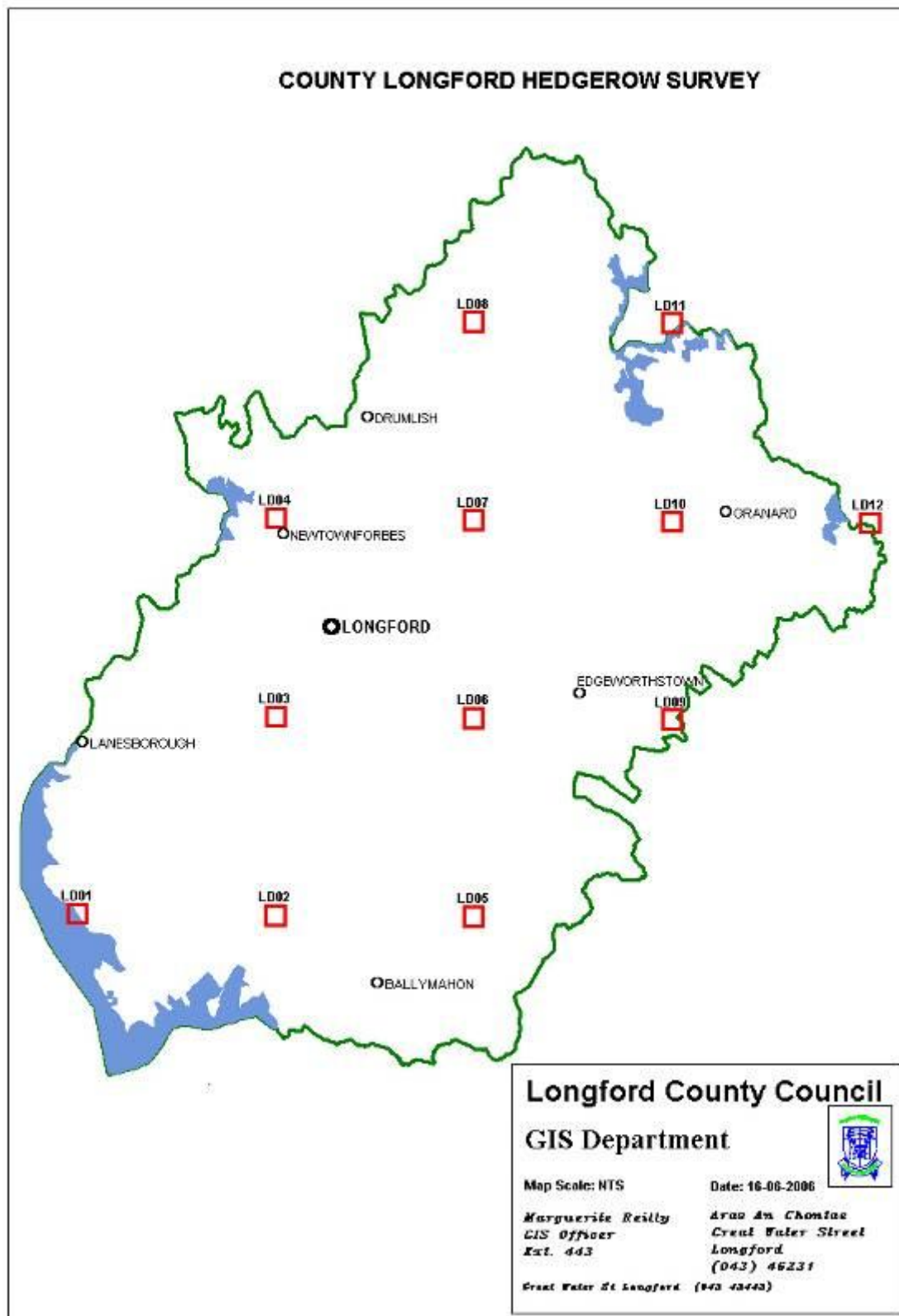
The terms ‘*hedge*’ and ‘*hedgerow*’ are used inter-changeably throughout this report.

In accordance with the Methodology, garden hedges and those bordering curtilage (BL3 as fully defined by Fossitt, 2000) have not been recorded, unless they also border agricultural land.

### 5.2 SELECTING THE SAMPLE

The south-western (or “bottom left hand”) 1 km square of each of the Ordnance Survey ten kilometre National Grid squares of the country was chosen for the Hedgerow Survey, in accordance with the sampling procedure used for *The Badger and Habitats Survey of Ireland* (Smal, 1995) and subsequently *The Countryside Bird Survey* (Birdwatch Ireland, ongoing study). This placement gives the potential for some joint assessment of these data sets in the future.

Samples areas are 1 km square, with the exception of three part squares which fall on the county boundary (in which case only the area within County Longford was surveyed). A total of 12 samples (nine full squares and three part squares) were selected in this way. The sample area comprises approximately 1% of the total area of County Longford. Figure 5.1 shows the location of the sample squares within the County. The relevant Ordnance Survey National Grid references and townland details for each survey square within the county are listed in Appendix 12.1.



**Figure 5.1 Map of County Longford showing location of the 1 km<sup>2</sup> samples**

Within each sample square a maximum of 10 hedges were selected for detailed study using randomly generated points on a transparent overlay. The points on the overlay were selected at random using a random number generator and an appropriately scaled, numbered grid marked by subdividing the square, and then matching the randomly chosen numbers with points on this grid. The overlay was then placed on top of the relevant aerial photograph of each square, and the hedge

nearest to each point on the overlay was chosen for detailed investigation. If there was no hedge within a fixed radius (equating to approximately 175m) of the randomly selected point, the number of sampled hedges was reduced by one. This was to ensure that the sample would not be skewed by a higher sampling density in certain areas. Where the 'hedge' chosen on the aerial photograph was discovered on the ground to be something other than a hedge (e.g. a tree line, a colonised drain, a vegetated bank, or a wall covered in vegetation), the next hedge nearest to the relevant point on the overlay sheet was recorded instead, provided that it fell within the specified radius of the random point.

Each hedge chosen for detailed investigation by the random selection process was clearly marked and labelled with a number on a copy of the relevant vector map (see Appendix 12.3), with beginning and end points also marked. A length of hedge was generally taken as one side of a field or enclosure. End points were identified as the junction between adjacent sides of a field, or where three or more hedge lengths meet. The average length of recorded hedgerows was 145m.

In a few instances end points were marked where the construction, management, or character of a hedge changed suddenly and conspicuously along its length, or where a clear and obvious difference in the origin of the hedge was apparent, but where no junction was evident. This was normally a result of boundary removal, where the two portions of a linear hedge once bounded separate fields.

### **5.3 MAPS AND AERIAL PHOTOGRAPHS**

The Ordnance Survey Discovery Series maps (scale 1: 50,000) were used to physically locate the sample squares. Vector maps (regularly updated), aerial photographs (photographed in 2000), and second edition six inch Ordnance Survey maps from the early 1900s, all at a scale of 1:5000 with the 1km square outline overlaid were supplied by the GIS Department of Longford County Council. The vector maps were used to identify features in the field and to record hedgerow extent. Aerial photographs enabled the square to be assessed in terms of its general character and the presence of hedges. This made the identification of the randomly selected hedge samples more efficient and aided orientation and navigation within and around the square. The second edition six inch Ordnance Survey maps were used primarily for the identification of townland boundaries. The first edition six inch Ordnance Survey maps were sourced through the Local Studies section of Library Head Quarters in Longford County Council.

### **5.4 PERIOD OF FIELDWORK**

Fieldwork commenced on 19<sup>th</sup> April 2006 and was concluded by 11<sup>th</sup> May 2006.

### **5.5 ACCESS AND PERMISSION**

Due to difficulties in identifying ownership of all parcels of land within the sample squares and the fact that landowners may not be around during the day it was not considered practical to seek permission for access to all lands. Where access to land was through a farmyard, close to a dwelling, or in any other situation deemed relevant, efforts were made to secure permission for access from the landowner. The Longford Heritage Officer provided a covering letter explaining the purpose of the survey and requesting the co-operation of landowners. Where requested, permission was granted without exception. In a number of cases landowners provided useful background information on their areas. The co-operation and assistance of landowners is much appreciated. Full public liability insurance cover was in effect for the field work

### **5.6 STRUCTURAL RECORDINGS OF HEDGES**

For each hedge selected (a maximum of 10 hedges per sample square, as described above), two end points were marked on the map. End points were generally identified as field corners or by junctions with other hedges or boundary features (i.e. one side of a field) or gaps greater than 20m. Each selected hedge was subjected to a detailed investigation along its whole length.

A 'Field Survey Sheet', developed in previous hedgerow surveys, was used to record the characteristics of each hedge and its associated features (see Appendix 12.5)

Recordings were made in 25 categories, grouped under the following headings: context, construction, structure/condition, and management. Each category field has a corresponding code that is entered into the appropriate box on the data recording grid.

#### *Context*

Each hedge is placed in its 'context': noting the type of farm on which it is located, and the wider physical environment, in terms of adjacent land use and links with other habitats. The data recorded is consistent with The Heritage Councils habitat classification 'A Guide to Habitats in Ireland' (Fossitt, 2000). Any potential indicators of hedgerow antiquity are also noted.

#### *Construction*

The basic 'construction' of the hedge relates to the linearity of the woody shrubs (single or double line) and the presence or absence of features such as drains, banks, walls or shelves (a 'shelf' is where there is a difference between the land height on either side of the hedge).

#### *Structure/Condition*

The 'structure' relates to the physical dimensions of the hedge (height, width, cross section, percentage of gaps, etc.), including any degradation to the basic construction. Condition is gauged by an assessment of the vigour of the hedgerow shrubs, degree of fruiting and a record of the quantity and age profile of hedgerow trees.

#### *Management*

'Management' covers the type and method of hedgerow management, past and present. The nature of any fencing is also recorded.

### **5.7 FLORISTIC RECORDINGS OF HEDGES**

For each hedge examined, two 30m strips were paced out and marked from two randomly chosen points along the sample's length. Based on hedgerow survey work in Britain (Bickmore, 2002), a 30m strip is generally accepted as an adequately representative sample size for recording woody species in a hedge. By recording woody species along a standardised length, statistical comparison of hedges of different lengths is made possible. Irish hedges tend to show high degrees of variation in species composition from one end of a hedge to the other. For this reason, two 30m strips were recorded for each sample hedge in this survey. The increased sampling intensity for each hedge gives a more accurate picture of the overall species composition of each hedge.

A 'Floristic Recording Sheet' was used to record these data. On this, each woody shrub species present within the length of each strip was allocated an appropriate Domin Scale value. The Domin Scale is used to record the percentage cover of each woody shrub species detected (see Appendix 12.6).

The presence of other species within the hedge but which did not fall within either sample strip was recorded separately.

The presence of Ivy (*Hedera helix*) at canopy level was recorded according to the Domin scale. The extent of cover (or absence) of the following species was also noted in accordance with the DAFOR scale (see Appendix 12.7).

Common Name	Latin Name
Brambles	<i>Rubus fruticosus</i> agg.
Wild Rose	<i>Rosa</i> spp
Honeysuckle	<i>Lonicera periclymenum</i>
Clematis	<i>Clematis vitalba</i>
Bindweed	<i>Calystegia sepium</i> , <i>Convolvulus arvensis</i>
Blackcurrant	<i>Ribes nigrum</i>
Gooseberry	<i>Ribes uva-crispa</i>
Bilberry	<i>Vaccinium myrtillus</i>
Raspberry	<i>Rubus idaeus</i>

Tree species present along the whole length of the hedge were noted and the dominant tree species, where applicable, was noted.

## 5.8 RECORDING THE EXTENT OF HEDGEROWS IN SAMPLE SQUARES

For the purposes of this survey the extent of hedgerows within a sample square were recorded by visual inspection of all linear features apparent on the relevant aerial photograph or vector map. The presence of hedgerows was marked with a solid red line on a black and white photocopy of the vector map. Remnant hedgerows were recorded with a broken red line. Remnant hedges are those where the shrubs have reverted to their (often aged) tree form with extensive gaps. Any other linear feature that was apparent on the aerial photograph/vector map was investigated and non-hedgerows were noted with a solid green line to prevent duplication of investigation. These included *Vegetated Banks*, *Vegetated Drains*, *Walls* with or without shrubs, *Fence lines*, *Mini Woodland Strips*. Where clear and extensive gaps occurred within hedges a green line was used to mark the gap section. This was practiced to minimize the over estimation of hedgerow length due to the inclusion of significant gaps.

## 5.9 TARGET NOTES

Where appropriate, notes were made of irregularities, special features, or notable characteristics within the sample square or with regard to specific hedges.

## 5.10 PHOTOGRAPHY

A Nikon Coolpix 3700 digital camera was used to photograph all sample hedges plus other notable hedges, specific characteristics, wildlife, etc.

## 5.11 DATA RECORDING

All of the data recorded during the field survey was transferred into a Microsoft Excel spreadsheet for subsequent analysis, with the exception of the Target Notes which were recorded in a Microsoft Word file and, where applicable, were cross-referenced to the data file. The information recorded for 'extent' purposes was digitised into the Longford County Council GIS System. The position of each of the sample hedges was also tagged and referenced to the information contained in the data file.

Digital photographs were downloaded, referenced, and stored in electronic folders relating to each sample square.

## 6.0 DATA ANALYSIS

Data recorded during the field survey was transferred from the field recording sheets in to a Microsoft Excel spreadsheet for further analysis.

All the data was subjected to standard statistical analyses (frequencies of species occurrence, mean species diversity, frequency of structural characteristics, etc.) and graphed using a Microsoft Excel spreadsheet. These results are presented in sections 7.1 to 7.8.



## 7.0 RESULTS OF THE COUNTY LONGFORD HEDGEROW SURVEY

The results from the sample survey are presented in this section, with comments on the significance of the data discussed further in section 8.0. Recommendations for the future conservation of the County Longford's hedgerow resource in the light of these results are presented in section 9.0.

### 7.1 THE EXTENT OF HEDGEROWS IN COUNTY LONGFORD

Table 7.1.1 shows the extent of hedgerows and remnant hedgerows in the individual sample squares of County Longford. The total area surveyed was 10.35 km<sup>2</sup> which is approximately 1% of the total area of the county.

*Table 7.1.1 Measurement of hedgerow extent in sample squares in County Longford*

O.S. Grid Reference	Square Reference	Nearest Town/Village	Area km <sup>2</sup>	Hedgerow Length (km)	Remnant Length (km)	Density (excluding remnant) (km/km <sup>2</sup> )
N 00 60	LD01	Newtown Cashel	1	2.65	0.12	2.65
N 10 60	LD02	Ballymahon	1	9.11	0.08	9.11
N 10 70	LD03	Killashee	1	10.67	0.74	10.67
N 10 80	LD04	Newtown Forbes	1	1.16	0.52	1.16
N 20 60	LD05	Taghshinny	1	12.56	0.09	12.56
N 20 70	LD06	Ardagh	1	16.07	0.44	16.07
N 20 80	LD07	Ballinalee	1	18.25	0.86	18.25
N 20 90	LD08	Ballinamuck	1	8.43	0.00	8.43
N 30 70	LD09	Edgesworthtown	0.94	7.76	0.33	8.27
N 30 80	LD10	Granard	1	11.57	0.42	11.57
N 30 90	LD11	Lough Gowna	0.14	0.00	0.00	0.00
N 40 80	LD12	Finnea	0.27	0.00	0.00	0.00

It can be estimated that County Longford has a hedgerow length of 9,903km assuming that the squares surveyed are a representative sample of the county as a whole.

The estimated length of remnant hedgerows is just 362 km. This equates to 3.5% of the total hedgerow and remnant hedgerow length. This compares with the results of the more detailed survey of hedges within each sample, which found that 2.5% of sample hedgerows recorded were remnant. Figures for remnant hedges are much lower than those from the neighbouring counties of Roscommon and Westmeath.

The length of hedgerows in the sample squares varies from 0km (in the two part squares LD11 and LD12), which were comprised of areas of bog, coniferous forestry and lake; and 1.16 kilometres per square kilometre (km/km<sup>2</sup>) in LD04 (Newtown Forbes) up to 18.25 km/km<sup>2</sup> in square LD07 (Ballinalee). The latter is the highest figure recorded in an individual 1km<sup>2</sup> in any of the specific Irish county based hedgerow surveys. The previous highest 'length of hedgerow' was 15.28km/km<sup>2</sup> in a square near to Clonbullogue, County Offaly.

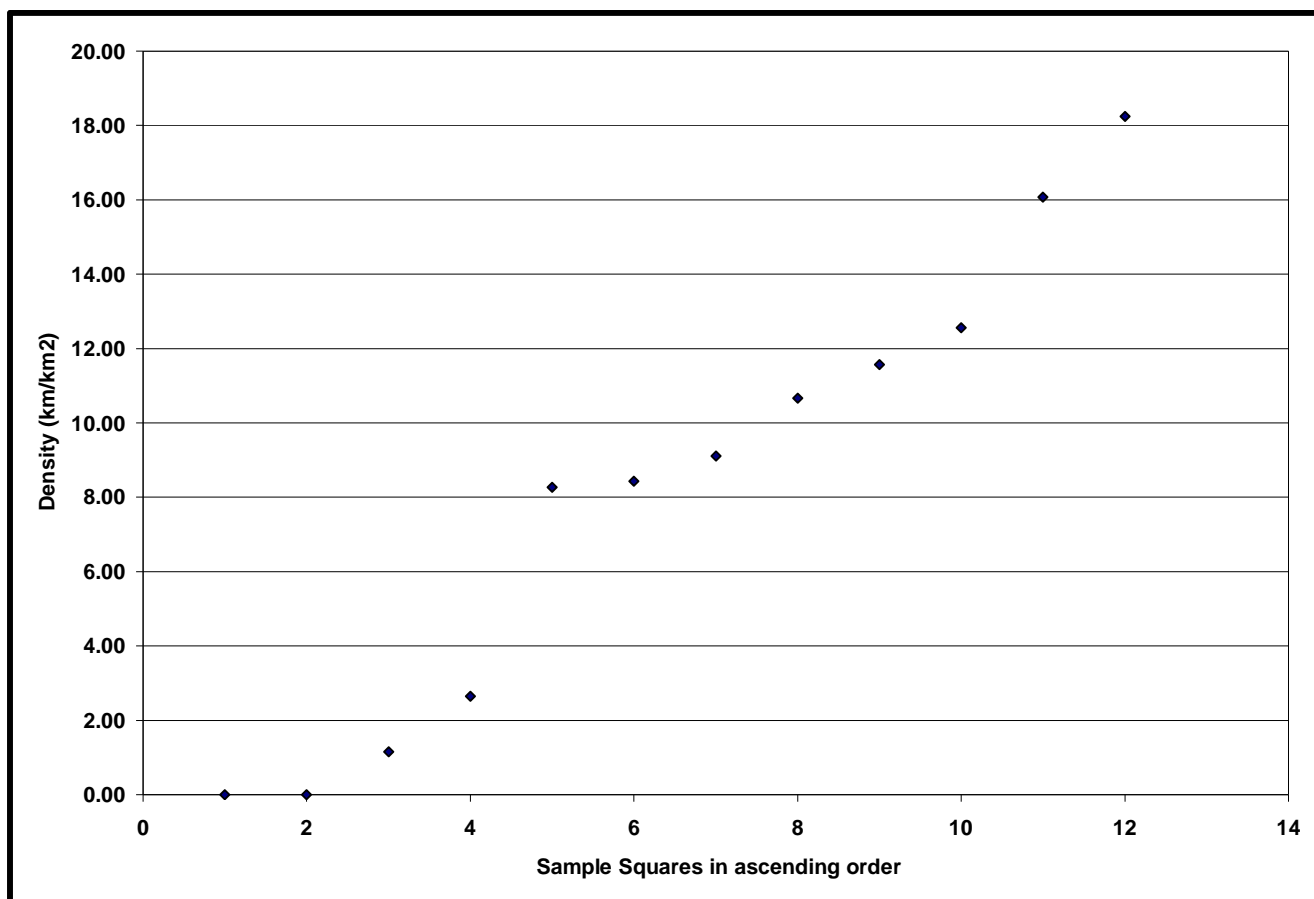
The average figure for hedgerow density in Longford is 8.23 km per km<sup>2</sup>. This is the highest average figure that has been recorded. The results from the other county surveys are shown for comparison, along with the standard deviations in Table 7.1.2.

*Table 7.1.2 Comparison of average hedgerow density*

County	Survey Year	Average Density (km/km <sup>2</sup> )	Standard Deviation	% of Remnant Hedges
Longford	2006	8.23	6.14	3.5
Laois	2005	7.28	3.15	1.7
Offaly	2005	5.81	4.32	2.1
Roscommon	2004	5.43	4.75	12.2
Westmeath	2004	5.82	3.28	9.7

The relatively high figure for ‘standard deviation’ indicates the wide variation in hedgerow density across the county from areas of bog and forestry with little or no hedges to the areas with a much heavier concentration of hedges. In contrast, County Laois has a high hedgerow density but relatively low standard deviation which indicates a more consistent hedgerow landscape.

Figure 7.1.1 illustrates the distribution of hedgerow density throughout the sample. It can be seen that half of the sample squares have a hedgerow density in the region 8.25km/km<sup>2</sup> to 12.5km/km<sup>2</sup>. Four squares have densities well below the average figure and two have densities well above average.



**Figure 7.1.1 Distribution of hedgerow density per km<sup>2</sup> in sample squares**

## **Potential Error in Extent Values**

### **Recording non hedgerows as hedgerows**

Close inspection of every hedge within each 1km square for the purpose of recording extent was outside the scope of the survey within the working timeframe. Even on close inspection it was difficult, in certain cases, to determine whether a particular linear feature was or was not a hedgerow based on the survey definition. When it came to recording extent this distinction was often determined from a distance. It is possible that some features that were recorded for extent purposes as hedgerows may have been considered not to be hedgerows on closer examination. This potential error would be almost non-existent in most landscapes but in areas on the fringes of bog-land the difference between a hedgerow and a colonized drain, or similar feature is more blurred.

### **Recording of remnant hedgerows as hedgerows**

Similar comments to the above apply, but in reverse. Some hedgerows that were recorded for extent purposes may on close inspection have been classified as remnant hedges. Any potential errors from the two above points would tend to cancel each other out. Overall any potential error would be deemed to be insignificant.

### **Non detection of new hedges**

Young hedges that would not be included on early Ordnance Survey Maps and that would have been too small to register as distinct linear features on aerial photographs or vector maps could only be recorded if detected during the field survey. The incidence of this was very low and it is not considered that new hedges would significantly contribute to the overall hedgerow extent.

## **Comparison with Badger and Habitat Survey Data**

The *Badger and Habitat Survey of Ireland* (Smal, 1995) produced figures for hedgerow and treeline lengths using the same sample squares as the current hedgerow survey. However, definitions between the two surveys are not entirely consistent.

The estimated hedgerow length in County Longford was 7,132 km, based on the definitions and results of the *Badger and Habitats Survey of Ireland*.

By comparing the results of the two surveys an approximation of 'hedgerow change' during the period between the two surveys should be possible. This varies between 13 and 17 years as the *Badger and Habitats Survey* was conducted during the period 1989-1993.

The results of this survey would suggest that there has been a gain of 2771km of hedgerows throughout County Longford in the period between the two surveys. This would equate to an increase of 39% in the hedgerow network which is clearly an anomaly. A similar discrepancy was noted in the County Roscommon Hedgerow Survey (Foulkes and Murray, 2005b), where an increase of over 40% was indicated.

Observations of 'new' hedgerows (less than 20 years old) were very rare and an explanation of this variation must be sought elsewhere. In fact, observation of recent hedgerow removal far exceeded that of any new planting. .

There has been some suggestion that not all of the sample squares were recorded during the *Badger and Habitats Survey*, and in a small county like Longford, where hedgerow density can be high, a factor such as this could have a huge impact on the overall result.

Comparing recent hedgerow survey data with the *Badger and Habitat Survey* results from counties Westmeath, Offaly and Laois indicated hedgerow loss at rates of 1.1% and 3.8%, and 6% respectively in a similar period.

The discrepancy between the figures produced between the recent hedgerow surveys in Counties Longford and Roscommon and those of the *Badger and Habitats Survey* would suggest that any direct comparison between the two bodies of work is irrelevant unless the sources for the above discrepancies can be deduced.

## 7.2 SPECIES COMPOSITION OF HEDGEROWS IN COUNTY LONGFORD

The 'species composition' of hedgerows is individually examined in respect of i) the shrub layer and ii) the tree layer. Making a meaningful record and examination of ground flora was outside the scope of this survey.

### SHRUB LAYER

#### Species occurring in the shrub layer

25 species were recorded in the shrub layer of the sampled hedges. 16 of these are species native to Ireland (excluding wild privet (*ligustrum vulgaris*), the native status of which is subject to different opinions. In common with all previous studies Hawthorn (Whitethorn) is the most commonly occurring hedgerow shrub followed by Blackthorn. Hawthorn also has the highest percentage cover in County Longford hedges. A block of five species - Elder, Wild Privet, Ash, Gorse and Holly, were present in over 20% of the hedges sampled. Gorse (Furze or Whin) was more frequently recorded in County Longford hedges than in any of the other counties previously surveyed. This is also true of Rowan and Broom, the latter having not been recorded in any hedges prior to this survey. There is a regional pattern to the distribution of Rowan with all but one of the recordings being located north and west of Longford town. Hazel was found in 13% of hedges which is less than that seen in counties Laois and Offaly (up to 33%), but more than that seen in counties Roscommon, Westmeath, and East Galway (7%, 10% and 11% respectively). It has a relatively high level of cover in those hedges where it is found. Willow was only recorded in the sample strips of 13% of hedges but was recorded as present in a further 6% of hedges outside the strips suggesting that because of its low level of cover in individual hedges its frequency of occurrence in respect of the surveys methodology may lead it to be under represented in the results. Spindle was only recorded in 6% of the sampled hedges. In East Galway spindle was recorded at 9% being the next lowest, ranging up to 27% in County Offaly. In common with Roscommon and East Galway, occurrences of Elm are low at around 1%. Snowberry was recorded in 5% of hedges but its level of cover is high in those hedges where it is found.



High proportion of hazel in townland boundary hedge (Taghshinny – LD05)

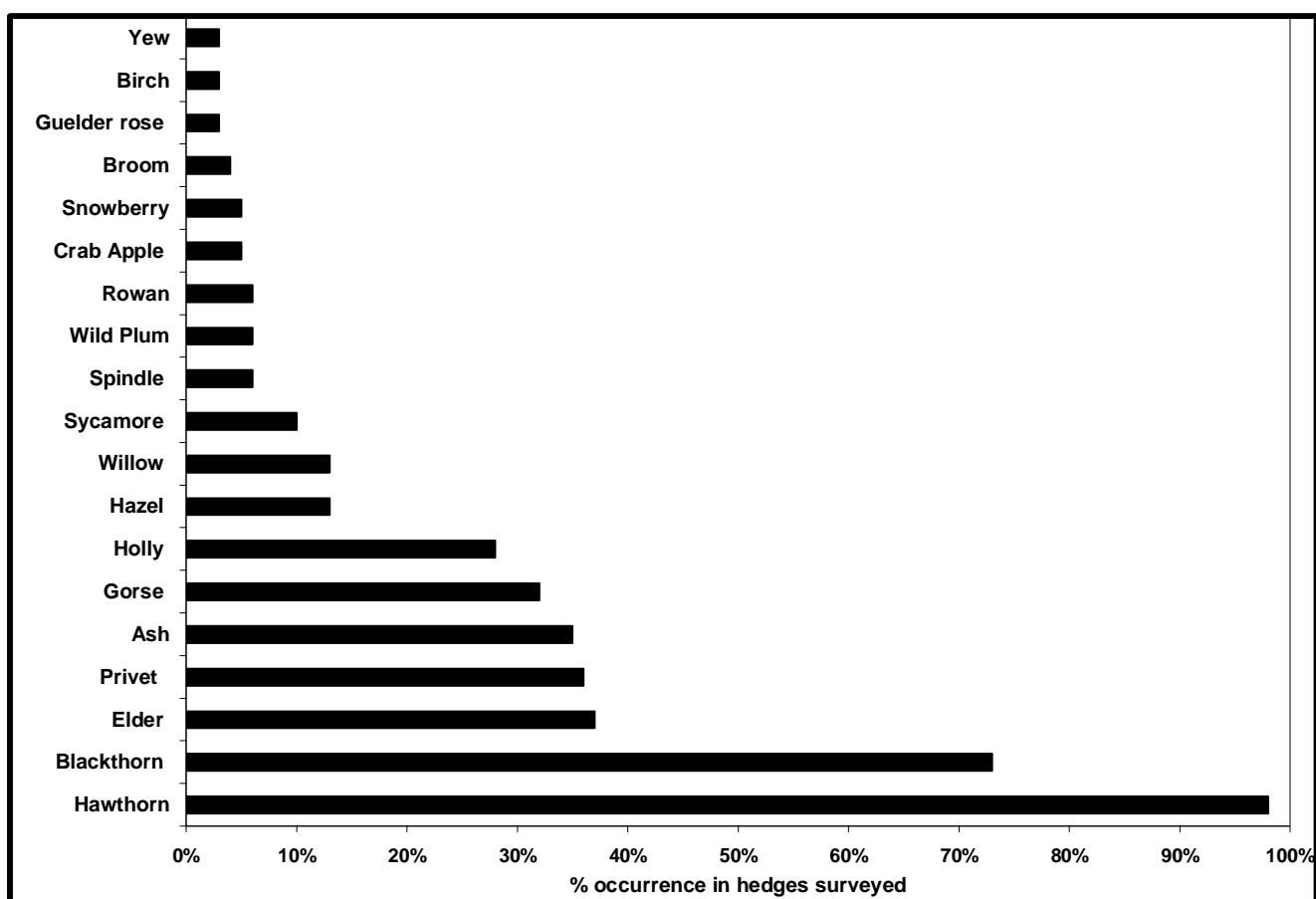
The frequency and abundance of each species is presented below in Table 7.2.1 with the frequency of the major species represented graphically in Figure 7.2.1.

The ‘frequency of occurrence’ is the frequency with which each species is found in one or other of the two sampled 30m strips of each hedge.

The ‘mean Domin abundance level’ is a representation of the degree of cover of each species within the 30m sample strips. To arrive at this figure the average is taken of the relevant mid-point Domin percentage figure from each hedge in which the species occurs.

**Table 7.2.1 Frequency of woody species occurrence and mean abundance in sampled County Longford Hedges**

Latin name (*denotes non-native species)	Common name	Frequency of occurrence (%)	Mean Domin abundance level
<i>Crataegus monogyna</i>	Hawthorn	99	8 (34–50% cover)
<i>Prunus spinosa</i>	Blackthorn	73	5 (11-25% cover)
<i>Sambucus nigra</i>	Elder	37	4 (4-10% cover)
* <i>Ligustrum vulgare</i>	Privet	36	5 (11-25% cover)
<i>Fraxinus excelsior</i>	Ash	35	4 (4- 10% cover)
<i>Ulex europaeus</i>	Gorse	32	5 (11-25% cover)
<i>Ilex aquifolium</i>	Holly	28	4 (4-10% cover)
<i>Salix spp</i>	Willow	13	3 (< 4% cover)
<i>Corylus avellana</i>	Hazel	13	5 (11-25% cover)
* <i>Acer pseudoplatanus</i>	Sycamore	10	4 (4- 10% cover)
<i>Prunus domestica</i>	Wild Plum	6	4 (4- 10% cover)
<i>Euonymus europaeus</i>	Spindle	6	3 (< 4% cover)
<i>Sorbus aucuparia</i>	Rowan	6	4 (4-10% cover)
<i>Malus sylvestris</i>	Crab Apple	5	4 (4- 10% cover)
* <i>Symphoricarpos albus</i>	Snowberry	5	7 (34-50% cover)
<i>Cytisus scoparius</i>	Broom	4	4 (4-10% cover)
<i>Viburnum opulus</i>	Guelder Rose	3	4 (4- 10% cover)
<i>Betula spp.</i>	Birch	3	3 (< 4% cover)
<i>Taxus baccata</i>	Yew	3	3 (< 4% cover)
* <i>Lonicera nitida</i>	Dwarf Box	3	4 (4-10% cover)
<i>Ulmus spp</i>	Elm	1	3 (< 4% cover)
* <i>Fagus sylvatica</i>	Beech	1	3 (< 4% cover)
* <i>Syringa vulgaris</i>	Lilac	1	4 (4-10% cover)
* <i>Acer campestre</i>	Field Maple	1	3 (< 4% cover)
* <i>x Cupressocyparis leylandii</i>	Leylandii	1	3 (< 4% cover)



**Figure 7.2.1** Frequency of occurrence of main shrub species in sampled hedges in County Longford

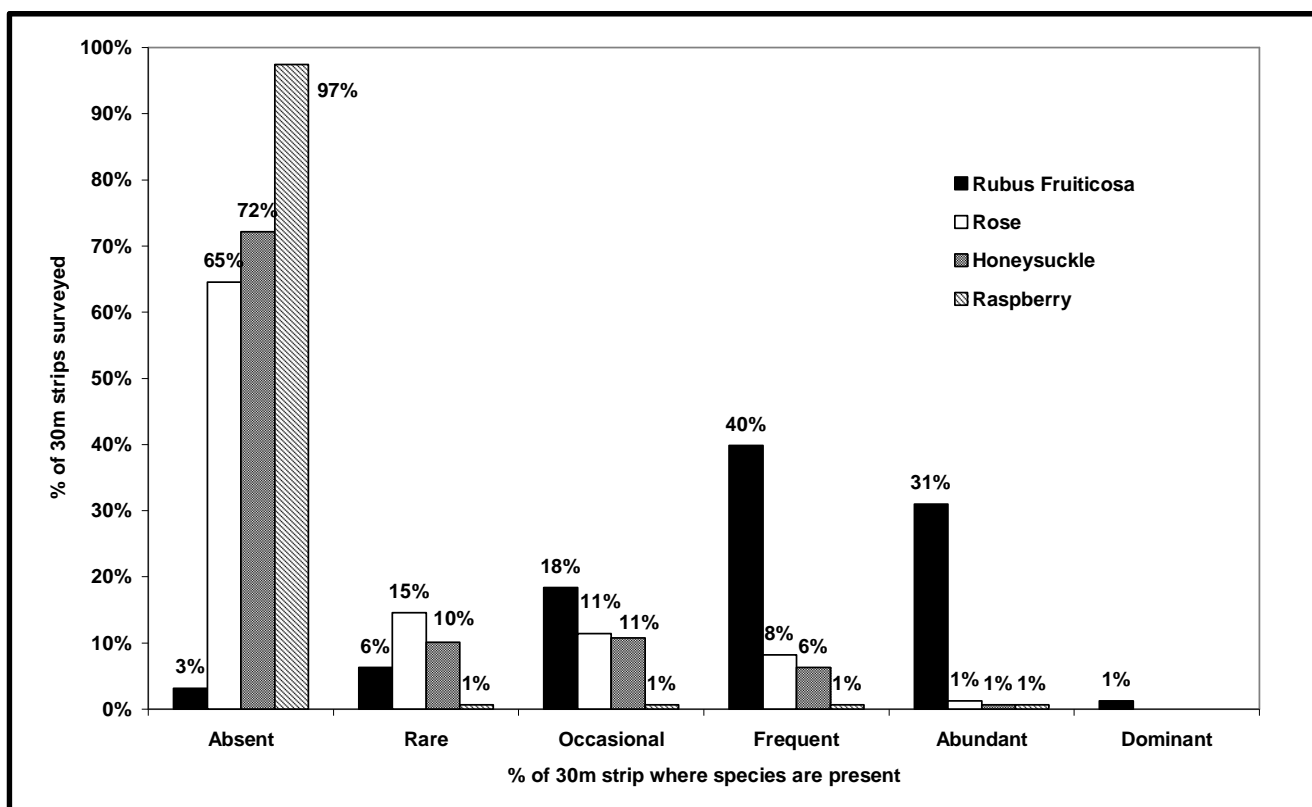
### Woody Climbers

Bramble (*Rubus fruticosus*) was recorded as being present in a total of 97% of the County Longford hedges surveyed which is consistent with results from County Laois and County Offaly (no comparative data from other surveys). Wild Roses (*Rosa* species) were recorded in 35% of samples which is much lower than in the south midlands where roses were present in over three quarters of the samples. Honeysuckle (*Lonicera periclymenum*) was recorded in 28% of the County Longford sample. This is similar to County Offaly (33%) but much lower than County Laois where honeysuckle was found in 58% of samples. Wild raspberry (*Rubus idaeus*) was more frequently recorded in County Longford than in either County Laois or County Offaly.

Recordings of woody climbers are presented in Table 7.2.2 below, with a graphical representation of their level of abundance using the DAFOR scale in Figure 7.2.2.

**Table 7.2.2** Frequency of woody non-shrub species occurrence in sampled hedges

Latin Name	Common Name	Frequency of occurrence (%)
<i>Rubus fruticosus</i> agg	Bramble	97
<i>Rosa</i> spp	Wild Rose	35
<i>Lonicera periclymenum</i>	Honeysuckle	28
<i>Rubus idaeus</i>	Raspberry	3



**Figure 7.2.2 Level of abundance of woody non-shrub species in sample strips in County Longford**

### Hedge Species Diversity

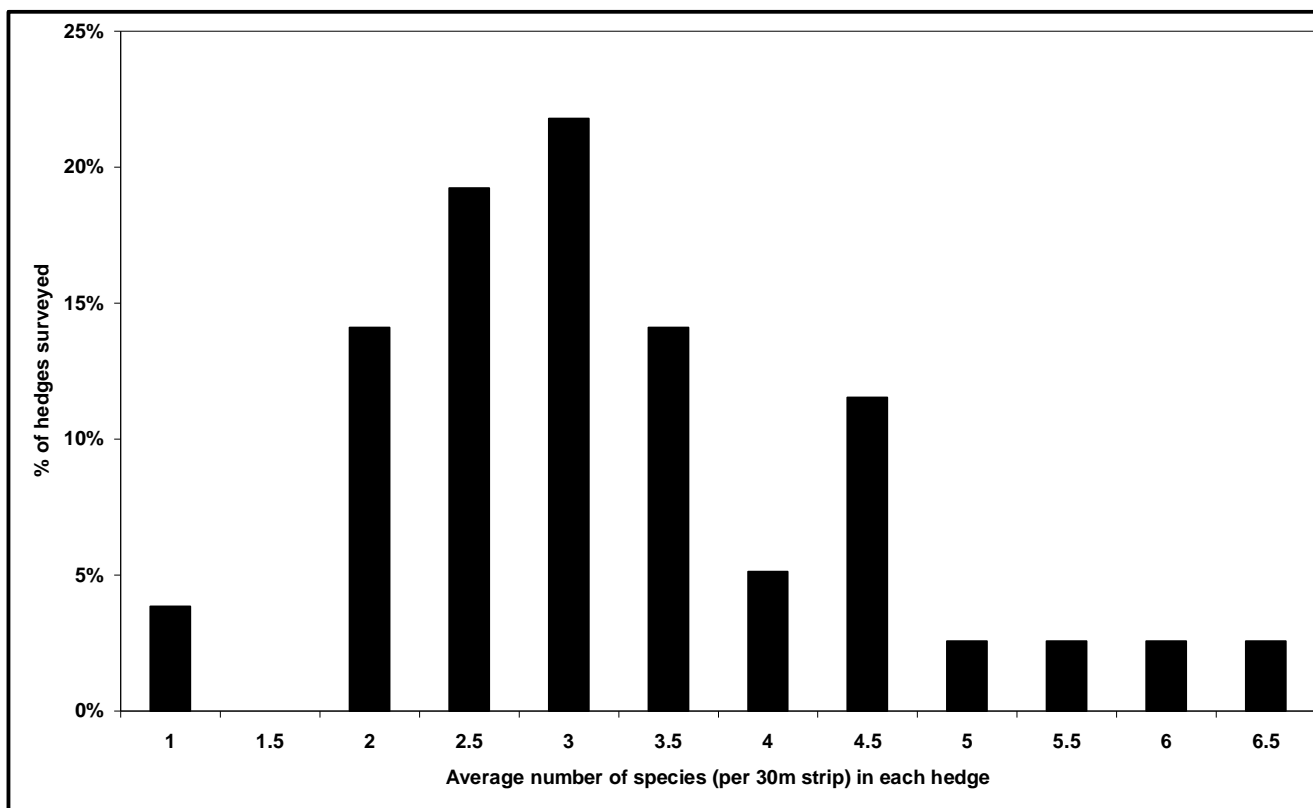
The species diversity of an individual hedge is defined as the number of shrub species found in a representative sample strip (usually 30m) of a hedge. As two 30m sample strips were recorded for each hedge in this survey, the average number of species from the two strips is the most representative figure of species diversity for each sampled hedge.

### Species Rich Hedges

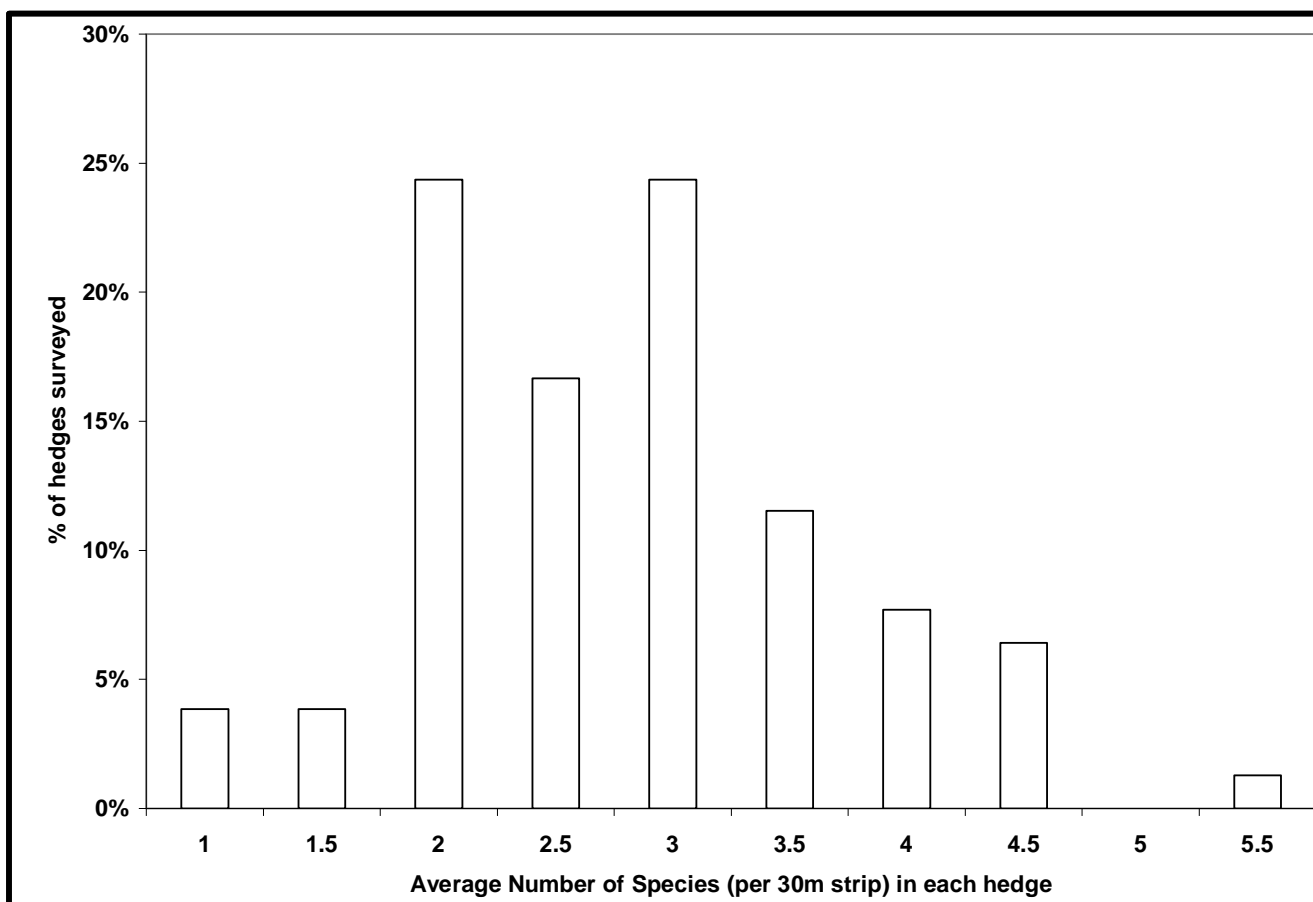
There are no defined criteria for what is considered to be a species rich hedge in Ireland. In the absence of a standard, I have based my assessment on British measures, where a species rich hedge is defined as one that contains five or more native woody species on average in a 30m strip (UK Biodiversity Action Plan, website). In northern England, upland Wales, or Scotland the presence of four or more native species qualifies as being species rich. As Ireland's native flora overall is less diverse than that of England, Wales and Scotland, four species per 30m length could be considered as species rich here. Only native species, based on Webb (1977) are included for the calculation of native species diversity.

### Species Diversity Figures

The average number of species in the two 30m strips was calculated. The breakdown of percentages for the different levels of species diversity found in the sample hedges is shown in Figures 7.2.2 and 7.2.3. Figure 7.2.2 shows diversity of all species, both native and non-native while Figure 7.2.3 shows just those species considered to be native to Ireland.



**Figure 7.2.3** Percentage breakdown of (average) species numbers in sample hedges (all species)



**Figure 7.2.4** Percentage breakdown of (average) native species numbers in hedges



It is interesting to look at species diversity results from different perspectives. Table 7.2.3 shows an analysis of the species diversity figures for the sampled 30m strips in County Longford. These can be compared with the results from County Laois and County Offaly which are also shown.

*Table 7.2.3 Comparison of species diversity figures in 30m sample strips in Counties Longford, Laois and Offaly*

Species Diversity criteria in 30m sample strips	% of sample in County Longford	% of sample in County Laois	% of sample in County Offaly
an average of 4 or more native species	15.4	44.7	31.5
4 or more native species in at least 1 strip	26.6	59.1	56.9
a combined total of 4 or more native species in the two 30m strips	48.7	66.0	66.9
an average of 4 or more (all) species	26.9	52.2	49.2
4 or more (all) species in at least 1 strip	34.6	69.2	69.2

These results indicate the variability in the species composition of individual hedgerows. Nearly half of the County Longford hedges sampled contained four or more native species, in total, in the two 30m sample strips, but only 15% had an average of four or more species over the two strips.

The results show that in many hedges the species are not necessarily the same species in the two strips, which suggests that the hedges are even more diverse than the general species diversity figures might portray.

33 separate recordings were made in 23 sample hedges of species that were present within those hedges but were not present within the two 30m strips.

In terms of native species only, this amounted to 28 recordings in 21 hedges.

The average species diversity for all hedges recorded in five County hedgerow surveys is shown in Table 7.2.4.

*Table 7.2.4 Comparison of species diversity statistics*

County	Mean species diversity (all)	Standard deviation	Mean species diversity (native)	Mean total number of species in 2 no. 30m strips (all)	Mean total number of species in 2 no. 30m strips (native)
Longford	3.26	1.2	2.80	4.20	3.57
Laois	4.00	1.5	3.56	5.10	4.45
Offaly	3.81	1.4	3.25	4.92	4.09
Westmeath	2.80	1.1	unavailable	unavailable	unavailable
Roscommon	2.50	1.0	unavailable	unavailable	unavailable

### **Relationship of individual species to overall species diversity**

The relationship between the presence of certain individual native species and the overall species diversity of the hedge was examined. The ‘*overall average*’ is taken to mean the average species diversity (all species) of all the hedges recorded. The ‘*mean species number*’ is taken to mean the average species diversity of those hedges where the listed species recorded a Domin value in one or other of the two 30m strips for that hedge. The results are shown in Table 7.2.5.

*Table 7.2.5 Relationship between species occurrence and species diversity (all species) in County Longford*

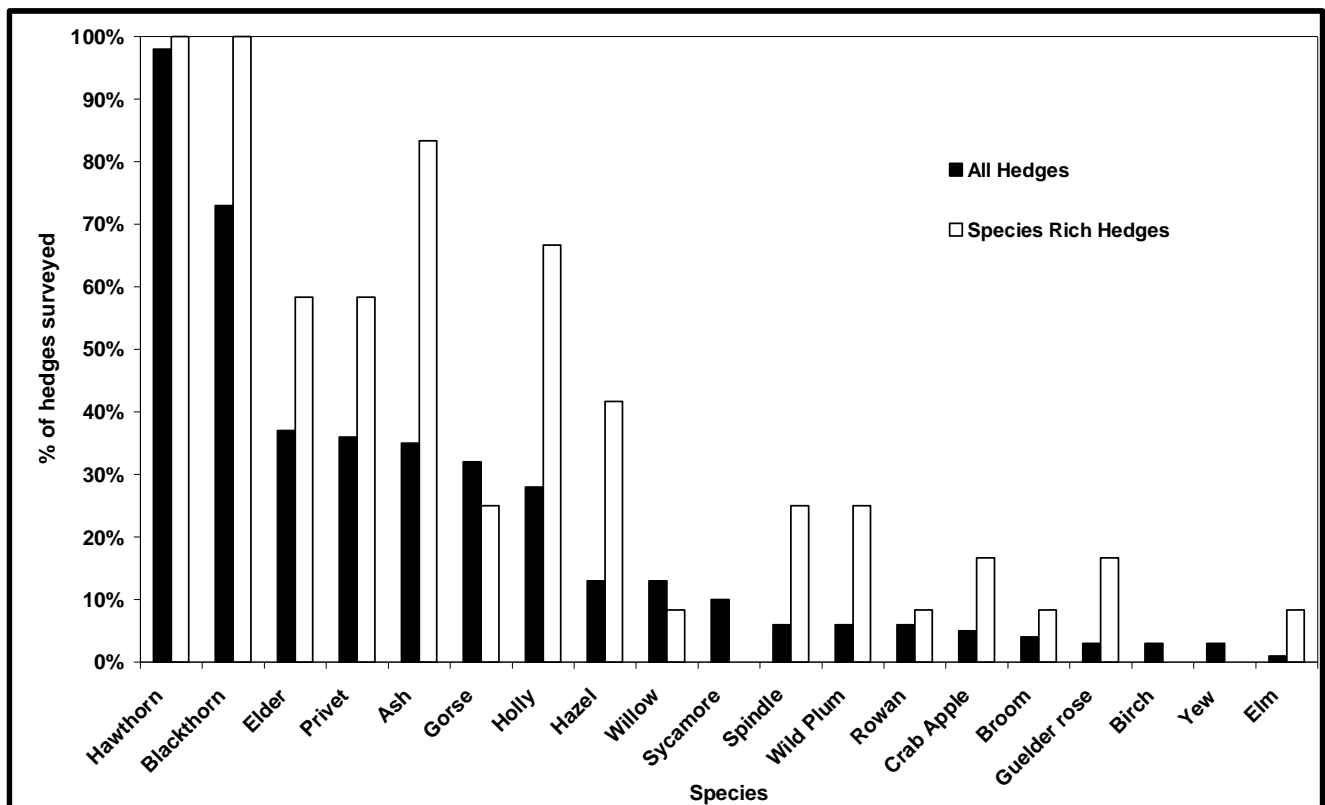
Hedges Containing	Mean Species Number
<i>Overall Average</i>	3.26
Guelder Rose	6.25
Crab Apple	4.75
Wild Plum	4.70
Spindle	4.60
Hazel	4.20
Ash	4.19
Holly	4.09
Privet	3.96
Willow	3.70
Elder	3.55
Blackthorn	3.53
Rowan	3.50
Hawthorn	3.27
Gorse	3.20

These figures would suggest that the presence of Guelder Rose, Crab Apple, Wild Plum or Spindle is a good potential indicator of species diversity in a hedge. However, these species were recorded at relatively low levels of frequency. Relating these findings with those from other studies would suggest that Guelder Rose and Hazel are the two best indicators of species rich hedges, with Spindle also a useful guide. Conversely, based on the County Longford results, Gorse would appear to be an indicator of less species rich hedges but this is not completely consistent with the results from County Laois and County Offaly.



**Guelder Rose in species rich hedge (Killashee – LD03)**

It would be expected that individual species would be more likely to occur in species rich hedges than the norm. Figure 7.2.4 shows the relationship between the occurrence of each of the major species in species rich hedges and their overall occurrence rate in County Longford.



**Figure 7.2.5 Relationship of individual species to overall species diversity**

Hazel, Holly, Spindle, Crab Apple, and Guelder Rose all occur substantially more frequently in species rich hedges than non-species rich hedges. Hazel in particular is interesting. While it occurs in 13% of all hedges, it is found in 42% of the species rich hedges. This is consistent with findings in County Laois and County Offaly where a similar comparison was made. Conversely, Willow which was also recorded in 13% of the total sample was only found in 8% of the species rich hedges. This is most likely a spurious result given that Willow was recorded as present in a number of hedges but outside the two 30m samples. Based on this survey, and previous surveys, Guelder Rose is consistently much more likely to be found in species rich than non species rich hedges.

#### **Townland Boundary and Roadside hedges**

Hedges adjacent to public roads comprised 11% of all the randomly chosen hedges surveyed in County Longford. 11% of hedges sampled during this survey formed part of a townland boundary. Table 7.2.6 shows a comparison of the species diversity of townland boundary hedges and roadside hedges with average species diversity figures.

*Table 7.2.6 Comparison of average species diversity figures for townland boundary and roadside hedges*

	Average Species Diversity (all species)	Average Species Diversity (native species)
All hedges	3.26	2.80
Townland boundary hedges	3.39	2.94
Roadside hedges	4.38	3.25



**Non-linear townland boundary adjacent to the N4 near to Newtownforbes (LD04)**

Roadside hedges are generally more species rich than non-roadside hedges. Roadside hedges were found to be more species rich than townland boundary hedges but the degree is lessened when only native species are considered. This indicates that roadside hedges are more likely to contain non-native species than townland boundary hedges. The species diversity for townland boundary hedges was slightly above the average figure for both “all” species and “native” species only. These results are generally consistent with the findings in other counties.

Further substantiation of the ‘species diversity’ difference between roadside and non-roadside hedges is seen in the results of a previous survey undertaken in Knock, County Mayo (Condon and Jarvis, 1989) which showed that the ‘average species diversity’ of roadside hedges in pre-1837 hedges to be 4.33 species per hedge compared with 3.77 species per hedge in non-roadside hedges. In post 1837 hedges the figures were 3.75 and 2.75 respectively.

These figures should be considered purely as a comparison between roadside and non-roadside hedges between the Condon and Jarvis survey and this survey. The difference in the actual values for species diversity could be due as much to a different consideration of what species are counted between the two surveys (e.g. dog rose and bramble) as to a difference in species diversity between the different areas.

### **Distribution of species rich hedges**

An examination of the distribution of species rich hedges around County Longford shows that over 40% of them were found in two sample squares in the south western part of the county (LD02 and LD03). This distribution is consistent with the findings of the County Roscommon Hedgerow Survey which found the majority of species rich hedges were in the sample squares in closest proximity to Lough Ree. The influence of areas of semi-natural woodland around Lough Ree may well be a factor. These wooded areas could be providing a seed reservoir for the colonisation of hedgerows.

These results would suggest that ‘species diversity’ is more likely to be a factor of soil type and other immediate environmental influence (for example their proximity to semi natural woodland, bogland) than historical factors.

### **TREE LAYER**

‘*Hedgerow trees*’ are any trees within the hedge that have been deliberately or incidentally allowed to grow distinct from the shrub layer of the hedge. A total of 16 tree species were found in sampled hedges in County Longford in this survey; 12 of these were native species. The most commonly occurring hedgerow tree in County Longford is by far the Ash (*Fraxinus excelsior*), which is found



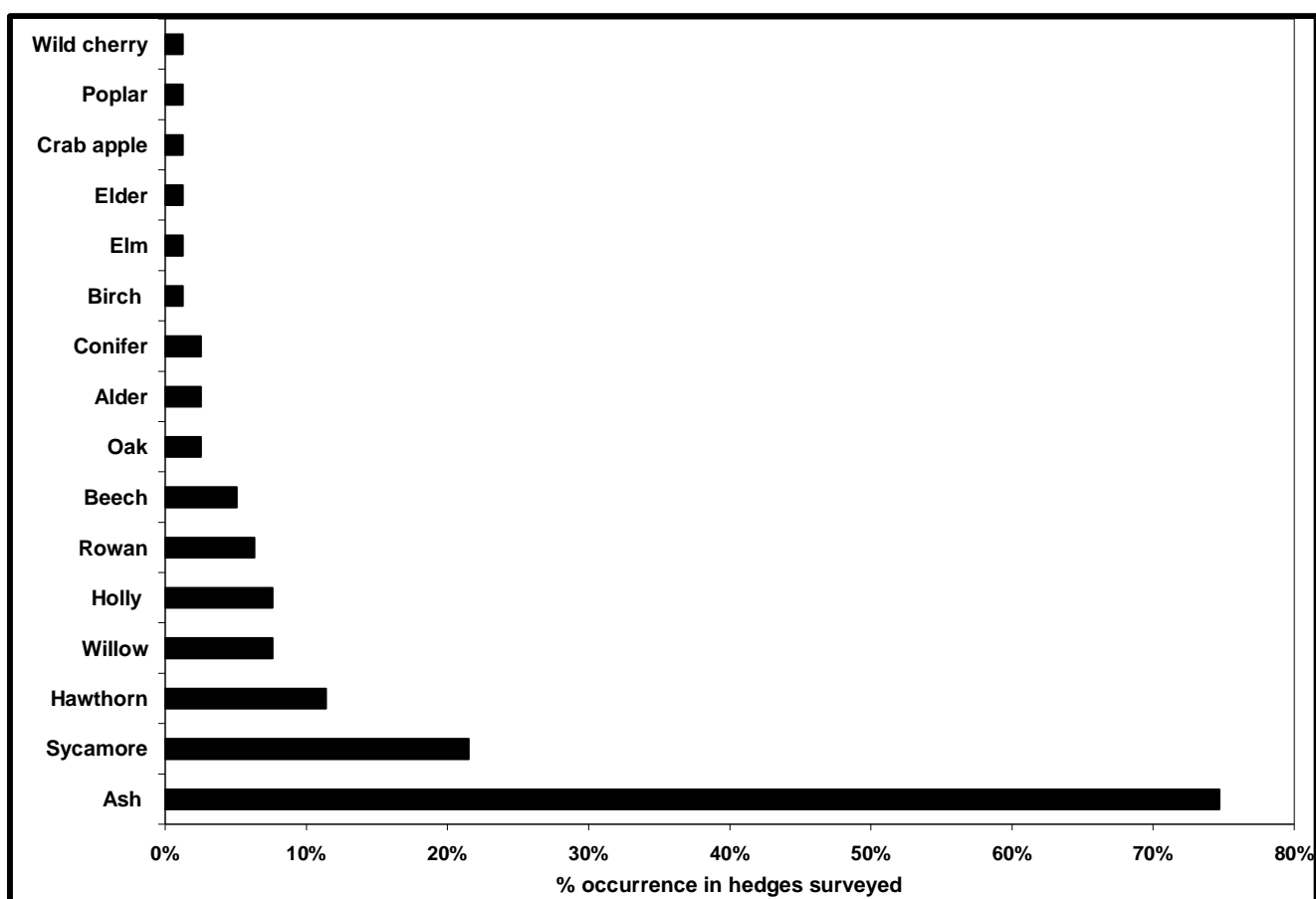
in 75% of hedges (89% of hedges that contain trees). Sycamore is the next most commonly occurring species (at 17%) and is the only non-native species present to any great degree in County Longford hedges. Rowan, found as a tree in 6% of hedges, is much more frequently occurring in County Longford than any of the previous county surveys and is very much a characteristic local feature. Figure 7.2.6 shows the frequency of occurrence of species in the tree layer.



**Fine mature wild cherry tree near to Newtowncashel (LD01)**

### **Tree Species Diversity**

47% of the hedges where trees were recorded had just one tree species. 35% contained two tree species, 15% had three species, and 3% had four or more species. One sample hedge in square LD07 had six different tree species in it. This is a similar breakdown to County Laois. In County Offaly a third of hedges had three or more different tree species in them.



**Figure 7.2.6 Frequency of tree species occurrence in sampled hedges in County Longford**

#### **RARE SPECIES**

Broom (*Cytisus scoparius*) was recorded in 4% of the sampled hedges, all in square LD08, near to Ballinamuck, but was also noted as present in square LD07 (Ballinalee), however not in the sampled hedges. This species has not been recorded in any of the previous county hedgerow surveys.

Whitebeam (*Sorbus aria*) was found in one sample square (LD01) in what used to be a hedge but is now part of an area of semi-natural woodland. From the authors' prior knowledge, it is known to occur in hedgerows in the county.

A single Field Maple (*Acer campestre*) sapling was recorded in a townland boundary hedge in the Taghshinny square (LD05). Field maple is not considered to be native to Ireland.

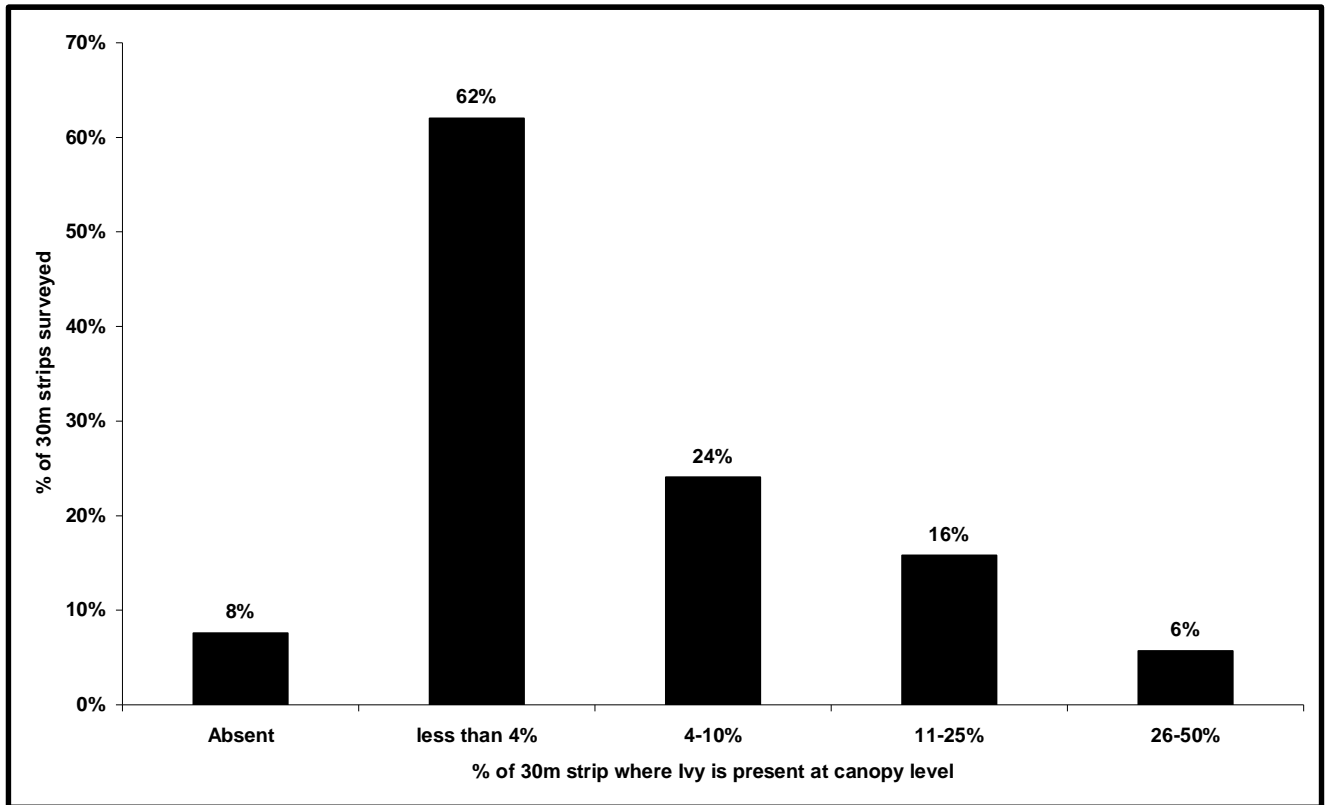


**Broom flower (left) and close-up of Field Maple twig (right)**

## Ivy

Ivy occurs frequently in County Longford hedgerows. It was present in 92% of the sample 30m strips. The specifications for the REP Scheme permit the control of ivy where it poses a threat to the stability or long term viability of hedgerows. This is set in the context of the importance of ivy for wildlife and the statement that “*wherever possible ivy should be retained and allowed to develop*” (Specifications for REPS Planners, 2004, 119).

Figure 7.2.7 shows the Domin level of ivy at canopy level in the sampled hedges.



**Figure 7.2.7 Percentage breakdown of domination of ivy at canopy level**

Levels of ivy at less than 10% would not be considered a threat to the long term viability of the hedge. There is a cause for alarm when the domination exceeds 25%. This applies to 6% of the hedges surveyed. This figure was higher in County Offaly (9%) and County Laois (12%), and as high as 20% in County Westmeath.



**Ivy has contributed to the demise of this whitethorn near to Ardagh (LD06)**

### 7.3 GENERAL ECOLOGICAL, HISTORICAL AND AGRICULTURAL CONTEXT OF HEDGEROWS IN COUNTY LONGFORD.

#### Adjacent Land Use

Figure 7.3.1 shows the breakdown of the adjacent land use of the sampled hedgerows. Over two thirds of the adjacent land use is related to intensive farming, (which is lower than in County Laois and County Offaly) with over 50% of hedges sampled bordered solely by non natural habitat. A number of target notes were recorded of adjacent land as reverting back to a more natural mix from a base of agriculturally improved grassland. In a number of cases, in the proximity of bogland and on less intensively farmed land, the spread of both gorse and blackthorn formed the bulk of the land area adjacent to the hedge. This spread of semi-natural vegetation and development of forestry as an alternative land use could well become factors in hedgerow “loss” in the future. This issue is covered in greater detail in the Discussion section of this report. In County Longford 32% of sample hedges were adjacent to one of the listed semi-natural habitat types. This is a much higher figure than recorded in County Laois and County Offaly which registered only 7% and 10% respectively. This does not necessarily mean that more of the land cover in County Longford is semi-natural, the figures simply relate to hedged landscapes.

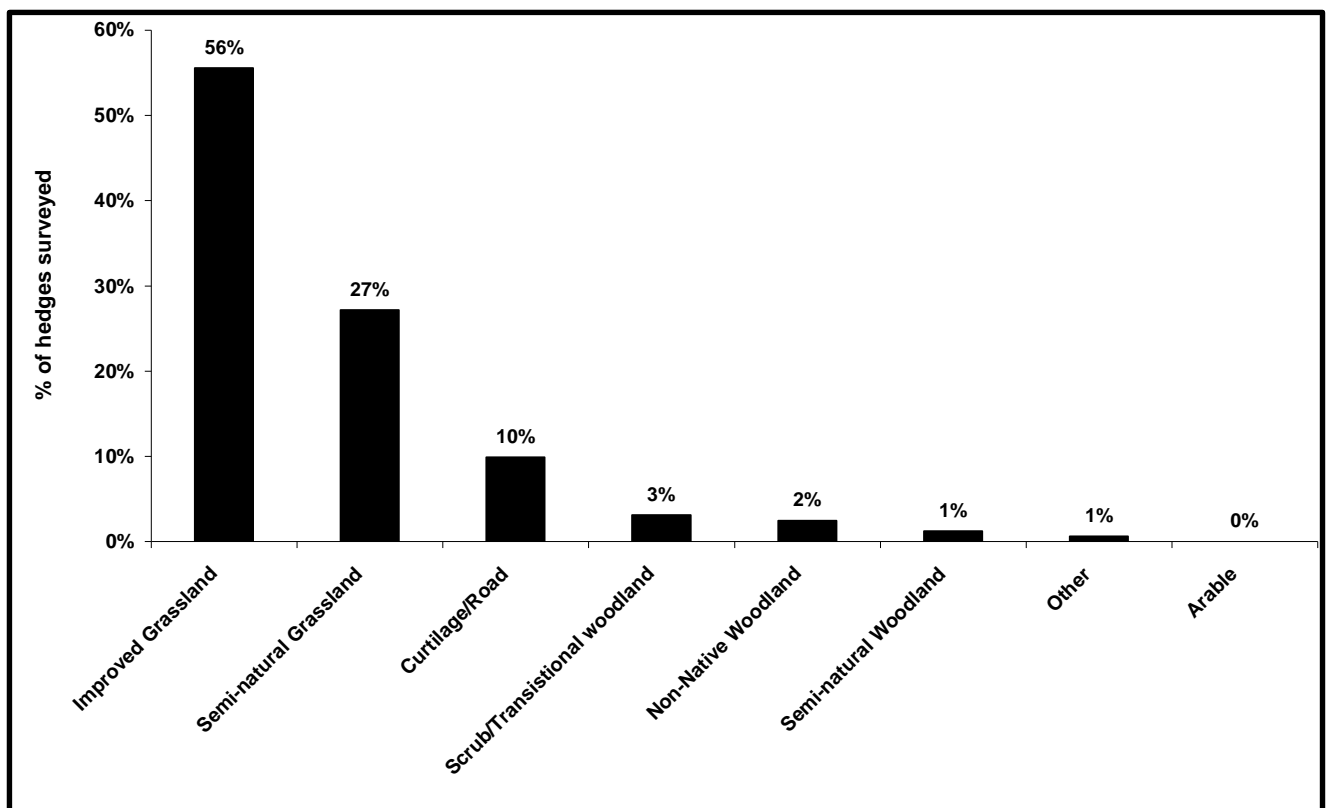


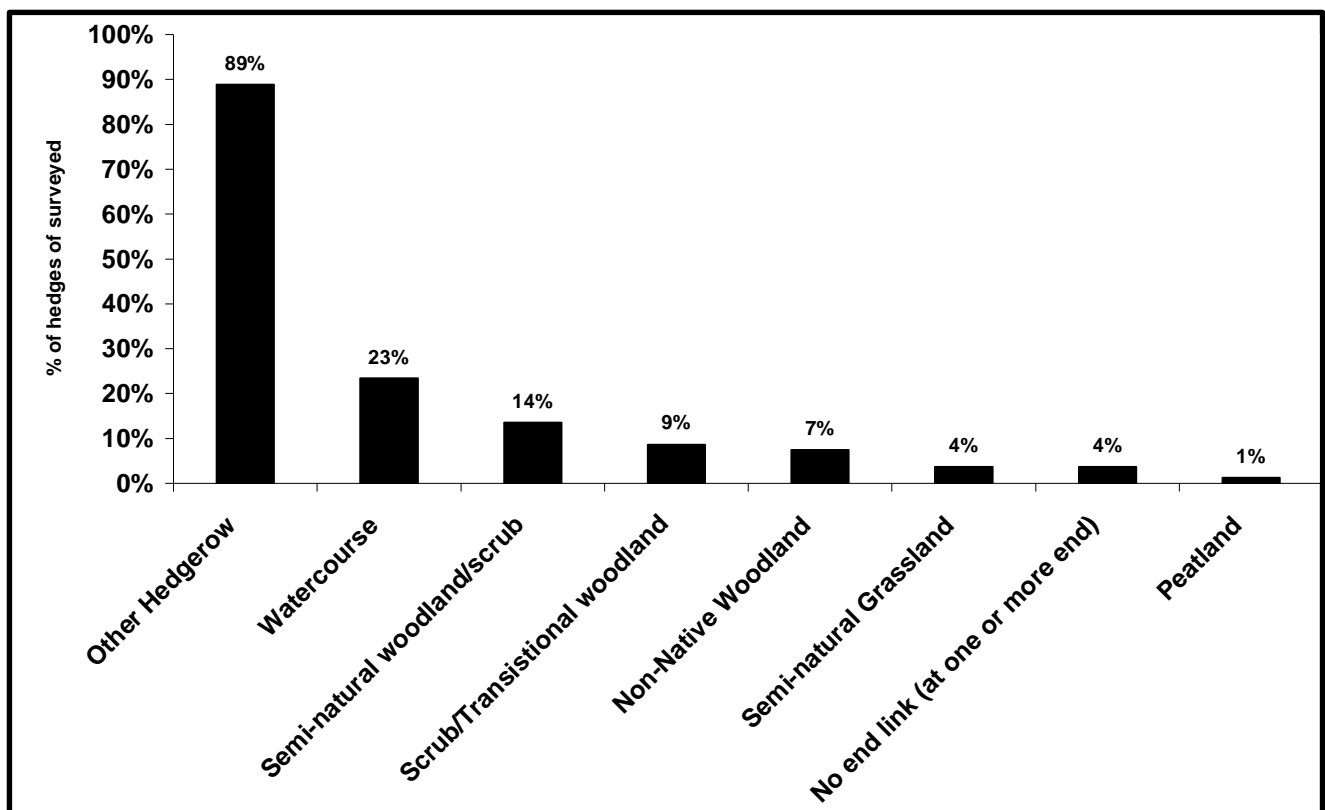
Figure 7.3.1 Habitat category of land adjacent to sampled hedgerows.

#### Links with Other Habitats

The corridor role of hedgerows in facilitating the movement and distribution of wild flora and fauna through the landscape is believed to be enhanced significantly if hedgerows link into other (natural or semi-natural) habitat features. Figure 7.3.2 shows the breakdown of how the ends of sampled hedgerows linked with other habitats. Hedgerows in County Longford compare favourably with the results from other hedgerow surveys. 89% of hedges sampled link to other hedges, at least at one end. Just 4% of hedges had no end link with any natural or semi-natural habitat (including other hedgerows) at one end. Ends of hedges that link into the built environment are recorded as having no end link at that end. Only one hedge had no end link at either end. Increasing development of



one-off housing in the countryside may have a negative impact on hedgerow connectivity, leading to a fragmentation of habitat networks.

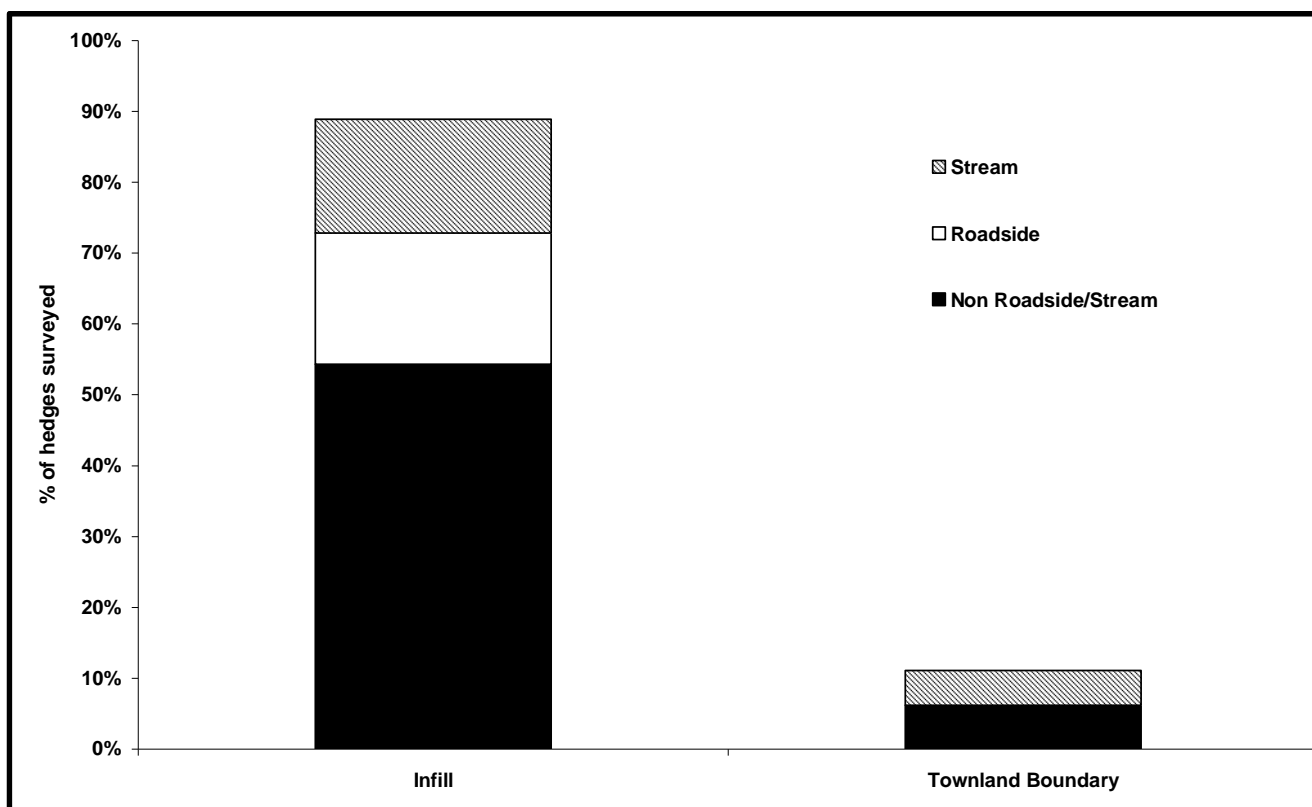


**Figure 7.3.2 Links of sampled hedgerows with natural or semi-natural habitats in County Longford**

### Hedgerow History

All sample hedges were compared with boundaries marked on the first and second edition Ordnance Survey maps. It cannot be known for certain if the boundaries marked on these maps were hedgerows, but the absence of any boundary marking would clearly indicate the absence of a hedgerow at that period. 32% of the sample hedges were not present on the first edition O.S. map (1837). The second edition O.S. map (1912/13) shows less than 4% of the sample hedges were not present.

Townland boundary hedges were identified from the relevant Ordnance Survey Map. In common with other county hedgerow surveys they accounted for approximately 11% of the sample; the range is from 10% to 14% across all surveys. *'Infill hedges'* are all those that don't fall into any of the other categories (railway side, canal side). Roadside hedges are at the forefront of the public's perception of hedgerows. In County Longford, 19% of hedges surveyed were located beside a road or track. Just over 11% were beside public roads, which is approximately the average figure for all of the hedgerow surveys undertaken. This indicates that roadside hedges form a significant proportion of the whole resource. Figure 7.3.3 compares the historical origins of the sampled hedgerows in the county.



**Figure 7.3.3 Historical context of sampled hedgerows**

### **Boundary Function**

To assess the relevance of hedgerow boundaries to modern agriculture, a record was made as to whether the hedgerow formed part of an active farm boundary. A '*redundant boundary*' is one where stock would have uncontrolled simultaneous access to the land either side of the hedge. The boundary function is irrespective of the functionality of the hedge which may or may not be reinforced with other forms of fencing. Hedges along redundant boundaries may not be redundant for shelter or other roles.

81% of hedgerows in County Longford are considered to be still part of active divisions or sub-divisions of farms, with 19% adjudged to be redundant. A similar ratio was found in County Roscommon, but the ratio was 92:8 in both County Laois and County Offaly.

## 7.4 CONSTRUCTION OF HEDGES IN COUNTY LONGFORD.

'Construction' relates to the physical infrastructure of the hedge. This survey recorded details of the linear outline of sampled hedges, the linearity of the hedgerow shrubs, and details and dimensions of any associated features such as banks, walls and drains.

In County Longford, 77% of the hedges surveyed were considered to be linear and regular in outline. Of the 23% having a more irregular outline 42% were associated with a stream and 37% were part of townland boundaries. In fact, over 75% of townland boundaries were non-linear. Figure 7.4.1 shows a breakdown of the construction type of the County Longford hedges surveyed. A single line of shrubs with a bank and drain is the most common form of hedgerow construction. Associated walls (present in 5% of hedges) are not a significant overall feature of County Longford hedgerows although they are locally abundant around the limestone lands of Newtowncashel.

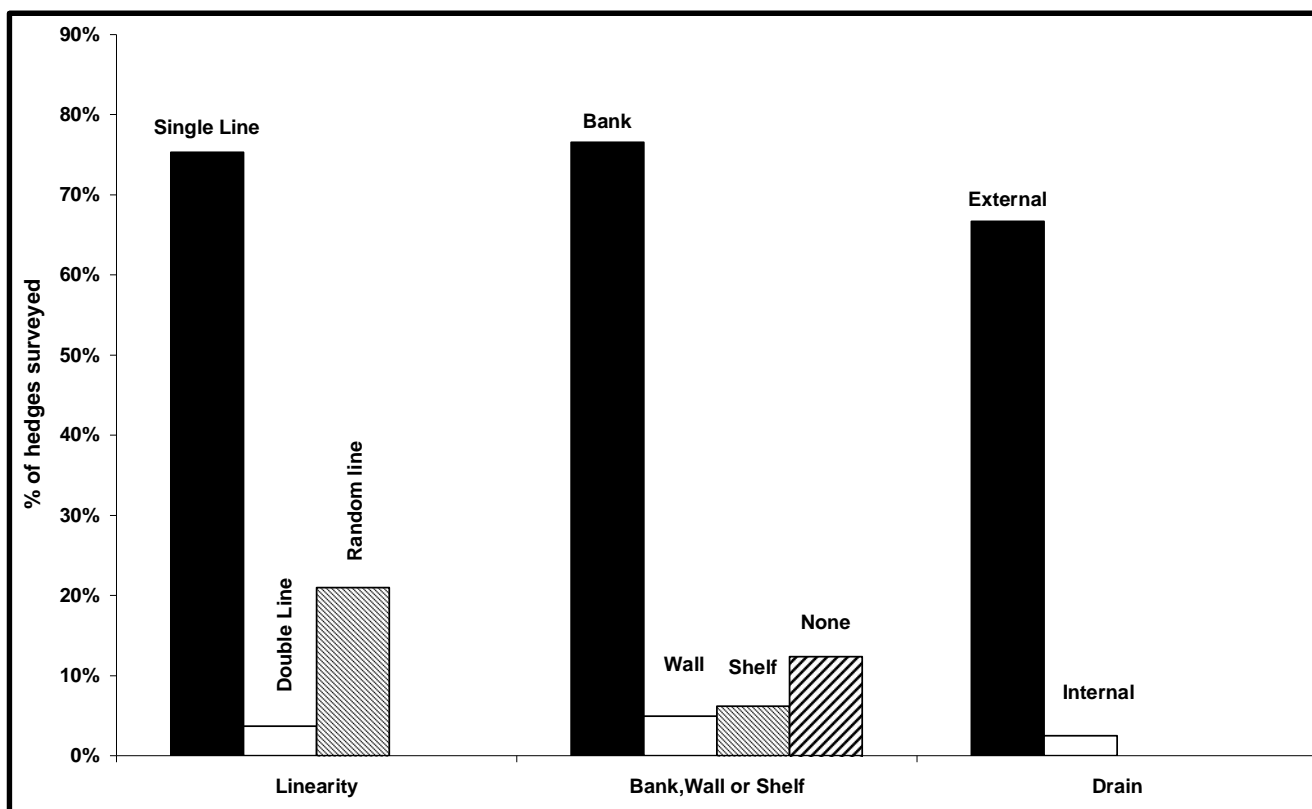
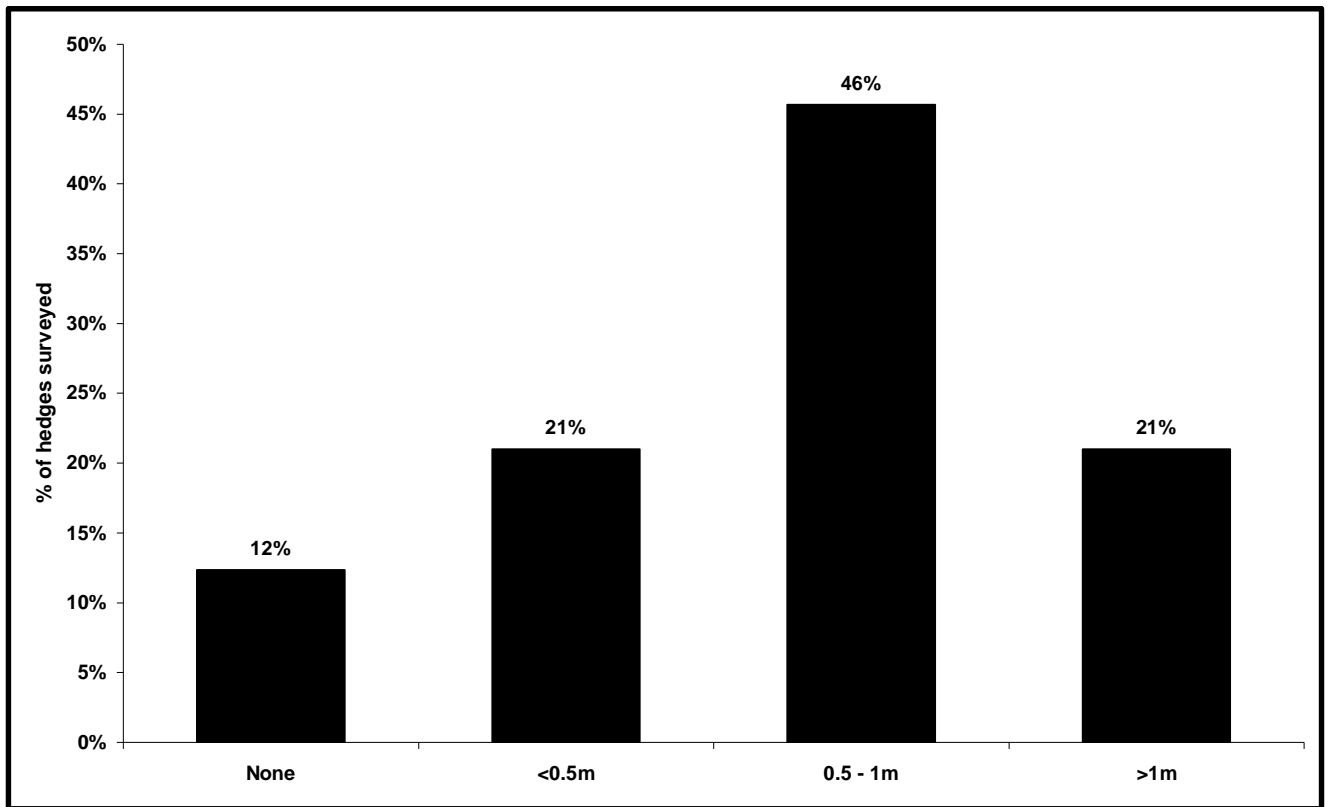


Figure 7.4.1 Boundary construction of sampled hedgerows

Figure 7.4.2 shows how the sampled hedges fared in the various size categories for banks, walls or shelves. Over a fifth of hedges surveyed were in the largest size category with a further 48% in the next largest size class. This is broadly consistent with findings in County Roscommon and County Westmeath. County Offaly has fewer hedges with large banks.



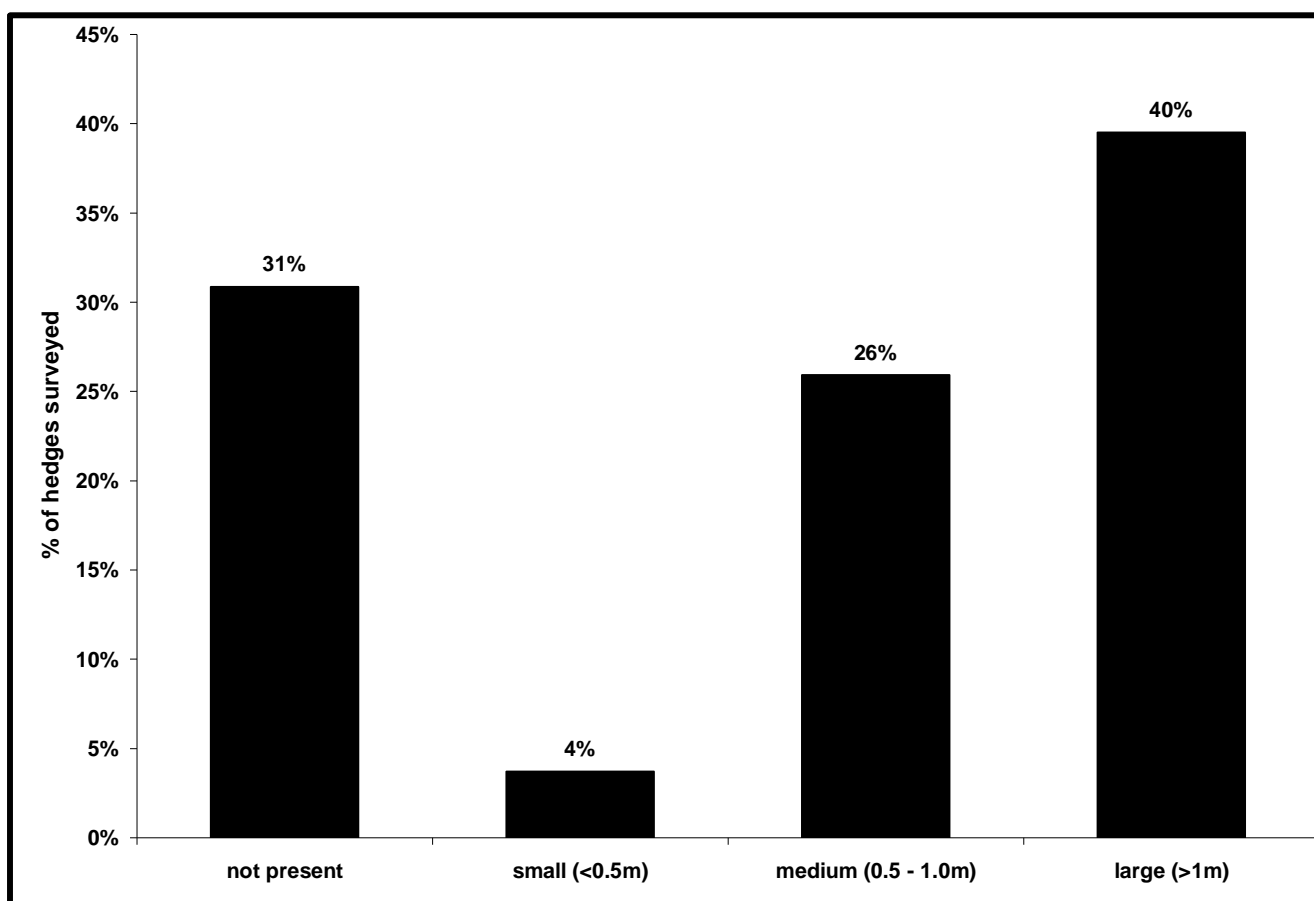
**Figure 7.4.2 Proportion of hedges in bank/wall/shelf size categories**

Hedge banks are often constructed from the material removed to create the associated drain and in many cases some degree of mounding above the ordinary soil level would be necessary for hedge plants to become established in the first instance. This is the same principle as that commonly used in the establishment of forestry plantations on marginal soils of relatively poor drainage. 69% of hedges sampled were associated with a drain of some degree. The fact that most of these drains were classed in the largest category is indicative of the wet nature of many of the soils in the county. The more free draining soils of counties Laois, Offaly and Westmeath would have fewer hedges with drains.

Figure 7.4.3 shows the breakdown of the various drain size categories



**Large drain beside hedgerow in Ballinalee (LD07)**



**Figure 7.4.3** Proportion of hedges in drain size categories

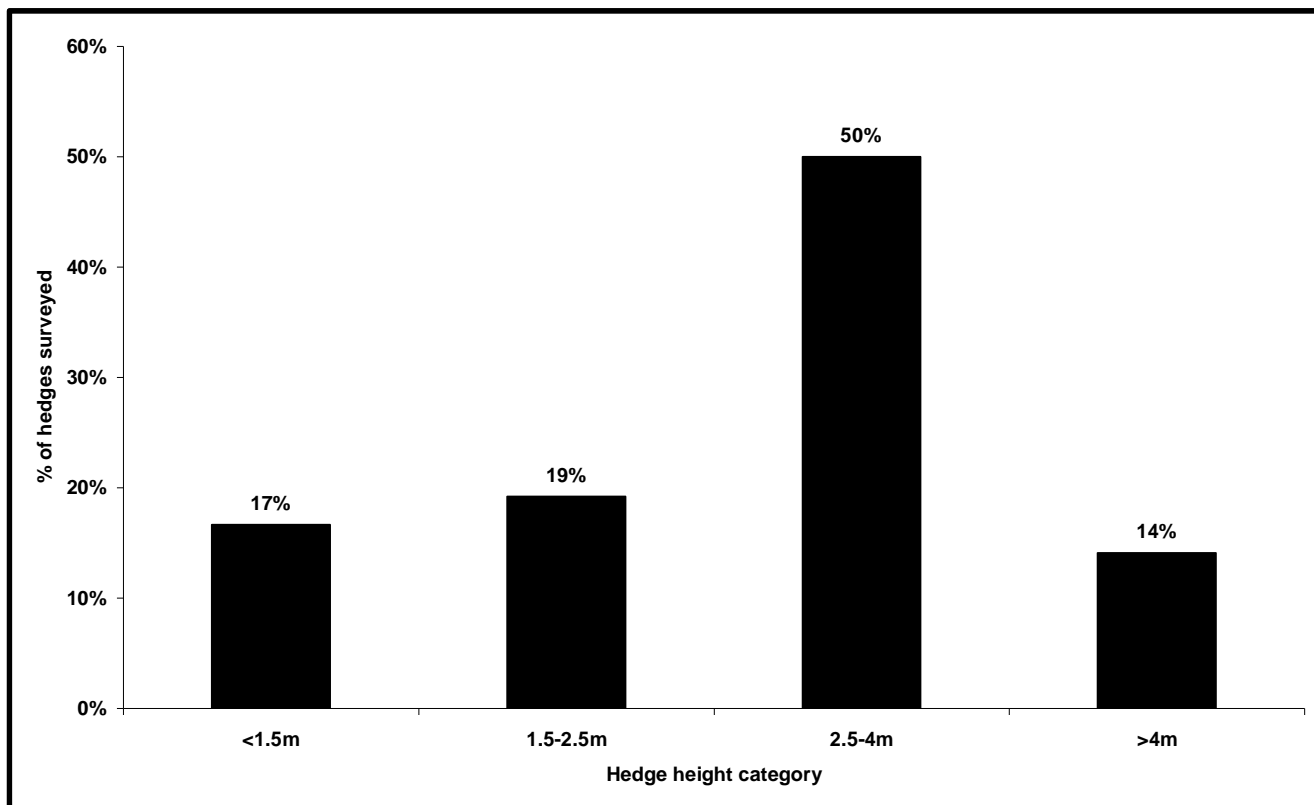
## 7.5 STRUCTURE AND CONDITION OF HEDGES IN COUNTY LONGFORD

Detailing the '*structure*' of the sampled hedgerows involved recording information on the average height, average width, the cross sectional profile, the percentage of gaps, the woody structure of the hedge base, and the presence of hedgerow trees. These features are indicators of the agricultural, ecological and landscape status of the hedge.

Assessing the '*condition*' of the hedge involves qualities such as bank/wall erosion, tree age composition and overall vigour. These factors can be indicators of the long-term viability or sustainability of the hedge.

### Hedge Height

Figure 7.5.1 shows a breakdown of the sample in terms of the various hedge height categories.

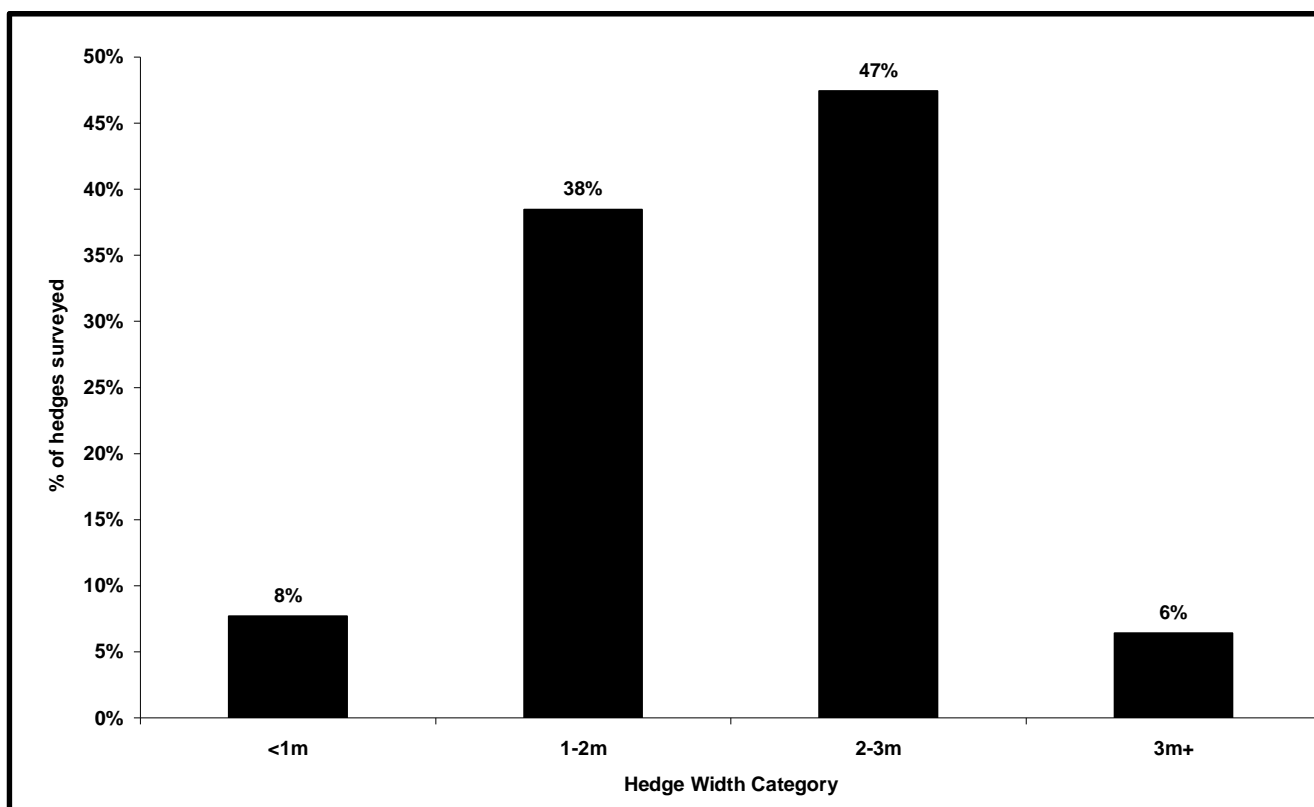


**Figure 7.5.1 Proportion of hedges in hedge height categories**

Research indicates that taller hedges are generally better for wildlife conservation. The fact that 17% of hedges recorded were in the lowest height category would not be considered a desirable feature of County Longford hedgerows. However, the figures are slightly lower than those found in counties Laois and Westmeath. This fact is slightly compensated for by the fact that, when compared with other counties, County Longford has a much higher proportion of hedges in the 2.50m to 4m high category than the 1.50m to 2.50m category. Interestingly, over 80% of roadside hedgerows are in the lowest height category.

### Hedge Width

Increasing width generally correlates with improved biodiversity in hedgerows. As can be seen from Figure 7.5.2, the results of the survey show that 92% of hedges surveyed in County Longford are over 1m wide. This is very much in line with findings in other studies.



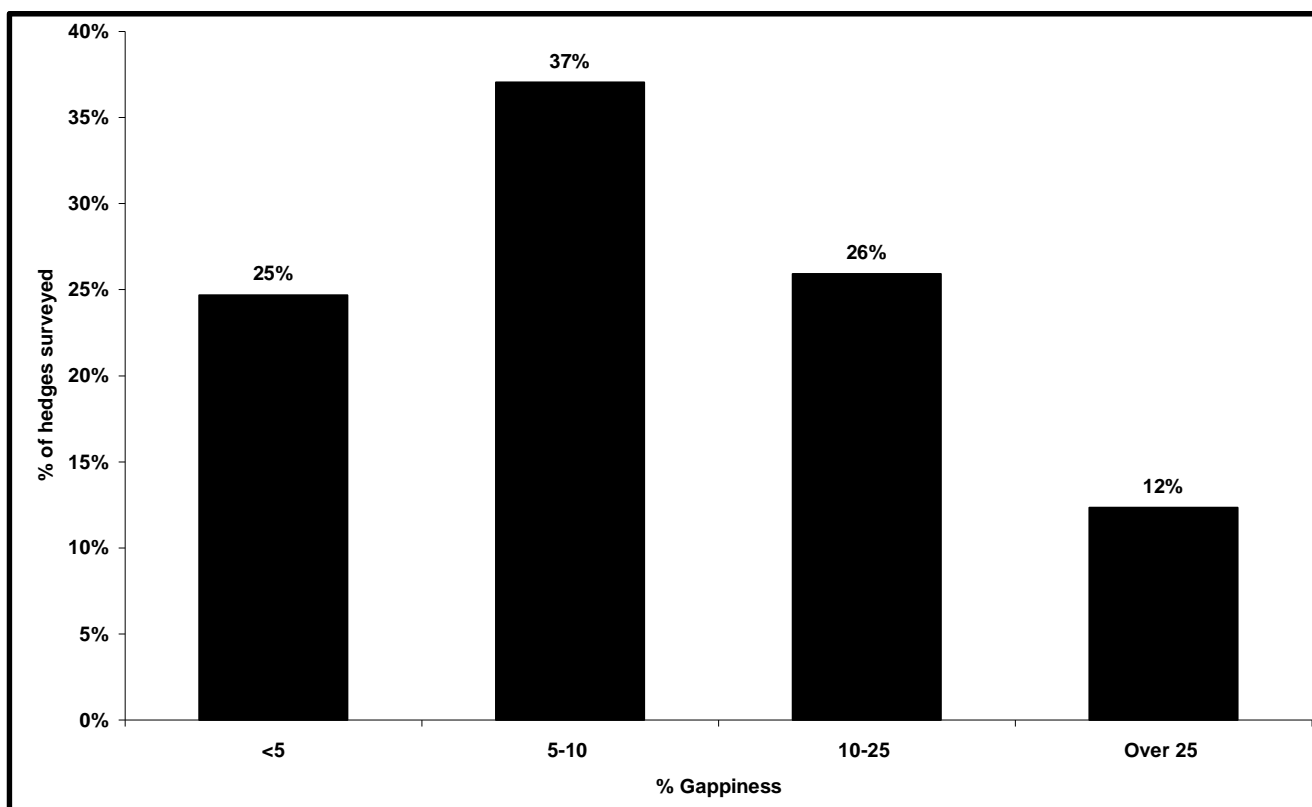
**Figure 7.5.2** Proportion of hedges in hedge width categories

### Percentage of Gaps

'*Gappiness*' is an assessment of the percentage of the length of the hedge that no longer has a cover of hedgerow shrubs. Gaps are associated with a weak hedge structure and are often a symptom of the deterioration of the hedge, often caused by the demise of plants through age or inappropriate management. Figure 7.5.3 shows the breakdown of the sample in terms of percentage gaps over the length of the hedge.



**High percentage of gaps in Granard hedge (LD10)**



**Figure 7.5.3 Proportion of hedges in ‘percentage gaps’ categories**

These figures exclude remnant hedges which by definition contain over 25% gaps. In comparison with the other counties previously surveyed County Longford falls mid-spectrum. County Laois and County Galway would have more hedges in the lowest category for gaps, while 50% of County Roscommon and County Westmeath hedgerows have gaps of 10% or more, against just over a third in County Longford.

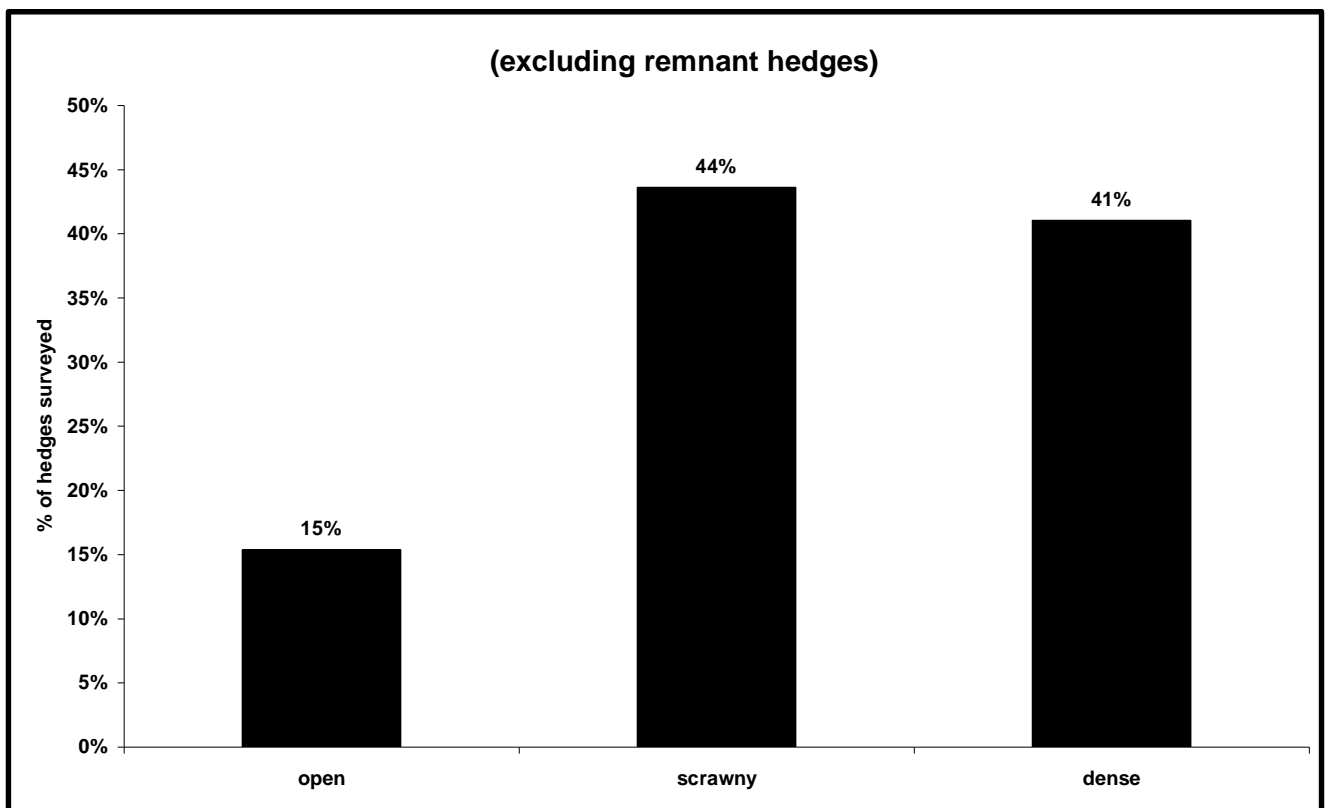
### **Basal Density**

Recording how dense the growth of hedge shrubs is in the bottom metre of the hedge is an important indicator of the hedge structure both environmentally and agriculturally. Figure 7.5.4 shows the breakdown of how the samples fared in terms of the hedge base categories. In this regard County Longford hedges were more similar to those of the south midland counties of Laois and Offaly than the nearer neighbours of County Roscommon and County Westmeath, in that there were fewer hedges with an open base and a greater proportion of hedges with a dense base structure.



**Ballinalee hedge with a scrawny base (LD07)**





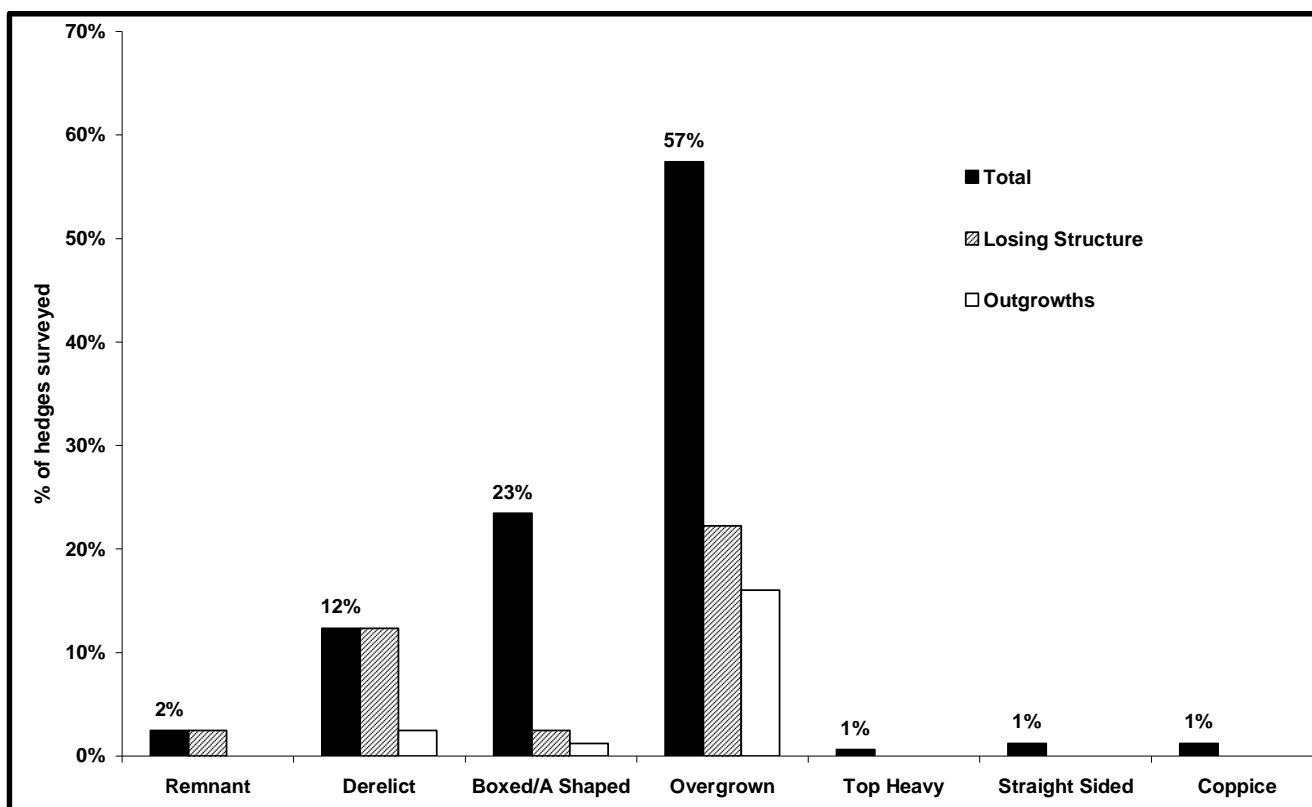
**Figure 7.5.4 Proportion of hedges in basal density categories**

#### **Hedge Profile (cross section)**

As hedgerow shrubs mature, growth near to the base generally declines as the plant is no longer threatened by browsing. This process is recorded as “losing structure”, and without management intervention can revert to their natural tree form with an empty or open base. Assessing the profile or cross sectional area of a hedge can be a good indicator of this process and the hedges potential need for rejuvenation. Hedgerows that contain a high proportion of spreading shrubs like blackthorn and gorse can eventually spread to a point where they are no longer considered to be hedges and are re-classified as other habitat types, most commonly scrub/ transitional woodland. The survey noted where the profile of the hedge included a significant element of outgrowths to the side of the main hedge line. An assessment of these findings in the sample hedges is shown in Figure 7.5.5.



**Derelict hedge, Granard (LD10)**



**Figure 7.5.5 Proportion of hedges in profile categories**

County Longford falls mid-spectrum in respect of most hedge profile characteristics. County Roscommon, County Westmeath and East Galway all have more remnant and derelict hedges (up to 29% in total in County Roscommon), and County Laois and County Westmeath would have more Boxed/A-shaped hedges. 39% of overgrown hedges in Longford (22% of the total) were considered to be losing their base structure and reverting to tree form which can be a potential indicator of deteriorating quality. However, County Longford showed a considerable difference from other counties in terms of hedges where there is a significant out-growth to the side of the hedge. Almost 16% of overgrown hedges recorded showed these outgrowths which is indicative of the relatively high presence of both blackthorn and particularly gorse and low levels of management. No other county has recorded a figure higher than 7% in this category. A number of hedges that were marked as potential sample hedges prior to the fieldwork were found to have spread to such an extent that they could no longer be considered to be hedges. Some implications of these facts are covered in the Discussion section.



**Gorse spreading to form an area of scrub (LD07 – Ballinalee)**

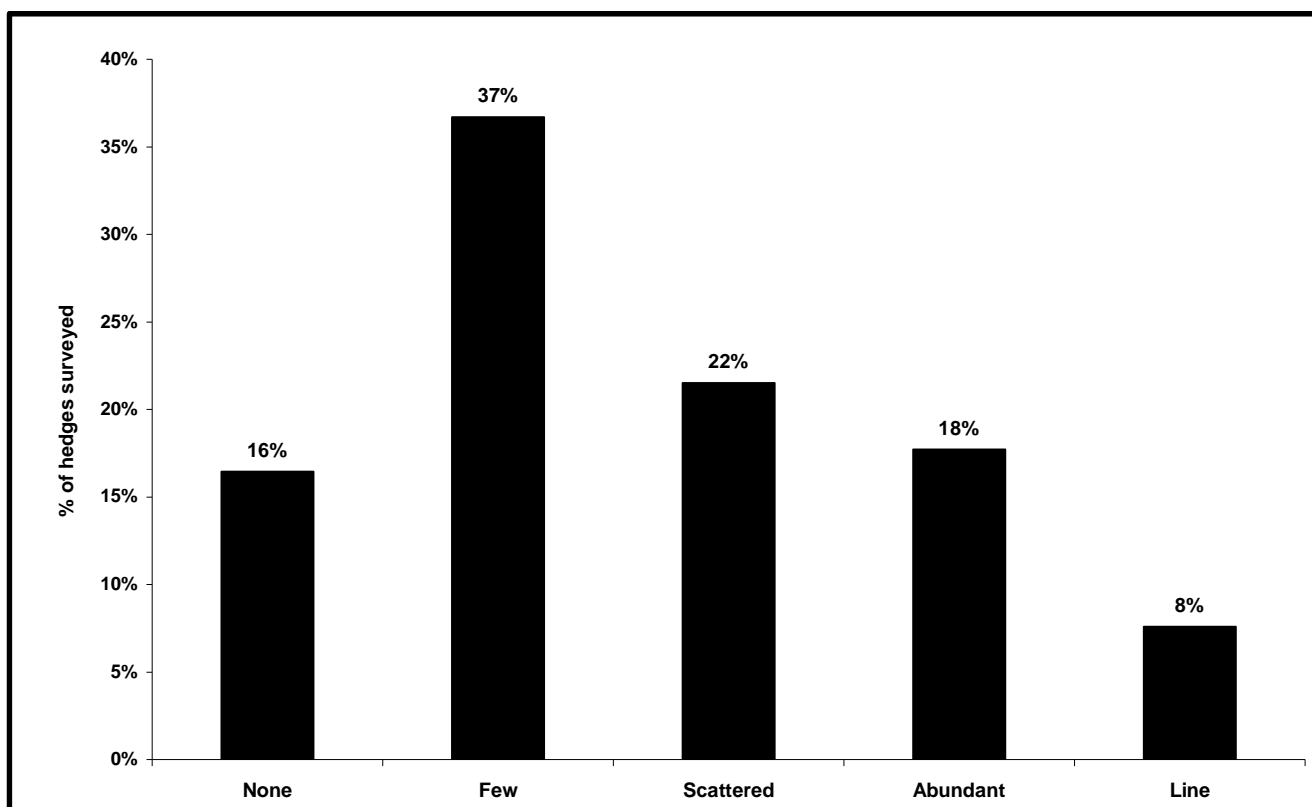
### **Hedgerow Trees**

This survey looked at both the abundance of trees in hedges (Figure 7.5.6) and also the age composition of the trees. Hedgerow trees are a feature of County Longford hedgerows, being present in 84% of hedges sampled. This is similar figure to County Westmeath (83%), but much higher than the 64% in County Laois which is the county with the lowest percentage of hedges containing trees so far surveyed.

Hedgerow trees can be the result of intent, where young trees have been purposefully allowed to grow and mature as part of a management regime or they can be a consequence of lack of management. Colonising species such as ash and sycamore become established in hedges and grow unchecked by management activities. Less than a third of hedges containing trees in County Longford were classed as being long-term unmanaged so the high presence of hedgerow trees appears to be by design rather than accident.



**Abundant hedgerow trees in Killashee hedgerow (LD03)**



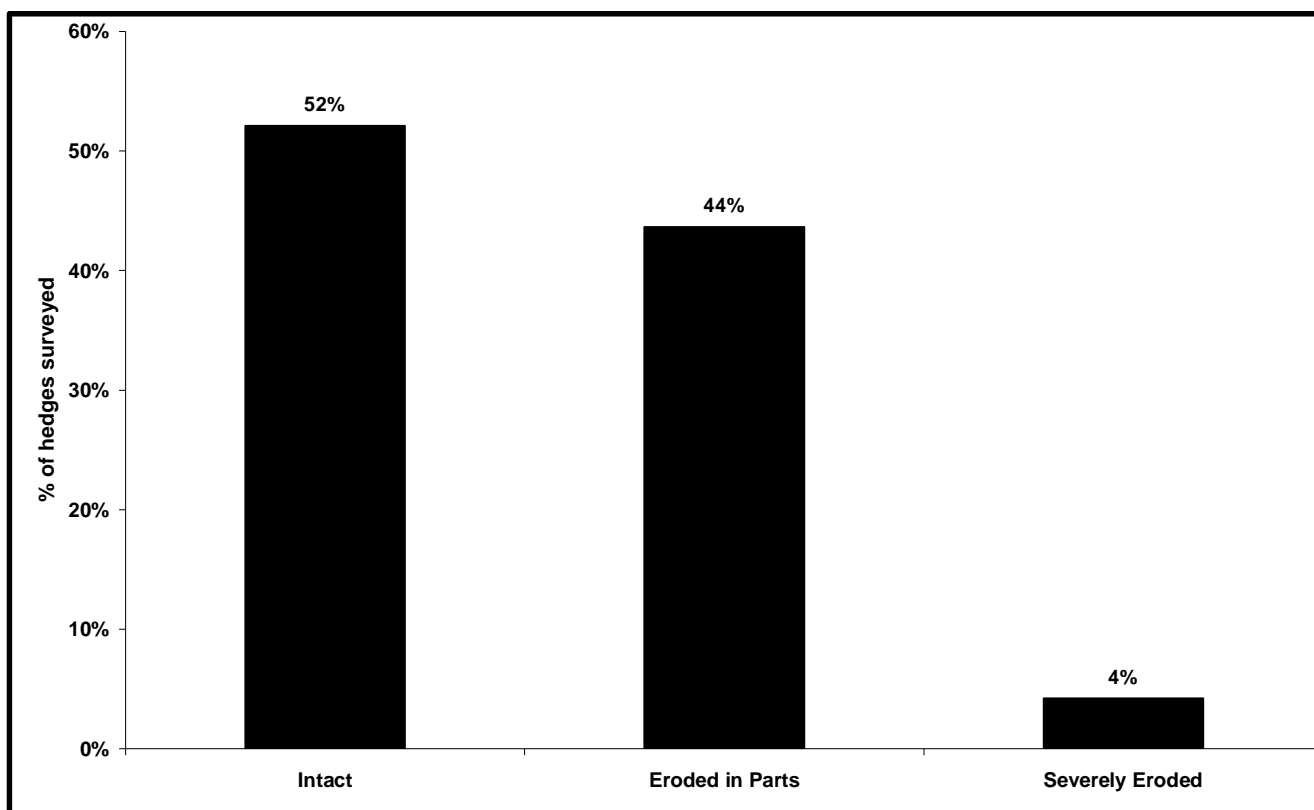
**Figure 7.5.6** Proportion of hedges in ‘abundance level of hedgerow trees’ categories

### **Tree Age Composition**

It is generally considered that to achieve sustainable levels of hedgerow trees, a balance between young, medium and older trees needs to be maintained. 74% of County Longford hedges which had hedgerow trees recorded young trees as being present. This is a positive sign for the future. County Westmeath, which has a similar proportion of hedgerow containing trees, had only 42% with young trees.

### **Bank/Wall Degradation**

Where hedgerow shrubs are established in hedge banks, the viability of the hedge can be threatened if the bank is damaged. Root systems are exposed to damage, drying and infection with the result that overall stability can be reduced. Sampled hedges were examined for damage to the supporting structure and the results are shown in Figure 7.5.7. As a rule, sheep are generally the main agents of bank degradation, but in County Longford, it would be my observation that a very high density of rabbits is also a significant factor.



**Figure 7.5.7 Proportion of hedges having degraded banks or walls**

County Longford fares well in comparison with other counties with the lowest percentage of severely eroded hedges banks. County Laois and County Roscommon recorded 12% in the same category with County Westmeath at 19%. The percentage of hedges with partially eroded banks was similar to that found in other counties and is a factor that should be monitored.



**Eroded hedge bank in Ballinamuck (LD08)**

### **Vigour**

An assessment was made of the overall vigour of the sampled hedges with a view to long term viability. 8% of the sample was deemed to be lacking vigour. However, a further 13% of hedges were target noted as having poor vigour in part or showing some evidence of decay or decline. This

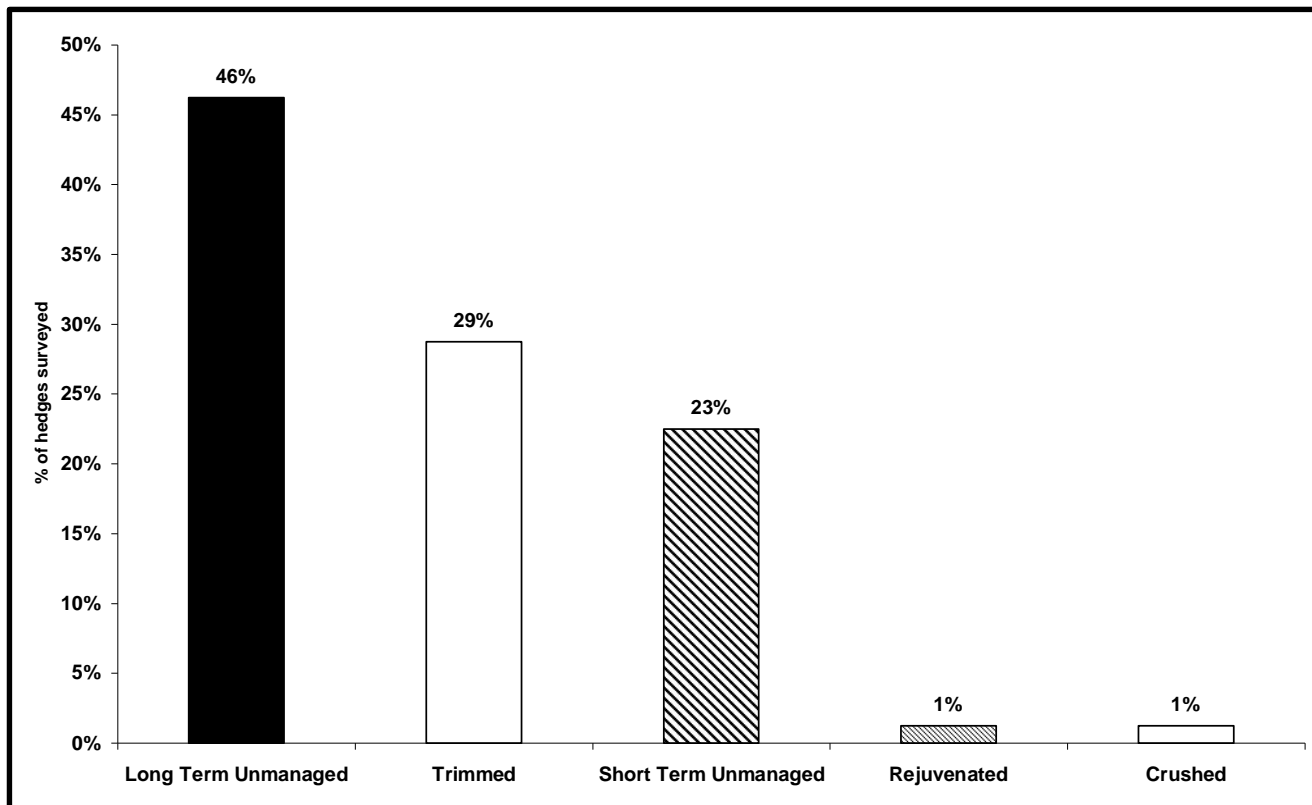
should be of some concern for the future. Of the hedges recorded or target noted in relation to their poor vigour 29% were part of redundant boundaries and over 40% were part of hedges with 10% or more gaps. These statistics do not include remnant hedges.



## 7.6 MANAGEMENT OF HEDGES IN COUNTY LONGFORD

The management of hedges is a hugely important factor influencing hedge structure, condition, viability, and sustainability. For these reasons an in-depth assessment of hedge management forms a major part of this survey. The implications of management variables recorded are presented in section 8.0.

Figure 7.6.1 gives a breakdown of the hedgerows sampled by their type of management.

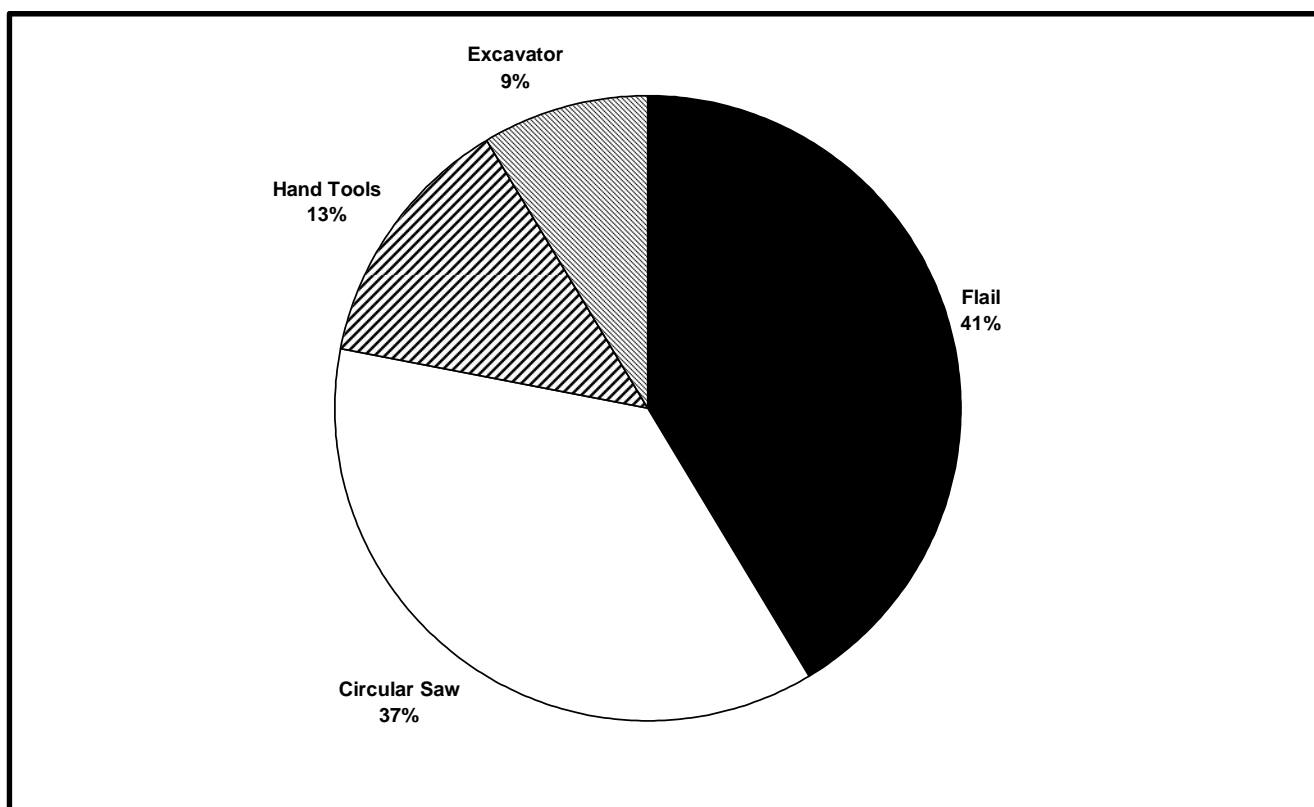


**Figure 7.6.1 Breakdown of the management type of the sample**

Degrees of hedge management in the recent past (last 8 years) have varied significantly in surveys carried out to date, from 77% in County Laois down to 38% in County Roscommon. County Longford falls at the lower end of the spectrum which might be expected given the relatively high proportion of redundant boundaries, with 46% of the hedges considered to be long-term unmanaged (no evidence of management within the last eight years). Many of these would not have been managed in decades.

Abandonment of management is regarded by most experts as the principle cause of dereliction and eventually the demise of hedgerows. It is generally considered that hedge rejuvenation needs to be carried out at least every 30 years in order maintain sustainability. This means that overall 3.3% of hedges would need to be rejuvenated on an annual basis. 1% of hedges surveyed in County Longford showed evidence of rejuvenation within the last few years, implying that current rates of rejuvenation are not sufficient to maintain a sustainable resource.

The method by which hedges were managed was also investigated. Where hedges have been managed in the short-term past, but not during the current season, detecting the precise means by which the management was carried out can be difficult to establish. Figure 7.6.2 shows the breakdown.



**Figure 7.6.2 Proportion of managed hedges in ‘management method’ categories.**

The flail is marginally the most frequently used management tool with the circular saw a close second. The use of the circular saw is much more prevalent in County Longford than in any of the other surveys, with 37% of managed hedges (19% of all hedges) in this category compared with 22% in County Westmeath the next highest. Excavator use, at 9% in County Longford, is higher than in East Galway, County Westmeath and County Laois, but the nature of the machine use was far less drastic than that encountered in County Offaly and County Roscommon. In the latter, 24% of hedges were managed in this way and generally involved the crushing down of mature hedgerow stems. In County Longford, excavator use was more confined to breasting rather than crushing which, although less drastic, is still not really desirable.

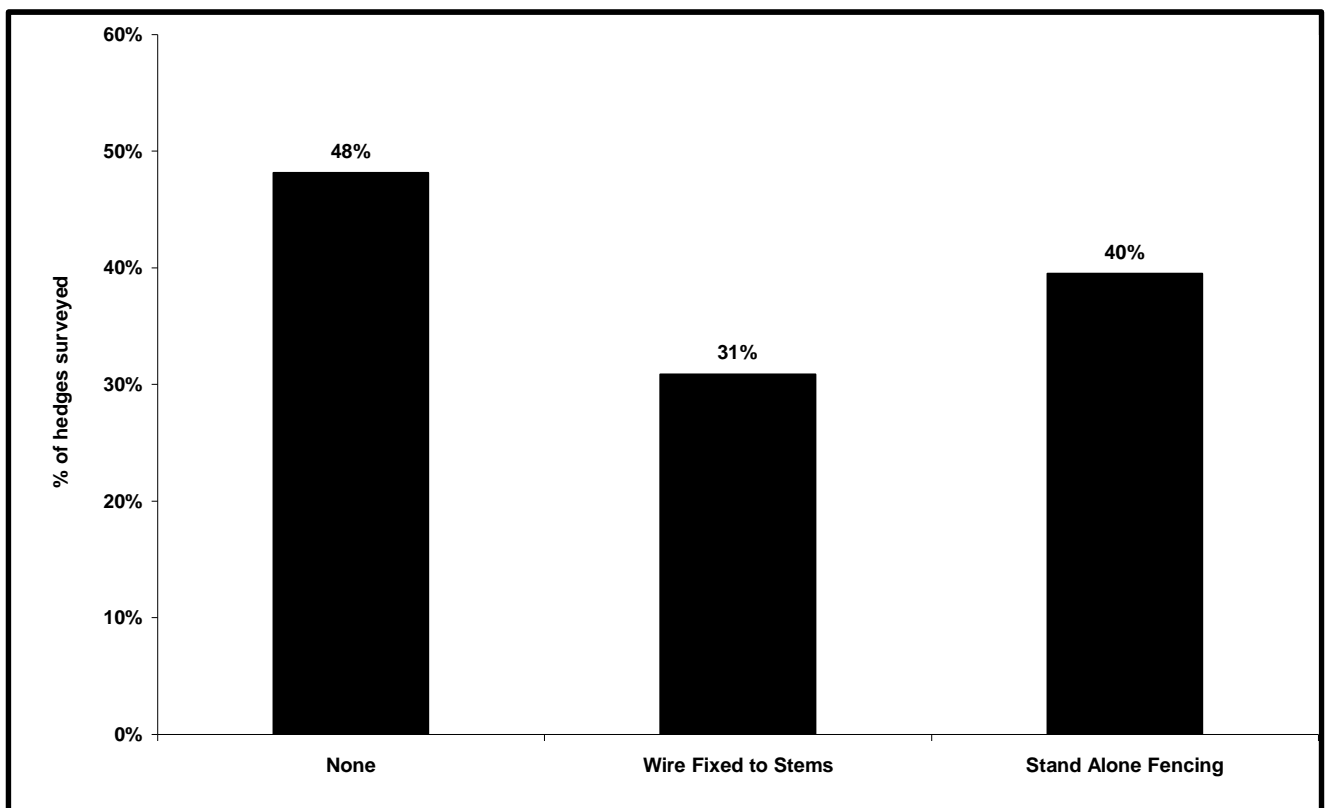
A breakdown of the trimming profiles for routinely managed hedges showed that none were being trimmed to the A-shaped profile recommended by the REPS and Teagasc.



**Saw-cut hedge near Ballymahon (LD02)**



The principal original function of hedges was to act as stock-proof barriers. The current survey looked at to what extent the hedgerow network is being reinforced with additional fencing to maintain its stock retaining capacity. The results are shown in Figure 7.6.3.

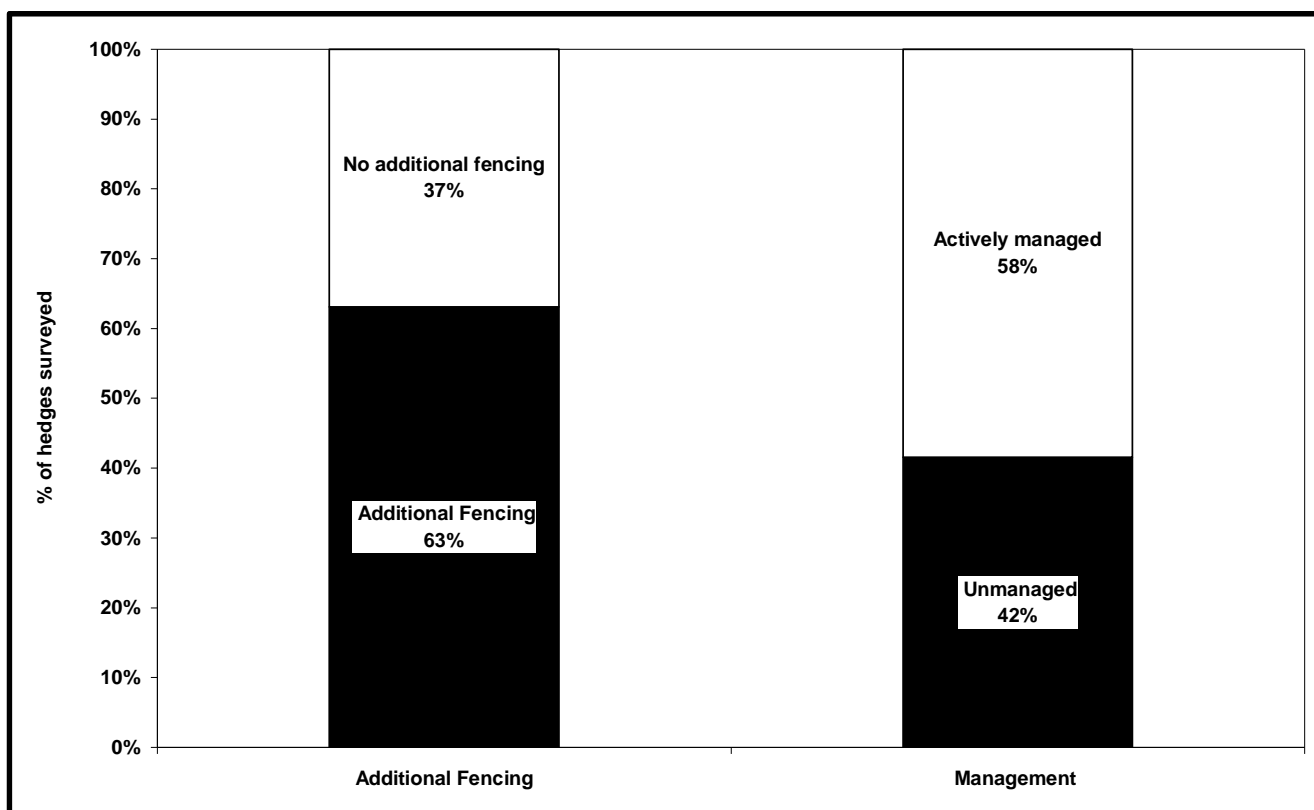


**Figure 7.6.3 Additional fencing of hedgerows**

Almost half of hedges form boundaries that are not reinforced with some other means of fencing. County Longford hedges have the highest percentage of unfenced hedges and the lowest percentage of stand alone fencing. This is probably largely due to the fact that many hedges have large drains associated with the hedges, the combination of which is sufficient to control stock without the need for additional fencing.

Eliminating redundant boundaries from the analysis decreases the percentage of hedges that are unfenced to 37%. It also reduces the percentage of long term unmanaged hedges from 46% to 42%. Details are shown in Figure 7.6.4.

Only 6% of hedges recorded showed evidence of having been laid in the past. This is a little surprising since the majority of hedges would be well suited to this technique which is more commonplace in the neighbouring counties of Roscommon (12%) and Westmeath (26%). Evidence of old hedge laying can be difficult to detect in dense hedges or those with dense ground vegetation. Hence, it should be assumed that these results are on the conservative side.



**Figure 7.6.4 Fencing and management of hedgerows along active boundaries**

## 7.7 QUALITY OF HEDGES IN COUNTY LONGFORD

### Condition of Species Rich Hedges

The Steering Group for the UK Biodiversity Action Plan (UK Biodiversity Action Plan Website) have produced a list of nine criteria as to what constitutes ‘favourable condition’ for species rich hedges. Of these only five were sufficiently consistent with data recorded in the County Longford Hedgerow Survey to allow comparison. These were

1. Average height at least 2m
2. Average width at least 1.50m
3. Less than 10% gaps, with no individual gap wider than 5m
4. Base of woody component closer than 50cm to the ground
5. Less than 10% introduced non native species.

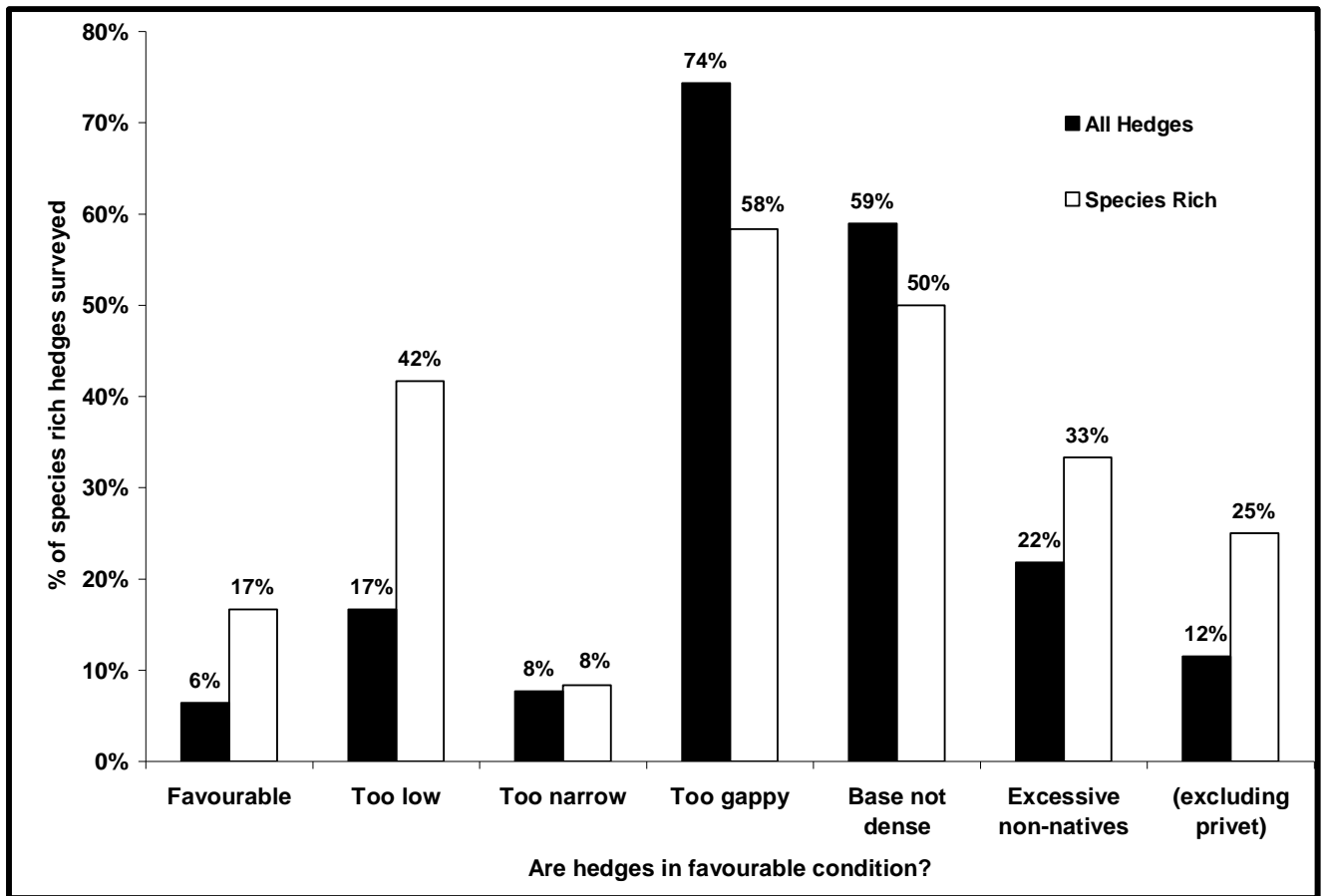
There are no defined criteria for what is considered to be a species rich hedge or what is considered to be ‘favourable condition’ for Irish hedgerows. In the absence of such criteria I have based my assessment on the British measures (see Recommendation 6.5).

All sample hedges were assessed against the above criteria.

Only 6.4% of hedges sampled in Longford passed all of the above standards for favourable condition. Of the sampled hedges in County Longford, 15.4% were classed as species rich and of these 16.7% passed the above criteria for ‘favourable condition’. This is just 2.6% of the total hedges sampled, an identical figure to that in County Westmeath, but well below the 14.5% of County Laois. All of the available comparative figures from the other county surveys are shown in Table 7.7.1.

*Table 7.7.1 Comparison of the ‘favourable condition’ status of hedges in midland counties*

County	% of hedges in favourable condition	% of Species Rich Hedges	% of species rich hedges in favourable condition	% of total sample that are species rich hedges in favourable condition
Longford	6.4	15.4	16.7	2.6
Laois	20.0	44.7	32.4	14.5
Offaly	4.8	31.5	24.4	7.7
Roscommon	Not available	4.8	55.6	2.6
Westmeath	Not available	4.6	14.3	0.7



**Figure 7.7.1 Favourable condition status of hedges**

Figure 7.7.1 shows a breakdown of how the sample compared against each of the favourable condition criteria. Interestingly, over 40% of species rich hedges are maintained below a height of 2m compared to just 17% in the overall sample. This is a situation that could be easily remedied. Excessive gappiness is the primary problem with almost three quarters of all hedges deemed to be over the 10% threshold. The lack of a dense base structure is also significant. Excessive gaps and lack of base structure are factors generally associated with lack of management intervention. They will almost certainly require greater levels of appropriate management involvement to achieve favourable status.



**Species rich hedge maintained below 1.50m in height (LD03 – Killashee)**

The non-native species that is present to 'excessive' levels most frequently is Wild Privet. The species is considered native to certain parts of Ireland (but not County Longford). Sycamore is another species that impacts on the statistics in this category. Its increasing use in afforestation schemes makes it probable that its presence in hedgerows will increase in the future as it is a ready coloniser.

## 7.8 OTHER OBSERVATIONS

A number of observations were made during the period of fieldwork which could not be recorded as part of the survey methodology but are considered to be worthy of note here.

### New Hedges

New and young hedges which would not be included on early O.S. maps and which would be too small to register as distinct linear features on aerial photographs (or have been planted in the five years since the aerial photographs were taken) could only be recorded if detected during the field survey. Only one short example of this was noted and it is not considered, at this point in time, that new hedges would contribute to the overall hedgerow extent to any significance. With the development of the REPS the extent of new hedgerows would be expected to grow over the next number of years.

### Summer Cutting

During the fieldwork stage of this project (late April to mid May) numerous examples of hedgerow cutting were observed which had clearly taken place outside of the prescribed season (1<sup>st</sup> September to end of February). In fact, almost 4% of sampled hedges were noted as having been cut out of season. In all cases there was no obvious justification on the grounds of Public Health and Safety. Accurate assessment of “out of season” cutting cannot form a part of the overall survey methodology because it can take place any time from 1<sup>st</sup> March to 31<sup>st</sup> August whereas fieldwork may well be completed, as in this case, earlier in the season. Also, it can be almost impossible to ascertain later in the season whether a hedge was cut in February or a few weeks later. Any examples recorded are therefore likely to be under estimates of the amount of ‘out of season’ cutting taking place in County Longford.

Cutting hedgerows during the growing season is potentially damaging to the health of hedgerow shrubs and to much wildlife dependent on the hedge. It is also contrary to the conditions of REPS agreements.

### Ground Flora and Fauna

The survey methodology does not have the scope to make any meaningful recordings of the wild flora and fauna associated with hedgerows. However, during the course of the fieldwork a number of direct and indirect observations were made of the wildlife associated with hedges, including sightings of kestrel, heron, curlew, blackcap and long-tailed tits as well as numerous hearings of the cuckoo.

The plethora of rabbits in a number of the sample squares poses a threat to the stability of hedge-banks. The large numbers of this species will also necessitate protection measures for young plants where new hedges are being established or gaps are being planted in existing hedges (as in REPS3). Ramsons or wild garlic (*allium ursinum*) were found in abundance in a few areas. Bluebells (*Endymion non-scriptus*) were also noted but less frequently.



**Cowslips**



**Ramsons (wild garlic)**

## 8.0 DISCUSSION

In this section, the results of the survey are discussed in absolute and in relative terms.

In 'absolute' terms the hedgerow resource can be assessed in light of current thinking on best conservation practice and data can be compared against a set of agreed criteria for favourable attributes. The 'relative' assessment compares the resource with that from comparative studies in Counties Laois, Offaly, Roscommon, Westmeath and East Galway.

In the future, a relative assessment could involve a follow up survey to compare the future resource with its current condition.

### Hedgerow Extent

County Longford has an extensive network of hedgerows throughout the county with an estimated total length of 9,903km. The general extent of hedgerows can be well expressed by the density of hedgerows per square kilometre and in this respect County Longford, at 8.23km per km<sup>2</sup> has the highest hedgerow density of any of the Irish county-wide surveys so far completed. County Laois at 7.28km per km<sup>2</sup> is the next highest. The hedgerow density figure compares favourably to England, which has an overall average density of 2.91km per km<sup>2</sup> (Barr, 1993), while the County of Suffolk, a county of rolling agricultural land, which has a mean hedgerow density of 3.6 km per km<sup>2</sup> (Parker, year unknown).

County Longford can also lay claim to the 1km<sup>2</sup> with the most hedgerows so far recorded. The Ballinalee square (LD07) contained 18.25 km of hedgerow, which is almost 3 km more than its nearest rival in Clonbullogue, County Offaly.

### Hedgerow Loss

An attempt to approximate hedgerow loss in County Longford over the last 12-16 years by comparing the results of the County Longford Hedgerow Survey with the results of the *Badger and Habitats Survey* (Smal, 1994) produced a spurious result. This assessment suggested that there has been almost a 40% *increase* in hedgerows during the period. The *County Roscommon Hedgerow Survey* threw up similar spurious results. The methodologies employed in both surveys were not totally consistent but the results are considered to be so implausible that an alternative explanation must exist.

The 'extent' data recorded during this survey sets a benchmark for future surveys. It is anticipated, on the basis of observations made during the current study, that there will be a measure of hedgerow loss in the coming decade.

Hedgerow 'loss' can be a misleading term. It can reflect, as most people would expect it to, the direct loss or removal of hedgerows for agricultural, development or other purposes. Hedgerow loss figures can also relate to situations where hedgerows are re-classified as other habitats or features. For example, if a hedgerow deteriorates in quality to such an extent, particularly in respect of an increasing percentage of gaps, it can be re-classified as remnant hedgerow. Of more relevance in County Longford is the situation where unmanaged hedgerows comprised of a high percentage of spreading or suckering species develop into small thickets or areas of scrub. Once a hedge line is greater than 4m wide it becomes re-classified as a new habitat type. Both of the above cases technically would be included in the figures for hedgerow loss. A similar circumstance can occur where areas of afforestation adjacent to hedgerows become sufficiently developed so that there is no distinction in the canopy between the forest and the hedge. The hedge is no longer a linear feature within the definition of the survey and the hedges are technically "lost", despite not having been removed.

The change from a 'headage' based subsidy for farmers to an 'area based' payment (Single Farm Payment) is resulting in reduced stocking levels. Increased extensification of land management will

most likely result in increasing levels of scrub development especially in areas where gorse and blackthorn are abundant.



**Blackthorn spreading to form a thicket in Edgeworthstown (LD09)**

Direct loss of hedgerows through removal for development purposes is likely to be an ongoing reason for a measure of hedgerow loss during the next number of years. This often involves the removal of short lengths of hedge to facilitate access and sight lines for new one-off houses. Loss rates are relatively small but habitat fragmentation may become an issue. A report by the Department of Environment: '*Urban and Rural Roles*' (2001), estimated that 420km of hedgerow was removed in Ireland to facilitate sight-line requirements to new rural dwellings in 1999 alone. This rate of removal is inconsistent with the recommendation of the National Heritage Plan, which states that "For the future, the overall goal should be to have no net loss of the hedgerow resource" (Dept. of Arts, Heritage, Gaeltacht and the Islands, 2002).

Direct removal of hedges for agricultural purposes is not likely to be a significant factor due to the measure of protection afforded through REPS. REPS farmers are not permitted to remove hedgerows and participation rates in REPS are expected to increase. However, loss through deterioration in quality and ageing is likely to be a factor on farms if rates of rejuvenation are not increased.

It will be important that the nature of any future hedgerow loss be classified in any new survey undertaken. Loss through change of habitat type may be considered a positive feature from a biodiversity perspective. This would depend on the new habitat type created; semi-natural woodland or scrub generally would be preferable to non-native woodland.

New, one-off housing developments are a feature in a number of the sample squares. There was no consistency in how the existing roadside boundary hedges associated with these developments were dealt with. Greater care and protection is thus needed at the Local Authority planning level. There is evidence that hedgerow conservation measures included in planning consents are not being adhered



to on the ground (McDonnell, 2005) and that greater enforcement of planning conditions is necessary.

Some research is ongoing in County Roscommon to investigate the practicalities of physically moving mature hedgerows. If this can be carried out in a cost-effective way without diminishing substantially the qualities of the hedgerow then this could become a recommendation within planning consents where existing hedgerows are interfering with new sight-line requirements.

The hedgerow network is largely a feature of land ownership patterns and agricultural practices of the nineteenth century. Rationalisation of the resource particularly in light of modern agricultural methods has taken place on many farms particularly during the 1960's and 1970's. Results from the hedgerow surveys undertaken indicate that this has happened to different degrees in different areas. 19% of recorded hedges in County Longford were considered to be redundant in respect of internal field divisions on farms. This figure was much lower in Counties Laois and Offaly (8%) which suggests that a greater degree of field boundary rationalisation has taken place in the south midlands.

### **Species composition**

A total of 25 shrub species including 16 native shrub species were found in the hedge layer of this sample of the county's hedges. Broom has not been recorded in hedges in any of the previous surveys. In addition, Rowan is more frequently occurring in County Longford than in any other county previously surveyed. In particular, it is a notable feature of hedges in the area around Ballinamuck and Ballinalee. Although the degree of species diversity within individual hedges is not as high as the south midland counties of Laois and Offaly, County Longford's hedges are generally more diverse than those of its nearer neighbours in County Westmeath and County Roscommon. Although only 15% of the County Longford sample could be classed as species rich (an average of four or more native species per 30m strip), almost a half of hedges contained four or more native species in total along the length of the hedge.

Most hedges would have been initially established using just one (usually whitethorn) or possibly two species. A number of factors contribute to the further development of the species composition of hedgerows through colonisation. Soil type and elevation can restrict the suitability for colonisation by certain species as can the availability of a local source for the seed. Age can also be a factor in the colonisation process. Older hedges have more time to be colonised so are more likely to be more diverse than relatively younger hedges.



**Rowan tree in Granard hedgerow (LD10)**

40% of the species rich hedges noted in this survey were recorded in just two of the sample squares (LD02–Ballymahon and LD03–Killashee). This geographic distribution is consistent with the findings of the County Roscommon survey which found the majority of species rich hedges were in the sample squares in closest proximity to Lough Ree. The influence of areas of semi-natural woodland around Lough Ree may well be a factor. These wooded areas could be providing a seed reservoir for the colonisation of hedgerows. The other sample square in proximity to Lough Ree (LD01 near to Newtowncashel) did not include any species rich hedges in the sample but since the square was largely comprised of semi-natural woodland the number of sampled hedges was low. The only Wild Cherry tree recorded during the survey was found in one of the sample hedges in this square, while Rowan and Whitebeam were also noted as being present but not in any of the sample hedges.

In common with previous hedgerow surveys Hazel and Guelder Rose were found to be closely associated with species rich hedges.

Townland boundary hedges make up 11% of the sample as did hedges that were adjacent to public roads. These figures are generally consistent with those from other county hedgerow surveys. These two classes of hedge have been found to contain higher mean species diversity than non townland boundary or non roadside hedges. Similar results have been found in the hedgerow surveys in counties Laois, Offaly, Westmeath and Roscommon, as well as in a study of hedges in County Kildare (Murray, 2001), and in Northern Ireland (Hegarty and Cooper, 1994). This is assumed to be the result of townland boundary and roadside hedges being generally of more ancient origins and having larger banks and ditches than non-townland boundary/roadside hedges.

The higher species diversity found for townland boundary and roadside hedges makes them candidates for particular care and attention in their management and measures should be taken to avoid their degradation and removal wherever possible.

Sixteen tree species, of which twelve are native species, were found in the hedges of this survey with the vast majority of hedges (84%) having trees along their length. The most commonly occurring hedgerow tree in County Longford is by far the Ash (*Fraxinus excelsior*). Sycamore (*Acer pseudoplatanus*) is the only non-native species found to any great extent in County Longford hedgerows. Its use in many new forestry plantations coupled with the fact that it is a ready coloniser of hedgerows would make it highly probable that its frequency of occurrence in hedgerows will increase in the coming years. It is not considered to be a desirable hedgerow tree species on the grounds that it casts a heavy, suppressing shade and being non-native is of less value for wildlife than native tree species. Allowing a greater percentage of the variety of native species present in County Longford hedgerows to develop as hedgerow trees would be a preferable option from a biodiversity perspective.



**Trimming Spindle removes its potential to form an attractive small tree**

### **Methodology**

Based on work by Dr. Max Hooper (1970) in Britain, the figure of 30m is generally used as a standard measure for recording a representative sample of hedgerow information. Some UK methods of hedgerow survey allocate the number of strips arbitrarily, with 30m normally considered an adequately representative floristic sampling size but additional strips can be recorded at will (CPRE Hedgerow Survey, 2000; Bickmore, 2002). The UK Hedgerow Regulations, however, require that one 30m strip per 100 metres of hedge must be surveyed, and the result is then averaged to give an average species diversity figure per hedge.

The methodology for this survey states that two randomly selected 30m strips per hedge should be selected from which to record hedgerow species composition data.

23% of the sample hedges in County Longford showed a difference of two or more in the species count between the two 30m strips. In County Offaly the figure was 27% and in County Laois 23%. In County Roscommon and County Westmeath, where species diversity was much less than in counties Laois and Offaly, the figures were 19% and 14% respectively. These figures would justify the decision to record two strips and would suggest that there is a need to review the method for assessing representative sampling of hedgerows for species composition in Ireland.

## **Ivy**

Ivy was recorded as present in 92% of the 30m strips recorded in County Longford. It is a plant that provokes polarised views from different quarters. Its value for wildlife as a food source and as nesting or roosting site is unquestionable. However, it is the destructive potential of ivy that provokes controversy. It is generally acknowledged that ivy is not directly parasitic on its host but the fact that ivy is frequently associated with trees that are in poor condition gives rise to two schools of thought.

One view suggests that ivy can dominate its host and cause it to lose vigour and even eventually kill it. The other view suggests that ivy only dominates trees and shrubs that are already in poor condition and that ivy itself is not destructive. The truth probably lies somewhere between the two. Just 6% of 30m strips recorded had ivy dominant at canopy level for over 25% of their length. This is significantly lower than the 20% recorded in County Westmeath but is still an issue which needs to be monitored.

## **History and Landscape Context**

The majority of the current hedgerow landscape in County Longford was established during the period from the mid 18<sup>th</sup> century up to the early part of the 20<sup>th</sup> century although a portion is likely to be older. Townland boundary hedges tend to be of more ancient origins than non-townland boundary hedges. Frequently older boundaries are non-linear and are often demarcated by natural features such as watercourses.

An examination of the first and second edition maps (6" to the mile) produced by the Ordnance Survey can give an indication of the likely period of origin of individual hedgerows. In County Longford, the first edition was produced in 1837, followed by the second edition in 1912/13. Where a boundary is present on the second edition Ordnance Survey map, but is absent from the first edition map it is possible to approximate the origin of the hedge to the period between 1837 and 1912/13. Boundary lines shown on the first edition O.S. maps were not necessarily hedgerows. However, some boundaries shown include small tree symbols to indicate the presence of timber trees. This could indicate an avenue or tree line but could also represent a hedgerow containing mature trees. 32% of hedges recorded during the survey were not present in 1837 but just 4% of hedges were undisputedly not established at the time of the edition O.S. map. More recently established hedges (that are not present on the second edition O.S. maps), are most likely associated with Land Commission property divisions. These hedges are almost invariably species poor. In general, the second edition O.S. maps show the greatest degree of field division indicating that although land enclosure was well established before the famine, further sub division of lands was ongoing up to the end of the nineteenth century. From this period to the present there has been a degree of field enlargement and also realignment most probably during the latter half of the twentieth century. There are exceptions to this general rule. One sample square in County Kildare (ongoing survey) has shown that an area sub divided into 11 fields on the first edition O.S. map was just one field by the time of the second edition of the survey. So, presumably, hedgerow removal is not solely a recent phenomenon.

Over three quarters of hedges surveyed in County Longford were linear in outline, constructed with a single (as opposed to double) line of hedging shrubs, and a hedge bank. A high proportion (37%) of the non-linear hedges recorded form part of a townland boundary. This supports other findings that non-linear hedges are normally associated with hedges of antiquity (Murray, 2001). High proportions (42%) of the non-linear hedges recorded were also constructed alongside natural features such as streams.

The period of origin of other hedges may be established by other means. Road-side, canal-side and railway-side hedges are likely to have their origins at the period of the development of the particular

route. Documentary evidence should enable precise dating of certain hedges adjacent to such features, but was beyond the scope of this survey.

Hedgerows exist in the wider framework of the landscape. How hedges interface with the wider environment can have a significant bearing on their relative value in the landscape and their ability to support biodiversity. Where hedgerows sub divide improved grassland or arable land their absolute value for supporting a diverse ecology is reduced but their relative importance for biodiversity in that area is increased. Just over a half of the County Longford hedges surveyed occur within the context of intensive farming. Maintaining these hedges in a favourable condition for wildlife is relatively more important than hedges in more extensively managed agricultural areas. In the extensive areas there is likely to be a range of potential habitat; in intensively managed farmland hedges may be the only habitat.

However, a high proportion (51%) of hedges surveyed link in to semi-natural habitats facilitating the movement and distribution of wild flora and fauna through the landscape. This figure compares well with other county hedgerow survey results and indicates that overall ecology of the hedgerow landscape in County Longford is favourable towards biodiversity. Protection and enhancement of these hedgerow corridors will have a positive impact on the connectivity of wildlife habitats throughout the countryside and the stability of wildlife populations.

However, increasing development of one-off housing in the countryside is likely to be having a negative impact on hedgerow connectivity leading to a degree of fragmentation of habitat networks.

### **Hedge Construction**

Hedgerows vary in their construction based upon numerous factors including soil type, topography, farming practice, tradition and legislation. In wetter areas or where soils are poorly drained, a bank needs to be constructed to prevent shrub roots from becoming water-logged. A drain to carry away surplus water is also common. Where stony soils are frequent, hedge banks often contain quantities of field stone cleared from adjacent farmland when under tillage. Sometimes there is sufficient stone to construct a wall in association with the hedge. Older hedges may follow natural landscape features such as streams; whereas other hedges were marked out by surveyors and follow straight lines. Certain Acts of Parliament prescribed specifications for hedgerow construction including dimensions for banks and drains, as well as methods of planting. Many landowners included such details as clauses in tenants' leases.

The majority of hedges surveyed in County Longford were of what can be considered a fairly standard construction comprised of a single line, planted hedge growing on a bank with an associated drainage ditch. Hedge banks, walls, and drains create niche environments for many wildlife species adding much to the habitat value of a hedge. They also improve the stock retaining capacity of hedges, particularly against sheep, and have a shelter value. In County Longford, 21% of hedges had very large hedge banks, which can often be a good indicator of hedges of antiquity. Stone walls associated with hedgerows were a very uncommon feature of County Longford hedgerows during this survey, with the exception of the limestone rich area around Newtowncashel.

Hedgerows and their associated banks and drains act as buffers to nutrient loss from agricultural land but there has been little or no research carried out in Ireland to evaluate to what extent. Given that the EU Nitrates Directive (1991) has been adopted on a national basis in Ireland, research is needed to quantify the buffer role of different types of hedgerows in various agricultural situations.

### **Hedge Structure and Condition**

17% of hedges recorded in County Longford were maintained below 1.50m in height. This figure rises to nearly 90% when just roadside hedges are considered. Low hedge height has been shown to



be least beneficial to nesting birds. Visibility can be a safety issue on many country roads necessitating them being managed at below the normal best practice minimum. However, it would be my opinion that road visibility would be an issue only in a few of the instances observed during this survey. As a general rule, many of County Longford's roadside hedgerows are being more restricted in their size than is necessary to achieve road safety functions.

Increasing hedgerow height has been shown to correlate positively with increasing diversity of bird species in a hedge (Arnold, 1983; Lack, 1987). Taller hedges also provide better shelter for farm animals. In terms of farming, landscape and wildlife perspectives the proportion of very low hedges in County Longford could be reduced. The percentage of low cut hedges in County Longford is similar to that in County Laois and County Westmeath but is higher than in County Offaly and County Roscommon where there is a tendency for hedges to be less intensively managed. There is a measure of compensation in the fact that 64% of hedges have an average height of 2.50m or more, with 14% recorded as being in the tallest category of 4m+.



**Roadside hedge cut to 'box' profile below 1.50m in height**

As with hedge height, it is generally accepted that the wider the hedge, the better it is for wildlife although agriculturally allowing hedgerows to occupy too much land is less likely to be acceptable. A reasonable compromise would be not to reduce hedges below one metre in width. 92% of County Longford hedges surveyed were greater than one metre wide.

It is generally acknowledged that lack of hedge management can lead to a weakening of the hedge base and lead to a gappier structure. Increasing levels of gaps in the hedge structure correlates with lower species diversity (Murray, 2001), as do smaller and lower hedges. Just over a tenth of County Longford hedges surveyed have more than 25% gaps. This level of 'gappiness' should be of some concern as most hedge functions are diminished if the level of gappiness is too high.



**Hedgerow losing base structure in Ardagh (LD06)**

The density of shrub growth in the bottom metre of the hedge is also an important indicator of the hedge structure. 59% of County Longford hedges surveyed displayed either no growth or ‘scrawny’ / weak growth in the base of the hedge. A scrawny, weak or open base is normally associated with a hedge that is moving towards becoming a tree line and losing its stock containing value.

Continuous hedges with a good basal structure are more agriculturally valuable as they may not need additional fencing and good growth from the bottom of the hedge also improves the shelter value. Several studies have shown that density of growth in the hedge base also influences the hedges capacity for supporting wildlife (Arnold, 1983; Osborne, 1984). From agricultural and wildlife perspectives the basal density of Longford hedges could be improved. However, County Longford is comparable with County Laois and County Offaly in respect of the percentage of hedges having a dense base. It is significantly better than in County Westmeath, County Roscommon and East Galway.

Many studies have found that taller, wider, denser and structurally more intact hedgerows are also preferred by most wildlife including small woodland plants ((Hegarty and Cooper, 1994, Corbit & Marks, 1999, and Murray 2001); invertebrates (Burel, 1989), and hedgerow birds (Chamberlain et al, 2001, Arnold, 1983, and Lysaght, 1990).

The most commonly occurring hedge profile in County Longford is the ‘overgrown’ category (57%), an indication of the fact that hedges have not been managed in the last few years. This can be beneficial for wildlife. There are negative implications if hedges are left unmanaged for longer periods. Significantly, 39% of the overgrown hedges were considered to be losing their base structure which is often a result of insufficient levels and type of management and would be considered an undesirable feature.



**Overgrown hedge in Ballinamuck (LD08)**

Just over a fifth of hedges have either the ‘boxed’ or ‘A-shaped’ profile characteristic of routine management. Previous results from hedgerow surveys and other research have shown that a high proportion of routinely managed hedges have little or no flowers or fruit. The Department of Agriculture and Food (REPS), and Teagasc recommend that when hedges are trimmed, this should be done so that the hedge is wider at the base tapering to a narrow top (A-shape). This reduces self shading and helps maintain a dense base to the hedge that is essential for stock control and also beneficial to the nature conservation value of a hedge. However, hedges that are regularly cut to a box or A-shaped profile produce less flowers and fruit than hedges which are allowed to grow unchecked. In common with other hedgerow surveys, despite a large number of farmers being in the REP Scheme, the figures from this study indicate that hedges are almost exclusively still being trimmed to a ‘boxed’ profile rather than the recommended ‘A-shape’.

In terms of best practice, it is necessary to achieve a balance between maintaining hedge structure and density, and allowing hedges to flower and fruit. In the future this might best be achieved by annually or biennially trimming the hedge sides to taper in to an ‘A-shape’ whilst still allowing a portion of the top of the hedge to grow freely in order to flower and fruit. Only 1% of the sample in County Longford was considered to have this (top-heavy) profile compared with 7% in County Offaly and 16% in County Laois.

In County Longford, the figure for remnant hedges is relatively low at 2%. However, 12% of hedges were considered to be derelict. Remnant hedges are those where the shrubs have reverted to their (often aged) tree form with extensive gaps. They have declined to the extent that they can no longer be called hedges and are deemed to be beyond rejuvenation. They can be considered as being unsustainable. Without intervention derelict hedges will become remnant over time and hedges that are classed as losing structure, (where many of the shrubs and thorns of the hedge no longer display low dense growth, and most of the stems are visible), can similarly become derelict. These problems are not as evident in County Longford as they are in Counties Westmeath and Roscommon.





**Remnant hedge near Newtownforbes (LD04)**

In common with the results from other county hedgerow surveys, damage to banks is a frequent occurrence in County Longford. In relative terms County Longford along with County Laois is at the best end of the scale in terms of degrees of damage. Livestock, particularly sheep, are generally the main culprits but in County Longford rabbits are much more significant agents of bank erosion. In certain sample squares rabbit (*oryctolagus cuniculus*) populations were very high. Rabbits can also physically damage hedgerows by browsing and bark stripping. Their actions can make new hedgerow establishment more costly since some form of specific protection through rabbit fencing or individual tree guards may be necessary (Deane, 1989). Actions to control rabbits may need to form part of management plans in certain areas. Research needs to be conducted to evaluate the full extent of the problem and to increase the understanding of the agricultural and ecological consequences of such high rabbit densities.



**Hedge bank hollowed by burrowing rabbits near Granard (LD10)**

### **Management of hedgerow trees**

Hedgerow trees are not only a very significant landscape feature but are, especially when mature, beneficial to the overall ecology of the hedge. County Longford (along with County Westmeath) has the highest proportion of hedges containing hedgerow trees of any of the counties surveyed to date. Most of the hedges with trees have young trees as well as mature trees which is a positive feature from a sustainability perspective.

Despite the diversity of species in the hedges, there is very little diversity in the composition of the tree layer of most hedgerows with ash being the dominant tree species. It is disappointing not to see more examples of small native tree species such as spindle, rowan and crab apple being allowed to mature rather than being clipped as part of the hedge.

Routine maintenance regimes carried out on hedgerows that have a proportion of young ash trees tend to favour the growth of ash over the thorny species. This is particularly evident underneath overhead cables where hedges are topped on a regular basis.

For hedgerow condition, trees can pose their own set of problems in terms of competition for light and moisture with the shrub layer. Heavily shading, non-native species such as Sycamore (22% of hedges) can be a particular problem while the leaf structure of the Ash tree allows greater penetration of light and thus does not impact hedge structure to the same extent. Given the increased volumes of afforestation which include sycamore, there is likely to be increased colonisation of hedgerows by sycamore in the future. This situation should be monitored and it may be necessary to put controls in place through the REPS.

### **Roadside Trees**

The view has been expressed to the author by a number of road engineers that there should be no trees growing within falling distance of a public road. This is an extreme view but is difficult to dismiss purely from a health and safety perspective. This view must be weighed against the enormous aesthetic and wildlife value of roadside trees. Over 62% of roadside hedges surveyed in County Longford contained hedgerow trees. It was outside the scope of the survey to determine the condition of trees but it can be stated as an undeniable fact of life that all of these trees will have to eventually come down at some point.

Healthy trees are of little danger to road users, and can in some circumstances be of benefit (e.g. trees can alleviate the blinding effect of low angled sunlight; the microclimate under mature trees can keep road surfaces drier and also reduce the amount of frost on the road). Roadside trees can be subject to (unintentional) damage by machinery during the course of ordinary hedgerow management work. This can often impact on their health and ultimately their stability.

Responsibility, and hence liability, for the safety of roadside trees rests with the landowner. The costs of dealing with unsafe trees can be considerable. Anecdotal reports from around the country suggest that there is a measure of pre-emptive felling of roadside trees by landowners concerned that they may be considered negligent if the trees were to fall and cause injury or damage. This is an issue that requires some attention at the strategic rather than the 'fire-brigade' level.

### **Hedgerow Management**

Hedgerows are predominantly man-made features and most require a degree of management intervention to fulfil agricultural and biodiversity functions and remain sustainable. The Department of Agriculture & Food, through the Rural Environment Protection Scheme (REPS) sets guidelines for appropriate hedgerow management as part of its contract with participating farmers.

Measure 5 of the Scheme concerns the '*Maintenance of Farm and Field Boundaries*'. The objective of the measure is to conserve, maintain and enhance hedgerows, in the interest of stock control, bio-security, wildlife and scenic appearance of the area. Some of the guidelines for REPS Planners most relevant to the recordings of this survey are outlined below;

- Where ivy infestation is a risk to the stability or long-term viability of a hedgerow it should be controlled.
- If possible, one side of a hedge should be trimmed in a season.
- Careful consideration should be given when prescribing the lowering of the height of a hedgerow.
- The quest for neatness should not take precedence over ecological and landscape considerations.
- Hedgerow maintenance must be avoided during the bird nesting season (March 1<sup>st</sup>- August 31<sup>st</sup>).
- Where hedgerows are cut, they must be cut to an A-shaped profile.
- The crushing of hedgerows by heavy machinery is not permitted.
- Fencing wire should not be attached to hedgerow trees and shrubs.

Participants in REPS 3, the most recent version of the scheme, must also chose from a number of biodiversity options to qualify for additional payments. In respect of hedgerows, this can involve planting a minimum of three metres of new hedgerow per hectare annually or rejuvenating a minimum of two metres of hedgerow per hectare annually through either coppicing, or laying, on a maximum of 20 hectares of their holding.

The latest statistics from the Department indicate that there were 1013 active participants in REPS in County Longford on 30/04/06.

Results of this survey show that there is almost an even split between those hedges that are being actively managed and those that are completely unmanaged, or have not received any management in at least the last 10 years. Of the managed hedges, there is a fairly even split between those that were flailed and those where the circular saw was used to carry out the work. This is a significantly different breakdown to the other counties where the flail is by far the dominant method of hedge management. The use of hand tools was more prevalent in County Longford than in other counties. The use of hand tools is considered to be more favourable from an environmental perspective and the REPS specifications state that '*The most desirable method of hedge maintenance is by the use of hand tools*', so this is a positive feature of County Longford hedgerows. A breakdown of the trimming profiles for routinely managed hedges showed that all were being trimmed to a box profile and none were trimmed to a distinct A-shaped profile as recommended by the REPS and Teagasc. The failure to trim hedges to a recommended best practice profile is a consistent problematic theme of other detailed surveys carried out to date. It is likely that most work is carried out by contractors rather than individual farmers. However, this would need to be confirmed through further research. In either case, it is apparent that education and training of machine operators could lead to improved standards of hedgerow care. Teagasc currently run a FETAC accredited training course for hedge-cutting machinery operators. If achieving this certification were a mandatory requirement for those carrying out work in the REP Scheme, management standards should be improved.

Although one of the principle functions of hedgerows to agriculture is that they can act as barriers to the movement of stock, evidence from previous and current hedgerow surveys indicate that a significant proportion of hedges are either reinforced with wire or displaced as the principle barrier by stand alone fences. County Longford (along with County Roscommon) has the lowest percentage (40%) of hedges that are reinforced. The fact that both counties have a relatively high percentage of redundant boundaries where additional fencing is not an issue is one factor, but also,

in part, in County Longford this is due as much to the deep drains acting as effective barriers to the movement of stock as to the structure of the woody component of the hedgerow. Almost a third of hedges surveyed had wire attached to the hedgerow stems. This is an indication that the hedge is no longer totally fulfilling its function as stock barrier. Attaching wire to live wood has implications for safety, the well-being of the hedge and the cost of restoration. Wire in the hedge is capable of damaging hedge cutting machinery and makes the activity potentially unsafe (44% of hedges containing wire were trimmed by mechanical means). Where wire is attached to hedgerow stems it can lead to bacterial and fungal infections which weaken the structure of the plant. In the worst case it can even threaten the viability of hedgerow stems. The cost of restoring degraded hedges is increased by the presence of wire which needs to be removed before work can be carried out safely.

Evidence of hedge laying was very low in County Longford with only 7% of hedges displaying clear evidence of past or recent laying. This was a slightly surprising result as the neighbouring counties of Westmeath and Roscommon recorded figures of 13% and 26% respectively. Many of the County Longford hedgerows recorded would be well suited to laying and many would benefit structurally from this type of management as it would improve base structure and reduce the amount of gaps, the two most significant factors in the failure of County Longford hedges to meet favourable condition criteria.

Rejuvenative hedge management refers to hedge laying and coppicing. Despite the increasing awareness of the value of rejuvenating hedgerows and its necessity for the sustainability of the hedgerow resource, this category of (recent) management was only recorded in 1% of the sample. Current rates of rejuvenation are not sufficient to maintain a sustainable resource.



**Coppiced stems in Edgeworthstown hedge (LD09)**

Interestingly, 40% of boundaries considered to be redundant are still being actively managed. Although the sample base is small the results are broadly consistent with those from other county surveys. It would be interesting to canvass the opinion of farmers on what they consider to be the main benefits of hedgerows from an agricultural perspective and what are their management objectives.



Accurate assessment of 'out of season' cutting cannot form a part of the overall survey methodology as the 'off' season extends from 1<sup>st</sup> March to 31<sup>st</sup> August whereas fieldwork may well be completed, as in this case, earlier in the season. However, almost 4% of sampled hedges were noted as having been cut out of season. In all cases there was no obvious justification on the grounds of Public Health and Safety. As well as potentially being in breach of the Wildlife Act, cutting hedgerows during the growing season is potentially damaging to the health of hedgerow shrubs and to much wildlife dependent on the hedge and is not permitted as part of the conditions of REPS agreements.

The results of this survey demonstrate that improved understanding of hedgerow management issues is needed if the resource is to be managed sustainably. Greater effort is required to have a positive influence on farmer's attitudes and awareness is also one of the recommendations of a study of hedgerows in County Roscommon (Kenny, 2004).

### **New Hedges**

REPS 3 has an optional measure for participant farmers to plant 3m/hectare/year of new hedgerow during the course of their 5 year plan. Based on figures given at the National REPS Conference (Tullamore, November 2003) this could result in over 2,000km of new hedgerows being planted annually under the scheme.

In Britain approximately 3500km's of new hedgerows were planted annually during the 1990's. A sample study by Bickmore (2005) for DEFRA reviewed the establishment success of these hedgerows and concluded that ground preparation, quality of planting stock, soil type, and aftercare were all factors in successful establishment. Teagasc are promoting all of these aspects in their support of new planting to farmers in the REPS. However, there are no mandatory standards to which new hedges planted under the scheme must comply. In five county wide hedgerow surveys the best examples of new hedge establishment that I have seen have been around new one off housing developments while the worst examples were seen in agricultural situations. One of the key problems is that protective fencing is invariably placed too close to the new hedge leading to browsing by stock. Within the next two years, Teagasc should carry out a similar specific study (on REPS farms) to that undertaken in Britain to assess the effectiveness of any new planting under the scheme.

The availability of planting stock from Irish seed sources is an issue in relation to the potential surge in hedge planting. Current research carried out by Jones et al (2001) indicates greater establishment success where hawthorn (whitethorn) provenance is closely matched to the planting site and that locally provenanced plants can be superior to commercially available material. The same report concludes that in Britain the current state of the commercial nursery sector is not sufficiently well regulated to ensure the necessary controls over provenance of material for hedgerow plantings. There is no information to suggest that the situation in Ireland is better and anecdotal evidence would indicate that the vast majority of the planting stock for Irish hedgerows is sourced from other parts of Europe.

More information is needed on the status and production capacity of the hedgerow nursery sector in Ireland.

The relatively high figure for redundant boundaries in County Longford, added to the low figure for hedges considered to be in favourable condition must call into question the promotion of new hedge planting under the REP Scheme. Why plant more hedges when the initial stock is not in optimum condition and where there appears to be a more than adequate degree of field division? Increasing the width of existing active boundaries to increase their biodiversity value may be a better option than creating a new series of boundaries. New hedge planting should be justifiable on agricultural or environmental grounds and not just be an easy option within the Scheme.

### **Hedgerow Quality**

A report by Robinson (2002) which assessed post war changes in farming and biodiversity in Britain concluded that while reduction in habitat diversity was important in the 1950s and 1960s, reduction in habitat quality is now probably more important. Biodiversity Action Plans need to reflect the importance of quality in relation to the value of habitats.

Just 6.4% of all hedges sampled in County Longford met all of those 'favourable condition' criteria of the UK Biodiversity Action Plan which were consistent with the recording details of this survey. All of these criteria can be influenced by management giving potential, with appropriate management, for all hedges to be in 'favourable condition'. In particular, 74% of hedges were considered to be too gappy. This could be rectified on REPS farms by focusing management plans in this direction. Gappiness is a problem with less than a third of hedges in County Laois and County Offaly.

17% of species rich hedges were classed as being in favourable condition, compared with 24% and 32% in County Offaly and County Laois respectively. Over 40% of species rich hedges in County Longford are trimmed below 1.50m in height.

It would be beneficial if criteria were agreed by relevant stakeholders as to what constitutes 'favourable condition' for Irish hedgerows. Management plans in REPS could then be designed to achieve favourable status for hedges on farms participating in the REPS.

## 9.0 RECOMMENDATIONS

The recommendations included in this section are based on the results of this survey considered in the light of current best conservation practice. Hedgerow conservation is within the remit of numerous stakeholders who have differing degrees of influence over the resource. In order to better target the recommendations, their relevance to each of the stakeholder groups is tabled at the end of the section with lead partners identified where appropriate. A copy of this report should be circulated to a representative of each of the stakeholder groups.

### 9.1 CONTEXT

In relation to hedgerows, the term ‘conservation’ does not simply relate to their retention but to their retention in a condition that is conducive to their multifunctional benefits.

Change has been a constant feature of the Irish landscape. It is an insufficient reason to try to conserve hedges just because they are there. Instead, their continuing role needs to be assessed in the context of the changing needs of agriculture, biodiversity, the environment and the landscape. For example, whilst wire fencing has reduced the need for hedges as stock enclosures, and shifts in fuel consumption have reduced their value as fuel sources, the importance of hedges for shelter and maintenance of soil quality is still highly regarded. The role played by hedges in maintaining water quality is insufficiently understood but in light of current research in Europe (Viaud et al., 2001), may be very significant.

In recent years the conservation of our natural and cultural heritage has gained importance, as reflected in current environmental and conservation policy (see section 4.3 Legislation & Policy) most especially through the REP Scheme. Within the context of these changes, the wildlife and aesthetic aspects of hedgerows must be regarded.

Changes in the Common Agricultural Policy are expected to reduce livestock numbers in Ireland considerably. It is yet to be seen fully how this will affect land utilisation. Will farmers maintain stocking density and put surplus land into forestry or other alternative enterprises, or will the same land be farmed more extensively? Either option has consequences for hedgerows.

The level of native woodland is another dynamic factor. Hedgerows are considered to be sub-optimal woodland edge habitats for wildlife. Most of the species that utilize hedgerows would be more at home in native woodlands. If, in any region, the area under native woodland were to increase significantly, the need for hedgerows as habitats in that area may diminish yet their importance as habitat corridors in order to maintain viable populations of woodland wildlife might increase.

The key to successful hedgerow conservation policy is that it is formulated in an appropriate and relevant context. This applies from management requirements for a single hedge up to policy decisions at a National (or even European) Level.

The value of a hedgerow or a network of hedgerows in any given environment is relative to its wider environmental context. A species rich hedgerow, in good structural condition, in an area well populated with similar hedges, in an area dominated by semi-natural vegetation, may be of lower relative importance in its setting than a less diverse hedge, in poorer condition, in an intensively farmed area with few hedges or other semi-natural features. The former may be a sub-optimum habitat for many species in its area; the latter might be the *only* habitat.

If hedgerow conservation is to be more than just aspirational then a series of practical, cost effective conservation measures need to be put in place. There are a number of issues which complicate the design of such measures:

- Some of the desirable qualities of hedgerows are subject to value judgements.
- Hedgerows are a multi-functional resource. In the absence of a full cost/benefit analysis it is not possible to determine what constitutes a cost effective measure.
- Fencing-off and leaving alone is not an option for most hedgerows. Hedgerows are man-made features of the landscape and the majority need a degree of appropriate active management to ensure their long term viability. Leaving them alone can be appropriate in the short term but is generally not a sustainable long-term option.
- Most hedgerows are private property. Ownership of hedgerows lies in the hands of thousands of farmers and land owners.
- The variable type, condition and regional differences make uncomplicated management guidelines difficult to frame.
- A significant percentage of the current network has fallen in to disrepair over a period of decades. Reparation of degraded hedgerows involves substantially higher costs than the routine maintenance of hedges in good condition.
- Lack of knowledge/skill base.
  - Intensification of agriculture has tended to diminish the agricultural value of hedgerows. Prior to the introduction of the REPS in 1994 there were no external incentives for farmers to retain hedgerows whereas grants have been available for land reclamation and drainage which have involved hedgerow removal. Declining agricultural functional value led to a fall off in the practical knowledge and skills to manage hedges appropriately.
- Relevance of the resource to the modern landscape.
  - The value of the hedgerow resource to the modern environment is fairly well documented. However, the relevance of a land division system that dates back 200 years is questionable.  
In 2002, the number of agricultural holdings in Ireland totalled 136,500, compared with 419,500 in 1855, less than a third the number (CSO, 2002).  
Agricultural methods have changed significantly, especially in relation to mechanisation. In addition, the decline in the number of people engaged in agriculture is of consequence.

## **9.2 POLICY RECOMMENDATIONS**

### **GENERAL**

Any hedgerow conservation policy or actions need to be cost effective. Cost effectiveness can only be assessed when the full costs and benefits have been quantified.

#### **1.1 A full cost / benefit analysis of the hedgerow resource should be carried out.**

### **REPS POLICY**

REPS plans should show a distinction between active and redundant farm boundaries.

#### **1.2 Unless there are specific conservation or management objectives, resources should not be directed into hedgerows that form part of redundant field boundaries. Conversely, ancient, species rich, and other notable hedges should be given particular and carefully targeted management attention, where appropriate.**

#### **1.3 REPS 3 and REPS 4 need to prioritise the improving the quality of existing hedgerows over the planting of new hedgerows.**

#### **1.4 The restoration and protection of degraded hedge banks and walls should be fully costed and included in the options for hedgerow management under REPS 3 and**



## **REPS 4.**

The appropriate aftercare of newly planted hedgerows needs to be stressed by advisory bodies. Fencing from livestock must be an adequate distance away from the hedge to prevent browsing and also to allow maintenance.

- 1.5 Recommended figures should be stated for the spacing of protective fencing from newly planted hedges in the REPS specifications and considered best practice for non REPS situations.**

Ivy is a valuable wildlife plant but can, when over-dominant, be potentially detrimental to the long term viability of hedgerows. Its control may be deemed to be a necessary part of a hedgerow management programme (as in REPS).

- 1.6 Guidelines should be given to REPS participants as to the timing of cutting ivy so as to minimize the wildlife disruption. This will need to be based on research evidence and then should be considered best practice for non-REPS situations.**

- 1.7 Planners and Inspectors operating the REP Scheme need to become familiar with recognised Standards in hedgerow management.**

Protection and enhancement of hedgerows that connect to other wildlife habitats such as woodlands and scrub will have a positive impact on the connectivity of wildlife habitats throughout the landscape and the stability of wildlife populations.

- 1.8 Hedges that provide direct connections to other natural or semi-natural habitats should be prioritised for protection and enhancement, and where new planting is to take place, further wildlife corridor establishment be promoted.**

## **FORESTRY POLICY**

Afforestation with non-native forestry species, e.g. sycamore, has the potential to impact on the species composition of hedgerows in the longer term.

- 1.9 Forest Biodiversity Guidelines should include consideration of the potential impact of the new forestry on the wider ecology in the locality.**

## **LOCAL POLICY**

### **Local Planning and Development**

There is a need for Longford County Council to deal systematically with the relevant issues of this report and to give status to the recommendations. A policy document could set policy, standards and targets, and assign areas of responsibility.

- 1.10 As part of the County's Biodiversity Action Plan, Longford County Council should draw up a Hedgerow Conservation Policy Document.**

There is currently little or no distinction, in terms of planning and development, between the different types of hedgerow recorded as part of this survey and their relative agricultural, ecological and aesthetic importance. For example townland boundary hedges, hedges with good species diversity or those containing rare species, should be safeguarded more stringently in roads, construction, and other development operations.

- 1.11 In the planning process, greater consideration should be paid to individual hedgerows in light of their particular qualities and characteristics.**

Simple and systematic methods should be developed for dealing with hedgerows within the planning process.

- 1.12 Guidelines should be produced for planners and road engineers dealing with**

**hedgerows in planning applications.**

- 1.13 Hedges on agricultural land that has been re-zoned for development should be surveyed and hedges with significant biodiversity, historical value or containing rare species should be identified and incorporated into the GIS database.**

Paragraph 2.27 of The National Biodiversity Plan states that *‘For the future, the overall goal should be to have no net loss of the hedgerow resource’*.

- 1.14 Hedgerow removal to facilitate development should be kept to an absolute minimum and where unavoidable, a requirement for mitigation planting should be incorporated into the planning consent. This should consist of a hedge of similar length and species composition to the original, established as close as is practical to the original and where possible linking in to existing adjacent hedges. Native plants of a local provenance should be used for any such planting.**

There is evidence from around the country that although measures to protect hedgerows are included in planning consents, lack of enforcement is resulting in less than optimum performance on the ground.

- 1.15 A study should be initiated to investigate the impact of development control in relation to hedgerows and to determine degrees of compliance with hedgerow related planning conditions by landowners.**

Greater enforcement of hedgerow conditions in planning consents is required.

- 1.16 Enforcement of hedgerow conditions in planning consents could be achieved by making the retention, re-location or re-establishment of hedgerows in planning consents the subject of a bond sought by the Local Authority from those seeking the planning permission. The bond to be returned on the successful retention, re-location or re-establishment of the hedgerow/s concerned within a given period.**

#### **New Planting**

- 1.17 The use of locally provenanced native plant species should be specified for any hedgerow planting (including hedgerow trees). Encouraging a diversity of native hedge species consistent with the findings of this survey is recommended.**
- 1.18 Nurseries and garden centres in County Longford should be encouraged to carry sufficient stock of the above.**

#### **Roadside Hedgerows**

Although roadside hedges make up only approximately 11% of the overall hedgerow extent, the fact that they are at the front line of public perception of hedgerows and that they tend to be relatively species rich due to historic factors makes their appropriate maintenance particularly important. Nearly 90% of roadside hedgerows surveyed were below best practice minimum height.

- 1.19 Special emphasis should be placed on the best practice maintenance of roadside hedgerows and verges.**

In the period from late April to mid May during the fieldwork stage of this project numerous examples were seen of recent cutting of hedges which had no obvious justification on the grounds of Public Health and Safety. Cutting hedgerows during the growing season is potentially damaging to the health of hedgerow shrubs and to much wildlife dependent on the hedge.

- 1.20 All of the relevant Stakeholders listed in Table 9.1 should commit to eliminating the cutting of hedges during the period indicated in the Wildlife Amendment Act (2001)**

(1<sup>st</sup> March to 31<sup>st</sup> August) except where absolutely necessary for safety reasons. They should also commit to implement forward planning in order to minimise the necessity for cutting for safety reasons.

- 1.21 A log should be kept by the local authority (or other body) detailing all hedge cutting carried out during the bird nesting season as stated in the Wildlife Amendment Act (1<sup>st</sup> March – 31<sup>st</sup> August). Details to include are the date of cutting; machine operator; location; landowner; details of any Section 70 Notification; length of hedge cut; and precise justification for management. This will provide a useful record for the council (or other body) in the case of any complaints or actions taken. Recording photographic evidence prior and subsequent to the action would also be recommended.**

- 1.22 A pilot programme for the assessment of the condition and potential hazard of roadside hedgerow trees should be undertaken.**

If the relevant stakeholders (local authority, farmers and landowners, arboriculturalists) were to come together and devise a project that allows for an assessment of the condition and potential hazard of trees, removal of potentially dangerous specimens and mitigation through alternative planting (in safer areas?), this issue could be tackled in a constructive, proactive and much more cost effective way than if it is tackled piecemeal. Such a programme would not only protect the interests of the landowner and road users but would also recognize the enormous aesthetic and nature conservation value of roadside trees. Appropriate management implemented in advance of crisis situations would result in a greater retention of roadside trees. Some level of European funding may be available for such a programme.

### **Incentives**

Not all of the species rich hedges within County Longford fall within the protection and support of the REPS. Given their role as ecological corridors it is important that the appropriate management of these hedgerows on non-REPS farms be incentivised in order to prevent a fragmented countryside. This could be done through Local Authorities, NPWS or Heritage Council.

- 1.23 Incentives should be available to landowners not participating in the REPS for maintaining or achieving favourable condition status for their ‘species rich’ hedges.**

### **Disposal of hedge cuttings**

Many land owners have expressed uncertainty over the legitimacy of disposing of woody residue from hedge cutting by burning. A clarification of the interpretation of the relevant section of the Air Pollution Act is needed along with consistency of implementation. Coppicing and hedge laying can generate significant amounts of this type of material. If the burning of hedgerow waste is to be prohibited the infrastructure for acceptable alternative methods of disposal needs to be developed.

- 1.24 Local Authorities jointly should set consistent standards for the interpretation and implementation of the section of the Air Pollution Act relevant to disposal of hedgerow waste. This interpretation should be communicated to farmers, landowners and contractors.**

- 1.25 The practice of piling hedgerow cuttings (or in the case of hedgerow removal, whole hedgerows) and leaving to dry out for a number of weeks or months before burning should be strongly discouraged on environmental grounds. Cuttings should either be disposed of promptly or allowed to bio-degrade.**

### **Fuel Wood Production**

Producing a greater proportion of its fuel demands from hedgerows would be consistent with Ireland's commitments under the Kyoto Protocol.

- 1.26 Farmers and landowners should be encouraged to utilise hedgerows for fuel wood production in a sustainable manner.**
- 1.27 Technical advice should be provided to farmers and landowners wishing to produce wood fuel on cyclical basis from hedgerows.**

#### **Re-survey**

The results of this survey should act as a benchmark for the assessment of trends in the status of the County Longford's hedgerow resource.

- 1.28 A repeat hedgerow survey for the county should be carried out no later than 2016.**

### **9.3 RECOMMENDATIONS IN RELATION TO HEDGEROW MANAGEMENT IN COUNTY LONGFORD**

#### **MANAGEMENT STANDARDS**

Results from the survey indicate that there is room for improvement in the structural quality of hedgerows, which can be achieved by appropriate maintenance.

- 2.1 As a base line, in order to achieve management objectives, stakeholders should commit to ensuring hedgerow management works carried out under their responsibility should conform to recognised, basic minimum standards.**
- Routine trimming should be carried out by operators qualified to Teagasc Unit MT 1302 – Mechanical Hedge Trimming.  
(This module should be reviewed on an ongoing basis to ensure that it is fully compliant with current best practice and remains consistent with standards in operation in other member states of the EU.)
  - Hedge laying should be to National Proficiency Test Council (NPTC) (UK) Standard (AO2098) or equivalent.
  - Coppicing of hedgerows should be carried out to standards currently being developed by the Coppice Association of Ireland in conjunction with Standards bodies in the UK.
  - Planting of new hedgerows should be to NPTC standard or equivalent.

In order to achieve these standards, more opportunities for training need to be made available to farmers and landowners who wish to undertake hedgerow management activities especially in connection with the REPS.

- 2.2 Opportunities for training to recognised Standards in hedgerow management should be made more widely available.**

#### **HEDGE TRIMMING**

Breasting hedges but allowing the top to grow freeform is as a management technique that potentially satisfies both ecological and agricultural functions. It is also well suited for the management of many roadside hedges.

- 2.3 Breasting hedges but allowing the top to grow freeform should be encouraged as a management option for routinely managed hedges.**
- 2.4 Farmers and landowners in County Longford should be encouraged to not reduce hedge height below 1.50m during routine maintenance.**

#### **HEDGE REJUVENATION**

Sustainable hedgerow networks will only be achieved if appropriate management regimes based on long term needs are implemented. Levels of hedgerow rejuvenation need to increase significantly from those detected in the survey.

- 2.5 A greater degree of rejuvenation of old and degraded hedgerows should be encouraged.**

#### **HEDGEROW TREES**

The species diversity in the shrub layer of County Longford hedgerows is not proportionately reflected in the frequency of occurrence of many of those species in the tree layer.

- 2.6 Landowners should be encouraged to allow more of the wider variety of native species already present in hedges to mature into trees.**
- 2.7 Control of invasive non-native species (especially sycamore) should be encouraged, particularly in species rich hedges.**

#### **SAFETY**

- 2.8 Farmers and Landowners should be strongly discouraged from attaching fencing to hedgerow stems and trees.**
- 2.9 Removal of old wire/ netting/ staples from hedgerow stems should be encouraged for safety reasons.**

### **9.4 INFRASTRUCTURAL RECOMMENDATIONS**

#### **REGISTRATION/ CERTIFICATION OF LOCAL PROVENANCE PLANTING STOCK**

The ability to source planting material of a known genetic provenance is important. The origin of plants or seeds determines their adaptability, quality and wildlife value. More information is needed on the status and production capacity of the hedgerow nursery sector in Ireland.

- 3.1 A study should be conducted of nursery suppliers and garden centres to determine the availability of native planting stock (including provenance) for the range of hedge species found in County Longford. This information should be disseminated to interested parties.**
- 3.2 A programme should be developed for the identification, registration, and certification of local provenance seed sites for woody hedgerow shrubs in County Longford.**

#### **SUPPLY AND DEMAND OF NURSERY STOCK**

Contact with nursery growers and other professionals has indicated a likely shortfall of native provenance whitethorn for the 2006/7 season. Plans need to be made to ensure that the planting requirements predicted as a result of the introduction of REPS 3 can be met from indigenous stock. This will require a degree of forward planning.

- 3.3 The production capacity of nurseries producing Irish hedgerow stock from Irish seed sources should be determined.**

#### **SUPPORT OF NURSERIES**

Individuals wishing to establish, develop or expand tree nurseries with a view to supplying hedgerow plants of a local provenance should be actively encouraged through the Development Agencies. The Department of Agriculture and Food could look at providing funding through its direct provision of support services. The Forest Service, which is now under the wing of the Department, could facilitate this. There is an excellent nursery facility at Coolamber, County Longford which has great potential in this regard.

- 3.4 Financial and technical support should be given to individuals and groups wishing to develop nurseries to supply woody hedgerow shrubs from local seed sources.**

## **MACHINERY**

The use of excavator machinery for the purpose of hedgerow management is not permitted under the specifications of the REPS. Its use is largely confined to poorer draining soils.

- 3.5 The suitability of hydraulically driven hedge cutting machinery capable of being used on tracked machines should be promoted. This would enable hedgerows on poorly drained land to be correctly managed during the appropriate season.**

## **CONTRACTORS**

The vast majority of hedgerow management is carried out by operators using tractor mounted machinery. Some anecdotal evidence has suggested that, given the restricted legitimate season of cutting, business viability may be threatened.

At a technical level the message promoted by Teagasc, and the Department of Agriculture through the REP Scheme, to cut hedges to an A-shape profile does not appear to be getting through at ground level. The reasons why the recommendation is not being heeded should be investigated.

- 3.6 A survey should be undertaken of hedge-cutting machinery operators, to assess the operation and requirements of the sector.**

## **9.5 EDUCATION AND AWARENESS RECOMMENDATIONS**

A chain is only as strong as its weakest link. All individuals in the process from decision making to implementation need to be sufficiently well informed so as to be able to direct, implement and evaluate best practice actions.

- 4.1 Ensure all relevant staff (and any contractors used) have the necessary skills and data sources to implement or evaluate best practice hedgerow conservation.**
- 4.2 Provide appropriate training for staff in aspects of hedgerow conservation relevant to their position.**

Education in terms of best practice management is best implemented with reference to good examples.

- 4.3 A number of showcase sites of best practice covering different aspects of conservation and management should be developed around County Longford.**
- 4.4 General awareness of the values of hedgerows should be encouraged among rural communities through circulation of educational materials, an increase in targeted education for schools and with the introduction of initiatives such as the Golden Mile Competition.**

Managing species rich hedges depends on the ability to identify species.

- 4.5 A pictorial information leaflet should be produced to show all of the species native to County Longford Hedgerows. This should be distributed to Teagasc offices, hedge-cutting contractors, marts, creameries, garden centres, etc.**

## **9.6 RECOMMENDATIONS FOR FUTURE RESEARCH**

### **ECOLOGY**

- 5.1 Studies should be undertaken to determine the extent to which adjacent land type and use influences biodiversity in hedgerows, particularly species rich hedges.**
- 5.2 Studies should be undertaken to assess the agricultural and ecological consequences of the high rabbit densities in certain areas.**

## **Ivy**

- 5.3 Research needs to be initiated to examine the causes of the development of ivy in hedgerow trees and shrubs and the impact that different levels of ivy growth have on the host plant.**
- 5.4 Research needs to be carried out to determine the optimum time for the cutting of ivy (where necessary) to minimize the disturbance to dependent wildlife.**

## **Water Quality**

- 5.5 Research is needed to quantify the nutrient buffer effect of hedgerows in different agricultural situations.**

## **EFFECTS OF NON TRADITIONAL MANAGEMENT TECHNIQUES**

- 5.6 A thorough research programme should be carried out to assess the full implications of managing hedges with excavator machines and until such time the precautionary principle should be applied.**

## **DISPOSAL OF HEDGE CUTTINGS**

- 5.7 Cost effective alternative methods to burning should be explored for the disposal of woody waste from hedge management activities.**

## **INVESTIGATING DATA SETS FROM OTHER SURVEYS**

This survey uses the same sample areas as the *Badger and Habitats Survey* of Ireland, the *Countryside Bird Survey* and other surveys carried out by NPWS (e.g. hare survey). This should allow some comparison of data sets. Even more concentrated recording of habitat data and how these habitats change over time should allow for a greater understanding of the factors that govern the fluctuations in wildlife populations.

- 5.8 Data from the Hedgerow Survey could be related to previous surveys using the same sample area to enable more specific analysis.**
- 5.9 A full habitat survey should be conducted in each of the sample squares on an ongoing basis.**

## **9.7 RECOMMENDATIONS IN RELATION TO THE SURVEYING OF HEDGEROWS**

### **NATIONAL SURVEY**

A National Hedgerow Survey is needed to fully record the national hedgerow resource and to place the findings of this survey in their national context. This can be achieved on a county by county basis. A full and meaningful floristic classification of Irish hedges can only be carried out when consistent data is available for the whole country.

- 6.1 It is recommended that comparable hedgerow surveys be carried out in other counties across the country.**

### **SURVEY METHODOLOGY**

Consistency is required in the recording of hedgerow data at a national level.

- 6.2 The methodology used for this survey, after suitable review, should be adopted as the standard methodology for carrying out national, countywide or regional hedgerow surveys in Ireland.**
- 6.3 Any future surveys carried out using the same methodology as this one should include an appraisal of the methodology as part of any report.**

- 6.4 An appropriate method of assessing the representative species composition for hedgerows in Ireland should be determined.**
- 6.5 Criteria for what constitutes “species rich”, “favourable condition” and “rare” will need to be developed in relation to hedgerows in Ireland, and should be decided upon by the relevant stakeholders. The concept of “Heritage Hedgerow” should be introduced for hedgerows which have notable historical, structural, or species composition characteristics.**

#### **STANDARDISING DATA INPUT INTO GEOGRAPHIC INFORMATION SYSTEMS**

- 6.6 A standard format for the presentation of hedgerow survey data in GIS should be agreed.**



Table 9.1 Relevance of policy recommendations to stakeholders

Stakeholder Group	Recommendation reference number																											
	1. 1	1. 2	1. 3	1. 4	1. 5	1. 6	1. 7	1. 8	1. 9	1. 10	1. 11	1. 12	1. 13	1. 14	1. 15	1. 16	1. 17	1. 18	1. 19	1. 20	1. 21	1. 22	1. 23	1. 24	1. 25	1. 26	1. 27	1. 28
Agri/Environmental Consultants		*	*			*	*	*									*									*	*	
Community Groups																	*		*	*	*	*				*		
Department of Agriculture	L	L	L	L	L	L	L	L									*						*			*		
Developers																*	*			*						*		
Environmental NGO's																						*						
Farmers/Landowners		*	*														*		*	*	*	*				*	*	
Forest Service/Foresters	*								L											*		L				L	L	
The Heritage Council	*																					*	L					
Longford County Council										L	L	L	L	L	L	L	*		*	*	*	*	*	L				L
Management Professionals		*	*			*														*		*				*		
National Parks & Wildlife Service	*																			*	*	*	*					
Nurseries, Garden Centres																		L										
Research Institutions	*					*									*													
Semi-State Bodies																	*		*	*	*							
Teagasc	*	*	*	*	*	*		*								*						*			L	*	*	

\* denotes relevant recommendation

L indicates Lead Partner(s)

Table 9.2 Relevance of management; infrastructural; and education and awareness recommendations to stakeholders

Stakeholder Group	Recommendation reference number																			
	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.1	3.2	3.3	3.4	3.5	3.6	4.1	4.2	4.3	4.4	4.5
Agri/Environmental Consultants	*		*	*	*	*	*	*	*					*		*	*			
Community Groups	*		*													*		*		
Department of Agriculture	*	*	*		*								*	*		*	*			
Developers	*															*	*			
Environmental NGO's																			*	
Farmers/Landowners	*		*	*		*	*	*	*							*	*			
Forest Service/Foresters	*										L	L	L			*	*			
The Heritage Council													*							*
Longford County Council	*		*	L												*	*	L	L	L
Management Professionals			*											*	*	*	*			
National Parks & Wildlife Service	*		*													*	*			
Nurseries, Garden Centre										*	*	*				*	*			
Research Institutions										*					*					
Semi-State Bodies	*															*	*			
Teagasc		L	L	L	L	L	L	L	L	L	*	*		L	L	*	*		*	*
Tourist Sector																			*	

\* denotes relevant recommendation

L indicates Lead Partner(s)

Table 9.3 Relevance of future research; and future survey recommendations to stakeholders

Stakeholder Group	Recommendation reference number														
	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.1	6.2	6.3	6.4	6.5	6.6
Agri/Environmental Consultants						*					*	*	*	*	*
Community Groups															
Department of Agriculture	*	*			*	*			*					*	
Developers						*									
Environmental NGO's				*											
Farmers/Landowners						*									
Forest Service/Foresters					*										
The Heritage Council										L	L			L	L
Longford County Council						*				*					*
Management Professionals						*	*								
National Parks & Wildlife Service					*				*					*	
Nurseries, Garden Centre															
Research Institutions	L	L	L	L	*	*	*	L	L		*	*	L	*	*
Semi-State Bodies															
Teagasc	*	*	*	*	L	L	L							*	
Tourist Sector															

\* denotes relevant recommendation

L indicates Lead Partner(s)

## **10.0 CONCLUSIONS**

The information gathered from this survey adds to the existing (limited, but growing) knowledge of hedges in Ireland, and should be of value to a wide range of interests and stakeholders in County Longford and the rest of the country. Recording and analysis of the various characteristics of County Longford hedges should also foster a greater appreciation of the unique nature of these hedges, and enable a strategic approach to their conservation.

This resource should be a source of pride to the County and is largely a credit to the agricultural community that has been responsible for its conservation over the years.

In absolute terms, there is plenty of scope for improvement in County Longford's hedgerows to maximise their full multi-functional potential. In relative terms County Longford compares well in most categories with its close neighbours in County Roscommon and County Westmeath although overall its hedges would be less diverse and structurally in generally poorer condition than those of Counties Laois and Offaly.

The recommendations presented, if implemented should go a long way to conserving and enhancing this extensive and interesting resource into the future.

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## 12.0 APPENDICES

### 12.1 SAMPLE SQUARES

O.S. Grid Reference	Square Reference	Nearest Town / Village	Townlands
N 00 60	LD01	Newtown Cashel	<i>Cashel Ballynahinch Priests Island</i>
N 10 60	LD02	Ballymahon	<i>Derryveagh Ledwithstown Foygh Derrylough</i>
N 10 70	LD03	Killashee	<i>Aghantrah Newtown Gorteenboy Gowlan</i>
N 10 80	LD04	Newtown Forbes	<i>Castleforbes Demesne Lisbrack Deerpark Carrickmoyragh Townpark</i>
N 20 60	LD05	Taghshinny	<i>Glebe Streamstown Tennalick Taghshinny Lisnacreevy</i>
N 20 70	LD06	Ardagh	<i>Lissanisky Finnaragh Bohermore Deerpark Drumroe</i>
N 20 80	LD07	Ballinalee	<i>Kilnacarrow Esker South Soran Aghaboy</i>
N 20 90	LD08	Ballinamuck	<i>Camagh Tawnagh Shanmullagh Edenmore</i>
N 30 70	LD09	Edgesworthstown	<i>Clonwhelan Mondarragh</i>

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			<i>Longfield Cam</i>
N 30 80	LD10	Granard	<i>Granard Balymore Ballybrien Ballymacroly Killeen</i>
N 30 90	LD11	Lough Gowna	<i>Aghanoran</i>
N 40 80	LD12	Finnea	<i>Derragh</i>

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## 12.2 EXAMPLE OF AERIAL PHOTOGRAPH



LD06 – Ardagh

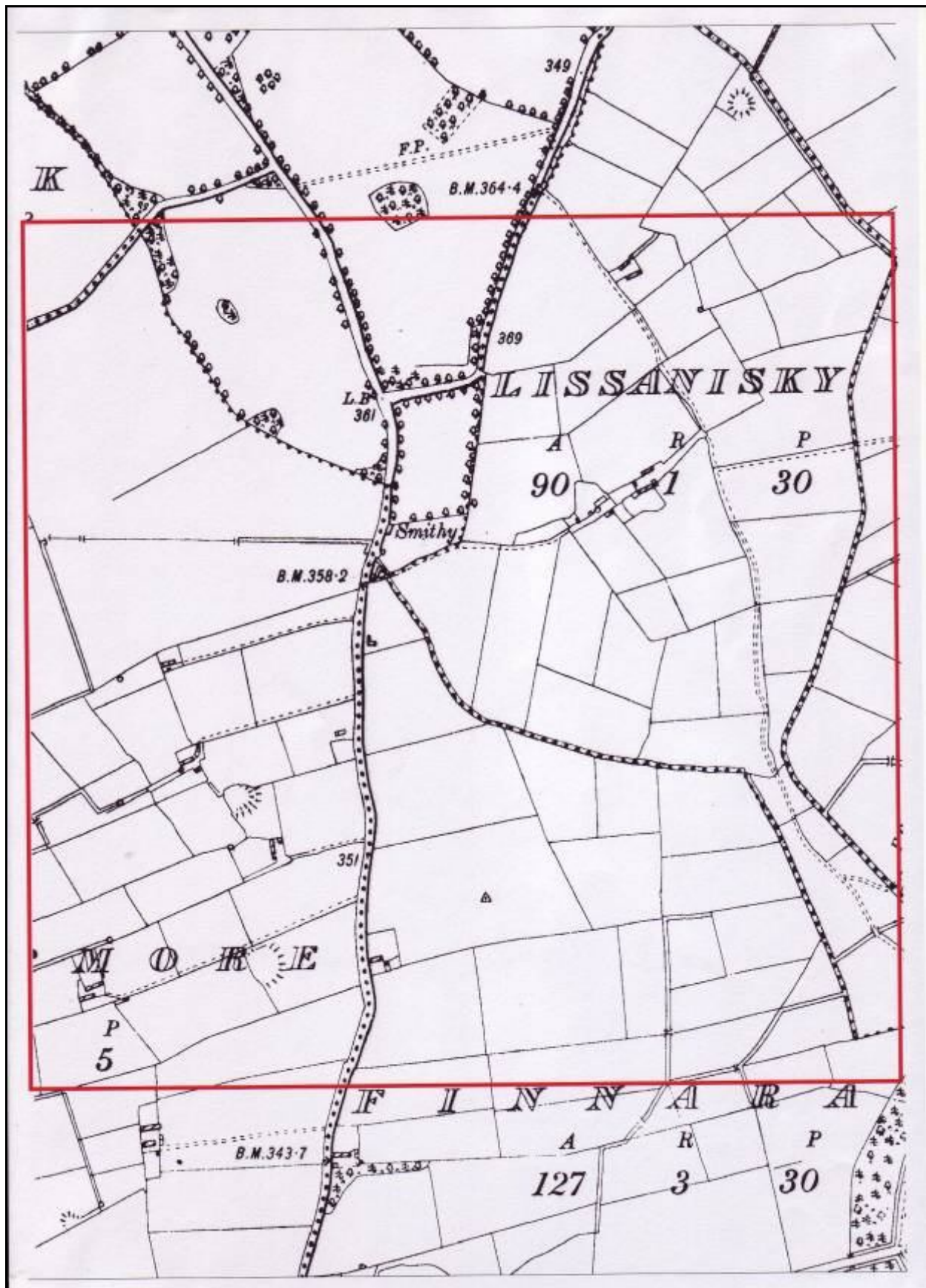
### 12.3 EXAMPLE OF VECTOR MAP



**LD06 – Ardagh**



## 12.4 EXAMPLE OF ORDNANCE SURVEY MAP



LD06 - Ardagh

## 12.5 BLANK 'FIELD RECORDING SHEET'

### 2006 Longford Hedgerow Survey

Square ref.:  
Grid ref.:

Survey duration:

Date:  
Surveyors:

<p><b>Context</b></p> <p><b>A FARM TYPE</b></p> <p>a tillage b dairy c cattle d sheep e mixed stock f mixed stock + crops g stud h other</p> <p><b>B HISTORY</b></p> <p>1x infill 2x townland boundary 3x canal side boundary 4x railway line boundary x1 + roadside x2 + stream</p> <p><b>C ADJACENT LAND USE &amp; D LINKS WITH OTHER HABITATS</b></p> <p>a arable (BC) b improved grassland (GA) c semi-natural grassland (GS) d non-native woodland (WD) e semi-natural woodland / scrub (WN) f scrub/transitional woodland (WS) g curtilage/built land (BL) h peatlands (P) i lake/pond (FL) j watercourse (FW) k other (target note) l. none m. hedge,treeline (WL1,2)</p> <p><b>E BOUNDARY FUNCTION</b></p> <p>1 hedge redundant 2 active boundary</p>	<p><b>Construction</b></p> <p><b>F OUTLINE</b></p> <p>a linear /regular b non-linear/irregular</p> <p><b>G BOUNDARY TYPE</b></p> <p>1x Single Line Hedge 2x Double Line Hedge 3x Random Line</p> <p>x1 + Bank x2 + Wall x3 + Shelf</p> <p>xa + External Drain xb + Internal Drain xc + Internal Path, Track-way, etc.</p> <p>x0 None of the above features</p> <p><b>G1 Fossitt Class</b></p> <p>1 WL1- Hedgerow 2 WL2 - Treeline</p> <p><b>H BANK/WALL/SHELF SIZE</b></p> <p>a &lt; 0.5m b 0.5 – 1 m c &gt; 1m d not applicable</p> <p><b>I DRAIN SIZE</b></p> <p>1 not present 2 small (&lt;0.5m) 3 medium (0.5 – 1m) 4 large (&gt;1m)</p>	<p><b>Structure/Condition</b></p> <p><b>J PROFILE</b></p> <p>a remnant b relict (derelict) c losing structure d boxed / A shape e overgrown f overgrown + outgrowth at base g top heavy / undercut h straight sided</p> <p><b>K HEIGHT</b></p> <p>1 &lt;1.5m 2 1.5 – 2.5m 3 2.5 – 4m 4 &gt;4m</p> <p><b>L WIDTH</b></p> <p>a &lt; 1m b 1– 2m c 2 – 3m d 3 m+</p> <p><b>M GAPPINESS</b></p> <p>1 complete 2 &lt; 5 % gaps 3 5 – 10 % gaps 4 10 – 25 % 5 25 – 50 % 6 &gt; 50 %</p> <p><b>N BASE</b></p> <p>a open c scrawny d dense e. very dense xa plus vegetation</p>	<p><b>Structure/Condition</b></p> <p><b>O BANK /WALL/SHELF DEGRADATION</b></p> <p>1 severely eroded 2 eroded in parts 3 bank intact 4 not applicable</p> <p><b>P TREES</b></p> <p>a none b few c scattered d abundant e line</p> <p><b>Q TREE AGE COMPOSITION</b></p> <p>1 all mature 2 young trees present 3 no trees</p> <p><b>R VERGE</b></p> <p>a &lt; 1m b 1 – 2 m c 2 – 4 m d 4m + e none</p> <p><b>S FRUITING</b></p> <p>1 none 2 sparse flowers and fruit 3 average fruiting 4 heavy fruiting</p> <p><b>T OVERALL VIGOUR</b></p> <p>a poor b average c good</p>	<p><b>Management</b></p> <p><b>U MANAGEMENT</b></p> <p>a cut box profile b cut 'A' shape c cut on one side d cut on both sides e topped f excavator g fully laid h laid in part i coppiced j short term unmanaged k long term unmanaged l infill planting</p> <p><b>V MANAGEMENT METHOD</b></p> <p>1 flail 2 circular saw 3 bar cutter 4 hand tools 5 excavator 6 other 7 unsure 8 not applicable</p> <p><b>W EVIDENCE OF LAYING</b></p> <p>a no evidence b past evidence c recent evidence</p> <p><b>X FENCING</b></p> <p>1 none 2 fixed to stems 3 electric 4 post &amp; wire 5 sheep wire 6 timber fence</p>
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	A	B	C	D	E	F	G	G 1	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
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## 12.6 DOMIN SCALE

The Domin scale is used to record the percentage cover of each woody shrub species in the recorded 30m strips of the sampled hedges. Total percentage cover may add up to more than 100% because of layering of the vegetation.

<b>Domin scale</b>	<b>% cover</b>
10	91-100
9	76-90
8	51-75
7	34-50
6	26-33
5	11-25
4	4-10
3	<4

## 12.7 DAFOR SCALE

The DAFOR scale is used to record a subjective assessment of the frequency of occurrence of certain shrub and climber species in the sample hedges.

<b>Code</b>	<b>Description</b>	<b>Meaning</b>
D	Dominant	Comprises most of the sample
A	Abundant	Very frequent in the sample but not dominant
F	Frequent	Frequently seen in the sample
O	Occasional	Seen but not frequently occurring
R	Rare	Hardly ever found
x	Absent	Not present in the sample