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An Chomhairle Oidhreachta
The Heritage Council



Kilcock



**HABITAT SURVEY AND GREEN
INFRASTRUCTURE MAPPING 2014**

KILDARE COUNTY COUNCIL

November 2014



KILCOCK

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**Prepared for
KILDARE COUNTY COUNCIL**

November 2014

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Habitat Survey and Green Infrastructure Mapping

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1 INTRODUCTION

1.1 Background

Kildare County Council, in partnership with the County Kildare Heritage Forum and the Heritage Council commissioned a series of Habitat Survey and Mapping projects for a number of towns in Kildare. An action of the County Kildare Heritage and Biodiversity Plan is to identify local important biodiversity areas. Such habitats are essential for preserving the biodiversity of an area and supporting its wildlife. In addition, there are a wide range of benefits to maintaining biodiversity areas such as provision of recreation and amenity areas, protection of soil and water quality, sustainable food and fuel production, flood alleviation and carbon sequestration. As a result, the importance of these habitats in Ireland is widely recognised and their significance should be fully appreciated.

In recognition of the importance of these habitats Kildare County Council prepared objectives for the County Kildare Biodiversity Action Plan (Kildare County Council 2009). These objectives are the same as those adopted in the County Kildare Heritage Plan (Kildare County Council 2005). These plans are distinct in that the main focus of the biodiversity plan is natural heritage. The objectives are as follows:

1. To facilitate the collection and dissemination of heritage information;
2. To raise public awareness, understanding and appreciation of County Kildare's heritage;
3. To promote best practice in heritage conservation and management; and,
4. To inform policy and provide advice to Kildare local authorities.

The Kildare County Development Plan 2011-2017 (Kildare County Council 2011) sets out a strategic approach to the management of development in the county. One of the strategies within this plan is to protect local assets by preserving the quality of the landscape, open space, natural, architectural, archaeological and cultural heritage and material assets of the county. Part of the core strategy of this plan is to balance the environment with sustainable and appropriate development. As such, it is the policy of the Council to:

- Protect and conserve the natural environment;
- Protect and conserve nationally important and EU designated sites;
- Promote and enhance biodiversity throughout the county; and,
- Ensure that the built heritage is appropriately protected through the Record of Protected Structures with policies to support the sensitive reuse and integration of such structures into new development works.

Protecting the environment by implementing an environmental protection policy which recognises the various environmentally sensitive zones within the county but not to mutually exclude appropriate and otherwise acceptable uses and development is one of the items which the preferred development strategy aims to achieve.

1.2 Objectives

The purpose of this study was to:

- Survey, map and assess habitats within the development boundary of the town;
- Identify green infrastructure;
- To liaise with Kildare County Council staff in the development of policies and objectives to protect and conserve the green infrastructure; and,
- To raise awareness about the biodiversity of the towns.

It is the intention of the Kildare County Council that the results of this study will:

- Inform future strategic planning;
- Identify green infrastructure;
- Assist the appropriate management of biodiversity;
- Provide information for the general public and relevant community groups; and,
- Raise awareness about the biodiversity resources that the towns support.

In order to efficiently conserve and sustainably manage the natural heritage of towns in Kildare a high level of understanding of the county's habitats and landscapes is required. One of the main aims of this study was to carry this out so that the safeguarding and sustainable management of habitats and green infrastructure within these towns can be fully integrated within the planning process.

1.3 The Study Area

This report focuses on the habitat survey and green infrastructure mapping for the town of Kilcock (Grid Ref: N 88567 39558), which is located in north Kildare, c. 12.2km west of Co. Dublin, adjacent to the Kildare Meath border. According to the Central Statistics Office Ireland, Kilcock had a population of 5,533 in 2011. The River Rye Water flows in a south-easterly direction along the northern boundary of Kilcock, while the Royal Canal also flows in a north-westerly direction through the town centre, parallel to the railway line. The Royal Canal is designated as a proposed Natural Heritage Area (pNHA). The River Rye Water flows through a candidate Special Area of Conservation (cSAC) Rye Water Valley/Carlton (001398), which is located c. 5.9km downstream of Kilcock. The M4 motorway also passes through the town, linking Kilcock to Co. Dublin in the east and Co. Galway in the west. Due to its close proximity to the Capital, Kilcock is a commuter town for Dublin. There are a number of significant areas located within Kilcock that are referred to in this report. These include:

- Courtown Demesne;
- Common West (also referred to Brayton Park);
- Common East;
- Lands at Boycetown; and,
- Lands at Kilcock GAA Club.

Courtown Demesne, which is located south of the town centre across the M4 motorway, is a large country house originally constructed in 1815 by the Aylmer family. It forms a large proportion of the open space within the Kilcock. Other areas of open space include Common West, Common east and lands at Kilcock GAA Club.



Legend

- Study Area
- Royal Canal pNHA
- River Rye Water
- 50m Buffer

Drawing No: 140090/01/A - Figure 1

Project Title:
Kildare Habitat Survey and Green Infrastructure Mapping 2014

Client:
Kildare County Council and Heritage Council

Project No.: 140090 Scale: 1:50,000 @ A4

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2 METHODOLOGY

2.1 Desk Study and Consultation

A desk study was carried out to collect any available information on the local ecological environment within the town. The following resources and organisations were consulted:

- Ordnance Survey of Ireland mapping and aerial photography available from www.osi.ie;
- Online data available on European Sites (Natura 2000 Sites) and protected species as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie;
- National Biodiversity Data Centre (NBDC) records available from <http://maps.biodiversityireland.ie/#/Map>;
- Environmental Protection Agency map view <http://gis.epa.ie/Envision>;
- Kildare County Council Heritage Officer;
- Bat Conservation Ireland <http://www.batconservationireland.org/>;
- Inland Fisheries Ireland <http://www.fisheriesireland.ie/>;
- Waterways Ireland <http://www.waterwaysireland.org/>;
- Control of Aquatic Invasive Species in Ireland (CAISIE) <http://caisie.ie/>;
- Kildare County Development Plan 2011 – 2017;
- Kildare Open Space Strategy 2008;
- Kildare Biodiversity Action Plan 2009 - 2014; and,
- County Kildare Hedgerow Survey Report 2006.

In addition, the following guidance has been followed during these surveys:

- *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.* 2011); and,
- *A Guide to Habitats in Ireland* (Fossitt, J. A. 2000)

Organisations that were contacted directly in order to obtain additional information for this study were:

The NPWS provided a subset of their habitat data for the designated sites within the study area. Aspects of these data sets may be incomplete and this information did not substitute for up-to-date field surveys.

Waterways Ireland was contacted in order to obtain any additional or updated information regarding habitat mapping and species records that are not already available on their website.

Inland Fisheries Ireland were contacted in the same capacity as the above.

National Transport Authority (NTA) was contacted to obtain details on recent studies undertaken of the Royal Canal.

Where received, all additional relevant data has been included in the species lists in Appendix A.

2.2 Evaluation of Habitats and Designated Sites

One of the main aims of a habitat survey is to identify its ecological value. Criteria for such evaluation may include noting its rarity, the abundance and diversity of its species, the level of human interference/modification and/or management of an area, their connectivity to other natural habitats and their size. Through gathering such information it is possible to identify habitats of conservation importance which should be offered greater protection than those of less value. The habitats in this study were evaluated according to the NRA Guidelines provided in Appendix D. This is discussed further in Section 4.

The European Commission has identified the prime habitats of conservation importance across Europe. Of these habitat types, 59 exist in Ireland and a number of these are qualifying features for designated sites here.

Special Areas of Conservation (SAC) are designated under the Habitats Directive (92/43/EEC). This Directive enables the protection, conservation and restoration of certain habitats and/or species (habitats listed on Annex I, and species listed on Annex II/IV of the Habitats Directive). Designated SACs are compiled within a framework of protected areas known as Natura 2000 or European Sites. In Ireland candidate SAC's are afforded the same level of protection as SACs. Legislation that will regularise the list of cSACs is likely to commence in 2015.

Special Protection Areas (SPAs) are designated under the Birds Directive (79/409/EEC). SPAs are designated to protect birds listed on Annex I of the Birds Directive, as well as for populations of regularly occurring migratory species. The Birds Directive obliges member states to conserve wetlands, especially those of international importance.

The Birds and Habitats Directives are principally transposed into Irish law by the European Communities Birds and Natural Habitats Regulations 2011 (SI 477/2011) (as amended).

Natural Heritage Areas are designated and protected under the Wildlife Act 1976 (as amended), while proposed Natural Heritage Areas (pNHAs) are offered some level of protection until such time as they are fully designated, under development plans.

The designated site within this town is described within Table 1 below.

Table 1 – Designated Sites located within 10km of the town’s development boundary.

Designated sites (Special Areas of Conservation, Special Protection Areas and proposed Natural Heritage Areas) within 10km of the town boundary				
Code	Site Name	Location	Qualifying Interests (i.e. reasons for designation)	Site Vulnerability
Kilcock (* = priority; numbers in brackets are Natura 2000 codes)				
proposed Natural Heritage Area (pNHA)				
002103	Royal Canal	Located within the Study Area	The canal NHA comprises the central channel and the banks on either side of it. The rare and legally protected Opposite-leaved Pondweed (<i>Groenlandia densa</i>) (Flora Protection Order 1987) is present at one site in Dublin, between Locks 4 and 5. <i>Tolypella intricata</i> (a stonewort listed in the Red Data Book as being vulnerable) is also in the Royal Canal in Dublin, the only site in Ireland where it is now found. The Royal Canal provides habitat for Otters (<i>Lutra lutra</i>). This is a linear habitat, providing connectivity between habitats and supporting a diverse range of species.	Habitats and species within this pNHA may be threatened by impacts such as: <ul style="list-style-type: none"> ▪ Water pollution. ▪ Over fishing. ▪ Litter. ▪ Disturbance.
candidate Special Area of Conservation (cSAC)				
001398	Rye Water Valley / Carton	Located c. 5.3km to the east of the Study Area	Annex I Habitats: <ul style="list-style-type: none"> ▪ * [7220] Petrifying springs with tufa formation (<i>Cratoneurion</i>) Annex II Species: <ul style="list-style-type: none"> ▪ [1014] Narrow-mouthed Whorl Snail (<i>Vertigo angustior</i>) ▪ [1016] Desmoulin’s Whorl Snail (<i>Vertigo moulinsiana</i>) 	<ul style="list-style-type: none"> ▪ Woodland section is vulnerable to woodland clearance, which would result in habitat loss for some of the rare plants present. ▪ River Rye Water is vulnerable to pollution. ▪ Petrifying Springs and Vertigo species are particularly vulnerable to urban development and dumping.

2.3 Notable Flora

NPWS and NBDC species lists can be seen in Appendix A. Plants of particular note which were recorded during the survey (refer to Appendix B) are discussed below.

There were no Flora Protection Order (FPO) species recorded during the field surveys. It is important to note that the findings are based on surveys conducted towards the end of the optimal survey season for many habitats and species. Records should be sought from the Vice County recorder to ensure that no Flora Protection Order species are missed when drafting policies and objectives for this town. There were no records of FPO species within 2km of Kilcock (this is discussed further in Section 3.1 below).

Although no invasive flora were noted during the survey, these plants are likely to be present within the town, particularly along watercourses or the railway line. Records for invasive flora and fauna in Kilcock are discussed further in Section 3.1.

2.4 Field Surveys

The assessments comprised a walkover of the town within the Study Area boundary during August and September 2014. A summary of the results is presented below. Desktop records are listed in Appendix A and species recorded during the field survey are provided in Appendix B. It should be noted that due to the limitations outlined in section 2.5 below, these lists do not constitute a full and complete species list for the Study Area, but instead provide a 'snapshot' of species that were recorded during the surveys at that time of year.

2.4.1 Habitats and Flora

The aim of the walkover was to identify habitats and flora that are either protected or of conservation importance. The Study Area was surveyed using methodology outlined in the Heritage Council's *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.* 2011). All habitat types were identified and classified using the Heritage Council's *A Guide to Habitats in Ireland* (Fossitt 2000). Within each habitat the dominant plant species and/or any notable species were recorded.

A summary description of each of the habitats identified within this town has been provided in this report. A list of all flora and fauna species recorded during the field surveys is appended in Appendix B. This list also includes all Latin/scientific names for these species.

Hedgerows were individually surveyed and their value assessed according to the hedgerow evaluation form in Appendix E.

2.4.2 Fauna

The habitats within the towns were considered for their potential to support protected flora and fauna. Where definitive evidence of this was found during the survey (such as tracks, habitats, markings, feeding signs, droppings and by direct observation), this was recorded as 'Target Notes' which have been incorporated into the mapping data. Likewise, *ad hoc* observations of notable bird species within the study area were recorded.

2.5 Green Infrastructure

Green infrastructure is broadly defined as *“an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations. Green Infrastructure is the ecological framework needed for environmental, social and economic sustainability – in short it is a nation’s natural life sustaining system”* (Benedict *et al.* 2002).

There is no standard definition for Green Infrastructure. As such, Comhar have conducted studies in Ireland using the following definition; *“Green Infrastructure is a strategically planned and managed network featuring areas with high quality biodiversity (uplands, wetlands, peatlands, rivers and coast), farmed and wooded lands and other green spaces that conserve ecosystem values which provide essential services to society.”* (Comhar 2010, Pg. 11)

The Green Infrastructure within the towns was mapped by paying regard to the two definitions above. The field surveys and desktop research identified area of high local importance and where appropriate included other habitats that provided important ecosystem services or acted as ecological corridors or stepping stones for wildlife, these included habitats such as unmanaged grassland or scrub, and low intensity farmland. These areas were recorded as ‘Key Green Infrastructure’ and this is illustrated on the maps and within Section 4.2 of this report.

Areas which are of lower ecological value, but which may provide useful ‘stepping stones’ for wildlife, included amenity areas and parks. Generally these were not included in the ‘Key Green Infrastructure’ unless they consisted of significant areas of woodland, hedgerow or scrub. However, these areas are noted for their ability to support certain flora and fauna and to encourage wildlife into more urbanised areas. Consequently, they contributed in part to the connectivity of the wider green infrastructure.

2.6 Limitations

Interpretation of the results of this study took account of seasonal limitations. These surveys provide a snapshot of the ecology of the towns within a specific time during the survey season. These assessments were undertaken towards the end of the optimum survey period for a number of habitats, and outside of the optimal period for surveying habitats such as woodland and species-rich grasslands. As such, species could not always be accurately identified.

Many of the fields on site were heavily grazed, mown or cut which may lead to certain flora being overlooked that could be present in the sward before such interventions.

As it was still possible to identify flora that had not yet senesced, the surveys undertaken were sufficient for identifying and evaluating the habitats and ecological features of value within the towns.

The data for species records held by the National Biodiversity Data Centre and statutory bodies (such as National Parks and Wildlife Service) is often provided on an *ad hoc* basis by recorders. These records can provide an indication of what species might be found in an area, however, they do not constitute full and complete species lists. Absence of certain species from these sources does not confirm absence of species in the area.

3 RESULTS

3.1 Desktop Study Records

The desktop study results give an indication of what notable species might be found within 2km of this town (10km for bat roost records). These details can be found in Appendix A of this report, which includes latin/scientific names for these species.

3.1.1 Notable Habitats and Flora

Flora Protection Order 1999 (FPO) Species

There are no records of FPO species located within 2km of the Study Area. The nearest record of FPO species Opposite-leaved Pondweed is located c. 11.2km to the south-east of Kilcock. According to the Site Synopsis of Royal Canal pNHA, the only record of this species on the Royal Canal is within Co. Dublin between Locks 4 and 5. This species typically occurs in rivers, canals and estuarine muds (Parnell & Curtis 2012).

3.1.2 Notable Fauna

Bats

According to NBDC map, a number of different bat species have been recorded within 2km of the Study Area. These include daubenton's bat (*Myotis daubentonii*), natterer's bat (*Myotis nattereri*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and Leisler's Bat (*Nyctalus leisleri*). According to Bat Conservation Ireland records, a total of 13 roosts of at least 3 different species were recorded within 10km of the Study Area, one of which is located within the Study Area. These species include common pipistrelle, soprano pipistrelle and brown long-eared bat (*Plecotus auritus*), as well as an unidentified Pipistrelle sp. roost and a number of unidentified bat roosts.

Birds

In total, 4 red-listed and 13 amber-listed birds have been recorded within 2km of the Study Area. Kingfisher (*Alcedo atthis*), which is listed on Annex I of the Birds Directive, has also been recorded. The red-listed birds recorded include black-headed gull (*Larus ridibundus*), grey wagtail (*Motacilla cinerea*), northern lapwing (*Vanellus vanellus*) and yellowhammer (*Emberiza citrinella*).

Other Mammals

With regard to terrestrial mammals, otters, badgers (*Meles meles*) and hedgehogs (*Erinaceus europaeus*) have also been recorded within 2km of the Study Area. Otters have been recorded within the Study Area on both the Royal Canal (in 2012 and 2013) and the Rye Water (2011) in the centre of Kilcock town. Badgers have been recorded directly adjacent to the western boundary of the Study Area in 2013, 2012 and 2011. There are 2 records of hedgehogs within Kilcock (2013) and one adjacent to the western boundary of the Study Area (2012).

Fish

The Royal Canal in Kildare supports significant populations of coarse fish, including pike (*Esox lucius*), perch (*Perca fluviatilis*), roach (*Rutilus rutilus*), rudd (*Scardinius erythrophthalmus*), bream (*Abramis brama*) and tench (*Tinca tinca*) (Pers. Comm. Senior Environmental Officer, Inland Fisheries Ireland).

3.1.3 Invasive Species

According to the NBDC there are records of Curly Pondweed (*Potamogeton crispus*) located within the Study Area (1987-1999 BSBI record) on both the Royal Canal and Rye Water. The nearest record of American mink (*Neovison vison*) is located c. 125m to the east of Kilcock on the River Rye Water. There are records of grey squirrel (*Sciurus carolinensis*) located within the Study Area (2012 and 2013) and adjacent to the eastern boundary of the Study Area (2012).

3.2 Habitat Categories

Map 1 in Appendix E illustrates the extent of all habitat types present within Kilcock. A list of all flora and fauna species recorded during the survey is shown in Appendix B which includes scientific (Latin) names according to New Flora of British Isles, 3rd Edition (Stace 2010).

Overall, the main habitats comprised of mixed broadleaved and conifer woodlands, areas of scrub, improved, semi-improved and wet grassland fields, parkland and linear stretches of reed swamp along the River Rye Water. There were also areas of disturbed and bare ground that were impacted by human activities, primarily construction. Fields boundaries generally consisted of hedgerows and treelines, some of which had associated drainage ditches.

The following habitat types were identified during the survey:

3.2.1 Woodland, Scrub and Hedgerows

(Mixed) Broadleaved Woodland (WD1)

A number of mixed broadleaved woodlands were identified across the town of Kilcock. The total area of this habitat was c. 13.59ha. The majority of woodlands identified were located within the Courtown Demesne, located in southern Kilcock. These woodlands appear on the 1829-41 Ordnance Survey Map of Ireland (www.osi.ie), suggesting that they may be long-established woodland (II), which is defined as:

'Woodland that has remained continuously wooded since the first edition OS maps of 1830-44, but for which there is positive evidence in older documentation that it is not ancient in origin.' (Perrin & Daly 2010, Pg. 6)

These woodlands were dominated by mature stands of broadleaved species Alder (*Alnus glutinosa*), Ash (*Fraxinus excelsior*), Horse-chestnut (*Aesculus hippocastanum*), and Oak species (*Quercus* sp.). Other occasionally occurring species included Elder (*Sambucus nigra*), Sycamore (*Acer pseudoplatanus*) and Larch (*Larix* sp.). The understorey was limited in terms of the number of species present and was almost entirely dominated by Ivy (*Hedera helix*) and Brambles (*Rubus fruticosus* agg.); however ferns such as Maidenhair Spleenwort (*Asplenium* sp.) were also noted in one of the woodlands.

(Mixed) Broadleaved/Conifer Woodland (WD2)

Mixed broadleaved/conifer woodlands were identified within the Courtown Demesne. The total area of this habitat was c. 19.13ha. These woodlands do not appear on either the 1829-1841 or 1897 -1913 Ordnance Survey Map of Ireland (www.osi.ie), suggesting that they were planted more recently in comparison to the mixed broadleaved woodlands described above.

Overall, these woodlands were dominated by mature Beech (*Fagus sylvatica*), Ash, Horse-chestnut and Spruce species (*Picea sp.*) in similar proportions. Other occasionally occurring species included Hawthorn (*Crataegus monogyna*) and Larch. The understorey of these woodlands was somewhat more species-rich compared to the woodland habitat type described above. It was dominated by Ivy, but also included herbaceous species typical of shaded woodlands such as, Wood Avens (*Geum urbanum*) and Enchanter's Nightshade (*Circaea lutetiana*), as well as Soft Shield-fern (*Polystichum setiferum*).

Scattered Trees and Parkland (WD5)

A small patch of Scattered Trees and Parkland habitat (c. 0.82ha in area) was identified adjacent to Amenity Grassland habitat, located adjacent to the residential estate Courtown Park in Kilcock. This habitat consisted of a cluster of young planted Rowan trees (*Sorbus aucuparia*).

Scrub (WS1)

Scrub was a very common habitat type identified across the Study Area. The total area of this habitat was c. 12.61ha. It was typically found growing in dense, wide patches along hedgerows and treelines in agricultural fields, as well as in areas impacted by human disturbance. There were also patches of scrub located within Common West and Common East, as well as on lands adjacent to both the M4 motorway and the railway line. This habitat was dominated in varying degrees/proportions by typical spinose, native, scrub species; Bramble, Blackthorn (*Prunus spinosa*) and Hawthorn, as well as Willow species (*Salix sp.*).

Hedgerow (WL1)

In total, 96 hedgerows were identified across the town of Kilcock. These hedgerows varied both in size and the species they supported; however in general, the dominant species included Ash, Hawthorn, Blackthorn, Elm (*Ulm sp.*) and Hazel (*Corylus avellana*) (see Figure 2 below). Occasionally occurring species included Crab Apple (*Malus sylvestris*) and Rose species (*Rosa sp.*). Bramble, along with Ivy, often formed part of a dense understorey. Lords and Ladies (*Arum maculatum*), a species typical of shaded hedges, was occasionally noted as an understorey species. 39 of the hedgerows also had associated drainage ditches, 8 of which were described as wet during the time of the survey.

Approximately 56% of the hedgerows surveyed across the Study Area were evaluated as being of moderate ecological value, while 32.3% were evaluated as having low ecological value and 11% were of high ecological value. The High value hedgerows were located across the Study Area, i.e. along the Rye Water, in Courtown Demesne, near to Kilcock GAA Club grounds and within Common West.



Figure 2 Hedgerow of moderate value located within a field of improved grassland.

Treelines (WL2)

In total, 43 treelines were surveyed across Kilcock. These treelines varied in length and species (see Figure 3 below). They were generally dominated by veteran trees including mature Ash, Sycamore, Beech and Oak species. Other occasionally occurring species included native mature trees of Hawthorn, Elder, Willow species and Poplar species (*Populus sp.*), as well as non-native mature trees Larch and Leyland Cypress species (*Leylandii sp.*). The longest treeline recorded stretched along the River Rye Water for c. 1.4km in the north of Kilcock adjacent to the northern boundary of the Study Area. The majority of treelines recorded were located along the boundaries of agricultural fields in the area of Boycetown in northern Kilcock. There was also a treeline present along the Royal Canal, adjacent to Dry Calcareous and Neutral grassland. Some had associated drainage ditches (some of which were wet others were noted to be dry during the field survey).



Figure 3: Treeline located within a field of improved grassland and wet grassland.

3.2.2 Grasslands

Improved Agricultural Grassland (GA1)

This habitat type was undoubtedly the most common across Kilcock. A total of 66 fields were identified as improved agricultural grassland (with a total area of c. 253.36ha), some of which were described as formerly improved agricultural grassland. Many of these fields were heavily grazed by livestock (such as cattle, sheep or horses) and had been fertilised. In general, species richness and diversity was low. The dominant species identified were those typical of intensively managed agricultural grasslands. For instance, there was a high abundance of Perennial Rye (*Lolium perenne*), Creeping Buttercup (*Ranunculus repens*) and White Clover (*Trifolium repens*). Other dominant species included typical 'agricultural' herbs such as Dandelion (*Taraxacum agg.*), Nettle (*Urtica dioica*), Broadleaved Dock (*Rumex obtusifolius*), Ribwort Plantain (*Plantago lanceolata*) and Spear Thistle (*Cirsium vulgare*). Other occasionally occurring species identified, which were more frequent in the formally improved agricultural grassland habitats, included Common Chickweed (*Stellaria media*), Ragwort (*Senecio jacobaea*), Common Mouse-ear (*Cerastium fontanum*), Willowherb species (*Epilobium sp.*), Yorkshire Fog (*Holcus lanatus*), Timothy (*Phleum pratense*) and Greater Stitchwort (*Stellaria holostea*). Some rarer species located along the boundaries of these fields included Bent Grass (*Agrostis sp.*), Sow-thistle species (*Sonchus sp.*) and Wavy Bitter-cress (*Cardamine flexuosa*).

Amenity Grassland (GA2)

In general, this habitat was found within the residential areas of Kilcock, which were located primarily within the centre of the Study Area, north of the M4 Motorway. A total area of c. 30.68ha of Amenity grassland was mapped. There were also a number of amenity grassland playing fields located across the Study Area that may not have been mapped due to their location within small urban patches and gardens. Larger areas of amenity grassland included Kilcock GAA Club pitches, playing fields located within Common West and adjacent to

Common East in Scoil Dara and St. Coca's National School, as well as those located within Scoil Uí Riada and Saint Joseph's Boys National School.

The dominant species identified included Creeping Buttercup, Self-heal (*Prunella vulgaris*), Meadow-grass species (*Poa sp.*) and Daisy (*Bellis perennis*).

Dry Calcareous and Neutral Grassland (GS1)

A small number of fields were recorded as dry calcareous and neutral grassland (with a total area of 5.33ha). These fields were found in Common East and fields located near to Kilcock GAA Club grounds. In comparison to other grassland habitat types identified within the Study Area, this habitat had a more diverse floral assemblage per area. It was generally dominated by graminoid species Cock's-foot (*Dactylis glomerata*) and Yorkshire Fog, as well as herbaceous species typical of calcareous grasslands including Yarrow (*Achillia millefolium*), Knapweed (*Centaurea nigra*), Bird's-foot Trefoil (*Lotus corniculatus*) and Red Clover (*Trifolium pratense*). Other dominant herbaceous species included Meadow Vetchling (*Lathyrus pratensis*), Red Bartsia (*Odontites vernus*), Black Medick (*Medicago lupulina*), Common Mouse-ear, Sticky Mouse-ear (*Cerastium glomeratum*), Ragwort and Hogweed (*Heracleum sphondylium*). Other occasionally occurring species included White Clover, Ribwort Plantain and Spear Thistle, indicating that these grasslands may have undergone some level of management in the past. These grasslands did not appear to be intensively managed for agriculture, although some were grazed by horses.

Dry Calcareous and Neutral Grassland Improved (GSi1)

An approximate area of c. 20.85ha of Dry Calcareous and Neutral Grassland which showed signs of improvement was identified in the town. This was mainly located along the railway line and canal, adjacent to Common West and located near the Kilcock GAA Club grounds. These fields were dominated by a variety of graminoid species including Yorkshire Fog and Cock's-foot. The dominant herbaceous species were more typical of improved grassland fields compared to the habitat described above, and included species such as Broadleaved Dock, Creeping Buttercup, Hogweed, Greater Plantain (*Plantago major*) and Ribwort Plantain. Other occasionally occurring species included Hedge Woundwort (*Stachys sylvatica*), Bird's-foot Trefoil, Cleavers (*Galium aparine*), Creeping Thistle and Common Mouse-ear. Rarer species included Red Bartsia, Bush Vetch (*Vicia sepium*), Lady's Bedstraw (*Galium verum*) and Willowherb species.

Dry Meadows and Grassy Verges (GS2)

This habitat was located in one large field which lies adjacent to the railway line and also borders the canal in the centre of the Study Area. It was also noted adjacent to the main roads in some areas within the town. The total area of this habitat was c. 9.19ha. The dominant species identified included Cock's-foot, Yorkshire Fog, Hogweed, Common Knapweed, White and Red Clover.

Wet Grassland (GS4)

This habitat was identified in fields located alongside water features such as the Royal Canal as well as adjacent to woodland in Courtown Demesne and improved agricultural grassland in Boycetown (with a total area of c. 24.38ha). These fields were dominated by species typical of wet conditions including Soft Rush (*Juncus effusus*), Hard Rush (*Juncus inflexus*), Jointed Rush (*Juncus articulatus*) and Horsetail species (*Equisetum sp.*).

Other dominant species included Devil's-bit Scabious (*Succisa pratensis*), Meadow Buttercup (*Ranunculus acris*), Yorkshire Fog, Valerian (*Valeriana officinalis*), Meadow Vetchling, as well as species typical of more disturbed habitats such as Creeping Thistle, Ragwort, Knotgrass (*Polygonum sp.*) and Rosebay Willowherb (*Chamerion angustifolium*). Other occasionally occurring species included Spear Thistle, Chickweed, False Oat-grass (*Arrhenatherum elatius*), Hedge Woundwort and Red Bartsia. Rarer species included St John's Wort species (*Hypericum sp.*), Purple Loosestrife (*Lythrum salicaria*) and Bittersweet (*Solanum dulcamara*). Additional species that were only identified within Common West included Eyebright (*Euphrasia sp.*), Sedge species (*Carex sp.*) and Orchid species.

3.2.3 Disturbed Ground

Spoil and Bare Ground (ED2)

There was one site located within the Study Area, which was identified as spoil and bare ground, with a total area of c. 1.67ha. This was an active construction site with heaps of spoil and rubble. There was a high level of bare ground in this area.

Recolonising Bare Ground (ED3)

There were a number of sites within the Study Area that contained the habitat type recolonising bare ground. The total area of habitat was c. 14.49ha. This included; a site adjacent to the Musgrave Park on Church Street; a site adjacent to the Kilcock GAA Club grounds; and, parts of Common West and Common East.

The dominant species identified included those typical of disturbed land or waste-ground such as Butterfly-bush (*Buddleja davidii*), Colt's-foot (*Tussilago farfara*), Hogweed, Ragwort, Rosebay Willowherb, Bindweed (*Calystegia sp/Convolvulus sp.*), Spear Thistle and Nettle. Other dominant species included Dandelion, Knapweed and Creeping Thistle. Occasionally occurring species identified included White Clover, St. John's Wort species, Silverweed (*Potentilla anserina*) and Willow species.

3.2.4 Cultivated and Built Land

Arable Crops (BC1)

There was a single field identified as 'Arable Crops' located within the study area (with a total area of c. 0.61ha). This field was located in the southern end of the study area. The dominant herbaceous flora present within the crops included those typical of arable ground, including Knotgrass species and Redshank (*Persicaria persicaria*).

Buildings and Artificial Surfaces (BL3)

This habitat is present across the town and, for the most part, was noted to support little or no ecologically valuable flora. There were a number of derelict buildings that support vegetation such as Ivy and Brambles and may provide important resting sites for wildlife (this is discussed further in Section 3.3 below). Figure 4.1 and Figure 4.2 below illustrate buildings of this type.

3.2.5 Freshwater

Depositing Lowland Rivers (FW2)

According to the EPA Envision Map Viewer, the River Rye Water flows in a south-easterly direction along the northern boundary of the Study Area for c. 3.8km. In parts, the fast-flowing river was shaded by dense vegetation growing on its banks. On the day of the survey, the river bed was difficult to assess, however areas of stoney substrate were noted adjacent to the bridge on the R158. Under the criteria of the Water Framework Directive, the water quality at this section of the River Rye Water is classified as being of 'Moderate Status' (i.e. Q value of 3-4), which suggests it is 'slightly polluted'. This section is considered to be 'at risk of not achieving good status' according to the EPA Envision maps.

Canal (FW3)

The Royal Canal slowly flows in a north-westerly direction through the northern section of Kilcock town centre for a distance of c. 4.4km. It was accessible in parts via a foot-path. The majority of the canal is bordered by steep stone walls. Within the town centre the canal is generally not shaded by dense vegetation, however, there are sections where mature treelines/hedgerows bound this water feature.

Drainage Ditch (FW4)

In total, three notable drainage ditches were identified, which held substantial amounts of water (at the time of the field surveys). In general, these drainage ditches were between c. 0.25m to 0.5m in width and c. 0.25m in depth. Two were located within agricultural fields in the south-eastern section of the Study Area, while the other was located in the north-western section. All of these drainage ditches were disturbed by livestock. Duckweed species (*Lemna sp.*), Meadowsweet (*Filipendula ulmaria*) and Common Reed (*Phragmites australis*) were noted in the ditches.

Reed and Large Sedge Swamp (FS1)

This habitat was identified in linear patches along the Royal Canal as well as adjacent to a small drainage ditch, located in a field of dry calcareous and neutral grassland. The total area of this habitat was c. 3.13ha. The dominant species of this habitat included those typically found in association with water features such as Bur-reed species (*Sparganium sp.*), Bulrush (*Typha latifolia*), Reed Canary-grass (*Phalaris arundinacea*) and Common Reed. Other species that occurred occasionally included Forget-me-not species (*Myosotis sp.*) and Meadowsweet. Rarer species included Brooklime (*Veronica beccabunga*). Overall, this habitat was unmanaged.

3.3 Fauna

The potential of the habitats within Kilcock to support fauna (and evidence of this) is summarised below. All species records identified in the desk study are listed in Appendix A and species noted during the field surveys are listed in Appendix B.

3.3.1 Badgers

Mammal paths were noted through tall herb vegetation and patches of scrub located along many of the field boundaries across the Study Area. It is possible that such mammal paths

could have been created by badgers, although there was no definitive evidence found to suggest this. No other signs of badgers (i.e. setts, latrines, hairs or track marks) were noted.

Badgers have been previously recorded within 2km of the Study Area. A number of habitats recorded across Kilcock are considered suitable for Badgers. Earth banks located within the woodlands and along hedgerows and treelines may provide suitable habitat that would support Badgers and their setts. Scrub adjacent to these habitat types would provide camouflage. The surrounding agricultural fields provide good foraging habitat for Badgers, as they are likely to contain an abundant supply of earthworms, insects and other sources of food. Other examples of excellent foraging habitat for badgers included Common East and Common West but again there was no positive evidence of foraging recorded.

3.3.2 Bats

Four bat species have been previously recorded within 2km of the Study Area. There were numerous habitats identified across Kilcock that may be utilised by bats, such as mature trees, hedgerows, the river and canal. Derelict and modern houses can both provide roosting features for bats. There were two abandoned buildings noted during the survey located in fields off Church Street and Connaught Street within the Study Area. Both buildings were densely covered with ivy and included potential entry and exit points that could be used by bats (see Figure 4.1 and Figure 4.2).

A bridge located along the Rye Water in the northern section of the Study Area provided suitable features for bat species such as daubenton's bats to roost within. In addition, natterer's bats and Whiskered Bats (*Myotis mystacinus*) are both known to use similar features. It is likely that species such as daubenton's bats forage for insects along both the Rye Water and the Royal Canal.

The expansive network of well-connected hedgerows and treelines across the Study Area may be used by bats as linear cues in the landscape while commuting to known feedings sites. These habitats are also be associated with various insect species that the bats can feed on (including moths).



Figure 4.1: Derelict house with bat potential, located off the Connaught Street in a field of improved dry calcareous and neutral grassland.



Photograph 4.2: Derelict house with bat potential, located off the Church Street, adjacent to a graveyard.

3.3.3 Other mammal species

Mammal paths were noted through the *Reed and Large Sedge Swamp* vegetation along sections of the canal as well as the tall herb vegetation located along the Rye Water. These paths may have been used by otters entering and exiting the water courses, or by other large mammals such as badgers or the invasive species American mink.

Otters have been previously recorded within 2km of the Study Area. No other signs of otters (i.e. holts, spraints or couch sites) were noted during the survey. Both the Rye Water and the Royal Canal provide suitable commuting, foraging and resting sites for otter. Suitable features which otters may utilise were noted along the section of the Rye Water that lies within the Study Area, e.g. hollows within exposed tree roots in the river bank that could support otter holts. The dense vegetation located along the river and canal provide adequate camouflage for this species and their young, which might protect them against potential predators.

Other mammals noted during the survey within the Study Area included fox (*Vulpes vulpes*) and rabbit (*Oryctolagus cuniculus*). There is also the potential for Irish hare (*Lepus timidus*), hedgehogs, stoat (*Mustela erminea*), red squirrel (*Sciurus vulgaris*) and pine marten (*Martes martes*) to occur across the Study Area, although these species were not noted during the field surveys.

3.3.4 Birds

During the survey, grey heron were seen perched along the Royal Canal. Swallow (*Hirundo rustica*) were also noted flying across an improved agricultural field. pied wagtail (*Motacilla*

alba yarrellii), Hooded Crow (*Corvus cornix*), Jackdaw (*Corvus monedula*) and Rook (*Corvus frugilegus*) were all commonly seen feeding in urban areas within the Study Area.

There are numerous habitats across the Study Area that would be suitable for breeding birds to nest and forage within. For instance, the hedgerows and treelines contained many species (such as Ash, Oak, Hawthorn and Blackthorn) that provide both suitable nesting material and nesting sites for a variety of different bird species. The berries from these plants, as well as those from the planted Rowan trees and Bramble scrub, would also offer important sources of food for many bird species, in particular common garden birds such as Thrushes, Tits, Sparrows and Finches.

The banks of the Royal Canal and the Rye Water were considered suitable for Kingfisher to nest in, as there was exposed soil in parts of the bank. Likewise, the Royal Canal contains fish that the Kingfisher could feed on. In the Common West and Common East, the dense, wet vegetation may be suitable ground-nesting birds, such as snipe (*Gallinago gallinago*). The agricultural fields located across the Study Area may be suitable foraging habitat for farmland birds, such as lapwing, snipe and curlew (*Numenius arquata*). Both kingfisher and lapwing have been previously recorded within 2km of the Study Area.

3.3.5 Amphibians

No ponds were identified across the Study Area; however there were three drainage ditches with stagnant water were present within the Study Area that provide suitable habitat for amphibians such as common frog (*Rana temporaria*) and smooth newt (*Triturus vulgaris*). Common frog has been previously recorded within 2km of the Study Area.

3.3.6 Reptiles

There are many habitats located across the Study Area that provide suitable foraging and resting sites for common lizard (*Zootoca vivipara*). These include dry meadows and grassy verges identified in a field adjacent to the railway and canal, as well as the recolonising bare ground identified in the site adjacent to the Musgrave Park. There are no records of common lizard within 2km of the Study Area but this species is often overlooked and hence under-recorded.

3.3.7 Fish

No fish species were identified during the survey; however fish species (pike, perch, roach, rudd, bream and tench) are known to be present in the Royal Canal (*Pers. Comm. Senior Environmental Officer*, Inland Fisheries Ireland) and are perhaps likely to use the Rye Water. The Rye Water is a known spawning area for salmon (*Salmo salar*) and brown trout (*Salmo trutta*) and lamprey species (*Lampetra sp./Petromyzon sp.*) and is also known to support pike.

3.4 Target Notes

Areas which were noted to be particularly important habitats (including those with a high potential to support protected species) have been Target Noted (TN) for Kilcock. These are discussed further below. The location of these 'Target Notes' can be seen on the map below.

The Target Notes are as follows:

- (1) Kilcock railway line provides a wildlife corridor habitat (i.e. with foraging, resting and commuting sites) for species such as bats, breeding birds, badgers and potentially red squirrel;
- (2) Woodland within Courtown Demesne provides suitable habitat for wildlife and can as a wildlife corridor connect into other habitats such as hedgerows and treelines;
- (3) Royal Canal (pNHA) acts as a wildlife corridor for aquatic and terrestrial species;
- (4) River Rye Water acts as a wildlife corridor for aquatic and terrestrial species;
- (5) Variety of habitats within Common West that may support protected species;
- (6) A number of mature trees that may support roosting bats;
- (7) Bridge on R158 over the Rye Water that may support roosting bats; and,
- (8) Two derelict buildings that may support roosting bats.



Legend

- Study Area
- River Rye Water
- Royal Canal pNHA
- Potential Bat Roost Bridge
- Potential Bat Roost House
- Potential Bat Roost Tree
- Wildlife Corridor (WC)
- WC and Potential for Annex I Habitat
- WC and Suitable Wildlife Habitat

Drawing No: 140090/01/A - Figure 5			
Project Title: Kildare Habitat Survey and Green Infrastructure Mapping 2014			
Client: Kildare County Council and Heritage Council			
Project No.: 140090	Scale: 1:50,000 @ A4		
Drawn: KMOC	Approved: PS	Rev. No.: 01/A	Date: 16/01/2015

4 DISCUSSION

4.1 Habitats and their potential for protected species in Kilcock

The habitats of ecological importance present within the Study Area are discussed below. Their potential to support protected species is considered. These habitats have then been evaluated according to the NRA 2009 criteria.

The most diverse habitats (in terms of dominant floral species present) were wet grassland (which contained at least 20 different species), dry calcareous and neutral grassland (which contained at least 17 different species) and recolonising bare ground (which contained at least 15 different species). The former two habitats have been highlighted as areas of interest in addition to woodland habitats, hedgerows and water courses located within the Study Area.

Woodland Habitats (WD1 and WD2)

Many woodlands in Ireland have been modified in some way. A large number occur within old or current estates (demesne woodlands) or forestry plantations. The National Survey of Native Woodlands (BEC 2008) found that of the woodlands that were surveyed across Ireland, Kildare registered the highest proportion of site with old conifer planting (54%), followed by Dublin (53%) and then Wexford 50%.

“The most notable feature of the data is that the majority of woodlands were associated with man-made habitats... This reflects the high number of woodlands which occur within the agricultural landscape, but also the number of sites which occur in conjunction with commercial forestry plantations or as part of large demesnes.” (BEC 2008, pg. 34 & 35)

Of the woodlands that were surveyed in Kildare within BEC’s study, >15% were primarily associated with flat river floodplains and lowland riversides. This was a relatively rare association in the rest of the country.

The conservation of broadleaved (particularly native) woodland is essential for maintaining the biodiversity and ecological value of our landscapes. Woodland habitats are important for a variety of flora and fauna. This habitat provides essential foraging and resting sites for species such as bats, badgers, breeding birds, otters, red squirrel and -pine marten – all of which are protected to varying degrees and have been recorded in Co. Kildare. Other species which are supported within marginal areas of woodland habitats are reptiles (such as Ireland’s only native reptile, common lizard) and amphibians (e.g. common frog and smooth newt).

The habitat category of mixed broadleaved woodland located within Courtown Demesne may be Long-Established Woodland (II), which can be defined as:

‘Woodland that has remained continuously wooded since the first edition OS maps of 1830-44, but for which there is positive evidence in older documentation that it is not ancient in origin.’ (Perrin & Daly 2010, Pg. 6)

Both of the woodland habitat types located within the Study Area have been classified as Local Importance (Higher Value) according to the NRA guidance provided in Appendix C. Woodland habitats, in general, have also been identified as an important habitat in the

Kildare Biodiversity Action Plan (Kildare County Council 2009). The woodlands that were identified in this study are not common within the Kilcock survey area and these habitats may support a range of protected species such as bats, breeding birds and badgers.

Hedgerows (WL1)

These linear habitats provide essential foraging and commuting areas for a wide variety of species such as breeding birds, badgers and bats. According to the County Kildare Hedgerow Survey Report (Foulkes 2006), hedgerows in Kildare typically show a higher level of fragmentation compared to those found in other counties. This is due, in part, to increased development and the intensification of agriculture that has occurred in the county. Considering the low percentage cover of native woodland within Kildare, hedgerows are of particular conservation importance. In areas where intensive farming dominates the landscape, hedgerows may be the only significant wildlife habitat remaining. This includes hedgerows ranked as low value.

Approximately 56% of the hedgerows identified across the Study Area (i.e. 54 hedgerows) are considered to be of 'Moderate Value' (Local Importance – Higher Value), as based on the hedgerow evaluation criteria outlined in Appendix D of this report. These hedgerows are located across the Study Area. Approximately 12% (i.e. 11 hedgerows) that were identified across the Study Area are considered to be of 'High Value' (County Importance). These hedgerows are located within areas such as Courtown Desmesne, near to Kilcock GAA Club grounds and in Common West. The remaining 32% (i.e. 31 hedgerows) were low value hedgerows identified are considered to be of 'Local Importance' (Lower Value) as they form part of an extensive wildlife network across the Study Area and contribute to the maintenance of habitat links across the Study Area. Treelines are also integral features in the wildlife network across Kilcock. They also provide important foraging and resting sites for a range of protected species and as such they are considered to be of 'Local Importance' (Higher Value).

Grassland Habitats (GS1 and GS4)

There were a limited number of dry calcareous and neutral grasslands identified within the Study Area. These grasslands can be described as semi-natural as the level of management that they have undergone is low and the plant species present were those not typical of improved grassland (including Black Medick, Bird's-foot Trefoil and Yarrow). This type of habitat is highlighted as an important habitat in Kildare (Kildare County Council 2009) and as such is considered to be of Local Importance (Higher Value).

Common West contained wet grassland that was composed of a variety of different plant species. *Sedge species*, Orchid species and Eyebright species were only identified at this site and in no other area across the Study Area. This suggests that Common West is of Local Importance (Higher Value) in terms of *'the habitats present'*, *'its high degree of naturalness'*, and *'the species present'*, which are uncommon in the Study Area (NRA 2009).

Watercourses (FW3 and FW4)

The presence of both the Royal Canal pNHA and the Rye Water, which flows through the Rye Water Valley / Carton cSAC located c. 5.9km downstream of the Study Area, adds to the diversity of habitats found within Kilcock. There are a number of habitats associated with these water courses that contain riparian species that are not locally abundant. Both these habitats have been identified as important in Co. Kildare (Kildare County Council, 2009) and

have the potential to support protected species, such as otter, breeding birds (e.g. Kingfisher) and the FPO species Opposite-leaved Pondweed. For these reasons, these habitats are considered to be of Local Importance (Higher Value).

4.2 Kilcock's Green Infrastructure

“Green Infrastructure is a strategically planned and managed network featuring areas of high quality biodiversity (uplands, wetlands, peatlands, rivers and coast), farmed and wooded lands and other green spaces that conserve ecosystem values which provide essential services to society” (Comhar 2010, Pg. 11).

There are two main networks of Key Green Infrastructure identified within the Study Area, which are dissected by the M4 Motorway. The larger of the two is located north of the motorway. It stretches from Boycetown in north-west Kilcock to lands surrounding the Kilcock GAA Club in the south-east. The most important Green Infrastructure habitats within this network are the watercourses (Royal Canal pNHA and River Rye Water) as well as their associated habitats. These linear habitats allow movement of both aquatic and terrestrial flora and fauna across the northern half of the town. The Kilcock Railway Line also offers an area of relatively undisturbed verge-side habitat which connects sites across the north-west to the north-east of the Study Area. In parts, this linear corridor runs along the Royal Canal. The expansive network of hedgerows and treelines, as well as numerous patches of scrub, are all other essential habitats that form part of the Green Infrastructure of this town.

The smaller Green Infrastructure network identified within the Study Area is located south of the motorway. It is situated primarily within Courtown Demesne, which has been highlighted as a significant area of open space within Kilcock (Kildare County Council 2008). This network is comprised of the areas of woodland, which are connected by hedgerows and treelines.

There are numerous ‘Stepping Stone’ habitats identified across both networks of Green Infrastructure that enhance the connectivity of habitats, and in turn, promote biodiversity across Kilcock. These include small patches of woodland located off Church Street in Boycetown and within Courtown Demesne.

5 RECOMMENDATIONS

One of the aims of this project was that all relevant information will be used by Kildare County Council planning staff in the development of policies and objectives to protect and conserve the Key Green Infrastructure and to raise awareness about the biodiversity of these towns. As such recommendations have been incorporated into the policies and objectives for the Kilcock Local Area Plan. These policies and objectives can be seen in Appendix F, along with specific target notes for sensitive Green Infrastructure areas. To note, these are in draft and all policies and objectives should be obtained from the most up to date LAP report.

5.1 Policy Guidance

Habitat and Green Infrastructure Protection and Enhancement

Consideration should be given when drafting planning policy and objectives to the ecological, social and economic benefits that can be reached by conserving and improving habitats and green spaces. In Kilcock, the following strategic planning recommendations could help in this regard:

- All habitats should be protected appropriately according to their ecological value;
- Developers should be asked to demonstrate how they are making efforts to protect, enhance and appropriately manage the habitats and land in which they develop;
- Ensuring that all developments are shown to pay due consideration to the flood risk and that they include Sustainable Urban Drainage Systems (SUDS); and,
- Planting of riparian buffer zones (to be confirmed with more detailed, site specific research and guidance from organisations such as EPA and IFI) adjacent to the River Rye Water and the Royal Canal (further specific advice can be sought in relation to this from the Inland Fisheries Ireland Senior Fisheries Environmental Officer).

“Invasive species, particularly invasive shrubs and trees, are a major threat to native woodland. They are characterised by being highly competitive, typically quick growing and highly fecund, and are often unpalatable to browsing animals. Invasive shrubs can dominate the understorey, outcompeting native herbs and impacting on the natural regeneration of native trees... Many of the sites where invasive shrubs were recorded were woodlands associated with demesnes and estate” (BEC 2008, Pg. 36).

Those responsible for managing Green Infrastructure and ecologically-valuable habitats should undertake best practice in conservation management. The following actions could be taken:

- Manage woodlands, grasslands and riparian habitats (such as those habitats within Courtown Demesne, Common West and along the Royal Canal pNHA and Rye Water) in an appropriate manner that will increase their biodiversity and habitat connectivity;
- Consideration should be given to the appropriate land use of Courtown Demesne, Common West and Common East in terms of their potential to provide ecologically valuable areas and where appropriate to increase the public amenity sites within the town; and,
- All identified key Green Infrastructure and ‘Stepping Stone’ habitats should be appropriately protected (according to their value) and enhanced where possible.

5.2 General Recommendations for Kilcock

Education and Public Engagement

The potential for increasing the level of public awareness of habitats and green spaces within Kilcock could be enhanced by the following recommendations:

- A 'Bio-Blitz' event could be organised to take place across Kilcock. This event could coincide with Ireland's national Bio-Blitz, which takes place every summer. It would involve members of the general public recording flora and fauna species across the town in an attempt to estimate the biodiversity of Kilcock. Such an event would raise awareness of the town's flora and fauna, increase public engagement in nature conservation and provide valuable field records. These records could then be shared with the NBDC and the Tidy Towns committee;
- Participation by the general public in wildlife surveys organised by various wildlife organisations could be promoted in order to increase public engagement. Examples of such surveys include; Daubenton's Bat Waterways Survey (Bat Conservation Ireland), Garden Bird Survey (Birdwatch Ireland) and Ladybird Survey (Irish Wildlife Trust);
- Participation by the general public in conservation activities across the town, such as invasive species removal would enhance the biodiversity and ecological value of Kilcock;
- Where appropriate, and where it has not already been undertaken, educational signs and posters highlighting Kilcock's wildlife could be put up in locations of ecological interest in Kilcock (e.g. along the Royal Canal or in Common West) to inform the general public; and,
- Engagement with local farmers regarding hedgerow management and planting of native trees would promote a greater understanding of wildlife conservation across Kilcock.

Further Research and Evaluation

The following steps could be undertaken to add further valuable information to the research, which has been carried out to date:

- In order to determine the ecological value of the mature trees, identified as having the potential to support a bat roost, as well as the derelict buildings (described in Section 3.3.2 above), it is recommended that detailed bat activity and building inspection surveys are carried out. Such surveys would help to establish whether or not these sites are of 'County Importance' in terms of bat species and population densities found there, which would support efforts to protect biodiversity of this town;
- An invasive species survey could be conducted at a suitable time of year to identify such flora or fauna and to devise appropriate mitigation to prevent their further spread. This action would help to increase biodiversity in areas where invasive species are problematic. All collected records in this town could then be submitted to the Invasive Species Ireland Database and NBDC; and,
- A large number of bridges and culverts in Kildare represent significant barriers to fish passage. An ecological survey of a selection of bridges and culverts in Kilcock would be beneficial. Such a survey would identify problem areas, identify the measures necessary to remove the obstacle and in doing so would help in providing options for habitat connectivity and overall biodiversity enhancement.

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APPENDIX A: RECORDS FOR PROTECTED, RARE OR NOTABLE SPECIES

Records of Protected, Rare and other Notable Flora and Fauna Species within 2km of Kilcock					
Common Name	Scientific Name	Protection ¹	Red-Listing Status ²	Number of Records; Date	Source
Flora					
No records available					
Fauna					
Amphibian					
Common Frog	<i>Rana temporaria</i>	HDV, WA	Least Concern	1, 2003	NBDC
Bird					
Barn swallow	<i>Hirundo rustica</i>	WA	Amber	2; 2010	NBDC
Black-headed gull	<i>Larus ridibundus</i>	WA	Red	1, 1988-1991	NBDC, McCarthy Keville O'Sullivan (2013)
Coot	<i>Fulica atra</i>	WA	Amber	2013	McCarthy Keville O'Sullivan (2013)
Cormorant	<i>Phalacrocorax carbo</i>	WA	Amber	2013	McCarthy Keville O'Sullivan (2013)
Goldcrest	<i>Regulus regulus</i>	WA	Amber	1, 1988-1991	NBDC
Golden Plover	<i>Pluvialis apricaria</i>	BDI, WA	Red	1, 2013	McCarthy Keville O'Sullivan (2013)
Greenfinch	<i>Carduelis chloris</i>	WA	Amber	2, 1988-1991	NBDC
Grey wagtail	<i>Motacilla cinerea</i>	WA	Red	1, 1988-1991	NBDC
House martin	<i>Delichon urbicum</i>	WA	Amber	1, 1988-1991	NBDC
House sparrow	<i>Passer domesticus</i>	WA	Amber	2, 1988-1991, 2013	NBDC, McCarthy Keville O'Sullivan (2013)
Kingfisher	<i>Alcedo atthis</i>	BDI, WA	Amber	1, 2013	McCarthy Keville

¹ HDII/IV/V = Habitats Directive Annexes II/IV/V; FPO = Flora Protection Order; WA = Wildlife Acts; BD I = Birds Directive Annex I.

² Mammal Red-list from Marnell et al., 2009. Birds from Birds of Conservation Concern in Ireland (BoCCI) (Colhoun et al. 2013); Vascular Flora from the Irish Red Data Book 1 Vascular Plants (Curtis & McGough 2005); Fish and Amphibians from King et al., 2011; Non-Marine Molluscs (Byrne et al., 2009).

Records of Protected, Rare and other Notable Flora and Fauna Species within 2km of Kilcock					
Common Name	Scientific Name	Protection ¹	Red-Listing Status ²	Number of Records; Date	Source
					O'Sullivan (2013)
Mistle Thrush	<i>Turdus viscivorus</i>	WA	Amber	2, 1988-1991	NBDC
Mute Swan	<i>Cygnus olor</i>	WA	Amber	2013	McCarthy Keville O'Sullivan (2013)
Northern Lapwing	<i>Vanellus vanellus</i>	WA	Red	1, 1988-1991	NBDC
Skylark	<i>Alauda arvensis</i>	BDII, WA	Amber	1, 1988-1991	NBDC
Snipe	<i>Gallinago gallinago</i>	WA	Amber	2013	McCarthy Keville O'Sullivan (2013)
Sparrowhawk	<i>Accipiter nisus granti</i>	WA	Amber	2, 1988-1991	NBDC
Spotted Flycatcher	<i>Muscicapa striata</i>	WA	Amber	1, 1988-1991	NBDC
Starling	<i>Sturnus vulgaris</i>	WA	Amber	2, 1988-1991, 2013	NBDC, McCarthy Keville O'Sullivan (2013)
Stock Dove	<i>Columba oenas</i>	WA	Amber	1, 1988-1991	NBDC
Swift	<i>Apus apus</i>	WA	Amber	2, 1988-1991	NBDC
Yellowhammer	<i>Emberiza citronella</i>	WA	Red	1, 1988-1991	NBDC
Fish					
Bream	<i>Abramis brama</i>	-	Non-native Non-benign	1, 2014 (Royal Canal)	IFI
Perch	<i>Perca fluviatilis</i>	-	Non-native Non-benign	1, 2014 (Royal Canal)	IFI
Pike	<i>Esox lucius</i>	-	Non-native Non-benign	1, 2014 (Royal Canal)	IFI
Roach	<i>Rutilus rutilus</i>	-	Non-native Non-benign	1, 2014 (Royal Canal)	IFI
Rudd	<i>Scardinius erythrophthalmus</i>	-	Non-native Non-benign	1, 2014 (Royal Canal)	IFI
Tench	<i>Tinca tinca</i>	-	Non-native	1, 2014 (Royal Canal)	IFI

Records of Protected, Rare and other Notable Flora and Fauna Species within 2km of Kilcock					
Common Name	Scientific Name	Protection ¹	Red-Listing Status ²	Number of Records; Date	Source
			Non-benign		
Mammal					
Daubenton's Bat	<i>Myotis daubentonii</i>	HDIV, WA	Least concern	2, 2013 and 2011	NBDC
Badger	<i>Meles meles</i>	WA	Least concern	3, 2013, 2012 and 1968	NBDC McCarthy Keville O'Sullivan (2013)
Otter	<i>Lutra lutra</i>	HDII, HDIV, WA	Near threatened	1, 2013	NBDC
Leisler's bat	<i>Nyctalus leisleri</i>	HDIV, WA	Least concern	3, 2005, 2007 and 2008	NBDC
Natterer's Bat	<i>Myotis nattereri</i>	HDIV, WA	Least concern	1, 2007	NBDC
Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	HDIV, WA	Least concern	3, 2005, 2007 and 2008	NBDC
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	HDIV, WA	Least concern	2, 2005 and 2007	NBDC
Hedgehog	<i>Erinaceus europaeus</i>	WA	Least concern	2, 2012 and 2013	NBDC

*It should be noted that the above species records are based on ad hoc information submitted to the data centres and as a result this list does not necessarily represent a full and complete species list of the area.

Bat Conservation Ireland records for species roosting within a 10km² boundary from the following town centre.

Latin Name	Common Name	Location	Distance to site ¹	Protection Status ²	Red Data Book Category
<i>Pipistrellus pipistrellus</i>	Pipistrelle bat	Celbridge Co. Kildare Tea Lane Cemetery, Co. Kildare Clongowes, Co. Kildare	c. 8.6km to the east c. 9.2km to the east c. 7.4km to the south	HDIV, WA	Least Concern
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	Castletown Estate, Leixlip, Co. Kildare Summerhill, Co. Meath Kilcock, Co. Kildare	c. 7.5km to the south-east c. 3.6km to the north-west Within site	HDIV, WA	Least Concern
<i>Pipistrellus sp.</i>	-	Clonllyn, Co. Kildare	c. 6.1km to the north-west	HDIV, WA	Least Concern
<i>Plecotus auritus</i>	Brown Long-eared Bat	Maynooth, Co. Kildare Donadea, Co. Kildare	c. 4km to the north-east c. 5.2km to the south-west	HDIV, WA	Least Concern
-	Unidentified Bat	Maynooth, Co. Kildare The Mullagh, Co. Meath Dunboyne, Co. Meath Celbridge, Co. Kildare	c. 3.7km to the south-east c. 4.8km to the north c. 6.1km to the south c. 7.5km to the south	-	-

¹Distance to site is approximate as full grid references not available for these records.

² HDII/IV/V = Habitats Directive Annexes II/IV/V; WA = Wildlife Acts

APPENDIX B: SPECIES RECORDED DURING THE SURVEY

Scientific name	Common Name
Flora	
<i>Alnus glutinosa</i>	Alder
<i>Fraxinus excelsior</i>	Ash
<i>Fagus sylvatica</i>	Beech
<i>Agrostis sp.</i>	Bent grass sp.
<i>Calystegia sp/Convolvulus sp.</i>	Bindweed
<i>Lotus corniculatus</i>	Bird's-foot Trefoil
<i>Solanum dulcamara</i>	Bittersweet
<i>Medicago lupulina</i>	Black Medick
<i>Prunus spinosa</i>	Blackthorn
<i>Rubus fruticosus agg.</i>	Bramble agg.
<i>Rumex obtusifolius</i>	Broadleaved dock
<i>Veronica beccabunga</i>	Brooklime
<i>Buddleja davidii</i>	Butterfly-bush
<i>Typha latifolia</i>	Bulrush
<i>Sparganium sp.</i>	Bur-reed sp.
<i>Vicia sepium</i>	Bush Vetch
<i>Phalaris arundinacea</i>	Reed Canary-grass
<i>Galium aparine</i>	Cleavers / Goose Grass
<i>Isolepis sp.</i>	Club-rush sp.
<i>Dactylis glomerata</i>	Cock's-foot
<i>Tussilago farfara</i>	Colt's-foot
<i>Stellaria media</i>	Common Chickweed
<i>Bellis perennis</i>	Common Daisy
<i>Cerastium fontanum</i>	Common Mouse-ear
<i>Phragmites australis</i>	Common Reed
<i>Manus sylvestris</i>	Crab Apple
<i>Ranunculus repens</i>	Creeping Buttercup
<i>Potentilla reptans</i>	Creeping Cinquefoil
<i>Cirsium arvense</i>	Creeping Thistle
<i>Taraxacum agg.</i>	Dandelion
<i>Succisa pratensis</i>	Devil's-bit Scabious
<i>Lemna sp.</i>	Duckweed sp.
<i>Sambucus nigra</i>	Elder
<i>Ulm sp.</i>	Elm
<i>Circaea lutetiana</i>	Enchanter's Nightshade
<i>Euphrasia sp.</i>	Eyebright sp.
<i>Linum catharticum</i>	Fairy Flax
<i>Arrhenatherum elatius</i>	False Oat-grass
<i>Myosotis sp.</i>	Forget-me-not sp.
<i>Plantago major</i>	Greater Plantain
<i>Stellaria holostea</i>	Greater Stitchwort
<i>Juncus inflexus</i>	Hard Rush
<i>Crataegus monogyna</i>	Hawthorn
<i>Corylus avellana</i>	Hazel
<i>Stachys sylvatica</i>	Hedge Woundwort

Scientific name	Common Name
<i>Heracleum sphondylium</i>	Hogweed
<i>Ilex aquifolium</i>	Holly
<i>Aesculus hippocastanum</i>	Horse-chestnut
<i>Equisetum sp.</i>	Horsetail sp.
<i>Hedera helix</i>	Ivy
<i>Juncus articulatus</i>	Jointed Rush
<i>Larix sp.</i>	Larch
<i>Centaurea nigra</i>	Knapweed
<i>Polygonum sp.</i>	Knotgrass sp.
<i>Galium verum</i>	Lady's Bedstraw
<i>Ranunculus flammula</i>	Lesser Spearwort
<i>Leylandii sp.</i>	Leyland cypress sp.
<i>Tilia sp.</i>	Lime
<i>Arum maculatum</i>	Lords and Ladies / Cuckoo pint
<i>Ranunculus acris</i>	Meadow Buttercup
<i>Lathyrus pratensis</i>	Meadow Vetchling
<i>Poa sp.</i>	Meadow-grass sp.
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Urtica dioica</i>	Nettle
<i>Quercus sp.</i>	Oak sp.
<i>Dactylorhiza sp.</i>	Orchid species
<i>Lolium perenne</i>	Perennial Rye-grass
<i>Populus sp.</i>	Poplar sp.
<i>Ligustrum vulgare</i>	Privet
<i>Lythrum salicaria</i>	Purple Loosestrife
<i>Senecio jacobaea</i>	Ragwort - INVASIVE (But Not on WCA)
<i>Odontites vernus</i>	Red Bartsia
<i>Trifolium pratense</i>	Red Clover
<i>Festuca rubra</i>	Red Fescue
<i>Persicaria persicaria</i>	Redshank
<i>Plantago lanceolata</i>	Ribwort Plantain
<i>Rosa sp.</i>	Rose sp.
<i>Chamerion angustifolium</i>	Rosebay Willowherb
<i>Sorbus aucuparia</i>	Rowan
<i>Pinus sylvestris</i>	Scots Pine
<i>Carex sp.</i>	Sedge species
<i>Prunella vulgaris</i>	Self-heal
<i>Potentilla anserina</i>	Silverweed
<i>Juncus effusus</i>	Soft Rush
<i>Polystichum setiferum</i>	Soft Shield-fern
<i>Rumex acetosa</i>	Sorrel
<i>Sonchus sp.</i>	Sow-thistle
<i>Cirsium vulgare</i>	Spear Thistle
<i>Asplenium sp.</i>	Spleenwort sp.
<i>Picea sp.</i>	Spruce
<i>Hypericum sp.</i>	St. John's-wort sp.
<i>Cerastium glomeratum</i>	Sticky Mouse-ear
<i>Acer pseudoplatanus</i>	Sycamore
<i>Phleum pratense</i>	Timothy

Scientific name	Common Name
<i>Valeriana officinalis</i>	Valerian
<i>Cardamine flexuosa</i>	Wavy Bitter-cress
<i>Trifolium repens</i>	White Clover
<i>Salix sp.</i>	Willow sp.
<i>Epilobium sp.</i>	Willowherb sp.
<i>Geum urbanum</i>	Wood Avens
<i>Achillia millefolium</i>	Yarrow
<i>Taxus baccata</i>	Yew
<i>Holcus lanatus</i>	Yorkshire Fog
Fauna	
<i>Birds</i>	
<i>Ardea cinerea</i>	Grey Heron
<i>Corvus cornix</i>	Hooded Crow
<i>Corvus monedula</i>	Jackdaw
<i>Motacilla alba yarrellii</i>	Pied Wagtail
<i>Corvus frugilegus</i>	Rook
<i>Hirundo rustica</i>	Swallow
<i>Mammals</i>	
<i>Oryctolagus cuniculus</i>	Rabbit
<i>Vulpes vulpes</i>	Red Fox

APPENDIX C: CRITERIA FOR ECOLOGICAL EVALUATION FROM:

Guidelines for assessment of Ecological Impacts of National Road Schemes (NRA, 2009)

Criteria for Ecological Evaluation
<p>International Importance:</p> <ul style="list-style-type: none">• ‘European Site’ including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.• Proposed Special Protection Area (pSPA).• Site that fulfils the criteria for designation as a ‘European Site’ (see Annex III of the Habitats Directive, as amended).• Features essential to maintaining the coherence of the Natura 2000 Network.³• Site containing ‘best examples’ of the habitat types listed in Annex I of the Habitats Directive.• Resident or regularly occurring populations (assessed to be important at the national level)⁴ of the following:<ul style="list-style-type: none">○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and / or○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.• Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).• World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).• Biosphere Reserve (UNESCO Man & The Biosphere Programme).• Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).• Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).• Biogenetic Reserve under the Council of Europe.• European Diploma Site under the Council of Europe.• Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).⁵

³ See Articles 3 and 10 of the Habitats Directive.

Criteria for Ecological Evaluation

National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).
- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level)⁶ of the following:
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing 'viable areas'⁷ of the habitat types listed in Annex I of the Habitats Directive.

⁴ It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

⁵ Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).

⁶ It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

⁷ A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

Criteria for Ecological Evaluation

County Importance:

- Area of Special Amenity.⁸
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level)⁹ of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan (BAP) if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- Resident or regularly occurring populations (assessed to be important at the Local level)¹⁰ of the following:

⁸ It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

⁹ It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County importance where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

Criteria for Ecological Evaluation

- Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
- Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
- Species protected under the Wildlife Acts; and/or
- Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

¹⁰ It is suggested that, in general, 1% of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

APPENDIX D: HEDGEROW EVALUATION CRITERIA

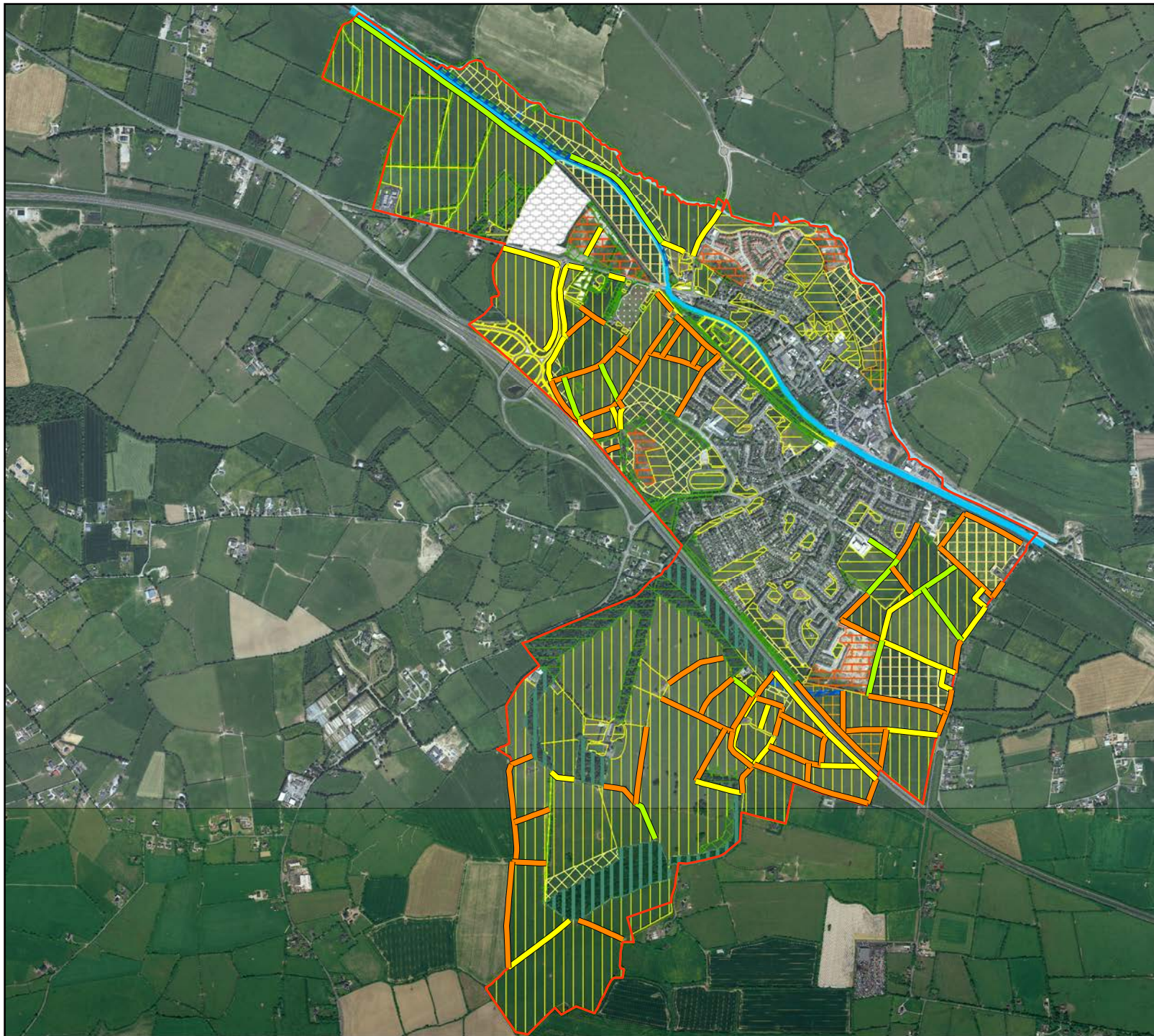
The hedgerow evaluation criteria shown in table below have been adapted from various sources, including the 'Ecological criteria for evaluation of hedgerows' (NRA guidance), UKBAP priority habitat description and the Hedgerow Regulations 1997 (England and Wales). This method was agreed with Kildare County Council for the purpose of this study.

A hedgerow is defined as any boundary line of trees or shrubs over 20m long and less than 5m wide, and where any gaps between the trees or shrub species are less than 20m wide. Any bank, wall, ditch or tree within 2m of the centre of the hedgerow is considered to be part of the hedgerow habitat, as is herbaceous vegetation within 2m of the centre of the hedgerow.

For each hedgerow an assessment is made of the 14 features listed in the table below. The hedgerow is then valued according to the category for which it contains the most features. Mature treelines (or very overgrown hedgerows) were separately recorded as such and these are considered to be of high value.

Hedgerow ecological evaluation criteria			
Feature	High value (County Importance)	Moderate value (Local Importance – higher value)	Low value (Local Importance – lower value)
1. Average shrub canopy height (excluding treelines)	> 5m	2-5m	<2m
2. Average width at ground level	>4m	2-4m	<2m
3. Ground cover	Dense	Patchy	Little or none
4. Mature standard trees per 50m length	> 5	1-5	None
5. Gaps per 50m length	< 10%	10-30%	>30%
6. Connection to other hedges	>4	2-3	<2
7. Dominant tree and shrub species	Mainly native or naturalised* species	Mixed native or naturalised species and non-native species	Mainly non-native species
8. Hedge acting as a wildlife corridor linking adjacent semi-natural habitats that would otherwise be isolated	Yes	Yes	No
9. Diversity of tree or shrub species per 50m length	>7	4-7	<3
10. Ground flora	Typical diverse woodland flora present	Some woodland ground flora present	No woodland ground flora present
11. Epiphytic flora (e.g. bryophytes & lichens)	Diverse epiphytic flora present	Some epiphytic flora present	No epiphytic flora
12. Associated stream or drain	With permanent water	With seasonal water only	No
13. Associated hedge bank height	>1m in height	0.5-1m	None
14. Age	Veteran hedge (approx. >50 yrs) with high landscape value	Mature hedge (approx. 10-50 yrs) with some landscape value	Recent hedge (approx. <10yrs) with little landscape value
Total	/14	/14	/14

APPENDIX E: HABITAT AND GREEN INFRASTRUCTURE MAPS



Legend

- Study Area

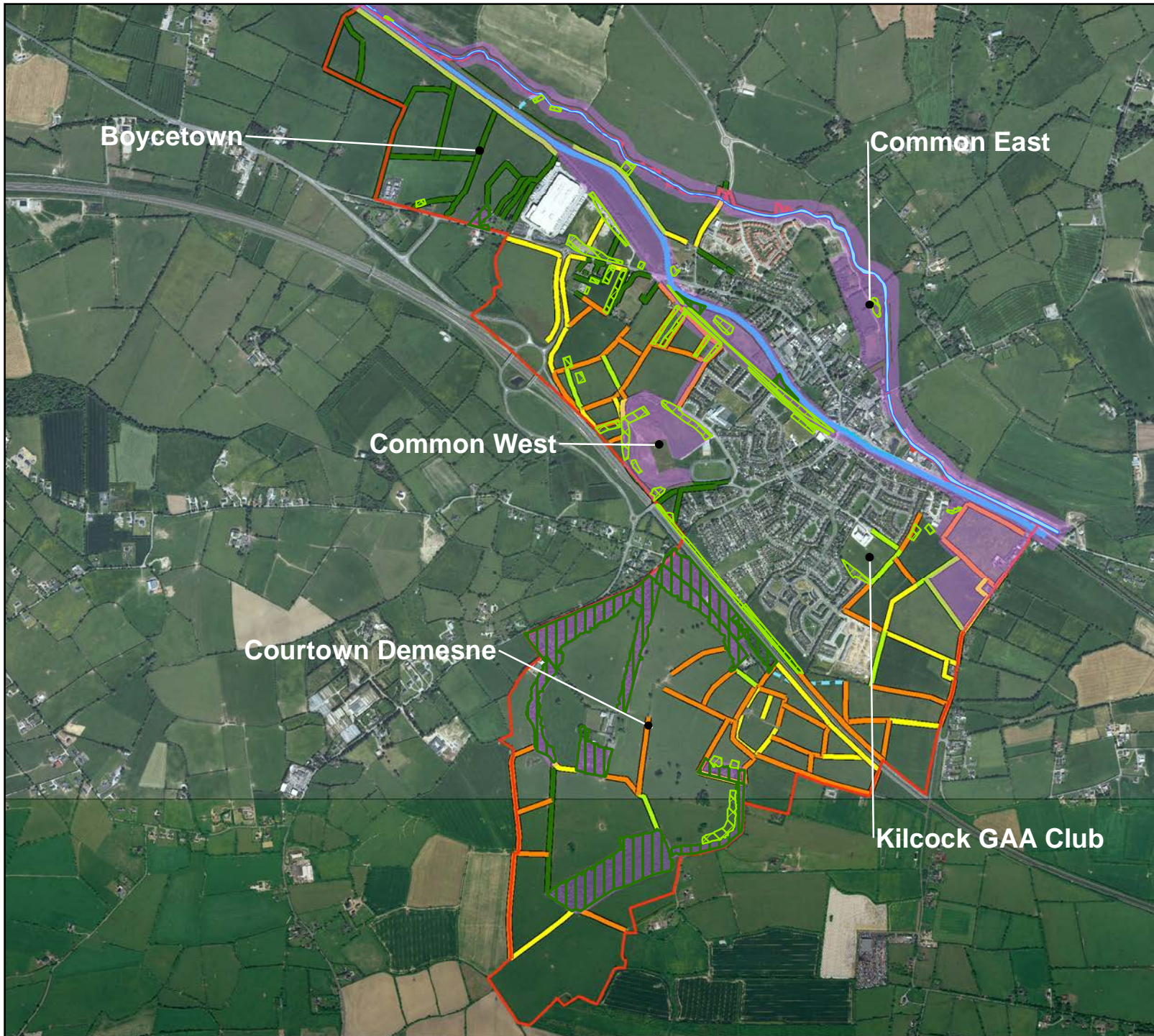
Fossitt Title

- (Mixed) Broadleaved woodland (WD1)
- Mixed broadleaved/conifer woodland (WD2)
- Scattered trees and parkland (WD5)
- Scrub (WS1)
- Ornamental/Non-native shrub (WS3)
- Improved Grassland (GA1)
- Amenity Grassland (GA2)
- Dry calcareous and neutral grassland (GS1)
- Dry calcareous and neutral grassland (Improved) (GS1)
- Dry Meadows and Grassy Verges (GS2)
- Wet grassland (GS4)
- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)
- Depositing/lowland rivers (FW2)
- Reed and large sedge swamp (FS1)
- Arable crops (BC1)
- Buildings and Artificial Surfaces (BL3)

Fossitt Title

- Canal (FW3)
- Drainage Ditch (FW4)
- Treeline (WL2)
- Hedgerow (WL1) High Value
- Hedgerow (WL1) Moderate Value
- Hedgerow (WL1) Low Value

Drawing No: 140090/01/A - Figure 6			
Project Title: Kildare Habitat Survey and Green Infrastructure Mapping 2014			
Client: Kildare County Council and Heritage Council			
Project No.:	140090	Scale:	1:50,000 @ A4
Drawn:	KMOC	Approved:	PS
Rev. No.:	01/A	Date:	16/01/2015



Legend

- Study Area
- Kilcock Green Infrastructure
- River Rye Water
- Hedgerow (WL1) High Value
- Hedgerow (WL1) Moderate Value
- Hedgerow (WL1) Low Value
- Canal (FW3)
- Drainage Ditch (FW4)
- Treeline (WL2)
- Woodland
- Scrub (WS1)

Drawing No: 140090/01/A - Figure 7

Project Title:
Kildare Habitat Survey and Green Infrastructure Mapping 2014

Client:
Kildare County Council and Heritage Council

Project No.: 140090	Scale: 1:50,000 @ A4
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Drawn: KMOC	Approved: PS	Rev. No.: 01/A	Date: 16/01/2015
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APPENDIX F: SITE SPECIFIC TARGET NOTES

The Green Infrastructure policies that are being drawn up by Kildare County Council (KCC), for Kilcock town, have been largely based on discussions following this study of the town's habitat categories, green infrastructure areas and the location of notable ecological features. This information was used to inform draft policies and objectives in the Kilcock Local Area Plan, and can be seen below. In addition, a number of site specific target notes have been outlined to assist the council when dealing with future planning applications in recognition of the ecological value noted in certain lands zoned for future development. These are discussed further below, also.

Key Green Infrastructure Areas identified in Kilcock:

Following a series of communication with the Council they have proposed the following policies for Green Infrastructure within Kilcock Town.

Green Infrastructure

The Green Infrastructure Strategy creates a green network which connects green spaces and other natural features such as the Rye Water River and the Royal Canal and also links to other towns within the region. It includes and integrates open spaces, green corridors for cycling and walking, areas of high biodiversity value, and recreational areas. It recognises the importance and benefits of interaction between the cultivated urban areas and the natural environment. Kilcock's Green Infrastructure Network incorporates and promotes the following range of assets:

- Gardens and institutional grounds
- Green corridors such as the Royal Canal and the Rye Water River, (including their banks), the railway corridor, roads, cycling routes and rights of way.
- Natural and semi-natural sites including, wetlands, grasslands and brownfield sites.
- Archaeological and historic sites, and sites of natural or ecological value.
- Functional spaces such as flood storage areas and sustainable drainage schemes.
- Buildings and hard surfaced areas such as green roofs, green walls and planters.

Kildare County Council will actively promote a Green Infrastructure Strategy. The strategy comprises the Green Infrastructure Map and will be delivered through this LAP and the Development Management process.

Trees, woodlands and hedgerows make a valuable contribution to the landscape and visual amenity of Kilcock. Trees perform many functions particularly in urban settings such as providing shelter, absorbing pollutants, habitats and food source for wildlife, combating climate change by absorbing surface water faster than grasslands.

Kilcock's natural heritage is a unique and special resource. As well as the Royal Canal and the Rye Water River habitats the natural heritage includes woodland and Courtown Demesne to the south of the plan area. It is critical to retain existing key landscapes and open spaces which help provide a sense of identity and place to Kilcock.

The Rye Water River valley/Carton is a Special Area of Conservation (ref: 001398) located between Leixlip and Maynooth, downstream from Kilcock. It should be noted that any development proposals in Kilcock the vicinity of the River Rye Water will be subject to an Appropriate Assessment to ensure that the integrity of the SAC is protected.

The Royal Canal a proposed Natural Heritage Area (002103) and is a manmade waterway linking the River Liffey at Dublin to the River Shannon near Tarmonbarry County Longford. The Royal Canal NHA comprises the central channel and the banks either side of it. The main water supply is from Lough Owel (also an NHA) via a feeder canal in Mullingar. The Royal Canal was closed for navigation in 1961. The section of canal west of Mullingar was allowed to dry out and the eastern section silted up and became overgrown. Restoration work began in 1988, Waterways Ireland continue the maintenance of the canal and towpaths. A number of different habitats are found within the canal boundaries – hedgerows, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. The policies as set out in the County Development Plan 2011-2017 in relation to designated sites apply to this area.

Open spaces also require protection to meet recreational and conservational needs within the town. Public open spaces make a valuable contribution to the setting of a town and assist in creating an attractive environment. Opportunities exist to add to the level of existing public open space within the local area plan boundary through the development of open space areas in new urban developments and through the utilisation and enhancement of green spaces within existing neighbourhoods to their full potential.

The River Rye Water's habitats and river water quality is influenced by activities along the length of the river's path and therefore trans-boundary co-operation is required for effective river management. In relation to the Royal Canal, cooperation with relevant statutory bodies is important in improving amenity and biodiversity, and linking to the green infrastructure network.

River walks and cycleways, where appropriate, can be developed in the riparian zone if sensitively designed and implemented in consultation with Inland Fisheries Ireland. If appropriately managed the creation and/or enhancement of riparian buffer zones is recommended as they create habitats necessary for fish and other aquatic life, filter out pollutants and sediments from overland surface runoff, provide significant amenity and recreational value and enhance flood alleviation.

'Biodiversity' – or biological diversity – is the term given to the variety of life on earth. Biodiversity includes plants, animals and micro-organisms both on land and in water. By maintaining and developing existing bio-diverse habitats, advantages such as improved drainage, reduced carbon emissions, and pollution control can result. The current Kildare County Biodiversity Plan 2009-2014 translates international, European and Irish policies and legislation into a coherent document which aims to raise awareness, setting out projects to reduce biodiversity loss. Priority species and habitats to be protected are also identified.

Children's play is important to their development. It is through play that they learn to socialise and interact with the world. In supporting play we need residential areas, parks and open spaces that are safe and enjoyable for children of different ages. The development of sport and recreation are important in encouraging a sense of wellbeing and social contact. Kildare County Council acknowledges the very important roles that open space, sporting and social clubs play in enhancing the social and recreational life of Kilcock's communities. Facilities for both formal and informal recreation and catering for the entire community of all abilities is required. Kildare County Council will liaise with sporting organisations to

ensure where possible the needs of sports clubs and the communities in the provision of quality facilities.

Green Infrastructure – Policies

It is the policy of Kildare County Council:

GK 1: To progress a strategic green network as illustrated in the Green Infrastructure Map.

GK 2: To protect from development where possible hedgerows and trees as illustrated in the Green Infrastructure Map.

GK 3: To improve pedestrian and cycle routes to recreational and amenity areas.

GK 4: To focus on key roads into Kilcock such as Church Road, Courtown Road Road and the Maynooth Road for 'greening' by way of higher standards of planting creating green avenues/boulevards entering the town (also see section 7.4.2.2).

GK 5: To protect and improve the natural character of the Royal Canal and the Rye Water River by promoting access, walkways, cycle lanes and other compatible uses along them, any such proposals in the vicinity of the Rye Water River are subject to Appropriate Assessment to determine the likelihood of such impacts on the designated site.

GK 6: To develop linear parks, particularly along the River Rye Water and the Royal Canal linking to areas of open space and amenity. Where lands are in private ownership it shall be policy, in any development proposal, to secure public access along the waterway.

GK 7: To co-ordinate between open space, biodiversity and flood management, in progressing a green infrastructure network.

GK 8: To develop a network of green corridors throughout the town interconnecting open space and extending out to the wider region.

GK 9: To ensure that the building line of all development shall be set back 91 metres from the Motorway, which is identified in Map 6. Kildare County Council will support the planting of native woodland species within this zone (also see policy QH 16).

GK 10: To protect and enhance the landscape, including existing green spaces through sustainable planning and design for both the existing community and for future generations in accordance with the principles of the European Landscape Convention.

GK 11: To require planning applications, with potential to impact adversely on the landscape character of the Plan area, to include an appropriate visual impact assessment of the proposed development.

GK 12: To prohibit development where it is likely that damage would be caused either to trees protected by a Tree Preservation Order or, to those which have a particular local amenity or nature conservation value, in particular those listed at GKO 3. Development that requires the felling of mature trees of amenity value, conservation value or special interest notwithstanding the fact that they may not be listed in this plan, will be discouraged.

GK 13: To encourage the protection of hedgerows, which provide a unique habitat for wildlife. It shall be expected that all new developments protect mature hedgerows and include hedgerows as an integral part of the overall development design as appropriate.

GK 14: To protect (c)SACs, SPAs, NHAs, and pNHAs which are designated or become designated and notified to Kildare County Council during the lifetime of this Local Area Plan.

GK 15: To protect any additional areas that may become designated during the lifetime of this plan, including the proposed and designated Protected Areas under the Water Framework Directive Register of Protected Areas, by resisting development which would detrimentally impact on the conservation status of those sites.

GK 16: To ensure that any development proposal within the vicinity of or having an effect on a designated site, or adjacent to/within and SAC will:

- Identify all ecological corridors, which are present on the proposed development lands (including hedgerows and masonry stone walls) that are likely to be affected by the development proposal.
- Identify any losses to these corridors which would result if the application in question was granted.
- Show that such losses would be fully offset if the application were to be granted through the replacement of the relevant corridors, with corridors composed of similar species and of a similar age prior to any losses to the existing corridors.

GK 17: To ensure that new residential developments provide public open space in accordance with the provisions of the Kildare County Development Plan and which is sufficient in quantity and distribution to meet the requirements of the projected future population, including play facilities for children.

GK 18: To promote the enhancement of public open spaces to meet the social, recreational, conservational and ecological needs of the town and to consider the development of appropriate complementary facilities which do not detract from the amenities of spaces.

GK 19: To support the provision of community gardens/allotments/local markets/pocket parks, where feasible, and in particular as temporary uses on vacant under-utilised or derelict sites (also see section 14.4.4).

GK 20: To protect existing open spaces and recreational uses from encroachment by unsuitable and incompatible other uses

GK 21: To promote the development of soft landscaping in public open spaces, where feasible, in accordance with the principles of Sustainable Urban Drainage Systems (also see section 8.2.4.7)

GK 22: To develop linear parks along the Rye Water River and the Royal Canal in conjunction with all relevant statutory and non-statutory bodies to include Waterways Ireland and Meath County Council. The development shall include:

- The provision of a high quality well lit cyclist and pedestrian route. The route shall also be suitable for the requirements of the mobility impaired.

- The planting of a mixture of semi-mature and mature trees for the length of the linear park.
- Pedestrian crossings, suitable for the requirements of the mobility impaired, over the River Rye Water and the Royal Canal. Any proposed pedestrian crossings shall be designed so that there is minimum impact on either the River Rye Water or the Royal Canal. In this regard the Heritage Officer and/or the National Parks and Wildlife Service may be contacted to determine the most appropriate locations for such crossing points.

GK 23: To develop a pedestrian/cyclist bridge over the River Rye Water to County Meath to connect the linear park (as above) to the area of amenity within the jurisdiction of Meath County Council.

GK 24: To conserve and protect riparian (beside rivers) corridors new development will not be permitted within a minimum of 10m from either side of all watercourses measured from the top of the bank, apart from in exceptional circumstances, in order to provide:

- Visual amenity of the river;
- Public space and access;
- Public walkway / cycleway / lighting.
- Spaces to allow for the conservation and enhancement of landscape features, such as tree coverage.
- Spaces to conserve and enhance biodiversity capacity.
- Redevelopment shall seek to create riparian buffer strips of at least 2.5m, along either side of all watercourses measured from the top of the bank. Riparian buffers have the greatest potential to control environmental damage, reduce flooding potential and provide habitats.

GK 25: To conserve and protect the natural habitats in the River and Canal systems.

GK 26: To preserve views and prospects to and from the River Rye Water and the Royal Canal and to ensure that further development along either of the water systems does not affect the quality of either the scenic viewpoint or the waterways amenity. New development adjacent to the riverside amenity area shall be restricted where such development could present a negative visual effect or negatively disrupt the vistas available.

GK 27: To protect all designated wildlife sites, including any additions or amendments to these, from any development that would adversely affect their conservation value.

GK 28: To identify, protect, conserve, and enhance, wherever possible, wildlife habitats and species of local importance, not otherwise protected by legislation. Such habitats would include woodland, river, grassland areas and field boundaries (hedgerows, stone walls and ditches). Such features form part of a network of habitats and corridors, which allow wildlife to exist and flourish.

GK 29: To have regard to the County Bio-Diversity Plan, and integrate the consideration of bio-diversity into all council actions and work programmes in order to ensure the protection and enhancement of this important aspect of the local environment.

GK 30: To ensure that any development proposal within the vicinity of or having an effect on a designated site, will provide sufficient detail illustrating how it will impact upon the designated site and will include proposals for appropriate amelioration. In all such cases the developer shall have regard to the County Bio-diversity Plan, and shall consult with the National Parks and Wildlife Section of the DoECLG.

GK 31: To the event of lighting being proposed along river or canal corridors a bat survey shall be conducted which will provide recommendations for suitable lighting. The impact on bats shall be minimised by using low – pressure sodium lamps, limiting the times during which the lighting can be used to provide some dark periods; directing the lighting to where it is needed to avoid light spillage; and, minimising upward lighting to avoid light pollution.

GK 32: In the event of a proposed development impacting on a site known to be a breeding or resting site of species listed in Habitats Regulations, a derogation licence may be required. Applications for a derogation licence should be made in writing to the Species and Regulations Unit of the National Parks and Wildlife Service and include survey results and proposed mitigation measures.

GK 33: To maintain and enhance existing recreation facilities.

GK 34: To continue to co-operate with community and sports bodies in the development of the canal and other recreational areas in the town.

GK 35: To prohibit the loss of existing public and private recreational open space unless alternative recreational facilities are provided at a suitable location.

GK 36: To seek the provision of children’s play facilities in new residential developments were deemed appropriate.

GK 37: To recognise and support the role of the private sector in providing specialist play facilities, including climbing walls, table tennis tables etc, both indoor and outdoor, and subject to zoning specifications.

GK 38: To develop a public park at the Bawnogues incorporating the following passive and active recreation facilities:

- All-weather playing pitches.
- Athletics track.
- Playground.
- High quality formal and informal seating arrangements.
- High quality landscaping including the planting of a mixture of semi mature and mature trees.

Green Infrastructure- Objectives

It is an objective of the Council:

GKO 1: To progress the following critical linkages:

- To provide a continuous cycleway and walkway from Maynooth to Enfield along the Royal Canal in line with the proposals for the Royal Canal Cycle Track project.
- To provide a continuous cycleway and walkway along the Rye Water River from Rye Valley to the Town Centre.
- To provide pedestrian and cycle access in from Bawnogues to the Royal Canal, linking to the Train Station and to the Rye Water River.

GKO 2: To develop linear parks along the Royal Canal and the Rye Water River which are linked to existing parks and open space creating green routes and wildlife corridors throughout Kilcock.

GKO 3: To protect, by way of tree preservation orders, trees and groups of trees of special amenity value at the following locations;

- The old cemetery off Church Lane.
- Group of trees on the site to the south-east of Courtown Road, along the Commons south and bordering Ballybrack stud.
- Line of trees along the boundary wall to the north of Church St. and adjacent to Scoil Dara.
- Mature woodlands (main avenue and boundary planting) within Courtown Demesne.
- Line of trees forming eastern boundary to Royal Meadows estate.
- Along the Sli na Slainte route.

GKO 4: To ensure that an Appropriate Assessment in accordance with the Habitats Directive is carried out for any plan or project which individually or in combination with other plans and projects is likely to have a significant direct or indirect impact on any Natura 2000 site or sites.

GKO 5: To develop linear parks along the Royal Canal and the Rye Water River which are linked to existing parks and open space creating green routes and wildlife corridors throughout Kilcock where appropriate and in accordance with the requirements of the Habitats Directive.

GKO 6: To develop a town park at the Bawnogues for the entire community of Kilcock.

GKO 7: To transform the under-utilised area of the 'Island' into public open space in conjunction with the provision of pedestrian/cycling crossings over the railway and Royal Canal (also see section 9.4.7 and 13.4.7).

GKO 8: To seek the improvement of the water quality of the Royal Canal in co-operation with Waterways Ireland ensuring recreational use of the community.

GKO 9: To enhance the amenities of the River Rye Water and the Royal Canal.

GKO 10: To support the implementation of the Kildare County Biodiversity Plan 2009-2014 or as may be amended.

GKO 11: To endeavour to provide play spaces throughout the town. Kildare County Council will ensure that play spaces are open to public use.

GKO 12: To encourage and facilitate the provision of adult amenities in parks such as table tennis tables, outdoor gyms, basketball courts, bowling greens and associated facilities etc.

GKO 13: To encourage the provision of a MUGA on the 'the island' adjacent to the Royal Canal and railway line (also see section 9.4.4 and 13.4.7).

GKO 13: To involve children and young people in greening initiatives and biodiversity projects, having regard to their need to interact with and be educated by nature.

GKO 14: To identify spaces which could be developed as playgrounds and recreational areas in neighbourhoods deficient in these facilities.

Note: These Policies and Objectives were drawn up for the Draft LAP for Kilcock and the most current draft should be referred to in order to ensure that the most up to date information is being used.

Site Specific Target Notes

Subsequent to further communication with the Council the following site specific target notes were suggested for areas zoned for development within Kilcock Town, and other notable sites. ***Note: the most up to date draft of the Kilcock Local Area Plan should be referred to when referring to the recommendations below.***

It is the policy of the Council:

To ensure that any planning application or pre planning consultation has regard to the habitat description and recommendations set out in the site specific target notes for Green Infrastructure set out in Table below:

Location	Zoning	Site Size	Committed Units	Density	Unit Potential	SC Notes
Site ref 1	New Residential	23ha	N/A	30 per ha	690 units	Wet grassland (GS4), Improved grassland (GA1) and Hedgerows (WL1) habitats present. Some hedgerows are considered to be of high, moderate and low ecological value and should be retained if possible. If they are to be removed, they should be replaced.
Site ref 2	Existing Residential	2.8ha	39 units granted	N/A	39 units	Spoil and Bare Ground (ED2). Construction was on-going on day of habitat survey. No further action required.
Site ref 3	Existing Residential	4.1ha	181 units granted	N/A	181 units	Recolonising Bare Ground (ED2), Wet Grassland (GS4), Scrub (WS4) and Dry Calcareous and Neutral Grassland (GS1). 'Common East' along the Rye Water is considered part of the green infrastructure of Kilcock. Maintain habitats where possible, to ensure habitat connectivity between sites. Enhance as an area of ecological value in Kilcock, e.g. by planting native trees and promoting biodiversity.
Site ref 4	Existing Residential	0.2ha	4 units granted	N/A	4 units	Hard standing (BL3). No further action required.
Site ref 5	Existing Residential	1.7ha	N/A	25 per ha	42 units	Recolonising Bare Ground (ED2) and high to moderate ecological value Hedgerows (WL1). Maintain hedgerows (and as such promote habitat connectivity), where possible. If they are to be removed, they should be replaced.
Site ref 6	Town Centre	2.2ha	N/A	30 per ha	66 units	Hard standing (BL3). No further action required.
Site ref 7	Town Centre	0.92ha	N/A	30 per ha	27 units	Hard standing (BL3). No further action required.
Site ref 8	Town Centre	0.5ha	N/A	25 per ha	13 units	Hard standing (BL3). No further action required.
Site ref 9	Town Centre	0.2ha	N/A	25 per ha	5 units	Hard standing (BL3). No further action required.
Site ref 10	Existing Residential	0.66ha	N/A	25 per ha	17 units	Amenity Grassland (GA2). Habitat is of low ecological value, enhance where possible e.g. by planting hedgerows, re-seeding grassland with a species-rich native seed mix.
Site ref 11	Town Centre	0.44ha	N/A	25 per ha	11 units	Hard standing (BL3). No further action required.
Site ref 12	New Residential	9.3ha	291 units granted	N/A	291 units	Dry Calcareous and Neutral Grassland (improved) (GSi1), high, moderate and low ecological value Hedgerows (WL1) and Improved Grassland (GA1). Maintain hedgerows (and as such promote habitat connectivity), where possible. If they

Location	Zoning	Site Size	Committed Units	Density	Unit Potential	SC Notes
						are to be removed, they should be replaced.
Site ref 13	New Residential	9.5ha	N/A	25 per ha	237 units	Improved Grassland (GA1) and high, moderate and low ecological value hedgerows (WL1). Maintain hedgerows (and as such promote habitat connectivity), where possible. If they are to be removed, they should be replaced. Improved Grassland habitat is of low ecological value, enhance where possible e.g. re-seeding grassland to with a species-rich native seed mix.
Site ref 14	New Residential	0.78ha	N/A	25 per ha	20 units	Dry Calcareous and Neutral Grassland (Improved) (GSi1) and moderate ecological value Hedgerow (WL1). Maintain hedgerow (and as such promote habitat connectivity), where possible.
Site ref 15	Town Centre	1.0ha	59 units granted	N/A	59 units	Hard standing (BL3). No further action required.