Kellystown
Local Area Plan

Adopted 11th January 2021

Appendix 1
Biodiversity Report

Comhairle Contae
Fhine Gall
Fingal County
Council

KELLYSTOWN LOCAL AREA PLAN

Biodiversity Report prepared to inform preparation of Local Area Plan for Fingal County Council

Minogue and Associates

CONTENTS

1 INTRODUCTION

Avison Young were appointed to prepare the Kellystown Local Area Plan (LAP). Minogue and Associates undertook a series of ecology surveys to describe the existing ecological baseline and help inform the LAP and Green Infrastructure Measures and proposals as part of the plan preparation.

1.2 OVERVIEW OF LANDS

Kellystown is located approximately 1.5 km from Blanchardstown Town Centre, 1.8 km from Blanchardstown Main Street and 9.8 km from O'Connell Street, Dublin. The subject lands are situated directly south of the Royal Canal and the Dublin-Maynooth Railway Line and between Diswellstown Road to the east and Clonsilla Road (R121) to the west. A mature hedgerow and trees along the northern boundary offers a defined visual barrier between the lands and Clonsilla village, located north of the canal. Luttrellstown Road, a country thoroughfare frames the lands to the south. Diswellstown Road to the east offers an access point for vehicular and pedestrian traffic to cross the canal and railway line without traversing via a level crossing. The R121/Clonsilla Road, a well-trafficked route, defines the boundary of the lands to the west and is part of a network of roads linking Blanchardstown to Lucan.

The lands at present are largely undeveloped and contain detached residential units and agricultural holdings.

1.3 OBJECTIVES OF THE STUDY

The following Objective for the preparation of the Kellystown LAP informed the ecological surveys:

• *Provide a study of the tress, hedgerows and other features of biodiversity value suitable for retention and a programme agreed with the Council's Biodiversity Officer as to how these features can be protected or improved and the biodiversity value of the Canal maintained or improved.*

The following surveys were undertaken to meet the above requirements:

1. Habitat and flora survey of subject lands
2. Hedgerow Appraisal Survey
3. Bat Survey- 2 transects between June to September.
4. Bird Survey (outside the original brief but included during hedgerow survey fieldwork).

1.3 STRUCTURE OF THIS REPORT

Section Two: Habitat and Flora Survey

Section Three: Hedgerow Appraisal Survey

Section Four: Bat Survey

Section Five: Bird Survey

Supporting appendices:

Appendix A: Habitat Survey of agricultural fields

Appendix B: Species List from Habitat Survey

Appendix C: Hedgerow Appraisal Forms

Appendix D: Bird Survey Notes

2 HABITAT SURVEY

This report documents a walk-over species record and habitat survey of fields under the ownership of Kellystown House and two short sections of the north and south tow path of the Royal Canal, Dublin.

Minogue and Associates commissioned Dr Frances Giaquinto CEnv MCIEEM to undertake a phase 1 habitat survey and botanical survey of the lands as part of the LAP plan preparation.

2.1 TEAM COMPETENCIES

Dr Giaquinto was assisted by Phoebe O'Brien, BSc Botany in undertaking the fieldwork and reporting elements.

2.2 METHODOLOGY

2.2.1 DESKTOP REVIEW

A desktop review was completed for the Local Area Plan lands. This involved a review of published information on the site and surrounding area, a review of historical mapping and satellite imagery, published atlases and national databases. Information held by nature conservation organisations, including the National Parks & Wildlife Service were also consulted during the desktop review.

In addition to the above, a search of the National Biodiversity Data Centre (NBDC) for all records of flora and fauna for the tetrad in which the study site is located was also completed. The NBDC was accessed on the 7th August 2019.

Ordnance Survey Ireland (OSI) historical maps were also reviewed to identify the presence of field enclosures and long-standing hedgerow boundaries within the study site.

2.2.2 RELEVANT LEGISLATION, POLICY & GUIDELINES

This report has been prepared with regard to the following legislation, policy documents, and guidelines as relevant:

National and International Legislation

- Planning and Development (Amendment) Act 2010, as amended; hereafter collectively referred to as the Planning Acts;
- Wildlife Act, 1976 and Wildlife (Amendment) Act (2000) (as amended); hereafter collectively referred to as the Wildlife Acts;
- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011 (as amended); hereafter referred to as the Birds and Habitats Regulations;
- EU Birds Directive 2009/147/EEC;
- EU Habitats Directive 92/43/EEC (as amended); and,
- Flora (Protection) Order, 2015.

RELEVANT GUIDELINES

- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA, 2003 and updated Draft 2015);
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2002 and updated Draft 2015);
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd Edition. (CIEEM 2016);
- Guidelines for Preliminary Ecological Appraisal (CIEEM, 2013)
- Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011);
- A Guide to Habitats in Ireland (Fossitt, 2000);

and

- Environmental Planning and Construction Guidelines Series (National Roads Authority, 2005 – 2011).

2.2.3. DESK STUDY

In addition to those listed in the references section of this chapter, key resources included:

- Ordnance Survey of Ireland mapping and aerial photography available from www.osi.ie;
- Online data available on protected species as held by the National Biodiversity Data Centre (NBDC) from www.biodiversityireland.ie;
- Online data available on European sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie;
- Information on land-use zoning from the online mapping of the Department of the Environment, Community and Local Government www.myplan.ie;
- Information on water quality in the area available from the Environmental Protection Agency (EPA) www.epa.ie;
- Information on the status of EU protected habitats and species in Ireland (National Parks & Wildlife Service, 2013a & 2013b);

RELEVANT LOCAL POLICIES AND PLANS:

- Fingal County Development Plan 2017-2023;
- River Basin Management Plan 2018-2021.

2.3 PHASE 1 HABITAT SURVEY & FLORA SURVEYS

The habitat survey was based upon an extended Phase 1 Survey in line with the Heritage Council's Best Practice Guidance for Habitat Survey and Mapping (2010). The classification of habitats recorded during the field survey is based on the Heritage Council's A Guide to Habitats in Ireland.

The Guide to Habitats in Ireland classifies habitats according to a hierarchical framework with Level 1 habitats representing broad habitat groups, Level 2 representing habitat sub-groups and Level 3 representing individual habitat types. The Phase I Field Survey focused on identifying habitats to Level 3 of the Guide to Habitats in Ireland. The survey was completed on the 8th August 2019.

Plant nomenclature in this report follows Webb (1996) for vascular plants and Smith (2004) for mosses.

2.4 RESULTS

2.4.1 DESKTOP ANALYSIS

Designated Conservation Areas

The lands occurring within and immediately adjacent to the study site are not subject to any European Site designations. The nearest European Sites to the study area is over 5km away. There are five SACs and two SPAs occurring in the wider vicinity. Table 1 presents the European Sites within a 15km buffer of the Kellystown Lands.

TABLE 1 EUROPEAN SITES WITHIN A 15KM BUFFER OF LAP LANDS

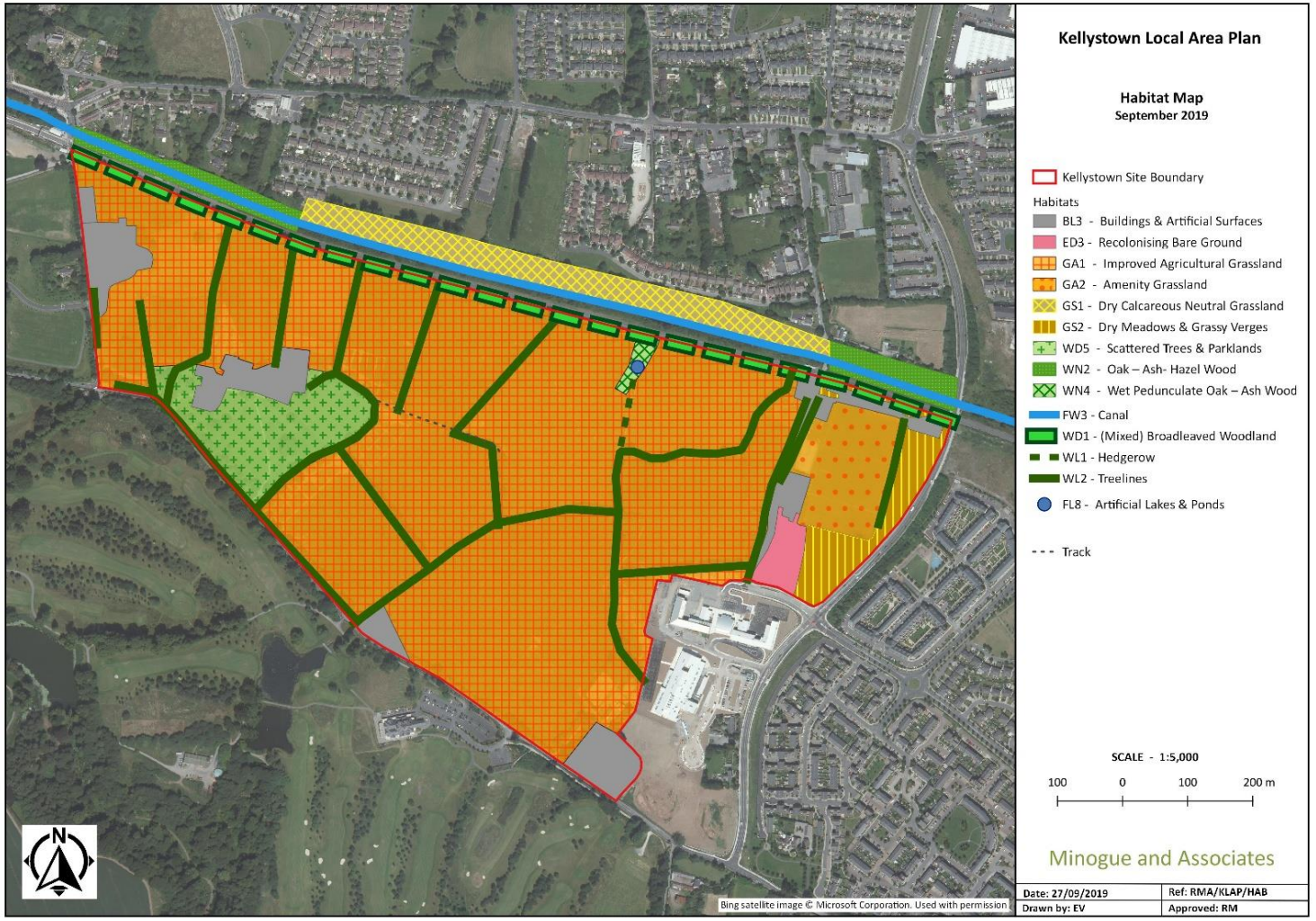
Site Code	Site Name	Distance To (m)	Qualifying Interests (* denotes a priority habitat)
001398	Rye Water Valley/Carton SAC	5187.12	**Habitats** 7220 Petrifying springs with tufa formation (Cratoneurion)* **Species** 1016 Desmoulin's Whorl Snail *(Vertigo moulinsiana)* 1014 Narrow-mouthed Whorl Snail *(Vertigo angustior)*
001209	Glenasmole Valley SAC	13610.69	**Habitats** 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) 7220 Petrifying springs with tufa formation (Cratoneurion)*
000210	South Dublin Bay SAC	14173.69	**Habitats** 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 2110 Embryonic shifting dunes
0004024	South Dublin Bay and River Tolka Estuary SPA	12477.13	Birds A144 Sanderling (Calidris alba) A157 Bar-tailed Godwit (Limosa lapponica) A149 Dunlin (Calidris alpina) A162 Redshank (Tringa totanus) A179 Black-headed Gull (Chroicocephalus ridibundus) A143 Knot (Calidris canutus) A192 Roseate Tern (Sterna dougallii) A046 Light-bellied Brent Goose (Branta bernicla hrota) A141 Grey Plover (Pluvialis squatarola) A130 Oystercatcher (Haematopus ostralegus) A194 Arctic Tern (Sterna paradisaea) A193 Common Tern (Sterna hirundo) A137 Ringed Plover (Charadrius hiaticula) Habitats Wetlands

The nearest proposed Natural Heritage Area to the subject lands is the Royal Canal pNHA which forms the northern boundary outwith the subject lands. This has been surveyed as part of the Royal Canal Greenway proposals, most recently in 2018[1].

The following Sub-Sections describe the habitats occurring within and immediately adjacent to the survey site. Each habitat described below has been identified to Level 3 of Fossit's Guide to Habitats in Ireland. The alpha-numeric code for each habitat is also provided alongside the habitat name (e.g. wet grassland GS4). The locations and extent of each habitat described below are illustrated on Figure 1. Appendix 1 provides a description of the fields surveys as part of the habitat survey undertaken.

[1] Royal Canal Urban Greenway Biodiversity Assessment, Fingal CC Natura Ltd 2018

FIGURE 1 HABITATS WITHIN KELLYSTOWN LAP BOUNDARY



2.4.1 Improved Agricultural Grassland (GA1)

The nine fields surveyed correspond to improved agricultural grassland (GA1). Most of the fields are included within the curtilage of Kellystown House and are grazed by high value horses and / or cows. The standard management practice adopted on the estate is routine herbicide treatment of all hedgerow edges to prevent seed dispersal of noxious weeds such as docks (*Rumex* spp.) and spear thistle (*Cirsium vulgare*). This has resulted in a sparse native ground flora and over-abundance of weedy species such as willowherbs and noxious weeds which tend to quickly colonise ground laid bare by herbicide treatment. Over the medium to long term the health of the hedgerows is likely to be damaged by the build-up of herbicide residues. The grassland is mainly rye (*Lolium perenne*) and white clover (*Trifolium repens*) with plentiful bentgrass (*Agrostis stolonifera)* and occasional weeds characteristic of high nitrogen conditions, such as docks (Rumex spp.) and Spear thistle (*C. vulgare*). Annex A presents a summary of each of the nine fields surveyed as part of the habitat survey. Note that the lands at Greenmount House, west of Kellystown are not yet accessible.

2.4.2 Amenity Grassland(GA2)

This corresponds to the playing pitch on the eastern boundary of the LAP at St Mochta's Football Club.

2.4.3 Dry meadows and Grassy Verges (GS1)

Again this habitat is located at the eastern boundary of the LAP lands and forms the southern and eastern boundary of the LAP.

Rounding the corner to the main road there are planted Ash and Dogwood with bindweed (*Calystegia sylvatica*) and ragosa roses behind. Behind this there is an earth bank of brambles, red bartsia, red clover. Bumblebees were plentiful during the survey. Through the bank there is an ungrazed field, with a rough path used as a short-cut to the playing field. The grass is long and herb rich with some Festuca sp., rushes (*Juncus* sp.) and plentiful Tufted vetch and Black knapweed. An unidentified vetch, possibly (*Vicia sativa*), has been dominant earlier in the summer and has now gone over. This grassland could be brought back to species rich grassland with careful management. Rosebay willowherb has established a stand mid-field and there are occasional Ragwort plants.

2.4.4 HEDGEROWS (WL1)/ TREELINES (WL2)

All fields within the study area are enclosed by hedgerows and treelines. A total of 19 hedgerows and treelines have been identified within the study area. The hedgerows and treeline field boundaries are numbered in Figure 2. The study area supports approximately 5.6km of linear hedgerow and treelines.

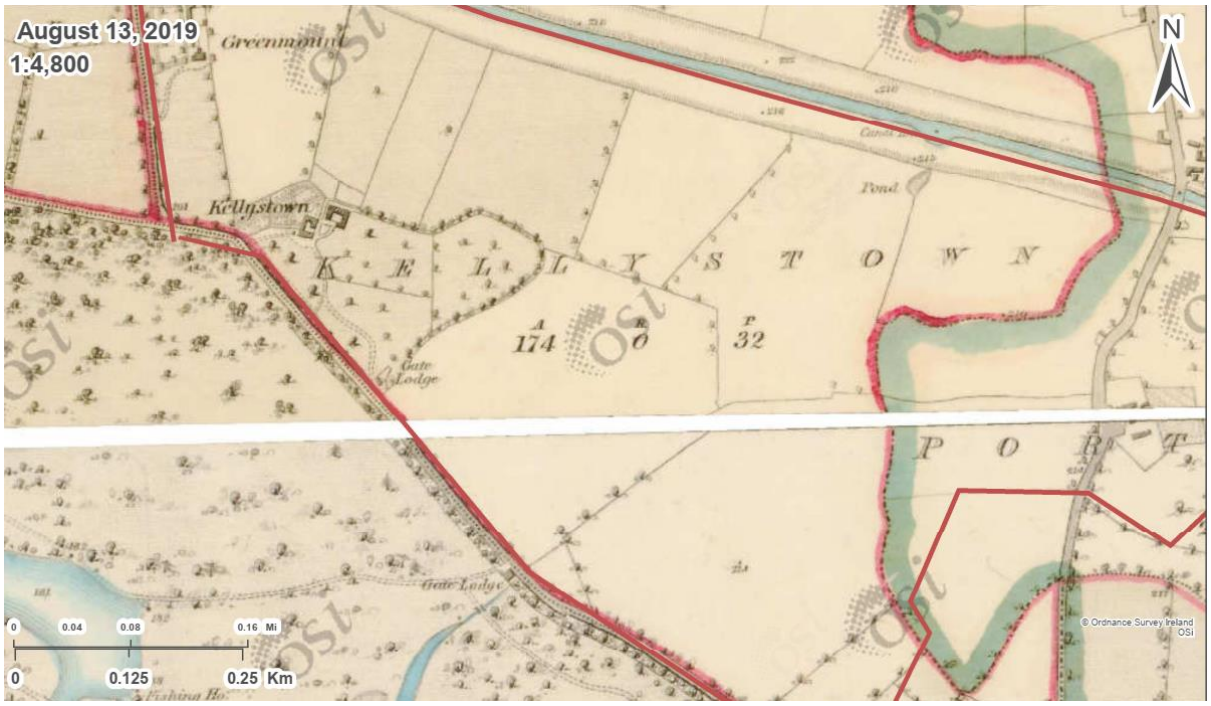
The dominant species in hedgerows are Ash *(Fraxinus excelsior),* Hawthorn (*Crataegus monogyna)* and Elder (*Sambucus nigra*). Shrub species noted along the hedgerows and treelines include Holly (*Ilex aquifolium),* Rowan (*Sorbus aucuparia*), elder (S. *nigra*) with occasional blackthorn (Prunus spinosa). Sycamore (*Acer_pseduplatanus*) was recorded in eight of the hedgerows and treelines surveyed.

The historic hedgerows and treelines occurring within the site are shown on Figure 2. Each of these field boundaries are indicated on the 1838 6-inch maps and the non linear boundary that runs north to south along the eastern part of the LAP lands is a parish and townland boundary. In three instances field boundaries at Kellystown house follow the 1838 boundaries but have been replaced in the past 40 year by a treeline of planted Poplar species.

18 of the 19 hedgerows are more accurately described as treelines or linear strips of woodland given their width exceeds 4m. Of note in this regard is the mature treelines that forms the northern boundary between the LAP lands and the railway corridor (H2).

A hedgerow appraisal and evaluation survey has been undertaken and the results are presented in Appendix 2. A summary of the appraisal in terms of significance and condition is presented in Table 2.

FIGURE 2 ORDNANCE SURVEY MAP 1ST EDITION, LANDS AT KELLYSTOWN (HERITAGEMAPS.IE)



2.4.5 WET PEDUNCULATE OAK-ASH WOODLAND (WN4)

Associated with the infrastructure of the Royal Canal is a canal pond (classified as Artificial Lake and Pond FL8, see below). The woodland is not present on the 1st edition Ordnance Survey map whilst the pond is marked. Most probable is the construction of the railway closely after the Royal Canal construction rendered this pond unusable for its original purpose to hold bricks and the mixed treeline developed around the pond.

Tree species recorded include a mature woodland of ash (*F. excelsior*), hawthorn (*C. monogyna*) and blackthorn (*P. spinosa*) with established woodland flora including Lords and Ladies (*Arum maculatum*), and Hart's tongue fern (*Asplenium scolopendrium*) although it was inaccessible at the time of the survey and may contain more vernal species.

2.4.6 ARTIFICIAL LAKES AND PONDS (FL8)

As outlined above in Section 2.3 this is a manmade pond associated with the industrial heritage of the Royal Canal. It is enclosed by woodland WN4 and includes steep embankments to the pond itself. Access is not possible due to the fencing and steep slopes. Based on a visual inspection, this pond is still with no obvious water supply in evidence. It is heavily shaded by the woodland and shows signs of nutrient enrichment with vegetation dominated by duckweed (*Lemna* sp.).

2.4.7 Drainage Ditches

Drainage ditches are present infrequently on the LAP lands, with ditches associated in whole or part with 5 hedgerows; one is a dry double ditch (H13); whilst the only wet ditch is at H16, a steep embankment on the eastern side with water flowing in it on the day of the survey, and contained some different species not found elsewhere in the site, including brown sedge (*Carex disticha),* great manner grass (*Glyceria maxima),* and wild celery (*Apium* sp). Ground flora next to the ditch included the invasive shrub, snowberry (*Symphoricarpos albus*), native hogweed (*H. sphondylium*), and coltsfoot (*Tussilago farfara*).

2.4.8 Recolonising Bare Ground (ED3)

The first small area is disturbed ground where some rubbish has been dumped on the eastern part of the lands. The flora contains a few (*Lolium italicum*), red shanks, shepherd's purse, knotgrass and swine cress and several willowherb species. Coltsfoot is establishing as are buddleia and willow saplings toward the northern edge. Grass cover is low, with herbs dominating creeping buttercup, (*Vicia sativa*), Black medic, silverweed (*P. anserina*) and creeping cinquefoil (*P.reptans*), red bartsia (*Odontites vernus*), pineapple weed (*Matricaria discoidea*)and ragweed point towards recent disturbance. Along the roadside fence there are small dogwood shrubs (*Cornus* sp.), presumable escapes from planting.

2.4.9 Built Land and Artificial Surfaces (BL3)

This corresponds to houses, outbuildings, lanes and hard surfaces within the LAP boundary. Some of the older buildings such as those associated with Kellystown House, and a derelict building on the east offer crevices and potential roosting opportunities for bats.

2.4.10 Scattered Trees and Parkland (WD5)

A small area to the east and south of Kellystown House is classified as Scattered Trees and Parkland and is likely demesne planting associated with the construction of Kellystown House in the 1800s. This parkland is grazed by horses, enclosed by timber fencing and includes a variety of mature specimen trees including a Lebanon Cyprus (*Cedrus liban*) and Lime Tree (*Tillia spp*) (forming part of H16). A small area of calcareous grassland was noted adjacent to this area There is a narrow border of Dry Calcareous Grassland, GS1, near Kellystown House (Plate 1), indicating what the vegetation would be like under different management.

PLATE 1 CALCAREOUS GRASSLAND ON EDGE OF IMPROVED AGRICULTURAL GRASSLAND.

2.5 ROYAL CANAL TOWPATH

2.5.1 ROYAL CANAL TOW PATH NORTH

The tow path to the north of the Royal Canal was surveyed from the entrance on the Porterstown Road, to just past the bridge where steps lead down from the railway station, approximately 1 km.

The path is laid to tarmac with a steep dry earth bank on the north side which rises 2 to 3 m to a flatter area above, and a narrow vegetation margin of 1 to 3 m on the south side with a steep bank down to the river (Image 4).

The dry bank alternated between being shaded with woodland ground flora and areas which were in full sunlight and not shaded by the canal-side trees. To the south of the path the bank is shaded and the sharp slope prohibited direct surveying and sampling of the aquatic vegetation in the canal. This difficulty of access may help protect the waterway from invasive plants.

The tow path north was walked from east to west. Terrestrial plants seen are discussed first, followed by aquatic species.

At the entrance to the tow path there is a mature larch (*Larix decidua*) where vegetation on the bank has been cut to keep the pathway clear. This is the only area which appears to be managed.

2.5.2 WILDFLOWERS

There was a great diversity of wildflowers which are supporting several bumblebee, butterfly and insect species. Meadowsweet (*Filipendula ulmaria*), herb Robert (*Geranium robertianum*), bush vetch (*Vicia sepium*), cat's ear (*Hypochaeris radicata*), honeysuckle (*Lonicera periclymenum*), black medic (*Medicago lupulina*), white clover (*T. repens*), red clover (*Trifolium pratense*), upright hedge parsley (*Torilis japonica*), Garlic mustard (*Alliaria petiolata*), Tutsan (*Hypericum androsaemum*), square stalked St John's wort (*Hypericum tetrapterum*), yellow vetchling (*Lathyrus pratensis*) and native hogweed (*H. sphondylium*) are all fairly common. More noteworthy species include wild carrot (*Daucus carota*) (Image 5), lady's bedstraw (*Galium verum*), agrimony (*Agrimonia eupatoria*), salad burnet (*Sanguisorba minor*), common restharrow (*Ononis repens*), dove's foot cranesbill (*Geranium molle*), wild marjoram (*Origanum vulgare*), field scabious (*Knautia arvensis*), kidney vetch (*Anthyllis vulneraria*), black knapweed (*Centaurea nigra*), red campion (*Silene dioica*) and Hemp agrimony (*Eupatorium cannabinum*). Many of these species favour calcareous and free-draining soils.

In the more shaded areas, the poisonous lords and ladies (*Arum maculatum*) and Hart's tongue fern (*Asplenium scolopendrium*) were locally abundant.

PLATE 2 WILD CARROT (DAUCUS CAROTA), CHARACTERISTIC OF CALCAREOUS HABITATS

2.5.3 SHRUBS AND TREES

Elder (*S. nigra*), wild privet (Ligustrum vulgare), gorse (Ulex europea), alder (*Alnus glutinosa*), rowan (*Sorbus aucuparia*), ash (F. excelsior) which was showing signs of ash dieback disease, hawthorn (*C. monogyna*), brambles (*Rubus fruticosa* agg.), dog rose (*Rosa canina*), and wild raspberry (*Rubus occidentalis*).

Buddleia (*Buddleia davidii*) and box-leaved honeysuckle (*Lonicera nitida*) were occasional. Both these shrubs can become highly invasive and implementation of control measures are recommended.

2.5.4 INVASIVE SPECIES

Rosebay willowherb (*Epilobium hirsutum*) was abundant. This native seed-dispersed plant can create large stands, particularly following disturbance in late summer and early autumn.

Coltsfoot (*T. farfara*) was locally abundant. This species, although native, can become invasive, spreading rapidly by rhizome fragments. Because it dies back in winter, soil contaminated with coltsfoot can be easily disturbed or transported to another area.

Bindweed (*Convolvulus major*) was recorded as infesting shrubs and ground flora near the station, which will eventually lead to suffocation of the plants it grows up. It is important not to inadvertently spread it by disturbance.

2.5.5 INVASIVE ALIEN SPECIES

Giant butterbur (*Petasites japonicus*) infests the north canal bank for 30 m opposite the steps to the station car park (Image 6). This introduced species rapidly spreads by underground rhizomes and destroys native vegetation by shading out ground dwelling species. Timely eradication is critical.

Buddleia (*Buddleia davidii*) and box-leaved honeysuckle (*Lonicera nitida*) are both highly invasive, and a programme of management is strongly recommended.

Winter heliotrope (*P. fragrans*) infests the area around the train track, old station building, and the steep wooded south bank of the canal. This species spreads remarkably quickly, particularly if the soil is disturbed. It shades out all native ground flora and rapidly becomes an unsightly monoculture. It is very difficult to eradicate, but efforts should be made to control its rate of spread.

Sycamore (*Acer pseudoplatanus*) and red valerian (*Centranthus ruber*) are not native but they are naturalised throughout Ireland. Both species were recorded as invading stone work along the tow path (Images 7 and 8). Their roots have the capacity to destabilise walls and control measures are recommended.

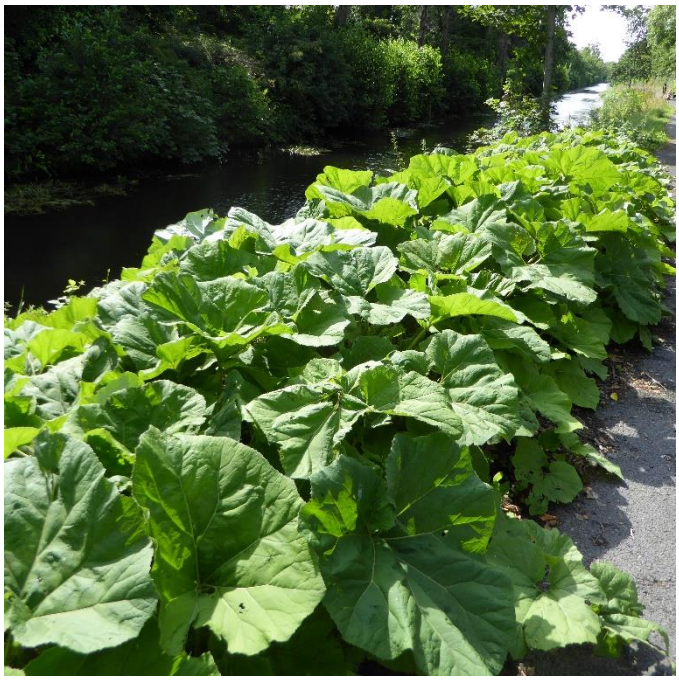


Plate 3 Giant butterbur infesting the canal bank.

Image 7.

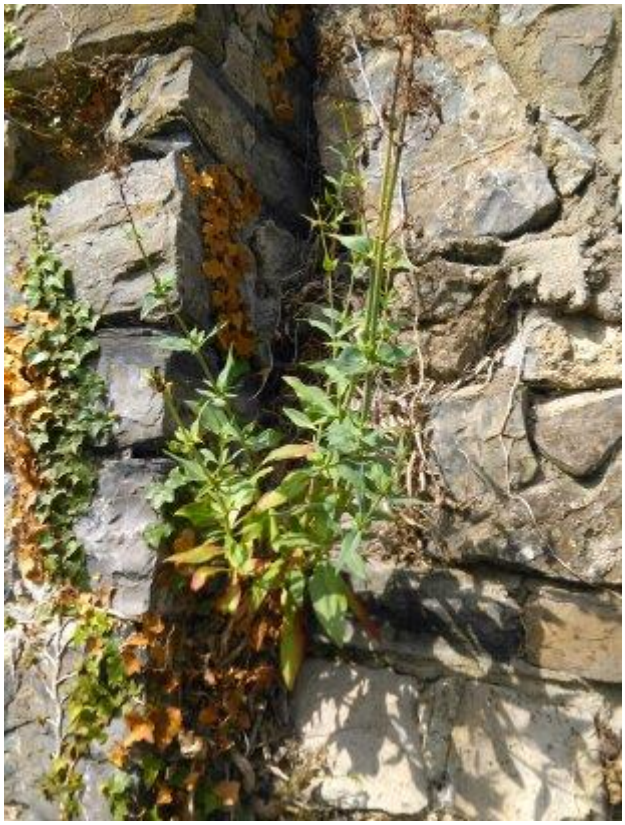


Plate 4 Red valerian (*Centranthus ruber*) can break apart stone work and damage structures.

Plate 5:. Sycamore (*Acer pseudoplatanus*) invading stone work at the canal edge by the bridge.

2.5.6 AQUATIC SPECIES

Floating sweet-grass (*Glyceria fluitans*), yellow water lily (*Nupha lutea*), unbranched bur-reed (*Sparganium emersum*), arrowhead (*Sagittaria latifolia*), common water plantain (*Alisma plantago-aquatica)*, water-milfoil (*Myriophyllum sp.*) and broad-leaved pondweed (*Potemogeton natans).*

No invasive alien aquatic species were recorded during the survey; however, the banks were very steep and the water was largely inaccessible. A more detailed survey by boat, along with routine monitoring is recommended.

2.5.7 MEADOW

An area of unmanaged grassland above the tow path and accessed by a step muddy track is species rich and could be restored to conservation status. Common rest harrow (*O. repens*) is locally abundant as is field scabious (*K. arvensis*), kidney vetch (*A. vulneraria*), and black knapweed (*C. nigra*).

The presence of restharrow is important in conservation terms. Although formerly widespread in its Irish distribution, this species is becoming scarce. A familiar species in sand dune systems of Wicklow and Wexford, its range was described by a leading botanist as follows: 'Frequent in the South and East [of Ireland], rare elsewhere', (Webb, 1967). Since then it has declined further. The New Atlas of the British & Irish Flora (2000) indicates contraction of its Midlands distribution and only three locations west of the Shannon (D'Arcy, 2005).[2]

Restoration of this habitat has the potential for citizen science projects and outdoor classrooms. It can be restored to a species rich status by mowing on a high setting in early autumn after seed set or by carefully managed horse grazing. Currently, there is encroachment by brambles throughout the meadow and by blackthorn (*P. spinosa*) at the hedgerow boundaries. These should be cut back manually.

Signage to raise awareness and for educational purposes is recommended.

2.5.8 TOW PATH SOUTH

The short section of the south tow path is very different from the north tow path with high, very steep banks and dense overhanging vegetation, creating dense shade in

[2] D'Arcy, G (2005) Clarinbridge Cow Park, habitats and heritage report. Prepared for Clarinbridge Cow Park Steering Committee.

places. Bank erosion is severe on both river banks. Vegetation is characteristic of woodland species and a further survey is recommended for the spring.

Plate 6: Entrance to the tow path (south)

2.5.9 WILDFLOWERS AND GROUND FLORA

Many of the plants recorded are those typically found in woodlands because of the dense shade created by the high unmanaged hedgerow. Species recorded include wood avens (*Geum urbanum*), herb robert (*G.*), native hogweed (*H. sphondylium*), Hemp agrimony (*E. cannabinum*), broad leaf plantain (*Plantago major*), willowherbs, bush vetch (*Vicia sepium*), viola spp., selfheal (*Prunella vulgaris*), germander speedwell (*Veronica chamaedrys*), lords and ladies (*A. maculatum*), and the ferns polypody (Polypodium vulgare) and Harts tongue (*Asplenium scolopendrium*). There may be more vernal species found if surveyed again in the spring. Less shaded areas were vegetated by lady's bedstraw (*G. verum*), marjoram (*O. vulgare*) and black knapweed (*Centaurea nigra*). Nettles (*U. dioica*) may become a problem given the narrowness of the path.

2.5.10 SHRUBS AND TREES

The hedgerow is predominately composed of ash (*F. excelsior*), hawthorn (*C. monogyna*) and elder (*S. nigra*). Sycamore (*A. pseudoplatanus*) borders the canal where there has been bank collapse. Buddleia (*B. davidii*) infests the north bank and there is a large stand of invasive snowberry (*S. albus*) at the entrance to the path.

2.4.10 INVASIVE NATIVE SPECIES

As described in Section 2.4.5, rosebay willowherb and coltsfoot can spread to form extensive stands and manual (not herbicide) control is recommended.

Prickly lettuce (*Lactuca serriola*) is an invasive alien species that was first recorded in Ireland in 2015. To date, it appears to be confined to Leinster and southern parts of Munster. Its control is recommended.

3 HEDGEROW APPRAISAL SURVEY KELLYSTOWN LOCAL AREA PLAN

3.1 INTRODUCTION

This report presents the results of the Hedgerow Appraisal and Condition Assessment undertaken on the hedgerows and treelines identified on the lands covered by the draft Kellystown Local Area Plan.

Field surveys were undertaken on 8th August 2019 by Ruth Minogue MCIEEM, Dr Fran Giaquinto MCIEEM, CEnv and Phoebe O'Brien, Bsc Botany. Additional fieldwork was undertaken on 19.08.2019. A site visit by the wider team was undertaken on 18.09.2019 to access the western lands at Greenmount estate.

3.2 METHODOLOGY

The hedgerow survey and appraisal methodologies followed the *Hedgerow Appraisal System – Best Practice Guidance on Hedgerow Survey, Data Collation and Appraisal* (Foulkes et al., 2013).

The hedgerows within the LAPS lands were surveyed. Access was not always possible to both sides or the interior of the hedgerow (for example the hedgerow/treeline that bounds the railway corridor). The hedgerow flora species were identified as well as any hedgerow features and where possible the confirmation of earth bank/ditch or stone wall. The surveyors walked the length of the hedgerow where access was possible and a 30m representative survey section. For the lands in Kellystown House farm access was limited in two fields due to the presence of bulls or high value race horses.

The main constraint relates to the ground flora and seasonality of the survey, many of the species identified in the Hedgerow Appraisal System are Spring or early Summer flowering and given the time of the surveys in August would no longer be in flower so may be under recorded.

Figures 3. presents the hedgerows surveyed and the 30m survey strip. Figure 4 presents the appraisal of the hedgerows surveyed in terms of overall significance and condition.

Section 2 presents a summary of the hedgerow appraisal and recommended enhancement/mitigation measures where relevant. It is proposed to retain all the hedgerows on site but a number of hedgerows will be severed to facilitate the proposed road through the LAP lands.

3.3 SUMMARY OF HEDGEROW APPRAISAL SURVEY

All fields within the LAP area are enclosed by hedgerows and treelines. A total of 18 treelines and one hedgerow have been identified within the study area. Of the treelines, three were not surveyed as they are relatively recently planted treelines comprising Poplar spp. that replace earlier field boundaries. The hedgerows and treeline field boundaries are numbered in Figure 3. The study area supports approximately 5.66km of linear hedgerow and treelines.

The dominant species in hedgerows are *Fraxinus excelsior* with *Crataegus monogyna* and some *Sambucus nigra*. Shrub species recorded include *Ilex aquifolium*, *Corylus avellana*, and *Rosa canina*. The occasional mature broadleaved *Quercus petraea* also occurs along the treeline of the townland boundary. A range of common herb species occur along the hedgerows that have not been treated with herbicide.

Most of the hedgerows and treelines on site are recorded as field boundaries in the 1838 6 -inch maps. Some of the historic field boundaries within the study area may be representative of ancient hedgerows. The unmanaged nature of the field boundary that forms then northern boundary of the LAP adjacent to the railway corridor has facilitated their spread into adjoining habitat, resulting in wide field boundary corridors. The width of some of this treeline is in excess of 5m, resulting in the development of features more representative of linear woodland.

3.3.1 NATURE CONSERVATION VALUE

The hedgerows occurring within the study site represent a long-term habitat feature within the area. The majority of them are representative of species-rich hedgerows, are of historic value and are of high local conservation value with respect to the species potentially dependent upon them for shelter and food. These hedgerows may function as important commuting and foraging corridors for bats and non-volant terrestrial mammals as well as nesting habitat for a variety of bird species. The native flora supported by the hedgerows are also likely to support a diverse community of invertebrates. The nature conservation value of this habitat is of high local conservation importance (Rating D).

FIGURE 3 HEDGEROW SURVEY KELLYSTOWN

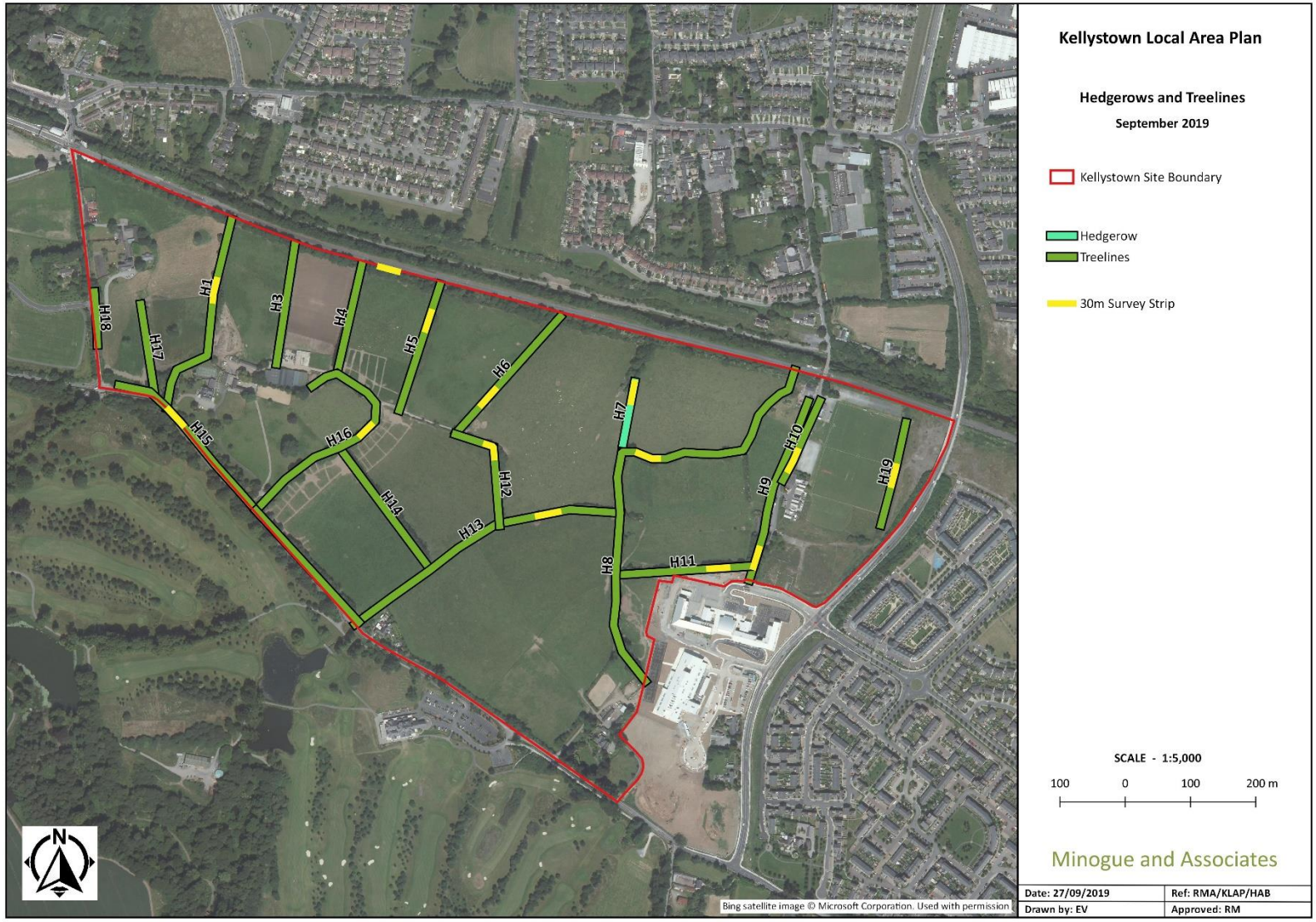
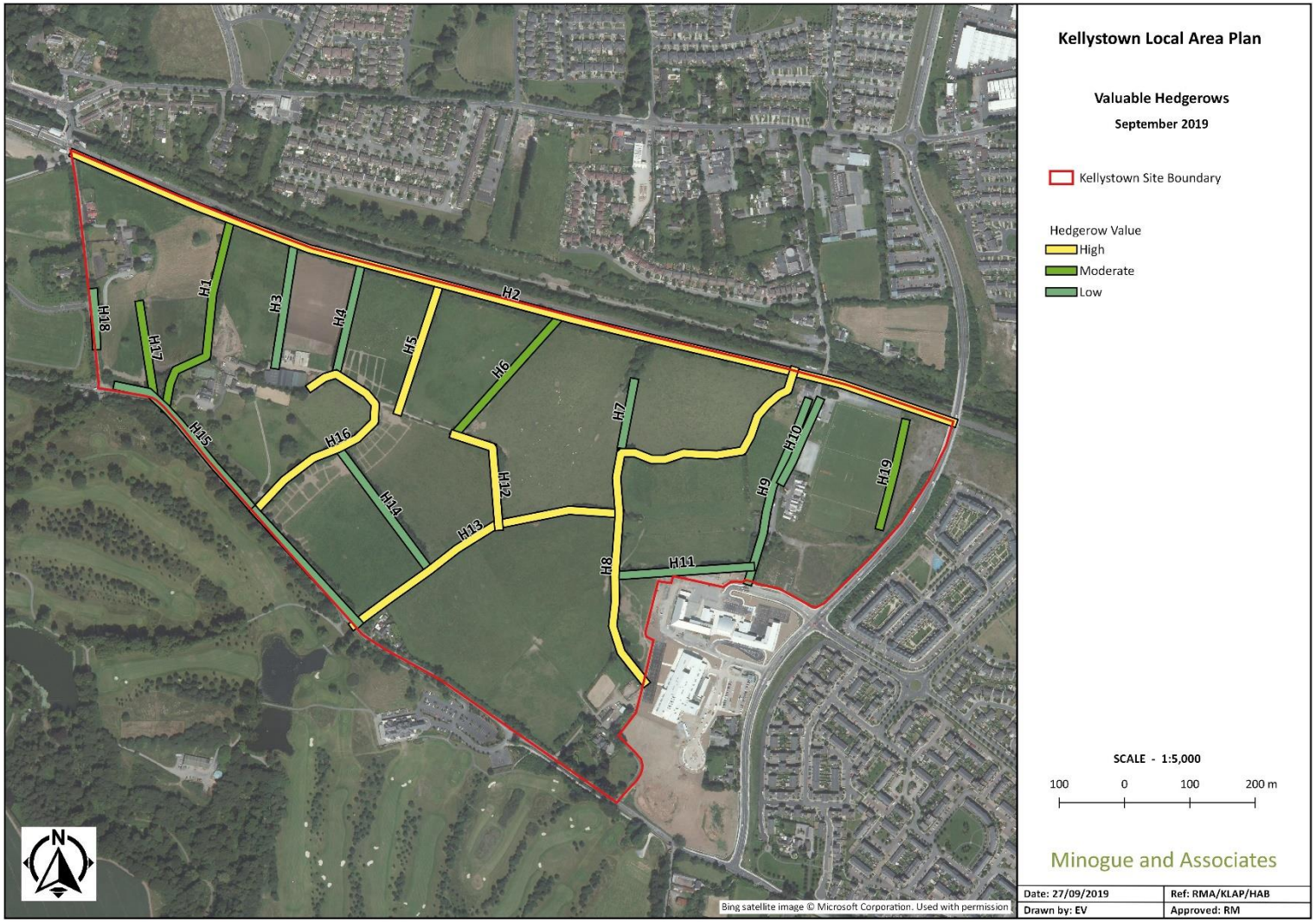


FIGURE 4.EVALUATION OF HEDGEROWS AND TREELINES



3.4 Summary of Hedgerow Appraisal Survey

TABLE 2 SUMMARY OF HEDGEROW APPRAISAL SURVEY

Hedgerow Number	Summary	Fossit Classification	Significance	Condition
H1	A mature hedgerow at the property boundary between Kellystown and Greenmount House; this the most intact westerly hedgerow in the LAP boundary. The lands are subject to spraying with herbicide with a ground flora of herbs tolerant of herbicide application which is used throughout the farm on field borders and under fencing. This hedgerow is mapped as a treeline on the 1st edition series and connects with the mature treeline and embankment to the north associated with the railway corridor.	WL2	13	10
H2	A mature treeline that grades into linear woodland forming the northern boundary of the LAP lands. This treeline is the longest linear boundary on the lands and is largely intact forming an important ecological linear feature and connecting with directly with 8 hedgerows/treelines that run north south within the LAP lands. The transport corridor of the railway line and the Royal Canal pNHA form the northern habitats increasing its overall ecological significance. The treeline and woodland are not marked as such on the 1st Edition O.S maps but are recorded as a boundary. This treeline is dominated by ash (F. excelsior), holly (Ilex aquifolium), and hawthorn (Crataegus monogyna).	WL2	19	17
H3 and H4	Recently planted (within 40 years) treelines of poplars replacing any earlier hedgerow planting. These are fenced by timber and herbicide application. They are of low ecological value based on mono species and narrow base with little ground flora.	WL2	0	0
H5	A well maintained dense hedgerow with a box shaped and supporting some good stands of mature Ash that runs north to south from the railway treeline and linear woodland. The species comprise hawthorn (C. monogyna), blackthorn (Prunus spinosa),	WL2	13	20

Hedgerow Number	Summary	Fossit Classification	Significance	Condition
	ash (F. excelsior), holly (Ilex aquifolium), and elder (Sambucus nigra).			
H6	This hedgerow provides good north south connectivity between railway corridor and two hedgerows south. The species comprise ash (F.excelsior), with shrub layer of holly (Ilex aquifolium), ivy (Hedera helix) and elder (Sambucus nigra).	WL2	14	12
H7	A gappy hedgerow that is dominated by hawthorn and is heavily poached and used by cattle for shelter. Its overall importance relates to the proximity to the Canal Pond and woodland fringe immediately to the north, that in turn links to the Railway corridor woodland (H2), to the south the hedgerow links to the townland boundary treeline	WL1	11	5
H8	A townland and parish boundary, this non linear and structurally diverse treeline runs north from the railway corridor to Luttrellstown Raod. Some gaps are present, primarily related to access to fields. The boundary varies with banks, wet ditches, occasional stone walls and a good diversity of tree and shrub species though dominated by Ash (F.excelsior) and occasional Oak (Querucs peatrea)	WL2	21	24
H9	A roadside treeline that is bisected by old farm buildings, and is recorded as a treeline on the 1st Edition Ordnance Survey Map. A yew tree is present close to the southern part of the treeline facing the roadside. Sycamore(Acer pseudoplantanus), blackthorn (Prunus spinosa), and hawthorn (C.monogyna) in the hedgerows have brambles and nettles growing under them..	WL2	13	6
H10	A roadside treeline that is has a number of gaps associated with access to housing and sports grounds, and is recorded as a treeline on the 1st Edition Ordnance Survey Map. A drain with extensive rubbish is present as well as a stand of winter heliotrope, and dogwood, a presumable garden escape is present along parts of this hedgerow. Ash, hawthorn, hazel are principal species.	WL2	8	8
H11	A treeline comprised entirely of mature ash on a low earth bank, formerly a longer treeline, now separated by recent road infrastructure. Between the road and the ash trees there is an earth mound covered in creeping thistle, fumitory and other ruderals	WL2	11	5

Hedgerow Number	Summary	Fossit Classification	Significance	Condition
H12	An important hedgerow for connectivity around the lands, linking with four other hedgerows. This hedgerow supports a more diverse tree species compared to others on the lands. Dominant species are ash, hawthorn with rowan, field rose and blackberry present also	WL2	14	16
H13	A long hedgerow that runs northeast-southwest, this partly includes a double hedgerow with embankments for part of the hedgerow, creating a small scale green lane. This feature may have been a former internal farm track. Another important hedgerow for connectivity that links with H8 (townland boundary hedgerow) and three other hedgerows/treelines. Hawthorn (C.monogyna), Ash (F.excelsior), Holly (I.aquifolium) and Rowan (Sorbus aucoparia) are present.	WL2	22	12
H14	A Single treeline of poplar trees (matchstick poplars); this is of low ecological value and the trees are in dangerous condition given their propensity to snap in windy and stormy weather. The poplars are fenced with timber and herbicide applied	WL2	0	0
H15	This forms the southern boundary of the lands and fronts Porterstown Road. Remnants of the original hedgerow remain. Around Kellystown House, the treeline comprises beech (Fagus sylvatica), planted small leaved lime (Tilia cordata), turkey oak (Quercus cerris) and whitebeam (Sorbus aria). The eastern end now comprises a stone wall and hedging associated with Luttlrellstown College, thereafter the hedgerow includes hawthorn, blackthorn and occasional specimen trees such as lebanan cypress as well as mature ash. Ivy growth is heavy on these parts of the treeline. The hedgerow is intact primarily in two stretches along this road as identified on the hedgerow map.	WL2	10	8
H16	This curved treeline suggests demesne planting associated with Kellystown House, and is marked as such on the 1st edition O.S map. There is a gravel track and deep ditch on the eastern boundary of the hedgerow. This ditch had water flowing in it on the day of the survey, and contained some different species not found elsewhere in the site, including brown sedge (Carex disticha), great manner grass (Glyceria maxima), and wild celery (Apium sp). Ground flora next to the ditch	WL2	21	17

Hedgerow Number	Summary	Fossit Classification	Significance	Condition
	included the invasive shrub, snowberry (Symphoricarpos albus), native hogweed (H. sphondylium), and coltsfoot (Tussilago farfara). Tree species present include Ash (F.excelsior) , Hawthorn (C.monogyna), Lime (Tillia spp), sycamore (A.pseudoplantaus) and rowan (S.aucoparia)			
H17	An internal remnant field boundary approximately 140m in length. Desktop survey only. As with other treelines on the lands, Ash is a dominant species.		11	12
H18	Hedgerow along Clonsilla Road. Similar to Luttrelstown Road, it is fragmented with a range of boundaries and stretches of intact hedgerow remain. This road is also a townland boundary increasing its historical value.		11	7
H19	A single hedgerow within the eastern part of the lands, evidence of large tree cutting within the past 2 decades. This supports a good diversity of tree and shrub species nonetheless. Some rubble associated with construction (road?) works are present on the eastern bank and herbicide application on the playing fields western side reduces ground flora diversity. It does provide a linear corridor between the Royal Canal and potential high value grassland to the south.		13	11

4 BAT SURVEY

4.1 INTRODUCTION

In line with the requirements of the brief, two transect surveys were undertaken on the Kellystown Lands over the 2019 activity season.

Prior to undertaking bat surveys, the status of habitats occurring within the study area were classified in terms of their potential to function as bat foraging habitat. The classifications follows the approach outlined by Bat Conservation Trust (2012) to assessing the value of potential development sites for bats, based on the occurrence of habitat features within the landscape, and the likelihood of bats being present. The classifications range from low to high.

4.1.1 IDENTIFICATION OF POTENTIAL BAT ROOSTS

There are a number of structures within the survey site that represent potential bat roosts. In addition, there are a high number of mature trees, mostly ash that could also function as bat roosts.

This assessment followed established Bat Conservation Trust (BCT) guidance and sought to identify features of trees commonly used by bats for roosting and shelter. Such features include natural holes, cracks in major limbs, loose bark, hollows/cavities and dense ivy cover. Where such features were identified they were inspected for field signs indicating the presence of bats. These field signs include scratches and staining at entry points, the presence of bat droppings and the smoothing of surfaces around cavities.

Much of H2 (Railway corridor treeline) supports a variety of trees that could function as bat roosts along its full length. Other veteran and mature trees on site also potentially support roosting bats, in particular at the following hedgerows and treelines: H8, H12, H13,H16.

4.1.2 MANUAL FORAGING ACTIVITY SURVEY

Manual foraging activity surveys were undertaken on the 26th July 2019 and again during 19th August 2019. The manual surveys focused on walking transects along hedgerow and treeline field boundaries occurring within the Kellystown LAP lands. Transects were walked slowly and the location of all bat passes were recorded during each transect survey. Where bats were encountered the time, species of bat, direction of flight, number of passes and estimated number of bats were recorded. Please note that due to access restrictions to lands on Kellystown House and Farm and Greenmount Farm, these transect surveys concentrated on the accessible, eastern part of the lands and along the Porterstown Road.

The manual foraging survey was undertaken using a Ciel electonrique and echometer pro (heterodyne and frequency division). Other equipment used during the survey included a high-powered torch and binoculars.

4.1.3 Habitat Classification

Habitats occurring within and adjacent to the study area provide a potential foraging resource for bat species. The canal pond, hedgerows and treelines, and drainage ditches within the LAP area support a prey resource for foraging bats. There is an abundance of "structured vegetation" in the form of hedgerows and treelines and these features are well connected throughout the site and also provide habitat connections to the railway corridor and Royal Canal to the north, and Luttrelstown Castle and River Liffey to the south.

Habitats of high value occurring to the north include open waterbodies in the form of the Royal Canal, fringing wet woodland and reedbeds, terrestrial woodland and scrub. The habitats associated with Luttrelstown Castle and estate include old mature broadleaved woodland, lakes and the River Lusk which joins the River Liffey to the south. ponds and the River and the River Camac corridor. The habitats occurring within the study area have been classified for their value to function as foraging and commuting habitat for bats in line with Table 4.1 of the BCT guidance manual (Collins, J, 2016). Based on the categorisation of habitats in this guidance manual the habitats occurring within the Masterplan Area are considered to be of at least moderate value for foraging and commuting bats.

Roost Surveys

Emergence surveys on the 19th August 2019 focused on the derelict farm building on the east of the lands adjacent to Porterstown Road. This emergence survey was completed between 21:05 and 22:00. all for bat activity with dry and still conditions and mild temperatures prevailing. Two surveyors undertook the emergence survey, one based on the farmyard, the other at the gable end of the derelict two storey building. Weather conditions were 14C with a slight northwest breeze. See Figure below for location of emergence survey.

In addition, during access for the other surveys, the team were brought to the upper floors of the farm buildings of Kellystown House (two story, traditional slate, forming part of original farm outbuildings). A visual inspection to ascertain evidence of usage by bats indicated through droppings the use of this building as a roost by bats.

Heritage Maps

Heritage Maps
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4.2 RESULTS

Table 3 presents the results from the emergence survey with the location shown below:

4.2.1 EMERGENCE SURVEY

TABLE 3 EMERGENCE SURVEY RESULTS

Emergence Survey 19.08.2019	**time**	**Activity. Visual confirmation (v)**
Leisler	21:12	pass
Leisler	21:13	passing across yard to the west (v)
Leisler	21:23	passing along yard to the south (v)
Leisler	21:25	pass
Common Pipistrelle	21:29	pass
Soprano pipistrelle	21:31	pass
Leisler	21:35	pass
Leisler	21:36	pass
Common Pipistrelle	21:37	pass
Common Pipistrelle	21:49	Foraging
Leisler	21:50	foraging across from shed (H8 treeline)
Soprano	21:58	pass
Leisler x 2	21:58	foraging along H9

No bats were recorded emerging from these buildings during emergence survey. However it is clear that bat are active in and around the building and may be roosting in a less accessible (or visible) part of the structure or close by.

4.2.2 MANUAL TRANSECT SURVEYS

Low levels of bat activity were recorded during the manual transects in July and August; however certain linear features on site supported foraging bat activity. The results are presented below in Table 4 below.

TABLE 4 TRANSECT SURVEY RESULTS

Transect Survey 26.07.2019	**time**	**Activity. Visual confirmation (v)**
Common Pipistrelle Leisler	21:38	pass along H9 (inside field)
No bat activity recorded along Porterstown Road along H9 and H10.		
Leisler	22:03- 22:04	foraging over H8 (north) and grassland
Common Pipistrelle	22:11	pass along H8 close to H13

Transect Survey 19.08.2019		
common pipistrelle	22:01	H8 (north) east and western aspect (v) Foraging
soprano pipistrelle	22:16	commuting south along H8
common pipistrelle x 2 Leisler x 1	22: 19-22:23	Foragingcorner of field enclosed by H8 and H13 (northeast corner)
unidentified pipistrelle	22:29	commuting along H8 south

5 Bird Survey

51. Introduction

Minogue and Associates were asked to undertake a late season bird survey on the Kellystown Lands. Although not part of the brief, a bird survey was undertaken during the second field survey of the Hedgerows.

5.2 Site description

The site was visited on the morning of the19th of August 2019. Due to access issues (access not possible without supervision on the grounds of Kellystown House), the survey concentrated on the lands at the eastern part of the site.

There was a wind from the north west which was cool but with dry conditions. Extensive grazing using set stocking over a number of fields was being practised, leading to uneven grazing patterns, resulting in some grass species seeding and some being grazed tightly. Some of the internal hedges were gappy while the external boundary was stock proof ; the hedgerows were stemmy and had not been maintained.

5.3 Methodology

The survey commenced at 10.10 hr after a walk around the perimeter of the fields. Hedges and trees were examined for bird activity. The buildings were examined internally for nests and perches. Though at this late point in the year, late fledglings would be taking to the wing.

One vantage point was selected on the south western side of the farmstead buildings in the middle of a field which gave good vantage over the entire buildings, this area leads directly to tree lines and pasture, as well as being adjacent to the roadway that serves the school. The vantage point survey was 1:50 mins in duration. Recorded observation was of birdlife within identifiable sight of the observation point. Any bird species sighted and identified were recorded. Identification was visual from song, flight and form. This was further aided by use of 10x50 binoculars.

5.4 SURVEY RESULTS

In the external building inspection, no evidence of nesting activity could be determined. In the internal survey a few older swallow nests were evident. As access was difficult and dangerous, an accurate count of swallow nesting activity could not be made. The nests seen were in various states of repair. Of these two were reworked upon this year as recent clay and moss construction was evident.

There was one bird species of note recorded during the survey, The Herring Gull, which is red listed. This species has encountered a large decline in its Breeding population. It is relatively common in Co Dublin and its European population is assessed as secure. The Swallow is Amber listed, though due to declining European population, for this reason it has been assessed as Depleted. The House Sparrow is also Amber listed due to moderate decline in the European Breeding population. The Irish population is stable.

The species are recorded in descending order of number of recorded sightings and presented in Table 5 below:

TABLE 5 BIRD SPECIES RECORDED AND CONSERVATION STATUS

Bird Species	***Latin name***	**Conservation status**
Woodpigeon	*Columba palumbus*	Green listed
Swallow	*Hirundo rustica*	Amber listed
Magpie	*Pica pica*	Green listed
Hooded crow	*Corvus corone*	Green listed
Jackdaw	*Corvus monedula*	Green listed
Chaffinch	*Fringilla coelebs*	Green listed
Song Thrush	*Turdus philomelos*	Green listed
Blackbird	*Turdus merula*	Green listed
Herring Gull	*Larus argentatus*	Red listed
Pied Wagtail	*Motacilla alba yarrellii*	Green listed
House Sparrow	*Passer domesticus*	Amber listed
Robin	*Erithacus rubecula*	Green Listed

The birdlife recorded during the survey was dominated by wood pigeon, around the treelines and field margins and swallows, flying north of the buildings and feeding around the farmyard.

5.5 MITIGATION AND ENHANCEMENT

In the longer term additional planting around the site incorporating fruit and berry bearing trees could enhance foraging opportunities for bird species. Species such as rowan (*Sorbus aucuparia*), blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), holly *(Ilex aquifolium*), crab apple (*Malus sylvestris*) and wild cherry (*Prunus avium*) would be suitable for consideration.

5.6. CONCLUSION.

There was no birdlife recorded that were rare or of any significant national or international conservation interest. The conservation status was referenced from Birdwatch Ireland's “Irish

Birds". Under EU legislation Ireland has to implement the Habitats Directive and the Birds Directive. Under National Legislation there are commitments under the Irish Wildlife Act 2000. The majority of the species associated with the site at present are common locally and nationally. Bird species listed as red on the Birdwatch Ireland, Birds of Conservation Concern List are of greatest conservation concern. Birds listed as amber are of medium conservation concern, while bird species listed as green are not considered threatened. The sighting of the Herring Gull was due to this species foraging around the Dublin Bay area. It would be unlikely that the site would be utilised by this species, other than to fly over. While the swallows and the house sparrows identified during the survey have an amber status for conservation this is generally due to declines in a European context, while they can be locally or nationally well represented. Any actions therefore that impact on the life cycles of these species should be mitigated against. The farmstead seems to provide nesting space for this species. It may be damaging during nesting season to curtail their access to the ground floor of the building where old nests were noted and currently has open access from the doorways. The species listed are well represented locally however, when any planned works are conducted outside the nesting season, they would not represent any threat to their conservation status. These species exhibit elements of adaptability in choosing nesting sites.

6 GREEN INFRASTRUCTURE RECOMMENDATIONS

6.1 INTRODUCTION

This section presents recommendations as they relate to biodiversity, green and blue infrastructure around the Kellystown LAP. They are informed by both the baseline ecological surveys presented in the preceding sections, as well as scientific research and good practice in the area of green and blue infrastructure. A reference list is provided at the end of this chapter.

This chapter is structured as follows:

- Recommendations regarding Habitats on site:
- Key components for Green and Blue Infrastructure (with Hedgerows)
  Key component for Lighting and Bats

6.2 RECOMMENDATIONS FOR HABITAT MANAGEMENT

When appropriately managed, hedgerow edges represent hotspots for biodiversity, and provide essential ecosystem services such as water regulation, prevention of erosion, and pest control.

6.2.1 PREVENT SPREAD OF ASH DIEBACK DISEASE

Currently, the hedgerows bordering the fields contain some fine mature ash (*F. excelsior*) which show little to no signs of ash dieback disease. However, the trees representing new hedgerow planting at 3fE are evidently diseased and the pathogen could easily spread from here to the mature ash elsewhere.

- Monitor all ash on the estate. Fell diseased specimens and burn all brush on site.

6.2.3 MONITOR FOR INVASIVE ALIEN SPECIES

The proximity of the railway at the estate boundary means there is an ongoing risk of incursion of invasive alien plants onto the estate lands. The most likely species are Japanese knotweed (*Fallopia japonica*), winter heliotrope (*Petasites fragrans*) and giant butterbur (*Petasites japonicus*). Regular surveillance and early intervention measures are essential.

Snowberry (*S. albus*) was recorded next to the ditch in field 3h. This non-native shrub was widely planted in Ireland in the past, but it can become highly invasive because of its capacity to spread by suckering. It is advisable to monitor its spread in this area and to control as necessary.

6.2.4 BIODIVERSITY

From a biodiversity perspective the fields and their boundaries have the potential to be species rich because of the mature and dense native hedgerows (some of which were recorded on the 1st Edition OS map series), and the grassland which would have represented dry calcareous grassland prior to grazing and current land management practices.

Every effort should be made to protect and maintain the hedgerows because they represent ecological corridors and important refuges for wildlife, and they have a vital ecosystem function. Less intensive grazing and cessation of routine herbicide use would, over time, allow some of the characteristics of the grassland to recover.

- Allow tussocky grass growth to develop at the base of hedgerows, extending into the field by at least 2m, cutting this only to control scrub encroachment (about once every 5 years).
- The potential exists for more species diverse grassland habitats to recover in the absence of herbicide treatment; in particular the margins around the hedgerows and also the southeastern corner of the LAP lands that have been disturbed in recent years for development but have potential to recover as calcareous grassland subject to an appropriate management regime.
- All development proposals within 30m meters from the Canal Pond shall be accompanied by an Ecological Impact Assessment. This shall be prepared by a qualified Ecologist and in line with Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater and Coastal (CIEEM 2nd ed 2016) .

  All development proposals should seek to enhance biodiversity and avoid or minimise loss of existing habitats and wildlife corridors.

6.3 KEY COMPONENTS FOR GREEN AND BLUE INFRASTRUCTURE

The Green and blue infrastructure within the LAP will consist of existing hedgerows to be retained, new hedgerow and/or treeline corridors and a necklace of ponds and

swales. These Green Corridors, which are drawn from the Ecology Baseline Report, will comprise the following:

- The following existing hedgerows/treelines will be retained: H1, H2, H5, H6, H7, H8, H9, H10, H13, H15, H16, H17 and H19. However, these will be severed due facilitate the proposed east-west road through the lands.
- The retained hedgerows will be maintained so that a diversity of hedgerow structure is provided. Tall and short (≤3m) sections will be provided. Thick and dense cover at the base of the hedgerow will be maintained and gaps along hedgerows will be minimised. Gaps to facilitate pedestrian access or visual permeability will be provided at selected locations along hedgerows.
- The outer edges of the retained Hedgerows will be maintained so that they undulate, or have a wavy plan profile.

Retained Hedgerows will be managed as follows:

- The retained hedgerows on site should be managed to provide a diversity of structure along the hedgerow, that include tall sections over 5m in height as well as shorter sections, less than 3m in height. The varying structure in hedgerows is important for enhancing the role of this habitat in supporting a greater variety of bird species.
- Hedgerow trimming will be undertaken on three year rotations.
- Hedgerow trimming will be alternated between sections of hedgerows so that at least one-third of the hedgerow length remains uncut.
- Hedgerow trimming will be undertaken between the months of January and February.
- Where these hedgerows cannot be retained, or will be severed, a new hedgerow network composed of the same species shall be planted along roadways within the development. Given the issues around Ash dieback disease, the following species are recommended:
    - Hawthorn
    - Blackthorn

- Rowan
- Elder
- Holly
- Oak

- A Method Statement for the construction, planting regime and species selection of both 'dry' and 'wet' hedgerows shall be provided with all planning applications for developments within 10m of existing hedgerows within the LAP lands.

- Where new canal crossings i.e footbridges/cycle bridges are proposed, they shall be designed so as to avoid fragmentation of linear habitats associated with the Royal Canal Corridor.

BLUE INFRASTRUCTURE

- A signature Green and Blue Corridor field boundary treatment will be applied along the western park boundary. A wide swale and pond necklace landscape treatment will be provided along this boundary that will accommodate Hedgerow 13, part of H8 and H7.

- These ponds should be managed for wildlife. The bank slopes should vary in gradation with the development of marginal wetland habitats being facilitated along shallow graded slopes. Patches of wet woodland, wet scrub and marginal, emergent vegetation should be provided around the edges of the ponds. Wet woodland and scrub species should include native willow species (Salix sp.), and alder. The dominant emergent vegetation can include a range of species including *Carex rostrata, Carex paniculata, Typha latifolia, Phragmites australis* and *Iris pseudacorus*. Optimum water depths for large sedges and reeds are up to 5 cm. Marginal wetland plant communities should be provided in areas that will not be susceptible to prolonged drying out.
- Filter strips should be provided either side of new swales. The centre of the swale should be managed as a damp area and planted with hydrophilous species typical of the area.
- Only clean surface water runoff should be channeled into wildlife ponds.

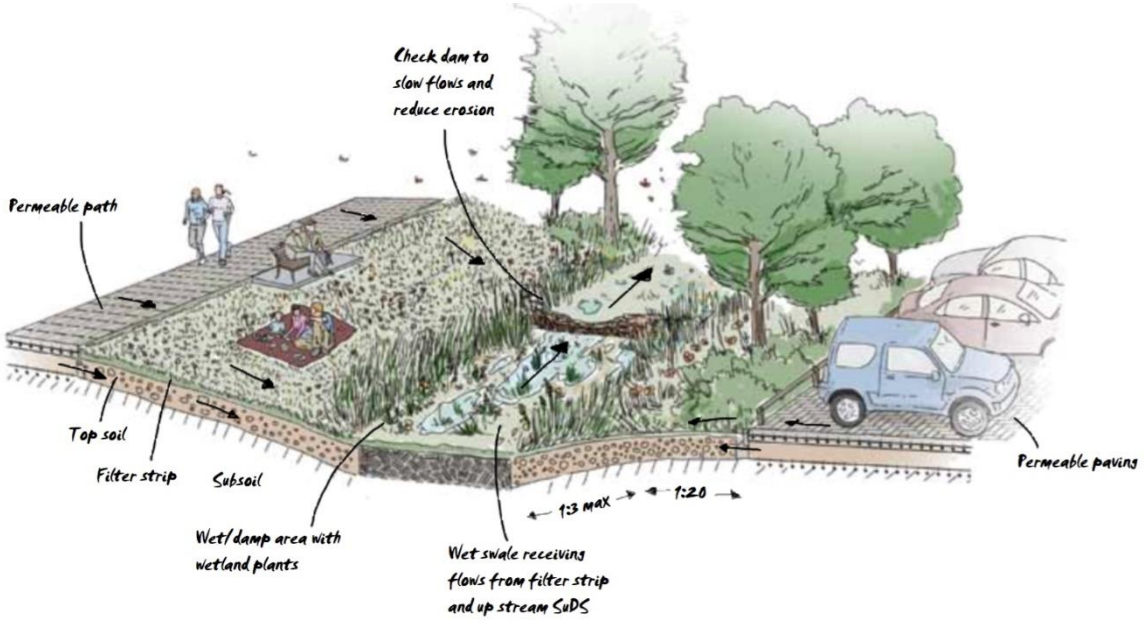
SWALES:

- Design criteria for swales will include the following:

- Maximum side slopes will be 3:1. Slopes and depths should be minimised to the extent practical for aesthetic and safety reasons. The base width should be a minimum width of 2 feet.
- Check dams should be installed at regular intervals along the swales to promote ponding. Large rocks that are obvious and do not become concealed by vegetation should be used as check dams. Such rocks will create an attractive as well as effective check dam and will provide micro-habitat for species (e.g. basking sites for invertebrates etc.). Figure 5 provides examples of swales.
- All new swales will be bounded by filter strips a minimum of 2m in width. Broadleaved trees should be planted along the filter strips (see example diagram in Figure 6).
- Grassy verges along retained field boundaries and new green corridors will function as natural filter strips.

Figure 6.1 Example of Swale (source: Natural England 2009)

Figure 5.2: Example of Swale Design Features (source: Graham et al. 2012)



PROTECTION OF BIRDS

Look after mature hedgerow trees and encourage new ones by selecting and marking promising saplings or stems to grow on, or by new planting. Mature native fruit and berry producing trees like crab apple and hawthorn are valuable as well as large trees like oak.

Allow tussocky grass growth to develop at the base, extending into the field by at least 2m, cutting this only to control scrub encroachment (about once every 5 years).

Aim to avoid trimming between March and early September, and instead cut hedges in January or February.

It is an offence under Section 22 of the Wildlife Act to intentionally injure or mutilate eggs or nests. All future developments within the LAP Area should be cognizant of the importance of hedgerows within the area for birds. Where hedgerow habitat must be removed to facilitate future development it is recommended that this habitat is removed during the months of January and the first half of February. Where hedgerows must be removed or disturbed during the breeding season, a pre-vegetation clearance survey for the presence of nests must be completed by a qualified ecologist. In the event that nests are present the NPWS must be consult prior to any further action being taken. The subsequent course of action will be guided by consultations with the NPWS.

PROTECTION OF BATS AND OTHER WILDLIFE

The following key principles for public lighting along Green Corridors (i.e. all retained and new hedgerows and treeline corridors) within the plan should be implemented to reduce the potential negative impacts of lighting on wildlife:

- Where feasible a Central Monitoring System (CMS) for lighting should be used for all public lighting within the plan Area. This will facilitate the implementation of a variable lighting regime (VLR) to suit both people and wildlife within the plan Area.
- All external lighting should be downlighting and should be time limited where possible. Lighting should be avoided in sensitive wildlife areas and light pollution, in general, should be avoided. Any additional nocturnal illumination of the canal corridor resulting from the development of the LAP should be kept to a minimum.
- Maintain a "Dark Corridor" along the railway boundary treeline (H2), H5, the retained treelines associated with the wetland park (H7, H8, H13 and H16).
- In light of the need for a dark corridor and the wetlands area, there will need to be careful consideration of potential light spill onto this dark corridor associated with the playing pitches to the east of same. There should be an avoidance of light closest to the wetland park area as this will represent a key mitigation measure as a commuting and foraging area for bats and other wildlife.
- Maximise the spacing between lights to reduce light intensity.
- Reduce light spill by directing light only where it is needed. The upward spread of light above the horizontal plane should be avoided. This will be achieved by installing low beam angle lights, less than 70 above the horizontal plane.
- Blue-white short wavelength lights should be avoided.
- Lights with a high UV content should be avoided.

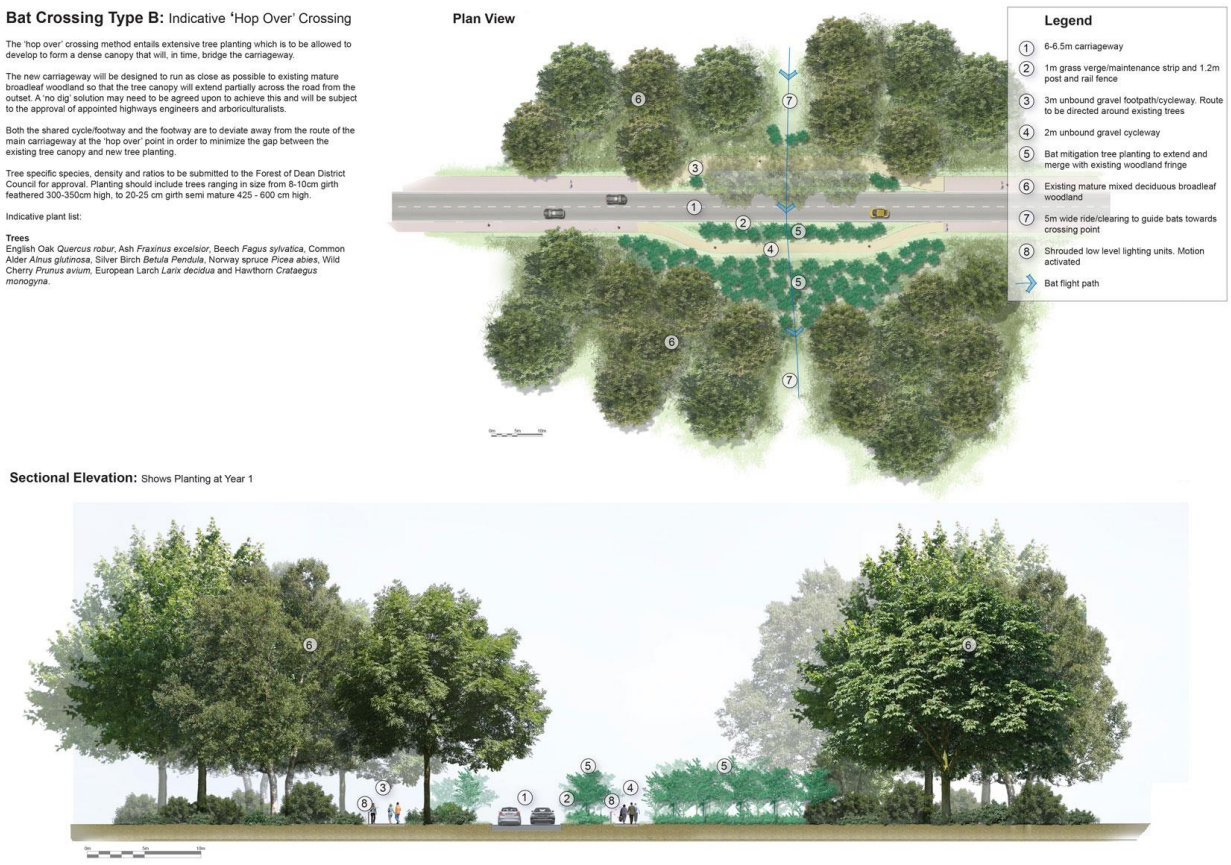
MEASURES TO MINIMISE SEVERANCE EFFECTS ASSOCIATED WITH PROPOSED EAST-WEST ROAD

- Illumination associated with the road should be carefully considered and avoid excessive light spill as outlined above.
- In line with Transport Infrastructure Ireland Guidelines (2019) additional higher tree planting should be extended through the proposed street where it intersects with the

existing hedgerow network to encourage higher flight by bats over these crossings. In particular the following intersections with hedgerow is essential to both provide for additional tree planting and absence of light – H1,H5, H8,H12, H13.

Detailed design should consider the provision of green verges associated with these locations and comprising suitable tree planting of fast growing, native species. Tree planting on verges should commence in advance of road construction to allow the advance establishment and growth of tree species along these verges.

Figure 6.3 shows an indicative Hop Over Crossing.



- Timing of demolition and tree-felling to consider potential effects and disturbance to bats

- A number of buildings and trees on the lands are potential bat roosts. In particular the following buildings – the older farm building on the eastern boundary, the outbuildings of Kellystown House. The enhancement of these structures to improve the conditions for bat species should be considered in future development.

6.4 MANAGEMENT OPTIONS FOR THE NORTH TOW PATH

- Stonework at the entrance to the tow path and by the bridge should be kept clear of vegetation, particularly sycamore and red valerian, to prevent damage.

- Ragwort should be monitored and manually pulled up wherever possible. It may be advisable to erect signage alerting the public and requesting that ragwort plants are not gathered and then thrown away where they could be eaten by horses and cattle.

- A programme of control against *Buddleia davidii* and *Petasites japonicus* should be implemented in a timely fashion. Skill and experience are required to effectively eradicate these species and it is advisable to appoint a reputable invasive species

contractor to conduct work. Please note that the abandoned site by the old school to the immediate north of the tow path is heavily infested with buddleia. Seed dispersal from this area is likely to infest the local area if actions are not taken to control spread.

- The meadow has considerable biodiversity and conservation value. It is recommended that a management plan for this area is implemented to include collaboration with the general public to restore the meadow to a good status.

Recommendations for management

- Erosion control measures are urgently needed along this section of the canal. The collapse of the banks beside the tow path may create a health and safety issue in the short to mid-term, although fencing is being erected.
- The native hedgerow has the potential to provide an important refuge for wildlife and careful management is recommended.
- A spring survey may reveal other, more interesting vernal species along this section.
- Control of snowberry and buddleia are strongly recommended.

APPENDIX A: HABITAT SURVEY OF FIELDS AND FIELD BOUNDARIES

Annex A: Habitat Survey of individual fields

Overview

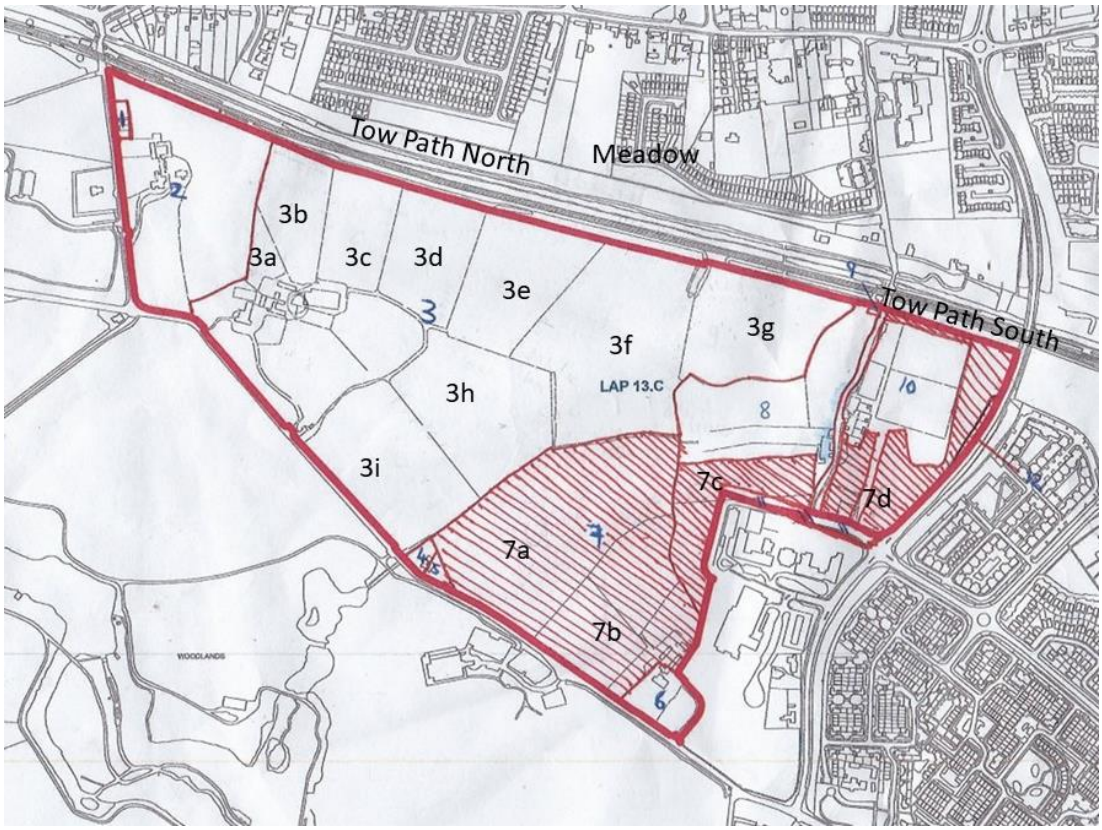
Nine fields were surveyed with particular attention paid to the hedgerow boundaries. The fields

When appropriately managed, hedgerow edges represent hotspots for biodiversity, and provide essential ecosystem services such as water regulation, prevention of erosion, and pest control.

The fields, 3a to 3i (Fig. 1) fall under GA1 improved agricultural grassland (Fossitt, 2000) which is generally species poor. There is a narrow border of Dry Calcareous Grassland, GS1, near Kellystown House (Image 1), indicating what the vegetation would be like under different management.

In the following descriptions, hedges are named after the fields they border and the direction they face i.e. 3bN, or when between fields 3c/3d. The full species list is given in **Appendix B.**

Figure A1 Surveyed fields, Kellystown House



Habitat survey of fields

Field 3a

The field contained cows on the day of the survey and the field is laid mostly to closely grazed grass with a raised area to the south which is part of a septic tank. Chemical fertilisers have not been applied for 3 or more years.

The grassland is mainly rye (*Lolium perenne*) and white clover (*Trifolium repens*) with plentiful bentgrass (*Agrostis stolonifera)* and occasional weeds characteristic of high nitrogen conditions, such as docks (Rumex spp.) and Spear thistle (*C. vulgare*). This presentation is typical of improved agricultural grassland, Fossitt habitat GA1.

The hedge 3aW is a mature native hedge, with a ground flora of herbs tolerant of herbicide application which is used throughout the farm on field borders and under fencing. There is increased *Poa trivialis* to the edge of the field, with abundant nettles (*Urtica dioica*), brambles (Rubus agg.) and occasional native hogweed (*Heracleum sphondylium*). The noxious weed, ragwort (*Senecio vulgaris*), was occasionally evident.

Two unusual plants are worth mentioning: a hybrid or garden escape elder and a white clover displaying phyllody (Image 2), where flowers revert to leaf like structures due to phytoplasma infection.

Image 2. Phyllody in white clover.

Field 3b

This field is currently grazed by horses. It was last reseeded 8-10 years ago with seed from Green Acre. The vegetation represents improved agricultural grassland, GA1.

There is a mature ash (*Fraxinus excelsior*) treeline to the north (3bN). Fossitt code WL2 The health status of the trees here appears to be good, with little to no sign of disease.

Fields 3b and 3c (3b/3c), and 3c and 3d (3b/3c) are both divided by a single planted row of tall poplar trees (probably *Populus nigra* var. Italica), some of which are suckering.

Field 3c

This field has also been reseeded and primarily consists of rye grass (*L. perenne*) and white clover (*T. repens*), with dandelions (*Taraxacum* agg.) an indication of high fertility.

Beneath the fence to the south (3cS) there are weeds tolerant of heavy herbicide application, namely the introduced weed, swine cress (*Lepidium didymum*), veronica (*Veronica persica)* and the liverwort (*Marchantia polymorpha*).

Image 3. *Marchantia polymorpha*

Field 3d

The entrance to the field is dominated by knotgrass (*Polygonum* sp.), scarlet pimpernel (*Anagallis arvensis*), shepherd's purse (*Capsella bursa-pastoris*), broad-leaf plantain (*Plantago major*) and ribwort plantain (*P. lanceolata*), which then transitions to GA1 improved agricultural grassland, with rye (*L. perenne*), white clover (*T. repens*) and bentgrass (*A. stonolnifera*).

To the north the field is bounded by a tall and dense native hedgerow of ash (*F. excelsior*), holly (*Ilex aquifolium*), and hawthorn (*Crataegus monogyna*), with an understory of ivy (*Hedera helix*), field rose (*Rosa arvensis*), smooth sow thistle (*Sonchus oleraceus*), false brome (*Brachypodium sylvaticum*) and a small patch of red fescue (*Festuca rubra)*.

Field 3e

This field is closely grazed by horses and represents GA1, improved agricultural grassland with poor species diversity.

There is a dense native hedgerow at the field boundary to the north, abutting the railway, and between field 3e and 3f. There is a similar, medium height hedgerow to the south. All hedgerows bordering this field consist of hawthorn (*C. monogyna*), blackthorn (*Prunus spinosa*), ash (*F. excelsior*), holly (*Ilex aquifolium*), and elder (*Sambucus nigra*).

Field 3f

This field is heavily grazed by cattle which can freely move through the non-continuous hawthorn hedge into field 3g. Ground flora includes rye (*L. perenne*), Cocksfoot (*Dactylis glomerata*), bentgrass (*A. stolonifera*), rough meadow grass (*P. trivialis)*, creeping thistle (*Cirsium arvense*) and meadow buttercup (*Ranunculus repens*).

There is an old drainage ditch which was blocked when the railway was built so contains some standing water dominated with duckweed (*Lemna* sp.). Around this there is a mature woodland of ash, hawthorn and blackthorn with established woodland flora including Lords and Ladies (*Arum maculatum*), and Hart's tongue fern (*Asplenium scolopendrium*) although it was inaccessible at the time of the survey and may contain more vernal species.

Field 3g

A continuation of the same grassland which has been cut for silage/hay recently.

The hedgerow between this field and the neighbouring land has some fine mature ash (*F. excelsior*); however, as this hedgerow turns south and begins to border field 3fE/Section 8 (Fig 1) there is increasing evidence of ash dieback disease, caused by the invasive alien pathogen *Hymenoscyphus fraxineus* on young ash trees among the more recent planting of elm, oak, elder and hawthorn. Oaks here have powdery mildew. This area was disturbed when the water line was put in (comment from our guides who work on the farm).

Ash die back was also seen in the hedgerows 3f/7a and 3f/3h.

Field 3h

As with the other fields, the grassland represents GA1 and is dominated by rye (*Lolium perenne*), bentgrass (*A. stolonifera*) and white clover (*T. repens*), with some docks (*Rumex* spp.), sorrel (*Rumex acetosa*) and buttercups (*R. repens* and *R. acris*). There is a planted row of poplars (*Populus* sp.) between fields 3h and 3i. The estate manager explained that these recently planted trees comprise a species unsuitable for the location and function because they easily snap.

There is a gravel track and deep ditch to the south west of field 3h. This ditch had water flowing in it on the day of the survey, and contained some different species not found elsewhere in the site, including brown sedge (*Carex disticha),* great manner grass (*Glyceria maxima),* and wild celery (*Apium* sp). Ground flora next to the ditch included the invasive shrub, snowberry (*Symphoricarpos albus*), native hogweed (*H. sphondylium*), and coltsfoot (*Tussilago farfara*).

Field 3i

As before, the closely grazed field comprises GA1 habitat with some areas of *Poa annua* and broad leaf plantain (*Plantago major*). There is fine, mature large leaved lime (*Tilia platyphyllos*) in the hedgerow which is suffering from over-abundant ivy (*H. helix*).

To the south west boundary with the road there is a fenced off border approximately 10m wide. Trees include beech (*Fagus sylvatica*), planted small leaved lime (*Tilia cordata*), turkey oak (*Quercus cerris*) and whitebeam (*Sorbus aria*). The ground flora is generally sparse, with a low carpet of ivy. There is a small area of coltsfoot (*T. farfara*) which should not be disturbed and spread accidently. Near the boundary to the neighbouring property there is an old stone-built gate. These mature trees, under which it is possible to walk could be a nice feature for future planning.

Three agricultural fields grazed by cows 7a, 7b, 7c border section 3 and the school. Area 7d which borders the halting site and playing field is ungrazed.

Field 7a and 7b

Field 7a and 7b are agricultural grassland surrounded by a good native hedgerow of hawthorn elder and ash. Ivy management is needed on some trees. Swallows were flying overhead at the time of the survey. The gateway between the fields has much silverweed (*Potentilla anserina*) due to the passage of cattle

Field 7c

The boundary to this field is heavily sprayed with herbicide. Between the road and the mature beech and ash trees there is an earth mound covered in creeping thistle, fumitory and other ruderals. Sycamore, blackthorn, and hawthorn in the hedgerows have brambles and nettles growing under them. The field is mainly rye grass, Yorkshire fog, white clover, ribwort plantain, common sorrel, meadow

buttercup and broadleaf dock. The ash trees seem healthy and there is a possibility that the hedge has possible bat roosts.

The field continues to the south west where the hedges are wider containing elder and have an adjacent area of creeping thistle and spear thistle encroaching into the grass. The same grassland continues to the south with the pathway leading to field 7b containing more annuals, red clover, Cut-leaved Crane's-bill (*Geranium dissectum*) and swine cress.

Field 7d

This section is divided with fences into a small area across the road from field 7c and a large field that borders the main road and the playing field. The first small area is disturbed ground where some rubbish has been dumped. The flora contains a few (*Lolium italicum*), red shanks, shepherd's purse, knotgrass and swine cress and several willowherb species. Coltsfoot is establishing as are buddleia and willow saplings toward the northern edge. Grass cover is low, with herbs dominating creeping buttercup, (*Vicia sativa*), Black medic, silverweed (*P. anserina*) and creeping cinquefoil (*P.reptans*), red bartsia (*Odontites vernus*), pineapple weed (*Matricaria discoidea*)and ragweed point towards recent disturbance. Along the roadside fence there are small dogwood shrubs (*Cornus* sp.), presumable escapes from planting.

Rounding the corner to the main road there are planted Ash and Dogwood with bindweed (*Calystegia sylvatica*) and ragosa roses behind. Behind this there is an earth bank of brambles, red bartsia, red clover. Bumblebees were plentiful during the survey. Through the bank there is an ungrazed field, with a rough path used as a short-cut to the playing field. The grass is long and herb rich with some Festuca sp., rushes (*Juncus* sp.) and plentiful Tufted vetch and Black knapweed. An unidentified vetch, possibly (*Vicia sativa*), has been dominant earlier in the summer and has now gone over. This grassland could be brought back to species rich grassland with careful management. Rosebay willowherb has established a stand mid-field and there are occasional Ragwort plants. Any cutting or grazing of this field should be careful not to open the sward in late August or September to avoid spreading the seed and hence greater distribution of these plants. Ragweed is toxic to horses if cut and incorporated into hay, however they avoid it when it is fresh and growing.

APPENDIX B: HABITAT SURVEY SPECIES LIST

TABLE B1 SPECIES LIST KELLYSTOWN HOUSE AND FARM

Acer pseudoplatanus	L.	Seiceamóir	Sycamore
Agrostis stolonifera	L.	Feorainn	Creeping Bent
Anagallis arvensis	L.	Falcaire fiáin	Scarlet Pimpernel
Arum maculatum	L.	Cluas chaoin	Lords-and-Ladies
Asplenium scolopendrium	L.	Creamh na muice fia	Hart's-tongue Fern
Brachypodium sylvaticum	(Hudson) P. Beauv.	Brómas bréige	False-brome
Capsella bursa-pastoris	(L.) Medik.	Lus an sparáin	Shepherd's-purse
Cerastium fontanum	Baumg.	Cluas luchóige	Common Mouse-ear
Chamerion angustifolium	(L.) Holub	Lus na tine	Rosebay Willowherb
Cirsium arvense	(L.) Scop.	Feochadán reatha	Creeping Thistle
Cirsium palustre	(L.) Scop.	Feochadán corraigh	Marsh Thistle
Cirsium vulgare	(Savi) Ten.	Feochadán colgach	Spear Thistle
Corylus avellana	L.	Coll	Hazel
Crataegus monogyna	Jacq.	Sceach gheal	Hawthorn
Dactylis glomerata	L.	Garbhfhéar	Cock's-foot
Epilobium hirsutum	L.	Lus na Tríoinóide	Great Willowherb
Epilobium montanum	L.	Saileachán leathan	Broad-leaved Willowherb
Eupatorium cannabinum	L.	Cnáib uisce	Hemp-agrimony
Euphorbia helioscopia	L.	Lus na bhfaitní	Sun Spurge
Festuca ovina	L.	Feisciú caorach	Sheep's-fescue

Fraxinus excelsior	L.	Fuinseog	Ash
Geranium robertianum	L.	Ruithéal rí	Herb-Robert
Geum urbanum	L.	Machall coille	Wood Avens
Glyceria maxima	(Hartman) O. Holmb.	Milseán mór	Reed Sweet-grass
Hedera helix	L.	Eidhneán	Ivy
Heracleum sphondylium	L.	Feabhrán	Hogweed
Holcus lanatus	L.	Féar an chinn bháin	Yorkshire-fog
Hypochaeris radicata	L.	Cluas chait	Cat's-ear
Ilex aquifolium	L.	Cuileann	Holly
Lapsana communis	L.	Duilleog Bhríde	Nipplewort
Lemna sp.			Duckweed
Lepidium didymum	L.	Cladhthach mhín	Lesser Swine-cress
Lolium perenne	L.	Seagalach buan	Perennial Rye-grass
Medicago lupulina	L.	Dúmheidic	Black Medick
Myosotis arvensis	(L.) Hill	Lus míonla goirt	Field Forget-me-not
Nasturtium officinale	R.Br.	Biolar	Water-cress
Plantago lanceolata	L.	Slánlus	Ribwort Plantain
Plantago major	L.	Cuach Phádraig	Greater Plantain
Poa trivialis	L.	Cuise garbh	Rough Meadow-grass
Polygonum aviculare	L.	Glúineach bheag	Knotgrass
Populus nigra	L.	Poibleog dhubh	Black-poplar
Potentilla anserina	L.	Briosclán	Silverweed
Potentilla reptans	L.	Cúig mhéar mhuire	Creeping Cinquefoil
Prunus spinosa	L.	Draighean	Blackthorn
Quercus petraea	L.	Dair ghealach	Sessile oak
Ranunculus acris	L.	Fearbán feír	Meadow Buttercup
Ranunculus repens	L.	Fearbán (reatha)	Creeping Buttercup
Rosa canina	L.	Feirdhris	Dog-rose
Rubus fruticosus agg.		Dris	Blackberry
Rumex acetosa	L.	Samhadh bó	Common Sorrel
Rumex crispus	L.	Copóg chatach	Curled dock
Rumex obtusifolius	L.	Copóg shráide	Broad-leaved Dock
Sambucus nigra	L.	Trom	Elder
Senecio vulgaris	L.	Grúnlas	Groundsel
Solanum dulcamara	L.	Fuath gorm	Bittersweet
Sonchus arvensis	L.	Bleachtán léana	Perennial Sow-thistle
Sonchus asper	(L.) Hill	Bleachtán colgach	Prickly Sow-thistle
Sonchus oleraceus	L.	Bleachtán mín	Smooth Sow-thistle
Stellaria media	(L.) Villars	Fliodh	Common Chickweed
Taraxacum agg.		Caisearbhán	Dandelion
Trifolium repens	L.	Seamair bhán	White Clover
Ulex europaeus	L.	Aiteann gallda	Gorse
Ulmus glabra	Hudson	Leamhán sléibhe	Wych Elm
Veronica persica	Poiret	Lus cré garraí	Common Field-speedwell

TABLE B2 ST MOCHTAS FC AND LANDS SOUTH OF FOOTBALL CLUB

Acer pseudoplatanus	L.	Seiceamóir	Sycamore
Achillea millefolium	L.	Athair thalún	Yarrow
Agrostis stolonifera	L.	Feorainn	Creeping Bent
Arrhenatherum elatius	(L.) P. Beauv. ex J.S. Presl & C. Presl	Coirce bréige	False Oat-grass
Buddleja davidii	Franchet	Tor an fhéileacáin	Butterfly-bush
Capsella bursa-pastoris	(L.) Medik.	Lus an sparáin	Shepherd's-purse
Cerastium fontanum	Baumg.	Cluas luchóige	Common Mouse-ear
Cirsium arvense	(L.) Scop.	Feochadán reatha	Creeping Thistle
Cirsium vulgare	(Savi) Ten.	Feochadán colgach	Spear Thistle
Cornus sp.			Dogwood
Crataegus monogyna	Jacq.	Sceach gheal	Hawthorn
Epilobium hirsutum	L.	Lus na Tríoinóide	Great Willowherb
Festuca rubra	L.	Feisciú rua	Red Fescue
Fraxinus excelsior	L.	Fuinseog	Ash
Geranium dissectum	L.	Crobh giobach	Cut-leaved Crane's-bill
Hedera helix	L.	Eidhneán	Ivy
Holcus lanatus	L.	Féar an chinn bháin	Yorkshire-fog
Juncus articulatus	L.	Lachán na ndamh	Jointed Rush
Lathyrus pratensis	L.	Peasairín buí	Meadow Vetchling
Lepidium didymum	L.	Cladhthach mhín	Lesser Swine-cress
Lolium multiflorum	Lam.	Seagalach lodálach	Italian Rye-grass
Lolium perenne	L.	Seagalach buan	Perennial Rye-grass
Matricaria discoidea	DC.	Lun na hiothlann	Pineappleweed
Medicago lupulina	L.	Dúmheidic	Black Medick
Odontites vernus	(Bellardi) Dumort.	Hocas tae	Red Bartsia
Plantago lanceolata	L.	Slánlus	Ribwort Plantain
Polygonum aviculare	L.	Glúineach bheag	Knotgrass
Potentilla anserina	L.	Briosclán	Silverweed
Prunus spinosa	L.	Draighean	Blackthorn
Ranunculus acris	L.	Fearbán feír	Meadow Buttercup
Rosa rugosa	Thunb. ex Murray	Rós rúsacach	Japanese Rose
Rubus fruticosus agg.		Dris	Blackberry
Rumex acetosa	L.	Samhadh bó	Common Sorrel
Rumex obtusifolius	L.	Copóg shráide	Broad-leaved Dock
Salix sp.			Willow sp.
Sambucus nigra	L.	Trom	Elder

Senecio jacobaea	L.	Buachalán buí	Common Ragwort
Senecio jacobaea	L.	Buachalán buí	Common Ragwort
Trifolium pratense	L.	Seamair dhearg	Red Clover
Trifolium repens	L.	Seamair bhán	White Clover
Tussilago farfara	L.	Sponc	Colt's-foot
Urtica dioica	L.	Neantóg	Common Nettle
Vicia cracca	L.	Peasair na luch	Tufted Vetch
Vicia sativa	L.	Peasair chapaill	Common vetch

TABLE B3: SPECIES LIST NORTHERN TOWPATH

Acer pseudoplatanus	L.	Seiceamóir	Sycamore
Agrimonia eupatoria	L.	Marbhdhraighean	Agrimony
Alisma plantago-aquatica	L.	Corrchopóg	Water-plantain
Alnus glutinosa	(L.) Gaertner	Fearnóg	Alder
Anagallis arvensis	L.	Falcaire fiáin	Scarlet Pimpernel
Anthyllis vulneraria	L.	Méara Muire	Kidney Vetch
Arrhenatherum elatius	(L.) P. Beauv. ex J.S. Presl & C. Presl	Coirce bréige	False Oat-grass
Arum maculatum	L.	Cluas chaoin	Lords-and-Ladies
Asplenium scolopendrium	L.	Creamh na muice fia	Hart's-tongue Fern
Buddleja davidii	Franchet	Tor an fhéileacáin	Butterfly-bush
Centaurea nigra	L.	Mínscoth	Common Knapweed
Centranthus ruber	(L.) DC. in Lam. & DC.	Slán iomaire	Red Valerian
Chamerion angustifolium	(L.) Holub	Lus na tine	Rosebay Willowherb
Crataegus monogyna	Jacq.	Sceach gheal	Hawthorn
Dactylis glomerata	L.	Garbhfhéar	Cock's-foot
Daucus carota	L.	Mealbhacán	Wild Carrot
Epilobium hirsutum	L.	Lus na Tríoinóide	Great Willowherb
Eupatorium cannabinum	L.	Cnáib uisce	Hemp-agrimony
Filipendula ulmaria	(L.) Maxim.	Airgead luachra	Meadowsweet
Fraxinus excelsior	L.	Fuinseog	Ash
Galium aparine	L.	Garbhlus	Cleavers
Galium verum	L.	Boladh cnis	Lady's Bedstraw
Geranium dissectum	L.	Crobh giobach	Cut-leaved Crane's-bill
Geranium molle	L.	Crobh bog	Dove's-foot Crane's-bill
Geranium robertianum	L.	Ruithéal rí	Herb-Robert
Geum urbanum	L.	Machall coille	Wood Avens
Glyceria maxima	(Hartman) O. Holmb.	Milseán mór	Reed Sweet-grass
Hedera helix	L.	Eidhneán	Ivy
Heracleum sphondylium	L.	Feabhrán	Hogweed
Holcus lanatus	L.	Féar an chinn bháin	Yorkshire-fog

Hypericum androsaemum	L.	Meas torc allta	Tutsan
Hypericum perforatum	L.	Lus na Maighdine Muire	Perforate St John's-wort
Hypericum tetrapterum	Fries	Beathnua fireann	Square-stalked St John's-wort
Hypochaeris radicata	L.	Cluas chait	Cat's-ear
Iris pseudacorus	L.	Feileastram	Yellow Iris
Knautia arvensis	(L.) Coulter	Cab an ghasáin	Field Scabious
Lapsana communis	L.	Duilleog Bhríde	Nipplewort
Larix decidua	Mill.	--	European Larch
Lathyrus pratensis	L.	Peasairín buí	Meadow Vetchling
Ligustrum vulgare	L.	Pribhéad	Wild Privet
Lonicera nitida	E.H. Wilson	--	Wilson's Honeysuckle
Lonicera periclymenum	L.	Féithleann	Honeysuckle
Lotus corniculatus	L.	Crobh éin	Common Bird's-foot-trefoil
Medicago lupulina	L.	Dúmheidic	Black Medick
Myriophyllum sp.			Water mil-foil sp.
Nuphar lutea	(L.) Smith in Sibth. & Smith	Cabhan abhann	Yellow Water-lily
Ononis repens	L.	Fréamhacha tairne	Common Restharrow
Origanum vulgare	L.	Máirtín fiáin	Wild Marjoram
Plantago lanceolata	L.	Slánlus	Ribwort Plantain
Poa trivialis	L.	Cuise garbh	Rough Meadow-grass
Polygonum aviculare	L.	Glúineach bheag	Knotgrass
Potamogeton natans	L.	Liach Bhríde	Broad-leaved Pondweed
Potentilla reptans	L.	Cúig mhéar mhuire	Creeping Cinquefoil
Poterium sanguisorba	L.	Lus na uille	Salad Burnet
Prunus laurocerasus	L.	Labhras silíní	Cherry Laurel
Ranunculus repens	L.	Fearbán (reatha)	Creeping Buttercup
Rosa arvensis	Hudson	Rós léana	Field-rose
Rubus idaeus	L.	Sú craobh	Raspberry
Rumex sanguineus	L.	Copóg choille	Wood dock
Sagittaria sagittifolia	L.	Rinn saighde	Arrowhead
Senecio jacobaea	L.	Buachalán buí	Common Ragwort
Silene dioica	(L.) Clairv.	Coireán coilleach	Red Campion
Sisymbrium officinale	(L.) Scop.	Lus an óir	Hedge Mustard
Sorbus aucuparia	L.	Caorthann	Rowan
Sparganium emersum	Rehmann	Rísheisc lom	Unbranched Bur-reed
Taraxacum agg.		Caisearbhán	Dandelion
Torilis japonica	(Houtt.) DC.	Fionnas fáil	Upright Hedge-parsley
Tussilago farfara	L.	Sponc	Colt's-foot
Ulex europaeus	L.	Aiteann gallda	Gorse
Urtica dioica	L.	Neantóg	Common Nettle
Valeriana officinalis	L.	Caorthann corraigh	Common Valerian
Vicia sepium	L.	Peasair fhiáin	Bush Vetch

TABLE B4: SPECIES LIST SOUTHERN TOWPATH

Acer pseudoplatanus	L.	Seiceamóir	Sycamore
Alnus glutinosa	(L.) Gaertner	Fearnóg	Alder
Arum maculatum	L.	Cluas chaoin	Lords-and-Ladies
Asplenium scolopendrium	L.	Creamh na muice fia	Hart's-tongue Fern
Buddleja davidii	Franchet	Tor an fhéileacáin	Butterfly-bush
Centaurea nigra	L.	Mínscoth	Common Knapweed
Chamerion angustifolium	(L.) Holub	Lus na tine	Rosebay Willowherb
Crataegus monogyna	Jacq.	Sceach gheal	Hawthorn
Epilobium hirsutum	L.	Lus na Tríoinóide	Great Willowherb
Eupatorium cannabinum	L.	Cnáib uisce	Hemp-agrimony
Fraxinus excelsior	L.	Fuinseog	Ash
Galium verum	L.	Boladh cnis	Lady's Bedstraw
Geranium robertianum	L.	Ruithéal rí	Herb-Robert
Geum urbanum	L.	Machall coille	Wood Avens
Hedera helix	L.	Eidhneán	Ivy
Heracleum sphondylium	L.	Feabhrán	Hogweed
Hypericum tetrapterum	Fries	Beathnua fireann	Square-stalked St John's-wort
Lactuca serriola	L.	--	Prickly Lettuce
Odontites vernus	(Bellardi) Dumort.	Hocas tae	Red Bartsia
Origanum vulgare	L.	Máirtín fiáin	Wild Marjoram
Plantago lanceolata	L.	Slánlus	Ribwort Plantain
Plantago major	L.	Cuach Phádraig	Greater Plantain
Polypodium sp.	#N/A	#N/A	Polypody sp.
Prunella vulgaris	L.	Duán ceannchosach	Selfheal
Rosa canina	L.	Feirdhris	Dog-rose
Sambucus nigra	L.	Trom	Elder
Senecio vulgaris	L.	Grúnlas	Groundsel
Symphoricarpos albus	(L.) S.F. Blake	Póirín sneachta	Snowberry
Tussilago farfara	L.	Sponc	Colt's-foot
Urtica dioica	L.	Neantóg	Common Nettle
Veronica chamaedrys	L.	Anuallach	Germander Speedwell
Vicia sepium	L.	Peasair fhiáin	Bush Vetch
Viola sp.			Violet sp.

APPENDIX C: HEDGEROW APPRAISAL FORMS

HEDGEROW 1

SITE NAME	HEDGEROW/TREELINE NUMBER: H1
Survey date: 08.08.2019	Fossitt: WL2

Hedgerow Description:
A mature hedgerow at the property boundary between Kellystown and Greenmount House; this the most intact westerly hedgerow in the LAP boundary. It has improved agricultural grassland, on the eastern side; and wetter grassland on the western side. A bank is present at the very southern boundary of the hedgerow adjacent to the walled garden boundary and is associated with the septic house for the main house. The lands are subject to spraying with herbicide with a ground flora of herbs tolerant of herbicide application which is used throughout the farm on field borders and under fencing. There is increased *Poa trivialis* to the edge of the field, with abundant nettles (*Urtica dioica*), brambles (*Rubus agg*.) and occasional native hogweed (*Heracleum sphondylium*). The noxious weed, ragwort (*Senecio vulgaris*), was occasionally evident. Cattle are currently grazing in this field. This hedgerow is mapped as a treeline on the 1st edition series and connects with the mature treeline and embankment to the north associated with the railway corridor.

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**

0	1	2	3	4
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
			3	
Ground flora significance				
Dominated by ruderal species.				
0				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
			2	

0	1	2	3	4
		Dry ditch		
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
			3	
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance				
Total Significance Score	**13**			

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5 -4**	**>4m**
		1		
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
		1		
Profile	Remnant /derelict	Wind shaped/losing base structure	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
			2	

	0	1	2	3
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
			2	
Continuity				
% gaps	>10%	5-10%	<5%	continuous
		1		
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
		1		
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
			2	
% of canopy dominated by ivy	>25%			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%		Green lane	
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			
			2	
Degraded margin	Ploughing upto base of hedge		(grassy) margin (2m or greater	(grassy) margin (2m or greater on both sides of the hedge

	0	1	2	3
	shrubs or poaching /erosion		on one side of the hedge)	
	0			
	Total Condition Assessment Score :10			

HEDGEROW 2.

SITE NAME	HEDGEROW/TREELINE NUMBER: H2
Survey date: 08.08.2019	Fossitt: WL2

Hedgerow Description:
A mature treeline that forms part of a linear strip of woodland forming the northern boundary of the LAP lands. This treeline is the longest linear boundary on the lands and is largely intact forming an important ecological linear feature and connecting with directly with 8 hedgerows/treelines that run north south within the LAP lands.
A steep embankment is present immediately behind the treelines that rises upto approximately 3m and then grades steeply down to the railway corridor. Landuse to the south is a primarily cattle grazing with some horses present also. The transport corridor of the railway line and the Royal Canal pNHA form the northern habitats increasing its overall ecological significance. The treeline and woodland are not marked as such on the 1st Edition O.S maps but are recorded as a boundary. This treeline is dominated by ash (*F. excelsior*), holly (*Ilex aquifolium*), and hawthorn (*Crataegus monogyna*), with an understory of ivy (*Hedera helix*), field rose (*Rosa arvensis*), smooth sow thistle (*Sonchus oleraceus*), false brome (*Brachypodium sylvaticum*). Herbicide application around the farm results in ground flora of herbs tolerant of herbicide application.

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	

0	1	2	3	4
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
			3	
Ground flora significance				
Dominated by ruderal species.				
0				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
		2		
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
			3	
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
			3	
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
			3	
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance	Longest treeline with linear woodland, important for connectivity across lands.			
Total Significance Score				**19**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**

	0	1	2	3
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5 -4**	**>4m**
				3
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
				3
Profile	Remnant /derelict	Wind shaped/losing base structure	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
				3
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
				3
Continuity				
% gaps	>10%	5-10%	<5%	continuous
			2	
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
		1		
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
				3
% of canopy dominated by ivy	>25%			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			

	0	1	2	3
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			
Degraded margin	Ploughing upto base of hedge shrubs or poaching /erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
			2	
	Total Condition Assessment Score 17			

HEDGEROWS 3 & 4

Recently planted (within 40 years) treelines of poplars replacing any earlier hedgerow planting. These are fenced by timber and herbicide application. They are of low ecological value based on mono species and narrow base with little ground flora.

HEDGEROW 5

SITE NAME	HEDGEROW/TREELINE NUMBER: H5
Survey date: 08.08.2019	Fossitt: WL2
Hedgerow Description: A well maintained dense hedgerow with a box shaped and supporting some good stands of mature Ash that runs north to south from the railway treeline and linear woodland. The species comprise hawthorn (*C. monogyna*), blackthorn (*Prunus spinosa*), ash *(F. excelsior*), holly (*Ilex aquifolium*), and elder (*Sambucus nigra*).	
	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
		2		
Ground flora significance				
Dominated by ruderal species.				
		2		
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7

0	1	2	3	4
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
		2		
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
		2		
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance				
Total Significance Score				**13**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5-4**	**>4m**
			2	
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
			2	
Profile	Remnant /derelict	Wind shaped/losing base	Boxed/ashaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base

	0	1	2	3
		structure		
			2	
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
				3
Continuity				
% gaps	>10%	5-10%	<5%	continuous
				3
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
				3
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
				3
% of canopy dominated by ivy	>25%			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			

	0	1	2	3
Degraded margin	Ploughing upto base of hedge shrubs or poaching /erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
			2	
	Total Condition Assessment Score :20			

HEDGEROW 6

SITE NAME	HEDGEROW/TREELINE NUMBER: H6
Survey date: 08.08.2019	Fossitt: WL2
Hedgerow Description: Ash, with shrub level of holly, ivy and elder. This hedgerow provides good north south connectivity between railway corridor and two hedgerows south.	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS

0	1	2	3	4
				Connects to features on SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
			3	
Ground flora significance				
Dominated by ruderal species.				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
	1			
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
			3	
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
		2		
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance				
Total Significance Score				**14**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5-4**	**>4m**
			2	
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
		1		
Profile	Remnant/derelict	Wind shaped/losing base structure	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
			2	
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
			2	
Continuity				
% gaps	>10%	5-10%	<5%	continuous
			2	
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
				3
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
			2	
% of canopy dominated by ivy	>25%			

	0	1	2	3
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			
Degraded margin	Ploughing upto base of hedge shrubs or poaching/erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0			
	Total Condition Assessment Score :12			

HEDGEROW 7

SITE NAME	HEDGEROW/TREELINE NUMBER: H7
Survey date: 08.08.2019	Fossitt: WL1
Hedgerow Description: This is a gappy hedgerow that is dominated by hawthorn and is heavily poached and used by cattle for shelter. Its overall importance relates to the proximity to the Canal Pond and woodland fringe immediately to the north, that in turn links to the Railway corridor woodland (H2), to the south the hedgerow links to the townland boundary treeline.	
	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
	1			

0	1	2	3	4
Ground flora significance				
Dominated by ruderal species.				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
	1			
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
	1			
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
			3	
Landscape Significance	Windshaped	Mature hedgerow trees		Area covered by landscape designation
	1			
Other factors of significance				
Total Significance Score				**11**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5 -4**	**>4m**
		1		
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
		1		
Profile	Remnant /derelict	Wind shaped/losing base	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base

	0	1	2	3
		structure		
		1		
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
		1		**3**
Continuity				
% gaps	>10%	5-10%	<5%	continuous
	0			
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
	0			
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
		1		
% of canopy dominated by ivy	>25%			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			

	0	1	2	3
Degraded margin	Ploughing upto base of hedge shrubs or poaching /erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0			
	Total Condition Assessment Score :5			

HEDGEROW 8

SITE NAME	HEDGEROW/TREELINE NUMBER: H8
Survey date: 08.08.2019	Fossitt: WL2

Hedgerow Description:
The townland and parish boundary between Kellystown and, this non linear and structurally diverse treeline runs north from the railway corridor to Luttrellstown Raod, although some gaps are present, primarily related to access to fields. The boundary varies with banks, wet ditches, occasional stone walls and a good diversity of tree and shrub species thought dominated by Ash.

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS

0	1	2	3	4
				Connects to features on SMR
				4
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
			3	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
				4
Ground flora significance				
Dominated by ruderal species.				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
		2		
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
			3	
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett	3-in part	
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
			3	
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance				

0	1	2	3	4
Total Significance Score				**21**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5-4**	**>4m**
				3
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
				3
Profile	Remnant/derelict	Wind shaped/losing base structure	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
				3
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
				3
Continuity				
% gaps	>10%	5-10%	<5%	continuous
				3
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
				3
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
			2	
% of canopy dominated by ivy	>25%			
			2	

	0	1	2	3
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			
Degraded margin	Ploughing upto base of hedge shrubs or poaching /erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0		**2**	
	Total Condition Assessment Score : 24			

HEDGEROW 9

SITE NAME	HEDGEROW/TREELINE NUMBER: H9
Survey date: 19.08.2019	Fossitt: WL2
Hedgerow Description: A roadside treeline that is bisected by old farm buildings, and is recorded as a treeline on the 1st Edition Ordnance Survey Map. A yew tree (Taxus battaca) is present close to the southern part of the treeline facing the roadside. Sycamore(Acer pseudoplantanus), blackthorn (Prunus spinosa), and hawthorn (C.monogyna) in the hedgerows have brambles and nettles growing under them.	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
		2		
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
		2		
Ground flora significance				
Dominated by ruderal species.				
0				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
0		**2**		

0	1	2	3	4
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
	1			
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
	1			
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance				
Total Significance Score				**13**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5-4**	**>4m**
		1		
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
		1		
Profile	Remnant /derelict	Wind shaped/losing base	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base

	0	1	2	3
		structure		
		1		
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
		1		
Continuity				
% gaps	>10%	5-10%	<5%	Continuous
	0			
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
	0			
% of canopy dominated by ivy	>25%			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			

	0	1	2	3
Degraded margin	Ploughing upto base of hedge shrubs or poaching /erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0		**2**	
	Total Condition Assessment Score : 6			

HEDGEROW 10

SITE NAME	HEDGEROW/TREELINE NUMBER: H10
Survey date: 19.08.2019	Fossitt: WL2
Hedgerow Description: A roadside treeline that is has a number of gaps associated with access to housing and sports grounds, and is recorded as a treeline on the 1st Edition Ordnance Survey Map. A drain with extensive rubbish is present as well as a stand of winter heliotrope, and dogwood, a presumable garden escape is present along parts of this hedgerow. Ash, hawthorn, hazel are principal species.	
	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/C boundary; shown a connected to wood on 1st edition OS Connects to feature SMR
			3	

0	1	2	3	4
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
			3	
Ground flora significance				
Dominated by ruderal species.				
0				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
0				
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
		Dry ditch	Wet ditch/drain **3- partly associated with road drain and outfalls from housing site.**	Stream/river
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designate area, particularly woodland
	1			
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designati
		2		
Other factors of significance				
Total Significance Score				**8**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**

	0	1	2	3
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5-4**	**>4m**
		1		
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
		1		
Profile	Remnant /derelict	Wind shaped/losing base structure	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
		1		
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
		1		
Continuity				
% gaps	>10%	5-10%	<5%	continuous
	0			
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
		1		
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
	0			
% of canopy dominated by ivy	>25%			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			

	0	1	2	3
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
		1		
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			
	0			
Degraded margin	Ploughing upto base of hedge shrubs or poaching /erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0		**2**	
	Total Condition Assessment Score : 8			

HEDGEROW 11

SITE NAME	HEDGEROW/TREELINE NUMBER: H10
Survey date: 19.08.2019	Fossitt: WL2
Hedgerow Description: A treeline comprised entirely of mature ash on a low earth bank, formerly a longer treeline, now separated by recent road infrastructure. Between the road and the ash trees there is an earth mound covered in creeping thistle, fumitory and other ruderals	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
		2		
Ground flora significance				
Dominated by ruderal species.				
0				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
0	**1**			

0	1	2	3	4
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
		2		
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
	1			
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance				
Total Significance Score				**11**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5-4**	**>4m**
				3
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
		1		
Profile	Remnant /derelict	Wind shaped/losing base	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base

	0	1	2	3
		structure		
		1		
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
	0			
Continuity				
% gaps	>10%	5-10%	<5%	continuous
	0			
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
	0			
% of canopy dominated by ivy	>25%			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			

	0	1	2	3
Degraded margin	Ploughing upto base of hedge shrubs or poaching /erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0			
	Total Condition Assessment Score : 5			

HEDGEROW 12

SITE NAME	HEDGEROW/TREELINE NUMBER: H12
Survey date: 19.08.2019	Fossitt: WL2
An important hedgerow for connectivity around the lands, linking with four other hedgerows. This hedgerow supports a more diverse tree species compared to others on the lands. Dominant species are ash, hawthorn with rowan, field rose and blackberry present also.	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	

0	1	2	3	4
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
				4
Ground flora significance				
Dominated by ruderal species.				
0				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
0				
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
			3	
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
		2		
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance				
Total Significance Score				**14**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5-4**	**>4m**
			2	
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
				3
Profile	Remnant /derelict	Wind shaped/losing base structure	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
			2	
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
			2	
Continuity				
% gaps	>10%	5-10%	<5%	continuous
			2	
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
		1		
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of llength of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
	0		**2**	
% of canopy dominated by ivy	>25%			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			

	0	1	2	3
Ground flora/hedge base: % ground layer showing evidence of herbicide use	> 20 %			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	> 20 %			
	0			
Ground flora/ hedge base: Alien invasive species	Present			
Degraded margin	Ploughing upto base of hedge shrubs or poaching /erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0		**2**	
	Total Condition Assessment Score : 16			

HEDGEROW 13

SITE NAME	HEDGEROW/TREELINE NUMBER: H13
Survey date: 19.08.2019	Fossitt: WL2
A long hedgerow that runs northeast-southwest, this also includes a double hedgerow with embankments for part of the hedgerow, creating a small scale green lane. This feature may have been a former internal farm track. Another important hedgerow for connectivity that links with H8 (townland boundary hedgerow) and three other hedgerows/treelines. Hawthorn, Ash, Holly and Rowan are present.	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
			3	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
			3	
Ground flora significance				
Dominated by ruderal species.				
0				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7

0	1	2	3	4
0	**1**			
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
				4
		Dry ditch **2**	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane **2**		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
		2		
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance				
Total Significance Score				**22**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5 -4**	**>4m**
			2	
Width	**<1m**	**1-2m**	**2-3m**	**>3m**

	0	1	2	3
				3
Profile	Remnant /derelict	Wind shaped/losing base structure	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
		1		
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
			2	
Continuity				
% gaps	>10%	5-10%	<5%	continuous
	0			
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
		1		
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
		1		
% of canopy dominated by ivy	>25%			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			

	0	1	2	3
	0			
Ground flora/ hedge base: Alien invasive species	Present			
Degraded margin	Ploughing upto base of hedge shrubs or poaching /erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0		**2**	
	Total Condition Assessment Score : 12			

HEDGEROW 14

A Single treeline of poplar trees (matchstick poplars); this is of low ecological value and the trees are in dangerous condition given their propensity to snap in windy and stormy weather. The poplars are fenced with timber and herbicide applied.

HEDGEROW 15

SITE NAME	HEDGEROW/TREELINE NUMBER: H15
Survey date: 19.08.2019	Fossitt: WL2
This forms the southern boundary of the lands and fronts Porterstown Road. Remnants of the original hedgerow remain. Around Kellystown House, the treeline comprises beech (*Fagus sylvatica*), planted small leaved lime (*Tilia cordata*), turkey oak (*Quercus cerris*) and whitebeam (*Sorbus aria*). The ground flora is generally sparse, with a low carpet of ivy. The eastern end now comprises a stone wall and hedging associated with Luttlrellstown College, thereafter the hedgerow includes hawthorn, blackthorn and occasional specimen trees such as lebanan cypruss as well as mature ash. Ivy growth is heavy on these parts of the treeline. The boundary treatments vary and are associated with a number of houses. The hedgerow is intact primarily in two stretches along this road as identified on the hedgerow map.	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significan**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/ boundary; shown connected to woo on 1st edition OS Connects to featu SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
		2		
Ground flora significance				
Dominated by ruderal species.				
0				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
0	**1**			
Pteridophyes from list/30m strip			3-5	>5
0				

0	1	2	3	4
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designa area, particularly woodland
		2		
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape design
		2		
Other factors of significance				
Total Significance Score				**10**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5-4**	**>4m**
			2	
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
			2	
Profile	Remnant /derelict	Wind shaped/losing base structure	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
		1		
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
			2	
Continuity				

	0	1	2	3
% gaps	>10%	5-10%	<5%	continuous
	0			
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
		1		
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
	0			
% of canopy dominated by ivy	>25%			
	0			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
	0			
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			
Degraded margin	Ploughing upto base of hedge shrubs or poaching /erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0			
	Total Condition Assessment Score : 8			

HEDGEROW 16

SITE NAME	HEDGEROW/TREELINE NUMBER: H16
Survey date: 19.08.2019	Fossitt: WL2

This curved treeline suggests the old demesne planting associated with Kellystown House, and is marked as such on the 1st edition O.S map.
There is a gravel track and deep ditch on the eastern boundary of the hedgerow. This ditch had water flowing in it on the day of the survey, and contained some different species not found elsewhere in the site, including brown sedge (*Carex disticha),* great manner grass (*Glyceria maxima),* and wild celery (*Apium* sp). Ground flora next to the ditch included the invasive shrub, snowberry (*Symphoricarpos albus*), native hogweed (*H. sphondylium*), and coltsfoot (*Tussilago farfara).*
Tree species present include Ash, Hawthorn, Lime, sycamore and rowan.

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
			3	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				

0	1	2	3	4
1-3	4-5	6-7	8-9	10+
		2		
Ground flora significance				
Dominated by ruderal species.				
0				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
			3	
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
			3	
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
			3	
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
		2		
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance				
Total Significance Score				**21**

Hedgerow condition assessment

	0	1	2	3
	Unfavo	**Adequa**	**Favour**	**Highly favourable**

	0	1	2	3
	urable	**te**	**able**	
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5-4**	**>4m**
			2	
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
			2	
Profile	Remnant /derelict	Wind shaped/losing base structure	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
			2	
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
			2	
Continuity				
% gaps	>10%	5-10%	<5%	continuous
				3
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
				3
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
	0		**2**	
% of canopy dominated by ivy	>25%			
	0			
Unfavourable species composition: % woody growth	10%			

	0	1	2	3
volume comprised of unfavourable species				
			2	
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			
	0			
Degraded margin	Ploughing upto base of hedge shrubs or poaching /erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0		**2**	
	Total Condition Assessment Score : 17			

HEDGEROW 17

SITE NAME	HEDGEROW/TREELINE NUMBER: H17
Survey date: 18.09.2019	Fossitt: WL2
An internal remnant field boundary approximately 140m in length. Desktop survey only.	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/Count boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
		2		
Ground flora significance				
Dominated by ruderal species.				
0				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
	1			
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				

0	1	2	3	4
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
		2		
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
	1			
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance	Forms part of a townland boundary along this road.			
Total Significance Score				**11**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2.5**	**2.5 -4**	**>4m**
			2	
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
			2	
Profile	Remnant/derelict	Wind shaped/losing base structure	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
		1		
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
				3
Continuity				
% gaps	>10%	5-10%	<5%	continuous
		1		
Specific gaps	Individual gap >5m	Individual	No gaps	No gaps

	0	1	2	3
		gap <5m		
				3
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
	0		**2**	
% of canopy dominated by ivy	>25%			
	0			
Unfavourable species composition : % woody growth volume comprised of unfavourable species	10%			
			2	
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			
	0			
Degraded margin	Ploughing upto base of hedge shrubs or poaching/erosion		(grassy) margin (2m or greater on one side of	(grassy) margin (2m or greater on both sides of the hedge

	0	1	2	3
			the hedge)	
	0			
	Total Condition Assessment Score : 12			

HEDGEROW 18

SITE NAME	HEDGEROW/TREELINE NUMBER: H18
Survey date: 18.09.2019	Fossitt: WL2
Hedgerow along Clonsilla Road. Similar to Luttrelstown Road, it is fragmented with a range of boundaries and stretches of intact hedgerow remain. This road is also a townland boundary.	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
		2		
Ground flora significance				
Dominated by ruderal species.				
0				
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
	1			
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch

0	1	2	3	4
		2		
		Dry ditch	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
	1			
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance	Forms part of a townland boundary along this road.			
Total Significance Score				**11**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5--2.5**	**2.5-4**	**>4m**
			2	
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
			2	
Profile	Remnant/derelict	Wind shaped/losing base structure	Boxed/a-shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
		1		
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
			2	
Continuity				

	0	1	2	3
% gaps	>10%	5-10%	<5%	continuous
	0			
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
	0			
% of canopy dominated by ivy	>25%			
	0			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			
	0			
Degraded margin	Ploughing upto base of hedge shrubs or poaching/erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0			
	Total Condition Assessment Score : 7			

HEDGEROW 19

SITE NAME	HEDGEROW/TREELINE NUMBER: H19
Survey date: 19.08.2019	Fossitt: WL2
A single hedgerow within the eastern part of the lands, evidence of large tree cutting within the past 2 decades. This supports a good diversity of tree and shrub species nonetheless. Some rubble associated with construction (road?) works are present on the eastern bank and herbicide application on the playing fields western side reduces ground flora diversity. It does provide a linear corridor between the Royal Canal and potential high value grassland to the south.	
	

Hedgerow significance assessment

0	1	2	3	4
Low significance	**Slightly significant**	**Moderately significant**	**Significant**	**Highly significant**
Historical Significance				
Recently established	Internal field boundary	Roadside/canal boundary/Farm boundary	Boundary appears on 1st Edition OS	Townland/Parish/County boundary; shown as/or connected to woodland on 1st edition OS Connects to features on SMR
			3	
	Past evidence of coppicing or laying		Non-linear (excluding roadside)	
Species diversity significance: tree/shrub/climber species count (all)/30m strip				
1-3	4-5	6-7	8-9	10+
		2		
Ground flora significance				
Dominated by ruderal species.				
0				

0	1	2	3	4
Species count (from list) 30m strip				
<2	2-3	4-5	6-7	>7
	1			
Pteridophyes from list/30m strip			3-5	>5
0				
Structure, construction & associated features				
	Wall /bank <0.5m (h/d)	Wall/bank 0.5-1m	Wall/bank >1m	Double ditch
		2		
		Dry ditch **2**	Wet ditch/drain	Stream/river
		Badger sett		
		Green lane		
Habitat connectivity Significance				
No connection	Single link with semi natural habitat inc hedgerow	Multiple links with semi natural hedgerows including other hedgerows	Link with woodland/forest habitat	Link with designated area, particularly woodland
	1			
Landscape Significance	Wind shaped	Mature hedgerow trees		Area covered by landscape designation
		2		
Other factors of significance	Forms part of a townland boundary along this road.			
Total Significance Score				**13**

Hedgerow condition assessment

	0	1	2	3
	Unfavourable	**Adequate**	**Favourable**	**Highly favourable**
Structural variables				
Height	**<1.5**	**1.5-2**	**2.5-4**	**>4m**

	0	1	2	3
		.5		
			2	
Width	**<1m**	**1-2m**	**2-3m**	**>3m**
			2	
Profile	Remnant/derelict	Wind shaped/losing base structure	Boxed/as shaped; straight sided	Overgrown; top heavy/undercut; outgrowths at base
			2	
Basal density/porosity to light of woody shrubs	**Open**	**Semi-translucent**	**Semi-opaque**	**Opaque/dense**
			2	
Continuity				
% gaps	>10%	5-10%	<5%	continuous
		1		
Specific gaps	Individual gap >5m	Individual gap <5m	No gaps	No gaps
		1		
Negative indicators/degradation/issues affecting long term viability				
Bank/wall	>20% of length of hedge degraded	<20% of the hedge degraded	Minor degradation	No degradation
		1		
% of canopy dominated by ivy	>25%			
	0			
Unfavourable species composition: % woody growth volume comprised of unfavourable species	10%			

	0	1	2	3
Ground flora/hedge base: % ground layer showing evidence of herbicide use	>20%			
	0			
Ground flora/hedge base: % noxious weeds/nutrient rich species	>20%			
	0			
Ground flora/ hedge base: Alien invasive species	Present			
	0			
Degraded margin	Ploughing upto base of hedge shrubs or poaching/erosion		(grassy) margin (2m or greater on one side of the hedge)	(grassy) margin (2m or greater on both sides of the hedge
	0			
	Total Condition Assessment Score : 11			

APPENDIX D: BIRD SURVEY NOTES

(1)

Vantage Point Watch Recording Sheet

Site:	Vantage Point Location:	Date:	Observer:
KELLYSTOWN	WEST OF FARMSTEAD.	19/8/19	JIM MINOGUE

Weather Conditions: FAIR GOOD VISABILITY. COOL / WINDY / DRY

Start Time: 10.10 AM

Finish Time: 11.50

Flight No.	Sp. Code/ sex/ag	No. of birds	Start time	Duration (s)	Height at 15s intervals (1 = <20m; 2 = 20 – 40m; 3 = 40 – 120m; 4 = >120m																Notes (hunting, displaying, carrying food/nesting material etc.)
					Start 0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	
1	WP	1	10·13																			TREELINE TO N.
2	JD	1	10·15																			FLYING E to W.
3	HM	1	10·17																			FLYING W. to E
4	HS	2	10·21																			IN HEDGEROW BY FARMSTEAD.
5	WP	1	10·22																			TREELINE TO N.
6	JD	1	10·23																			WEST OF V.P.
7	ST	1	10·24																			WEST.
8	WP	1	10·24																			
9	CH	1	10·25																			
10	WP	3	10·26																			TO NORTH.
11	JD	2	10·30																			OVER SCHOOL TO S.
12	CH	2	10·32																			
13	MG	2	10·35																			TO N.
14	MG	2	10·37																			
15	WP	2	10·40																			
16	HM	1	10·43																			
17	SL	1	10·51																			SWALLOWS AROUND FARMSTEAD
18	SL	9	10·54																			
19	WP	1	10·57																			FLYING E to W
20	HC	2	10·58																			
21	WP	2	10·59																			
22	JD	1	11·02																			
23	SL	2	11·03																			
24	SL	2	11·05																			
25	B	1	11·06																			
26	SL	2	11·11																			FORAGING OVER GRASSLAND
27	WP	2	11·13																			
28	HC	1	11·15																			TOWARDS SCHOOL N.
29	SL	5	11·17																			
30	MG	2	11·19																			

2

Vantage Point Watch Recording Sheet

Site:	Vantage Point Location:	Date:	Observer:
KELLYSTOWN	WEST OF FARMSTEAD.	19/8/19	JIM MINOGUE

Weather Conditions: FAIR GOOD VISABILITY COOL / WINDY / DRY.

Start Time: 10.10

Finish Time: 11.50

Flight No.	Sp. Code/ sex/ag	No. of birds	Start time	Dura-tion (s)	Height at 15s intervals (1 = <20m; 2 = 20 – 40m; 3 = 40 – 120m; 4 = >120m																Notes (hunting, displaying, carrying food/nesting material etc.)
					Start 0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	
31	HS	6	11.21																		
32	ST	1	11.23																		IN HEDGE BY BUILDINGS
33	WP	2	11.23																		
34	CH	2	11.26																		
35	WP	2	11.27																		
36	B	1	11.30																		
37	WP	1	11.30																		
38	HC	2	11.31																		
39	WP	2	11.33																		FLYING N AROUND BUILDINGS
40	SL	2	11.34																		ACROSS GRASSLAND TO N
41	SL	4	11.35																		
42	WP	2	11.36																		
43	PL	2	11.39																		
44	HC	2	11.41																		5 at SCHOOL
45	WP	3	11.41																		
46	HC	1	11.43																		
47	WP	2	11.44																		
48	MG	1	11.46																		
49	CH	1	11.47																		
50	WP	2	11.48																		
51	B	1	11.51																		HEDGE BY FARMSTEAD