Ecological Impact Assessment

Proposed residential development at Nancy's Lane, Clane

12 February 2018

NM Ecology - Consultant Ecologists
276 Harold's Grange Road, Dublin 16
Website: www.nmecology.com
Email: info@nmecology.com
Tel: 087-6839771

Executive Summary

This Ecological Impact Assessment has been prepared by NM Ecology Ltd on behalf of Kildare County Council as part of a planning application for a residential development at Nancy's Lane, Clane, Co. Kildare. The proposed development will involve the construction of 77 residential units, with associated internal roads, parking spaces, green areas and services. The aim of this report is to identify, quantify and evaluate the impacts of the proposed development on ecosystems and their components, including designated sites, habitats, flora and fauna.

The main habitats within the proposed development site are arable crops, hedgerows and treelines. Most habitats and flora are common and widespread in Ireland and are considered to be of negligible ecological importance. No protected plants or problematic invasive species (e.g. Japanese knotweed) are present. Most habitats will be cleared in advance of the proposed development, but this will not have a significant impact on habitats or flora.

Nancy's Lane – a long-established, tree-lined pedestrian track of county ecological value – is located along the eastern boundary of the site. In the (draft) Clane Local Area Plan 2017 – 2023, Nancy's Lane has been proposed for two purposes: to provide pedestrian and cycle links between residential areas and schools, and to act as a natural heritage feature. The pedestrian / cycle path will comprise a tarmacadam surface of up to 3m width, with associated LED lighting for security purposes, and access points through the hedgerow into the proposed development site. A range of mitigation measures will be implemented during the construction and operation of the proposed development to reduce the magnitude of impacts on ground flora, nocturnal fauna and hedgerow-dwelling bird species within the lane. There will still be an unavoidable ecological impact on the lane due to the loss of small sections of ground flora and the introduction of lighting, but impacts will not be significant at a local scale.

The site may support some threatened bird species and is likely to be used by small mammals such as hedgehogs, hares and pygmy shrews. Nancy's Lane is also likely to be of importance for bats. On a precautionary basis the proposed development site is considered to be of local ecological importance for birds and mammals. Impacts on these taxa will be avoided by scheduling the initial site clearance works for the non-breeding season (October – February), or by commissioning a pre-construction survey by a suitably-qualified ecologist.

Subject to the successful implementation of these measures, it can be concluded that the proposed development will not cause any significant negative impacts on designated sites, habitats, legally protected species, or any other features of ecological importance.

Table of Contents

1 Introduction

1.1 Assessment brief

This aim of this Ecological Impact Assessment (EcIA) is to identify, quantify and evaluate the impacts of the proposed development on ecosystems and their components, including designated sites, habitats, flora and fauna. It has been prepared in accordance with the *Guidelines for Preliminary Ecological Appraisal* (2013) and the *Guidelines for Ecological Impact Assessment in the UK and Ireland* (2016), which are the primary resources used by members of the Chartered Institute of Ecology and Environmental Management (CIEEM). The purpose of this document is to:

- Provide an objective and transparent assessment of the potential ecological impacts of the proposed development for all interested parties, including planning authorities and the general public
- Facilitate objective and transparent determination of the consequences of the development in terms of national, regional and local policies relevant to ecology
- Propose the steps will be taken to adhere to legal requirements relating to designated sites and legally protected species (CIEEM 2016).

Although the above guidelines provide a scientifically-rigorous framework for EcIA, some processes also rely on the professional judgement of an ecologist, including survey design, the valuation of ecological features, and the characterisation of impacts. An outline of the author's experience, training and accreditation is provided in the following section, which support his competency to make such judgements.

1.2 Statement of authority

All surveying and reporting was carried out by Nick Marchant, the principal ecologist of NM Ecology Ltd. He has an MSc in Ecosystem Conservation and Landscape Management from NUI Galway and a BSc in Environmental Science from Queens University Belfast. He is a member of the Chartered Institute of Ecology and Environmental Management, and operates in accordance with their code of professional conduct.

He has ten years of professional experience, including more than seven years as an ecological consultant, one year as a local authority biodiversity officer, and two years managing an NGO in Indonesia. He has provided ecological assessments for over two hundred development projects throughout Ireland and Northern Ireland, including renewable energy, infrastructural projects (roads, water pipelines, greenways, etc.), and a range of residential and commercial developments.

2 Methods

2.1 Scoping

The aim of this assessment is to identify any ecological features that may pose a constraint to the proposed development. It involves the following steps:

- Identification of designated sites within an appropriate zone of influence
- A review of existing biological records for the site and surroundings
- A walkover survey incorporating the following elements:
    - Classification and mapping of habitats
    - A search for rare or protected flora, and for any problematic non-native plant species (e.g. Japanese Knotweed)
    - A search for field signs of rare or protected fauna (e.g. badgers), and habitat suitability assessments for species that are shy, nocturnal or seasonal
- Valuation of ecological features, review of legal considerations, and selection of important ecological features
- Assessment of impacts on important ecological features and development of appropriate mitigation strategies

2.2 Data collection and walkover survey

A desk-based scoping study was carried out using data from the following sources:

- Plans and specifications for the proposed development
- Bedrock, soil, subsoil, ground water and surface water maps from the Geological Survey of Ireland webmapping service (www.gsi.ie/mapping.htm), the National Biodiversity Data Centre (http://maps.biodiversityireland.ie/), and the Environmental Protection Agency web viewer (http://gis.epa.ie/Envision/)
- Maps and details of designated sites from www.npws.ie
- Records of protected and red-list species from the Scientific Unit of the National Parks and Wildlife Service, obtained via a data request
- Biological records from the National Biodiversity Data Centre online mapping service
- *Ecological Assessment of Nancy's Lane, Clane, Co. Kildare* (Scott Cawley Ltd, 2016), which was prepared for Kildare County Council during the preparation of the Clane Local Area Plan 2017 – 2023.

The following resources were used for the walkover surveys:

- Habitat surveys were carried out in accordance with the *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al 2011), and using the classification system of *A Guide to the Habitats of Ireland* (Fossitt 2000)

- Flora were identified using *New Flora of the British Isles, 3rd Edition* (Stace 2010), *The Wildflower Key* (Rose 2006), *Grasses, Sedges Rushes and Ferns of the British Isles and northwestern Europe* (Rose 1989) and *The Vegetation Key to the British Flora* (Poland & Clement 2009). Nomenclature follows the plant crib of the Botanical Society of the British Isles (BSBI 2007). The abundance and extent of species is described using the DAFOR scale (Dominant, Abundant, Frequent, Occasional, Rare)
- Fauna surveys followed the methods outlined in the *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (NRA 2006), with reference to other species-specific methods as appropriate.

Desktop data from internet resources was accessed from the 1st – 29th of November 2016, and a site inspection was carried out on the 14th of November. The survey area covered the proposed development site and a buffer of approx. 50m beyond its boundaries (where accessible).

2.3 Valuation of ecological features

Based on the information collected during the desktop and walkover surveys, the ecologist assigns an ecological value to each feature based on its conservation status at different geographical scales (Table 1). For example, a site may be of national ecological value for a given species if it supports a significant proportion (e.g. 5%) of the total national population of that species.

Table 1: The six-level ecological valuation scheme used in the CIEEM guidelines (2016)

Ecological value	Geographical scale of importance
International	International or European scale
National	The Republic of Ireland or the island of Ireland
Regional	Leinster, and/or the east coast of Ireland
County	County Kildare
Local	Clane and its immediate surroundings
Negligible	None, the feature is common and widespread

It is accepted that any development will have an impact on the receiving environment, but the significance of the impact will depend on the value of the ecological features that would be affected. The following is outlined in the CIEEM guidelines: "*one of the key challenges in an EcIA is to decide which ecological features (habitats, species, ecosystems and their functions/processes) are important and should be subject to detailed assessment. Such ecological features will be those that are considered to be important and potentially affected by the project. It is not necessary to carry out detailed assessment of features that are*

sufficiently widespread, unthreatened and resilient to impacts from the development, and that will remain viable and sustainable."

For the purposes of this report we have only assessed impacts on ecological features that are of local value or higher, or those that receive legal protection. These features are termed 'important ecological features' and are listed in Section 4.7. Features of negligible ecological value (e.g. species-poor grasslands) are not considered to be material in decision making, so they are not included in the impact assessment.

2.4 Ecological Impact Assessment

Potential direct, indirect or cumulative impacts on ecological features can be described in relation to their magnitude, extent, duration, reversibility and timing/frequency, as outlined in the CIEEM (2016) guidelines. Depending on the type of impact and the sensitivities of the important ecological feature, the ecologist may determine that the impact would have a 'significant effect'. The following definitions are provided in the CIEEM: "*A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project*". "*For the purpose of EcIA, a 'significant negative effect' is an effect that undermines biodiversity conservation objectives for 'important ecological features', or for biodiversity in general."*. Where significant impacts are identified, measures will be taken to avoid, minimise or compensate for impacts. Based on these measures, the impact assessment will be repeated, and any residual impacts will be discussed.

3 Development Proposals

3.1 Characteristics of the proposed development

The proposed development will consist of 77 residential units. Road access will be from the College Wood Manor estate on the northern boundary of the site, which will lead to internal roads and paved parking areas. Detailed specifications can be found in the architect's drawings, but some elements relevant to ecology are summarised below.

Foul water will be discharged to a local authority foul sewer in the College Wood Manor housing estate and treated in the Osberstown waste water treatment plant. There is capacity in the waste water treatment plant to cater for planned growth in Clane, and it is understood that the local collection network will be upgraded by Irish Water in coming years.

Surface water will be passed through a petrol interceptor and stored in an on-site attenuation tanks, and will be discharged to a surface water sewer in the College Wood Manor housing estate.

A pedestrian and cycle link will be created along Nancy's Lane, with associated lighting and access points in the hedgerow to provide passive surveillance to the residential area (further details are provided in Section 5.2). The lane will be paved with tarmacadam, with a width equivalent to the underlying track (now partially obscured by earth), but no wider than 3m.

Landscaped areas will be developed in the centre and east of the site, and there will be a 10m green buffer alongside Nancy's Lane (refer to Section 3.2) on the eastern boundary of the site. The green buffer will grade into the existing hedgerow Nancy's Lane, comprising a 4m zone of coppice / shrub vegetation alongside the hedgerow, a strip of wildflowers, and an area of amenity grassland.

3.2 Other developments in the area (potential in-combination effects)

The proposed development site is marked as key development area #4 in the draft Clane Local Area Plan 2017-2023. The vision for this area is to achieve "*the consolidation of the urban area of Clane through new residential development and open space and amenity provision, protecting lands for Community and Educational uses, delivering important connectivity between Ballinagappa Road/College Wood Manor and the schools quadrant and Prosperous Road and integrating Nancy's Lane while protecting its natural heritage features.*" In addition to the proposed residential development, there are proposals to develop a 'strategic connection' between the College Wood Manor estate and the R403 road to the south (this forms part of the proposed development), to provide pedestrian and bicycle access to the school, and to develop Nancy's Lane as a natural heritage feature. Therefore, it is likely that there will be other developments in this area over the seven-year cycle of the Local Area Plan.

There is a live planning application to the east of the proposed development site, which is for 92 residential units and a crèche; it was granted planning permission in 2008, and was recently granted an extension until 2019. If constructed at the same time as the proposed development, it is possible that they could act in-combination to increase the scale of potential ecological impacts (if applicable). No other approved or pending planning applications were identified in the vicinity of the site.

4 The Receiving Environment

4.1 Environmental setting

The site is located on the western outskirts of Clane town. It covers parts of two fields of arable crops, which are bordered by hedgerows / treelines on the northern, eastern and western sides. There is similar farmland to the west of the site, and some unmanaged farmland to the south and east (although these areas are likely to be developed in the

coming years). There are housing estates to the north / north-east of the site, and a school approx. 200m to the southeast. Nancy's Lane – a long-established, tree-lined pedestrian track – is located along the eastern boundary of the site.

The underlying bedrock is Argillaceous bioclastic limestone and shale of the Malahide formation. Subsoils are limestone till and soils are grey-brown podzolics / brown earths, which are deep, well-drained soils derived from basic materials.

The only surface-water features on the site are shallow drainage ditches at the base of the hedgerows, but all were dry at the time of survey in November 2016. The closest watercourses are the Betaghstown and Kilmurry/Gollymochy rivers, which are located approx. 360m south and 1.2km north-east of the proposed development site, respectively. Both are tributaries of the River Liffey, which passes approx. 1.5km to the east of the site, on the far side of Clane. The River Liffey is currently of good status downstream as far as Celbridge, after which it declines to poor - moderate status until it reaches the coast (Water Framework Directive Status Assessments 2010-2015).

4.2 Designated sites

There are no designated sites within 1km[1] of the proposed development (see Figure 1). There is a distant hydrological connection to some designated sites on the River Liffey, including the Liffey Valley NHA (approx. 20km downstream) and a number of SACs, SPAs and NHAs in Dublin Bay (45km downstream), but due to the distances involved the risk of impacts is considered to be negligible, even in the absence of standard site management measures. Nonetheless, a *Screening for Appropriate Assessment* report also accompanies this planning application.

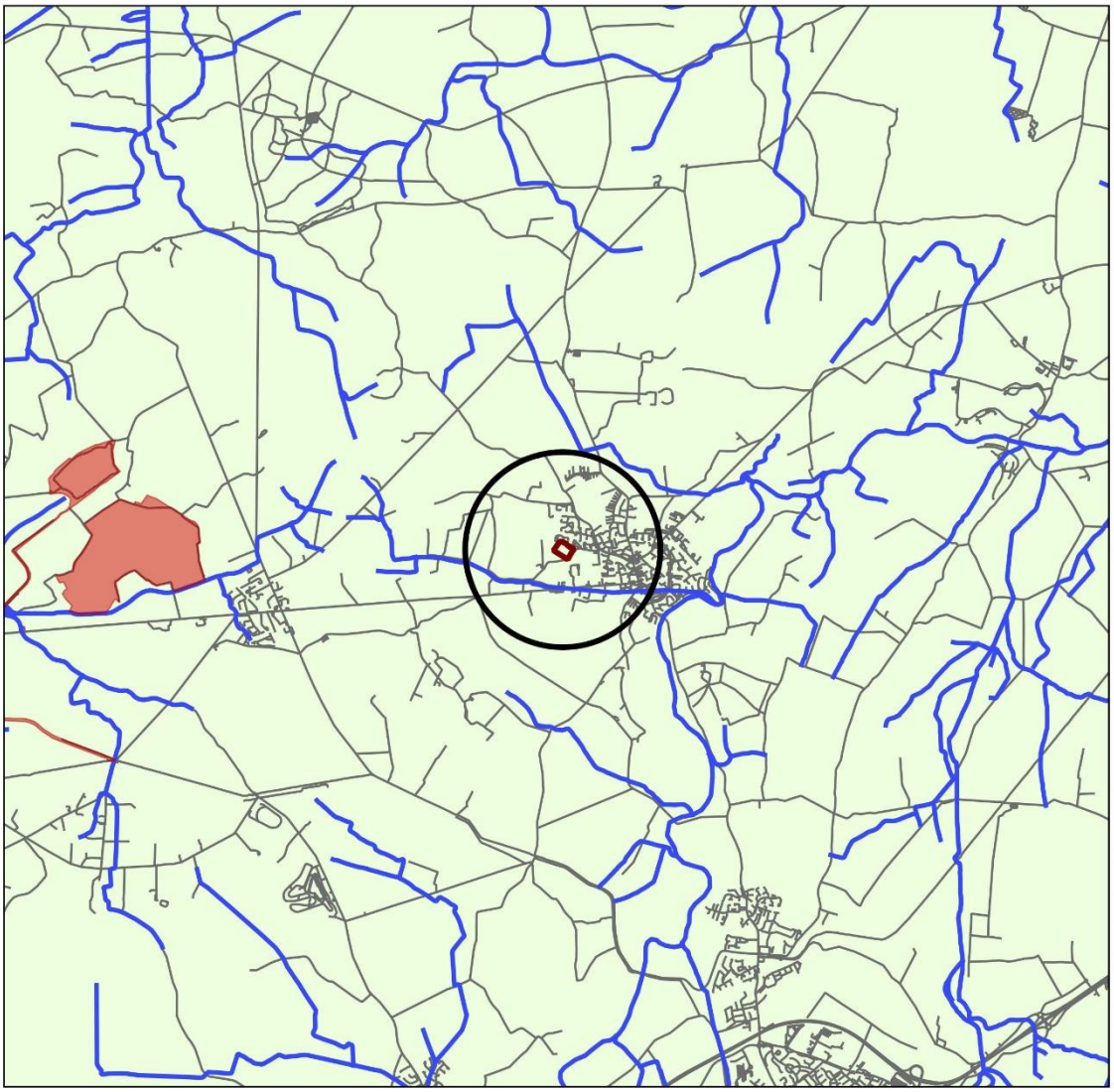
[1] For the purposes of this assessment we considered indirect impacts on designated sites within a potential zone of influence of 1km. This distance is considered to be proportionate to the relatively small scale of the proposed development, its suburban setting, and is distance from watercourses.

Figure 1	Designated sites
Location	Nancy's Lane, Clane
Applicant	Kildare County Council
Date	27-10-2017

NM Ecology Ltd - Ecological Consultants
Website: www.nmecology.com
Email: info@nmecology.com
Tel: 087-6839771

Site location
- Proposed development site
- 1km buffer
- Roads
- Watercourses

Natura 2000 sites
- Special Areas of Conservation
- Special Protection Areas



NM ECOLOGY

0 1 2 3 4 5 km

4.3 Desktop records of flora and fauna

Records of flora and fauna in the vicinity of the proposed development site (10km grid square N82) were obtained from the Scientific Unit of the National Parks and Wildlife Service (NPWS) and the National Biodiversity Data Centre. The former are from the NPWS' internal databases of rare and protected species, and the latter are public records from a range of verified sources (e.g. BSBI tetrad data for Ireland). These records were filtered for protected and priority species, and an edited list is provided in Appendix 1.

It is important to note that these records do not provide a definitive confirmation of the presence or absence of these species in the study site or the surrounding area. Most records are from national distribution atlases that are based on representative sampling at a few randomised sites, so the true distribution of these species (and also species not included on this list) may be much higher than recorded. Conversely, the distribution of some species may have decreased since the latest record, and some may have become locally extinct. The list should be interpreted in this context.

4.4 Phase 1 Habitat Survey

A map of habitats within the local authority landholding is provided in Figure 2; it should be noted that the proposed development site only covers a proportion of the landholding.

Arable crops (BC1)

All of the fields are used for the production of barley *Hordeum vulgare*. Following the harvesting of the crop the stems have been cut, baled and left on site. There are relatively few other plant species in the sward because it is likely that crops were treated with herbicide, but there was also some occasional false oat-grass *Arrhenatherum elatius*, Yorkshire-fog *Holcus lanatus*, cock's-foot *Dactylis glomerata*, perennial rye-grass *Lolium perenne* and nettle *Urtica dioica*. This habitat has been modified by agriculture and supports very little semi-natural vegetation, so it is considered to be of negligible ecological value.

Hedgerows (WL1)

The fields are surrounded on all sides by hedgerows, most of which also have a shallow drainage ditch (all were dry at the time of survey). The dominant shrub was hawthorn *Crataegus monogyna*, with locally-abundant patches of elder and blackthorn, and an occasional hazel *Corylus avellana* or guelder-rose *Viburnum opulus*. Occasional emergent trees include ash *Fraxinus excelsior* and wych elm *Ulmus glabra*. The ground layer is dominated by bramble *Rubus fruticosus* ag., nettle and false oat-grass.

Detailed assessments of hedgerows were carried out along Nancy's Lane by Scott Cawley Ltd in 2016 during the preparation of an ecological assessment of the lane. The hedgerows were assessed using the Hedgerow Appraisal technique, and four out of the five sections were

rated as being in favourable condition, with the remainder in adequate condition. During surveys by NM Ecology Ltd in November 2016, it was noted that there was a relatively high diversity of ground flora within the lane, including wood avens *Geum urbanum*, hart's-tongue fern *Phyllitis scolopendrium*, herb-robert *Geranium robertianum*, pignut, bush vetch *Vicia sepium*, common hogweed *Heracleum sphondylium* and greater plantain *Plantago major*. Some of these species are indicative of native woodland, suggesting that the laneway may once have been part of a larger woodland. Most of the woodland ground flora was growing at the base of the hedgerows along each side of the lane, whereas the centre of the lane consisted only of ruderal vegetation and exposed earth.

Overall, most of the hedgerow habitat is common and widespread and is considered to be of negligible ecological value, but Nancy's Lane has a higher species diversity and is considered to be of at least local ecological value. In the Scott Cawley report (2016) it was concluded that the lane was of local value, and potentially of county value. On this basis, we will treat the lane as a feature of county value. It is also important to note that all hedgerows within the proposed development site may provide habitat for birds and small mammals; this is discussed in further detail in Section 4.5.

Treelines (WL2)

Some of the hedgerows along Nancy's Lane and in the west of the local authority landholding are dominated by trees and have a sparse shrub layer, so they were classified as treelines rather than hedgerows. Most trees are approx. 10-20m in height with trunk diameters of >0.5m, but some of the trees in the south-western corner of the landholding exceed 20m height and 1m in trunk diameter. Most of the trees on the western boundary are ash, with a moderate proportion of sycamore, beech *Fagus sylvatica* and wych elm. All treelines are considered to be of local ecological value. They may also provide habitat for birds and other fauna (see Section 4.5).

Rare or protected flora

No rare or protected plants were encountered during field surveys, including the species listed in Appendix 1.

Invasive plant species

A small patch of snowberry *Symphoricarpos albus* was found on the side of Nancy's Lane in the south of the site. It is non-native and can be moderately invasive in Ireland, but it tends to spread quite slowly and is relatively easy to control if required. Therefore, it will not pose a constraint to the proposed development.

No Japanese knotweed or any other restricted invasive species (as listed on the third schedule of the *European Communities (Birds and Natural Habitats) Regulations 2011*) were recorded on the site.

Figure 2	Habitat map
Location	Nancy's Lane, Clane
Applicant	Kildare County Council
Date	12-02-2018

NM Ecology Ltd - Ecological Consultants
Website: www.nmecology.com
Email: info@nmecology.com
Tel: 087-6839771

Boundaries
- Public lands
- Proposed development site

Habitats
- BC1 Arable crops
- GS2 Dry meadow
- WL1 Hedgerow
- WL2 Treeline

NM ECOLOGY

0 50 100 150 200 m

4.5 Surveys for protected / priority fauna

Birds

The following birds were recorded during the site visit: blackbird, woodpigeon, great tit, jackdaw and wren. All of these species are currently of good conservation status in Ireland. However, a number of threatened birds have been recorded in the surrounding 10km square (Appendix 1), including red-listed countryside birds such as the yellowhammer and common quail, and a number of amber-listed species. Arable fields usually provide good habitat for the countryside cereal-feeding finches and other small passerines. Therefore, it is possible that the site may be of local ecological value for birds. In addition, all birds (including nests, eggs and chicks) receive protection under the Wildlife Act 1976 (as amended).

Terrestrial mammals

A small number of rabbit burrows were observed in the field boundaries, but rabbits are common and widespread in Ireland and do not receive any legal protection, so they are considered to be of negligible ecological value.

No protected mammals were observed during the field survey, but badger, otter, pine marten, hare, hedgehog, red squirrel and pygmy shrew have all been recorded in the surrounding 10km square (Appendix 1). However, the habitats within the proposed development site are not suitable for many of these species: otters usually live in close proximity to waterbodies, while red squirrels and pine martens are usually found in woodland habitats. No badger setts or any other field signs of this species (e.g. prints, latrines) were recorded. Therefore, the proposed development site is considered to be of negligible importance for these species.

Hedgehogs and pygmy shrews typically favour hedgerow, woodland and scrub habitats, so it is possible that they would use the proposed development site on an occasional basis. Hares have broad habitat preferences, but can be found in arable fields and hedgerows. Therefore, on a precautionary basis the site is considered to be of local value for these species.

Bats

Four bat species have been recorded in the surrounding 10km square (Appendix 1): common pipistrelle, soprano pipistrelle, Leisler's and brown long-eared bat. All of these species are listed as 'least concern' on the Irish red list of terrestrial mammals (Marnell et al 2009), with the exception of Leisler's bat, which is 'near-threatened' because Ireland supports an internationally-important population.

Although there are some mature trees on the site, no crevices or cavities were observed in any of them, so they are considered to be of negligible suitability for bats. Some of the

nearby residential houses could support a bat roost (e.g. in attic spaces), but as most nearby structures are modern it is highly unlikely that a significant bat roost is present. Pipistrelle species and Leisler's bats may forage within the proposed development site on an occasional to regular basis, but the majority of the site is unlikely to be an important feeding area or commuting route due to the availability of similar habitat in the open farmland to the west of the site. Therefore, most of the proposed development site and its immediate surroundings are considered to be of negligible value for bats.

However, the Nancy's Lane provides an ideal 'dark corridor' for bats, as it is sheltered by hedgerows on both sides, has no artificial lighting, and has a broad open void in which bats could feed and commute. Therefore, Nancy's Lane is considered to be of local value for bats.

Reptiles and amphibians

No reptiles or amphibians were observed during the site survey. Considering the lack of wetland breeding sites for amphibians, and that all habitats within the site boundary are well-represented in the surrounding landscape, the proposed development site is considered to be of negligible value for these taxa.

Terrestrial invertebrates

The habitats within the proposed development site are common in agrictural landscapes in Ireland, so the site is considered to be of negligible value for invertebrates.

4.6 Potential limitations and information gaps

The walkover survey was carried out in November, which is outside the ideal survey season for botanical surveys (usually May – August), because most species are not in flower. However, all plants were identifiable by vegetative means, and no potential rare or protected species were encountered. On this basis the assessment does not have any limitations or information gaps.

4.7 Identification of important ecological features

Table 3 provides a summary of all ecological features identified on the site, including their valuation and legal / conservation status. For the purposes of this impact assessment, any features that are of local ecological value, or that receive legal protection, are considered to be 'important ecological features', and will be addressed in the impact assessment.

Table 3: Identification of 'important ecological features' within the proposed development site

Ecological feature	Valuation	Legal status	Important feature?
Nancy's Lane	County	-	Yes
Treelines (WL2)	Local	-	Yes
Hedgerows (WL1)	Negligible	-	Yes, secondary value for fauna
Arable crops (BC1)	Negligible	-	No
Hedgehog, hare and pygmy shrew	Local	WA*	Yes
Birds	Local	WA	Yes
Bats (Nancy's Lane)	Local	-	Yes
Other terrestrial mammals	Negligible	-	No
Reptiles and amphibians	Negligible	-	No
Invertebrates	Negligible	-	No

** WA - protected under Section 19 or 20 of the Wildlife Act 1976 (as amended)*

In summary, the important ecological features identified on the proposed development site are birds, bats, hedgehogs, hares, pygmy shrews and Nancy's Lane. The other hedgerow and treeline habitats would provide habitat for birds and small mammals, so they are also considered to be important ecological features.

5 Predicted Impacts of the Proposed Development

5.1 Impacts on breeding birds and mammals during site clearance (construction phase)

If scrub, hedgerow and treeline habitats are cleared during the bird nesting season (usually between March and August, inclusive), it is possible that active nests could be destroyed. In a similar manner, if any protected mammals (notably hedgehogs, hares and pygmy shrew) are present at the time of site clearance, they could be killed or injured. Depending on the species and numbers involved, it is possible that impacts on some birds and mammals could be significant at a local scale. The killing of any protected fauna or disturbance of their breeding / resting places would constitute an offence under the *Wildlife Act* 1976.

5.2 Impacts on Nancy's Lane (construction and operational phases)

Nancy's Lane has been proposed for two purposes in the Draft Clane Local Area Plan 2017 - 2023: to provide pedestrian and cycle links between residential areas and schools, and to act as a natural heritage feature. The lane will be paved with tarmacadam up to a maximum

width of 3m, and LED lighting will be provided for security purposes. Four small access points will be created in the hedgerow along the northern / western side of the lane, each of which would be fitted with lockable bollards to ensure the cycle path is not used for vehicles or anti-social behaviour. Potential impacts of these activities on habitats and fauna associated with the lane are discussed in further detail below.

The construction of the cycle path may have some localised direct impacts on ground flora. There is an existing surfaced track of 2 – 3m width along the centre of the lane, although the surface has become obscured by mud and ruderal vegetation, so the original surface is no longer available. Prior to the construction of the path, the mud and ruderal vegetation will be cleared, and the original track will be used as a foundation for the cycle path. The intended width of the cycle lane will be 3m, but there appears to be some narrow points in the lane of only approx. 2m width, in which case the path will be reduced to the width of the original, underlying track. The exact width along the length of the track will be confirmed in advance of construction, and will be reviewed by an ecologist. This will ensure that only mud and ruderal vegetation will be removed from the footprint of the path, and that there will be no direct impacts on the woodland ground flora along the sides of the lane. However, there is a risk that ground flora could temporarily be affected during construction works, which could have an impact of slight to moderate significance.

The creation of access points from the residential development into the lane will require the permanent removal of a small number of hedgerow shrubs (estimated 10 – 15 small hawthorn trees), but would not involve the removal of any mature trees. As this would only affect a small proportion of the hedgerow, and would affect shrubs rather than trees, it would not have a significant effect on the ecological value of the laneway as a whole.

There will be substantial planting of woody vegetation along the northern / western side of Nancy's Lane as part of the proposed development. This will comprise a 10m buffer zone, of which the nearest 4m will be planted with coppice / shrubby vegetation to provide ground cover. Hazel would be the dominant species, with a proportion of other native shrubs (e.g. guelder rose, spindle) included in the species mix in order to improve diversity. The hedgerows and shrubs would be cut on an annual basis to provide passive surveillance and safe access. Overall, the additional planting would compensate for any trees removed from the access points, and would increase the width and diversity of the existing hedgerow, resulting in a neutral or slight positive impact on the adjacent section of Nancy's Lane.

Some level of lighting will be required along the lane in order to provide safe access for pedestrians and cyclists, particularly during winter months. However, many of the fauna that are likely to use the lane – notably bats, badgers, and other mammals – are nocturnal, and will avoid areas that are brightly lit. A low level of lighting may have a localised or temporary effect on wildlife, but if lighting is very bright, directed towards trees, and/or active throughout the night, it could permanently displace nocturnal fauna from the lane. This

would have a significant impact on nocturnal fauna, which are considered to be of local ecological value.

5.3 Potential for pollution of waterbodies (operational phase)

All foul water from the proposed development will be discharged to a local authority sewer and treated in the Osberstown waste water treatment plant. The plant has recently been upgraded and is currently within capacity and providing adequate treatment before discharge to the River Liffey. It is the responsibility of Irish Water to provide appropriate treatment to foul water in municipal waste water treatment plants, and the responsibility of the local authority to assess any potential impacts on water quality at the discharge point, which is usually undertaken during the preparation of county development plans or local area plans.

All surface-water runoff from hard surfaces will percolate to ground or will be discharged to a local authority sewer (via a petrol interceptor). Rainwater that percolates to ground is considered to be free of pollutants and does not pose a risk to local watercourses. Any rainwater discharged to local authority sewers will receive appropriate treatment prior to discharge to receiving waters.

Consequently, it can be concluded that foul water and surface water treatment during the operational phase would not cause any significant impacts upon receiving waters. There is no risk of any other impacts during the operation of the proposed development.

6 Proposed Mitigation Measures

6.1 Protection of birds and mammals during site clearance

Under Sections 22 and 23 of the *Wildlife Act* 1976 (as amended), it is an offence to kill or injure a protected bird or mammal, or to disturb their breeding / resting places. Most birds nest between March and August (inclusive), and the peak breeding period of hedgehogs, hares and pygmy shrews is broadly similar. Therefore, it is strongly recommended that site clearance works are carried out between September and February (inclusive). If this is not possible, an ecologist will survey the affected areas in advance in order to determine whether any protected fauna are present. If any are encountered, the vegetation clearance will be delayed until the protected fauna have moved away from the area, e.g. when chicks have fledged and a nest has been abandoned.

6.2 Protection of Nancy's Lane

The creation of a cycle path along Nancy's Lane could have impacts on three ecological features: ground flora could temporarily be damaged during the construction of the

tarmacadam path, lighting could displace nocturnal fauna from the lane, and the cutting of hedgerows could prevent birds from nesting or feeding within the lane. In order to avoid or minimise these impacts, the following measures will be implemented during the construction and operational phases.

The footprint of the tarmacadam path will match the width of the underlying track, up to a maximum of 3m, and there will be no disturbance of the vegetation outside this corridor. The width of the existing track will be established prior to construction works, marked out clearly, and reviewed by an ecologist. No vehicles will be used for the construction process, because this would cause disturbance of the ground outside the 2m corridor; instead, the track will be laid either by hand or using small-scale vehicles, and compacted / levelled using a narrow-gauge roller.

All lighting will be designed in order to minimise impacts on bats and other nocturnal fauna by implementing the principles of bat-sensitive lighting (BCT 2009, Stone 2014). The design principles will be to reduce the lux to the minimum levels required for pedestrian access, to minimise the height of lighting columns, to direct light only onto the required areas (thus avoiding light spill), and to use bulbs that have little or no UV content. The following is recommended in the Scott Cawley (2016) report "*Lighting along the lane should be bollard or low level embedded lighting such as http://www.solar-eye.com/bat-hat so as to minimise light spill that could affect movement of nocturnal species*". In order to ensure that these principles are met, an ecologist will be employed to advise on the design of the lighting proposals for the lane. This will ensure that the design principles listed above are adapted for the exact requirements of the site.

The hedgerow and coppice / shrubs along the northern side of the lane will be managed in order to provide a balance between passive surveillance, amenity and natural heritage. They should not be excessively thinned, but instead should be managed as a typical agricultural hedgerow by annual cutting. Seasonal restrictions on cutting will be followed (as outlined in Section 6.1), and the annual cutting should be carried out in January or February in each year rather than in autumn / winter months (i.e. September to December, inclusive), because the latter would destroy berries that provide food for birds and mammals during winter months. The bases of hedgerow shrubs should not be cut, in order to increase the density of foliage at ground level. Overall, this approach will provide a balance between the maintenance of the hedgerow, and its importance as a nesting and feeding resource for fauna.

7 Residual Impacts

Any removal of scrub, hedgerow or treeline habitats would take place outside the season of peak nesting activity in birds, or the area would be surveyed by an ecologist to confirm that

no protected fauna were present. As a result, there would be no impact on local bird or mammal populations, and no legal offence under the *Wildlife Act 1976* (as amended).

The mitigation measures outlined in Section 6.2 will reduce the magnitude of impacts on ground flora during the construction phase, and nocturnal fauna and hedgerow-dwelling bird species during the operational phase. There will still be an unavoidable residual impact on the lane due to the loss of small sections of ground flora, and the introduction of lighting, but impacts will not be significant at a local scale. Overall, this should meet the objective of the Clane Local Area Plan 2017 – 2023 of "*integrating Nancy's Lane while protecting its natural heritage features".*

Subject to the successful implementation of these measures, it can be concluded that the proposed development will not cause any significant negative impacts on designated sites, habitats, legally protected species, or any other features of ecological importance.

8 References

Bat Conservation Trust, 2009. *Bats and Lighting in the UK*. Bat Conservation Trust, London.

Botanical Society of the British Isles 2007. *Plant species nomenclature checklist.* Botanical Society of the British Isles, Southampton.

Chartered Institute of Ecology and Environmental Management, 2013. *Guidelines for Preliminary Ecological Appraisal*. C.I.E.E.M., Hampshire, England.

Chartered Institute of Ecology and Environmental Management, 2016. *Guidelines for Ecological Impact Assessment in the U.K and Ireland: Terrestrial, Freshwater and Coastal* (2nd Edition). C.I.E.E.M., Hampshire, England.

Collins, J (ed.) (2016). *Bat surveys for professional ecologists: good practice guidelines* (3rd edn). The Bat Conservation Trust, London.

European Commission. 2002. *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. Office for Official Publications of the European Communities, Luxembourg.

Joint Nature Conservation Committee, 2010. *Handbook for Phase 1 habitat survey - a technique for environmental audit*. JNCC, Peterborough, UK

Marnell, F., Kingston, N., Looney, D., 2009. *Ireland Red List No. 3 – Terrestrial Mammals*. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Poland, J., Clement, E. 2009. *The Vegetation Key to the British Flora*. John Poland and the Botanical Society of the British Isles, Southampton.

Rose, F., 1989. *Grasses, Sedges Rushes and Ferns of the British Isles and northwestern Europe*. Penguin Books Ltd, London.

Rose, F., 2006. *The Wildflower Key*. Penguin Books Ltd, London.

Stace, C. 2010. New Flora of the British Isles, 3rd Edition. Cambridge University Press

Stone, E.L. (2013) *Bats and lighting: Overview of current evidence and mitigation guidance*. University of Bristol

Appendix 1: Desktop records of rare or protected species

Table A1-1: Data obtained from the National Parks and Wildlife Service

Taxon	*Scientific Name*	Common Name	Location	Latest record	Legal Status	Cons Status
Amphibians	*Lissotriton vulgaris*	Smooth Newt	Prosporous	1972	WA	lc
	Rana temporaria	Common Frog		2011	HR, WA	lc
Mammals	*Lepus timidus subsp. hibernicus*	Irish Hare	Prosporous	2011	HR, WA	lc
	Martes martes	Pine Marten	Prosporous	2011	HR, WA	lc
	Meles meles	Badger		1992	WA	lc
Freshwater fish	*Lampetra planeri*	Brook Lamprey		1982	HR	lc
Freshwater crustacean	*Austropotamobius pallipes*	Freshwater Crayfish	Liffey, Grand Canal	2011	HR, WA	N.A.
Molluscs	*Vertigo angustior*	Narrow-mouthed Whorl Snail		1971	HR, WA	VU
	Vertigo moulinsiana	Desmoulin's Whorl Snail		2006	HR, WA	EN
Flowering plants	*Scrophularia umbrosa*	Green Figwort	Liffey valley	1931		VU
Lichens	*Cladonia portentosa*	Reindeer Moss	Ballinafagh	1986	HR	N.A.

Table A1-2: Data obtained from the National Biodiversity Data Centre

Taxon	Latin Name	Common Name	Latest record	Legal Status	Cons Status
		Vertebrates			
Birds of Prey	*Accipiter nisus*	Eurasian Sparrowhawk	2016	WA	Amber
	Circus cyaneus	Hen Harrier	2011	BD 1, WA	Amber
	Falco columbarius	Merlin	2011	BD 1, WA	Amber
	Falco peregrinus	Peregrine Falcon	2011	BD 1, WA	Green
	Falco tinnunculus	Common Kestrel	2011	WA	Amber
	Tyto alba	Barn Owl	2011	WA	Red
Chats & thrushes	*Saxicola rubetra*	Whinchat	2011	WA	Red
	Turdus viscivorus	Mistle Thrush	2011	WA	Amber
Divers & Grebes	*Podiceps cristatus*	Great Crested Grebe	1972	WA	Amber
	Tachybaptus ruficollis	Little Grebe	2015	WA	Amber
Gamebirds, crakes & rails	*Coturnix coturnix*	Common Quail	1991	WA	Red
	Crex crex	Corn Crake	1972	BD 1, WA	Red
	Fulica atra	Common Coot	2015	WA	Amber
	Rallus aquaticus	Water Rail	2011	WA	Amber
Gulls, terns and auks	*Larus argentatus*	Herring Gull	1984	WA	Red
	Larus canus	Mew Gull	1984	WA	Amber
	Larus fuscus	Lesser Black-backed Gull	2011	WA	Amber
	Larus marinus	Great Black-backed Gull	1984	WA	Amber
	Larus ridibundus	Black-headed Gull	2011	WA	Red
Herons	*Egretta garzetta*	Little Egret	2015	BD 1, WA	Green
	Alauda arvensis	Sky Lark	2015	WA	Amber

Larks, swallows and pipits	*Anthus pratensis*	Meadow Pipit	2015	WA	Red
	Hirundo rustica	Barn Swallow	2016	WA	Amber
	Motacilla cinerea	Grey Wagtail	2016	WA	Red
	Riparia riparia	Sand Martin	2011	WA	Amber
Pigeons & cuckoo	*Columba oenas*	Stock Pigeon	2011	WA	Amber
Shearwaters, gannet & cormorants	*Phalacrocorax carbo*	Great Cormorant	2011	WA	Amber
Shrikes, starling & crows	*Sturnus vulgaris*	Common Starling	2016	WA	Amber
Sparrows, finches & buntings	*Carduelis cannabina*	Common Linnet	2011	WA	Amber
	Carduelis chloris	European Greenfinch	2011	WA	Amber
	Emberiza citrinella	Yellowhammer	2015	WA	Red
	Passer domesticus	House Sparrow	2011	WA	Amber
	Passer montanus	Eurasian Tree Sparrow	2011	WA	Amber
Swifts, woodpeckers & allies	*Alcedo atthis*	Common Kingfisher	2011	BD 1, WA	Amber
	Apus apus	Common Swift	2016	WA	Amber
Waders	*Gallinago gallinago*	Common Snipe	2015	WA	Amber
	Numenius arquata	Eurasian Curlew	2011	WA	Red
	Pluvialis apricaria	European Golden Plover	2011	BD 1, WA	Red
	Scolopax rusticola	Eurasian Woodcock	2011	WA	Red
	Tringa totanus	Common Redshank	1991	WA	Red
	Vanellus vanellus	Northern Lapwing	2016	WA	Red
Warblers & Flycatchers	*Muscicapa striata*	Spotted Flycatcher	2016	WA	Amber
	Regulus regulus	Goldcrest	2011	WA	Amber
Wildfowl	*Anas acuta*	Northern Pintail	2001	WA	Red
	Anas clypeata	Northern Shoveler	2001	WA	Red
	Anas crecca	Eurasian Teal	2011	WA	Amber
	Anas penelope	Eurasian Wigeon	2011	WA	Red
	Aythya ferina	Common Pochard	2001	WA	Red
	Aythya fuligula	Tufted Duck	2011	WA	Red
	Cygnus cygnus	Whooper Swan	2001	BD 1, WA	Amber
	Cygnus olor	Mute Swan	2015	WA	Amber
Mammals	*Erinaceus europaeus*	West European Hedgehog	2015	WA	lc
	Lepus timidus subsp. hibernicus	Irish Hare	2015	HR, WA	lc
	Lutra lutra	European Otter	2014	HR, WA	NT
	Martes martes	Pine Marten	2015	HR, WA	lc
	Meles meles	Eurasian Badger	2015	WA	lc
	Myotis daubentonii	Daubenton's Bat	2014	HR, WA	lc
	Nyctalus leisleri	Lesser Noctule	2008	HR, WA	NT
	Pipistrellus pipistrellus sensu lato	Pipistrelle	2013	HR, WA	lc
	Pipistrellus pygmaeus	Soprano Pipistrelle	2008	HR, WA	lc
	Plecotus auritus	Brown Long-eared Bat	2004	HR, WA	lc
	Sciurus vulgaris	Eurasian Red Squirrel	2012	WA	NT
	Sorex minutus	Eurasian Pygmy Shrew	2015	WA	lc
Amphibians	*Lissotriton vulgaris*	Smooth Newt	2012	WA	lc

	Rana temporaria	Common Frog	2015	HR, WA	lc
Invertebrates					
Bees	*Sphecodes hyalinatus*		1935	0	VU
Butterflies	*Argynnis aglaja*	Dark Green Fritillary	1978	0	VU
	Coenonympha pamphilus	Small Heath	1975	0	NT
	Coenonympha tullia	Large Heath	1984	0	VU
	Erynnis tages	Dingy Skipper	1984	0	NT
	Euphydryas aurinia	Marsh Fritillary	2010	HR	VU
	Hipparchia semele	Grayling	1974	0	NT
	Lasiommata megera	Wall	1984	0	EN
Damselflies	*Lestes dryas*	Scarce Emerald Damselfly	1986	0	NT
Freshwater crustacean	*Austropotamobius pallipes*	Freshwater White-clawed Crayfish	2010	HR, WA	N.A.
Mayflies	*Ephemerella notata*		1947	0	EN
	Procloeon bifidum		1947	0	VU
Molluscs	*Helicella itala*	Heath Snail	1997		VU
	Musculium lacustre	Lake Orb Mussel	2003		VU
	Myxas glutinosa	Glutinous Snail	2006		EN
	Pisidium hibernicum	Globular Pea Mussel	2003		NT
	Pisidium pseudosphaerium		1997		EN
	Vallonia pulchella	Smooth Grass Snail	1997		VU
Non-vascular plants					
Liverworts	*Ricciocarpos natans*	Fringed Heartwort	1972	0	NT
Mosses	*Campyliadelphus elodes*	Fine-leaved Marsh Feather-moss	2011		NT
	Encalypta vulgaris	Common Extinguisher-moss	1949		NT
	Leucobryum glaucum	Large White-moss	2011	HR	lc
	Sphagnum cuspidatum	Feathery Bog-moss	2011	HR	lc
	Sphagnum denticulatum	Cow-horn Bog-moss	2011	HR	lc
	Sphagnum fallax	Flat-topped Bog-moss	2011	HR	lc
	Sphagnum magellanicum	Magellanic Bog-moss	2011	HR	lc
	Sphagnum papillosum	Papillose Bog-moss	2011	HR	lc
	Sphagnum tenellum	Soft Bog-moss	2011	HR	lc

** Codes used in the 'legal status' column are as follows: HD – species that are protected under Annexes 2, 4 or 5 of the EC Habitats Directive 1993; BD – species that are listed on Annex I of the EC Birds Directive; WA - species that are protected under the Wildlife Act 1976 (as amended); FPO – species listed on the Flora Protection Order 2015, which receive protection under the Wildlife Act 1976 (as amended).*

*** Codes in the 'conservation status' column refer to national red lists (see references), using the following supplementary categories: RE (regionally extinct), CR (critically endangered), EN (endangered), VU (vulnerable), NT (near-threatened), lc (least concern), dd (data deficient) or N.A. (not assessed). Birds are assessed using the Red-Amber-Green categories as defined in Colhoun & Cummins (2013).*