

N24 Carrick Road Improvement Scheme, Co. Kilkenny



ECOLOGICAL IMPACT ASSESSMENT

Version (23-3-22)



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EXECUTIVE SUMMARY

The current document provides an ecological assessment of the proposed N24 Carrick Road Improvement Scheme. The proposal also includes for two no. attenuation ponds, as well as realignment of the Skelpstown 16 stream within the site, with new box culvert. A combined underbridge with footpaths and an adjacent cattle underpass will be provided at the location of the Local Road L7416. This report assesses the potential impacts of this road improvement scheme on flora and fauna. The current surveys were completed in December 2017, September 2020, and October 2020.

The closest Special Area of Conservation (SAC) is the Lower River Suir SAC, c. 660m downstream, and an assessment of this designated site is completed in a separate 'Screening for Appropriate Assessment (AA)' and 'Natura Impact Statement (NIS)' report (Ecofact, 2022a; 2022b). The Screening report identified the potential pathway for impacts on the Lower River Suir SAC and therefore a Natura Impact Statement was prepared. Potential impacts assessed included water quality impacts, dust and noise, invasive species and disturbance impacts, identified for both the construction and operational phases of the development. Best-practice mitigation was also provided in the NIS and with the implementation of this mitigation all significant impacts can be avoided. No Natural Heritage Areas (NHA) are located within 5km of the proposed development.

Habitat loss, disturbance, invasive species and water quality impacts were identified as potentially affecting habitats and flora. However the habitats in the footprint of the proposed scheme are of 'Local importance' only. Otters would not be affected by the scheme and do not use the Skelpstown 16 stream. There are no Badger setts or other protected mammal dwellings in the study area. No bat roosts were identified and the habitats in the study area are already fragmented and not of significant importance to bats. The bird population in the study area is dominated by common passerine species typical of the Co Kilkenny countryside. The Skelpstown 16 stream is not a salmonid watercourse and lampreys are not present.

The existing N24 already fragments the study area and this relatively small-scale proposed road improvement project would not increase this fragmentation as it is a realignment of an existing road. The proposed realignment section of the road scheme is positioned further away from the River Suir Estuary than the existing N24. There is currently no water treatment system on the existing road, while the proposed road will have both runoff treatment and attenuation. The proposed realignment of the Skelpstown 16 stream with a new box culvert and adjacent combined underbridge/ underpass at the location of the Local Road L7416 would facilitate safe mammal commuting between habitats at either side of the proposed road which is currently facilitated with the existing N24 which fragments the landscape and prevents habitat connectivity. Mammal fencing would also be provided along the new road. In addition the proposed landscaping along the new realignment will bring positive biodiversity benefits.

The minor potential negative impacts identified can be easily mitigated. Transport Infrastructure Ireland (TII)/ National Roads Authority (NRA) guidelines will be followed such as for landscape treatments, invasive species, protection of badgers, otters and bats. Landscaping and new habitat creation will use native species only and will mitigate for the minor habitat loss envisaged. Pre-construction bat and mammal surveys will be carried out as a precaution. Tree / hedgerow removal will take place outside the bird nesting season. TII/ NRA guidelines for bats will also be followed when felling trees. Planting of native trees and hedgerows along the boundaries of the proposed scheme will be used to improve the landscape for bats and other animals. Best practice water quality mitigation will be implemented to protect the Skelpstown 16 stream.



The provided mitigation is sufficient to minimise any potential negative impacts on biodiversity resulting from the proposed N24 Carrick Road Improvement Scheme. Provided all mitigation measures are followed, it has been assessed that the proposed scheme can be built while avoiding significant impacts on flora and fauna both during the construction and operational phases and will actually bring positive benefit to the biodiversity in the area.



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1. INTRODUCTION

Ecofact Environmental Consultants Ltd. were commissioned to undertake an Ecological Impact Assessment of the proposed N24 Carrick Road Improvement Scheme. The location of the proposed development is illustrated in Figure 1.

The proposed road improvement scheme for the N24 Carrick Road is c. 2.2km in length, and involves a realignment of the existing N24 road. The proposal also includes for two no. attenuation ponds, and the realignment of the Skelpstown 16 stream, with new box culvert. A combined underbridge with cattle underpass will be provided at the location of the Local Road L7416. The drawings for the scheme are presented in Appendix 1.

This report assesses the potential impacts of the proposed N24 Carrick Road Improvement Scheme on terrestrial and aquatic flora and fauna (ecology). The aim of the study is to identify features of ecological interest along the proposed alignment that may present constraints to development or where special mitigation is necessary. An evaluation is made of the scientific or conservation value of the sites identified and the potential for adverse impacts affecting designated sites following the implementation of appropriate mitigation at design stage.

The proposed N24 Carrick Road Improvement Scheme does not lie within any Special Area of Conservation (SAC) or Special Protection Area (SPA). However, the Lower River Suir SAC is located approximately 510m southwest of the development, and c. 660m downstream via the Skelpstown 16 stream which runs through the site, so there are pathways for potential effects. A standalone Screening for Appropriate Assessment Report has been prepared (Ecofact, 2022a), as well as a Natura Impact Statement (Ecofact, 2022b).

This assessment has been prepared in light of current guidance including the EPA (2017) *'Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports'* (EIAR), *'Draft Advice Notes for Preparing Environmental Impact Statements'* (EPA, 2015), *'Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report'* European Commission (2017) along with the *'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine'* (Chartered Institute of Ecology and Environmental Management, 2018).

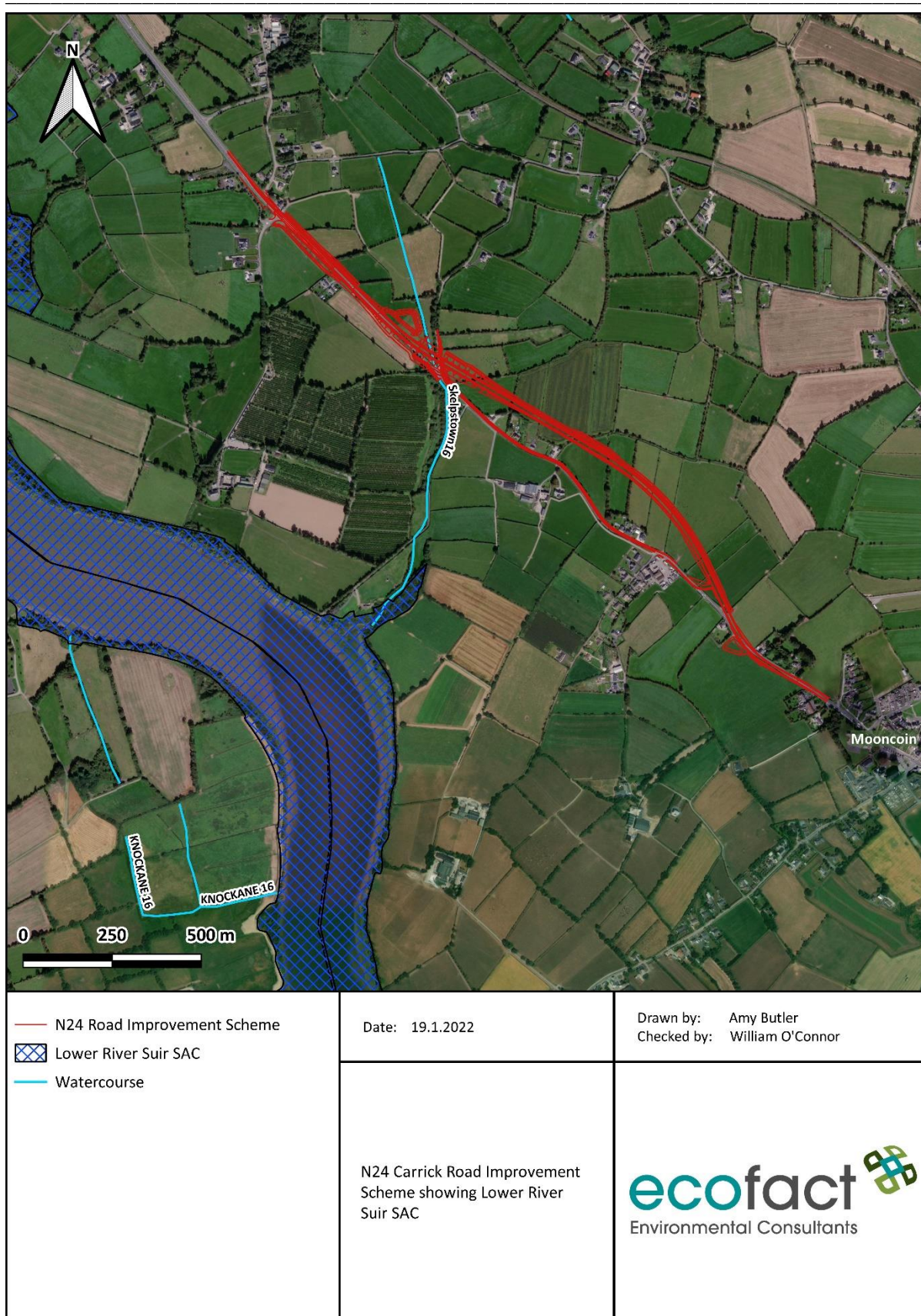


Figure 1 N24 Carrick Road Improvement Scheme showing Lower River Suir SAC (002137).



2. METHODOLOGY

2.1 Guidelines and legislative context

The current assessment has been prepared taking account of the Environmental Protection Agency's (EPA) '*Draft Guidelines on the Information to be contained in Environmental Impact Statements*' (EPA, 2017) and '*Draft Advice Notes for Preparing Environmental Impact Statements*' (EPA, 2015) and also the '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*' (Chartered Institute of Ecology and Environmental Management, 2018). The Heritage Council publication '*Best Practice Guidance for Habitat Survey & Mapping*' (Smith *et al.*, 2011) was also referenced for habitat mapping.

2.2 Desk study

A desktop study was carried out to identify features of ecological importance within the study area and surrounding region. The ecological assessment included designated and sensitive areas in the vicinity of the study area, to enable sufficient assessment to identify and quantify any significant impacts on the habitats, flora and fauna likely to arise from the proposed development and operation of the road improvement scheme. Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Proposed Natural Heritage Areas (pNHAs) in the vicinity of the proposed development site were identified. This information was collated by accessing the National Parks and Wildlife Service (NPWS) website.

The online database hosted by the Irish National Biodiversity Data Centre (NBDC) (www.biodiversityireland.ie) was also utilised to assess the importance of the study area for mammals and bats. Other sources accessed to gather information on bats in the study area included The Bat Conservation Trust's report '*Distribution Atlas of Bats in Britain and Ireland 1980-1999*' (Richardson, 2000). The '*Irish Red Data Book 2: Vertebrates - Threatened Mammals, Birds, Amphibians and Fish in Ireland*' (Whilde, 1993) and the updated '*Irish Red List No. 3: Terrestrial Mammals*' (Marnell *et al.* 2009) were also reviewed.

2.3 Field Survey

2.3.1 Initial Surveys (2017)

The proposed development site was visited during December 2017, outside of the growing season. A walkover habitat survey was undertaken during daylight hours. The habitats present in the study area were categorised and photographed and particular attention was paid to the primary habitats and land take to be directly affected by the proposed development, with regard to '*Best Practice Guidance for Habitat Surveying and Mapping*' (Smith *et al.*, 2011). Habitat mapping was aided by aerial photography and habitats were assessed and categorised as per '*A Guide to Habitats in Ireland*' by J.A. Fossitt (2000). The length of the scheme and environs were also inspected for evidence of ecological features of high conservation concern such as those flora and fauna that occur in the closest Natura 2000 sites.

2.3.2 Further Surveys (2020)

The proposed development site was visited and surveyed again during September to October 2020. A walkover habitat survey was undertaken during daylight hours which had regard to '*Best Practice Guidance for Habitat Surveying and Mapping*' (Smith *et al.*, 2011). Habitats were assessed and categorised as per '*A Guide to Habitats in Ireland*' by J.A. Fossitt (2000) and updated habitat maps were produced. The length of the scheme and environs were also inspected for evidence of ecological



features of high conservation concern such as those flora and fauna that occur in the closest Natura 2000 sites.

A walkover mammal survey of the proposed development site was completed. The walkover mammal surveys were conducted to assess the potential for mammal activity in the study area, including observing trails, tracks and other mammal signs such as scat. The Skelpstown 16 Stream was surveyed for any evidence of Otter activity. The main Otter signs which were searched for include spraints (Otter faeces), paw-prints left in mud or silt, runways (pathways across fields, usually at bends in streams or rivers), slides, hair, haul-out places / couches, holts and breeding sites.

Bat roost, habitat, and activity surveys were undertaken in September 2020. All potential bat roost features (PRFs), which includes trees and built structures, that were considered likely to be disturbed or removed during the project, i.e. those within the footprint of the proposed road scheme area, were assessed in the field survey. The survey had regard to the methodology outlined in *Bat Mitigation Guidelines for Ireland* by Kelleher & Marnell (2006), *Bat Surveys for Professional Ecologists: Good Practice Guidelines* by Collins (2016) and *Bat Tree Habitat Key* by Andrews and Gardener (2016). The assessment of features involved careful inspection from the ground to identify evidence indicating the level of potential of each feature as a bat roost and / or the presence of bats. Key indications of potential as a roost habitat that were searched for in the inspection included, rot / knot / woodpecker holes, cracks and splits in stems and branches, cavities from branch tearing, detached bark, ivy growth, gaps between overlapping stems or branches and other hollows.

Night-time bat activity surveys (n=3 full nights) were completed during mild conditions with no rain within the appropriate bat survey season (September 2020). The night-time surveys commenced 30 minutes before dusk and lasted until 2+ hours after dusk, with additional surveys completed at from 1 hour before dawn. The range of bat detectors used were the BatBox 3 Heterodyne bat detector, BatBox Duet Bat Detector (both Heterodyne and Frequency Division) and Echo Meter Touch 2 Pro detector. The surveys included both walkover and targeted surveys, and also car-based monitoring (following the methods in Catto *et al.*, 2004).

A general bird survey / bird habitat survey of the site was also undertaken in September 2020. The trees and hedgerows on the proposed development site were assessed in terms of their importance for birds.

Any watercourses on the site were also assessed in terms of potential for supporting important aquatic ecology interests. Cognisance of any other ecological features of interest such as the occurrence of any terrestrial invertebrates, reptiles or amphibians of conservation importance, and any invasive species of concern was also noted during the site survey.

2.4 Evaluation

The evaluation of impact significance is a combined function of the value of the affected feature (its ecological importance), the type of impact and the magnitude of the impact. It is therefore necessary to identify the value of ecological features within the study area in order to evaluate the significance and magnitude of possible impacts. Ecological features are assessed on a scale ranging from international-national-county-local. The local scale is approximately equivalent to one 10 km square but can be operationally defined to reflect the character of the area of interest. The evaluation criteria used is shown in Appendix 3. The Criteria for assessing impact magnitude is also included in Appendix 3.



3. DESCRIPTION OF PROJECT CHARACTERISTICS

The proposed N24 Carrick Road Improvement Scheme is c. 2.2km in length. The layout of the scheme is illustrated in Figure 1. Approximately 950m of the road scheme will run along the existing N24 road, and the remainder of the scheme involves a realignment that is c. 1.25km in length. The following information has been obtained from drawings, which are provided in the current report in Appendix 1.

The drainage designs for the proposed road scheme involve the construction of two no. attenuation ponds treatment facilities, with 2m high palisade fencing, one at the western end of the scheme and the other at the eastern end. According to the design drawings, included in Appendix 1, the proposed attenuation pond for road run-off to the west is noted to have a design flow of a 1 in 100 yr return = 13 litres / second. The attenuation pond to the east is noted to have a design flow of 1 in 100 yr return = 32 litres / second. The western attenuation pond will discharge to the Skelpstown 16 stream. 'Interceptor ditches' are also included along the edge of the scheme near an existing bohereen.

The proposal also includes for a proposed realignment of the Skelpstown 16 stream which flows through the site, with the construction of a new box culvert. A combined underbridge and a cattle underpass will be provided at the location of the Local Road L7416. This also includes a track for cattle to gain access to the underpass, according to the design drawings provided. It is noted in the drawings that the new box culvert will adhere to OPW guidelines. This new underbridge and cattle underpass also includes for a 1.5m wide footpath underneath the road.

The proposed N24 Carrick Road Improvement Scheme also includes for a timber post and tension mesh fences are proposed along much of the scheme length, as well as 2.5m wide shared surface either side of the carriageway. Proposed residential access tracks and adjacent field access tracks are also included in the design. There is an existing 'bohereen' running through part of the site and as noted in the drawings, access to this will be closed due to its narrow nature and the fact that it is generally unsuitable for modern agricultural machinery.



4. RECEIVING ENVIRONMENT

4.1 Designated Areas

4.1.1 *Natura 2000 Sites*

The proposed works do not lie within any SAC or SPA. The closest Special Area of Conservation is the Lower River Suir SAC (Site Code: 002137), located ca. 510m (straight line) southwest of the development. This Natura 2000 site will be discussed in the current report however it is noted that a full assessment of this designated site is completed in a Screening for Appropriate Assessment Report and Natura Impact Statement prepared by Ecofact. SACs and SPAs within 15km of the proposed development is illustrated in Figure 2 below.

4.1.2 *Natural Heritage Areas*

Natural Heritage Areas (NHAs) are sites of national ecological importance in the Republic of Ireland. NHAs and pNHAs within 5km of the proposed development are illustrated in Figure 3. No NHAs are located within 5km of the proposed development.

Proposed Natural Heritage Areas are also sites of national ecological importance in the Republic of Ireland. NHAs and pNHAs within 5km of the proposed development are illustrated in Figure 3. The closest pNHA to the proposed realignment is the Lower River Suir (Coolfinn, Portlaw) pNHA (Site Code: 000399), ca. 1km southwest, followed by the Fiddown Island pNHA (Site Code: 000402), located ca. 1.7km northwest.

4.1.3 *Other*

There are no other designated sites, such as Ramsar Sites, or other protected areas within 5km of the proposed development site.

4.2 Habitats and Flora

In general the habitats on the proposed development site are of Local Importance and are habitats that are widespread and common across Ireland. A total of 11 habitats were recorded on the proposed development site: Arable Crops (BC1), Wet Grassland (GS4), Amenity Grassland (improved) (GA2), Improved Agricultural Grassland (GA1), Buildings and Artificial Surfaces (BL3), Hedgerows (WL1), Mixed Broadleaved / Conifer Woodland (WD2), Horticultural Land (BC2), Treelines (WL2), Scrub (WS1), Eroding / upland Rivers (FW1). No records of Fossitt Wetlands are located within the study area. No Annex I Habitats occur within the proposed development site. No rare plants, protected species or protected habitats occur on the proposed development site. Habitats present along the proposed N24 Carrick Road Improvement Scheme study area are illustrated below in Figures 4a and 4b, for the northern and southern sections of the scheme respectively. The different habitat types (as classified according to Fossitt, 2000) recorded from within the proposed development area are listed in Table 1 and described individually below.

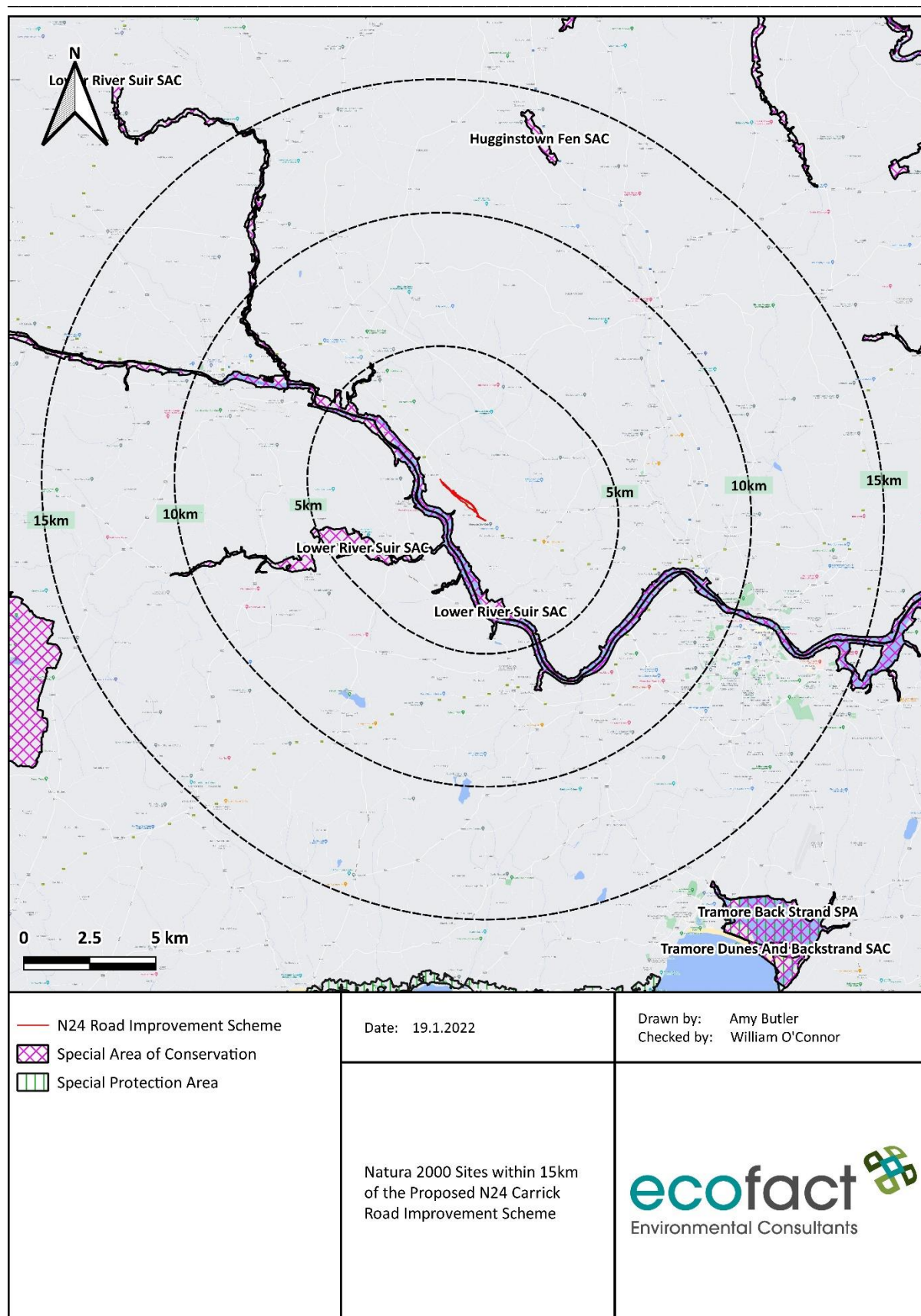


Figure 2 Natura 2000 Sites within 15km of the proposed N24 Carrick Road Improvement Scheme.

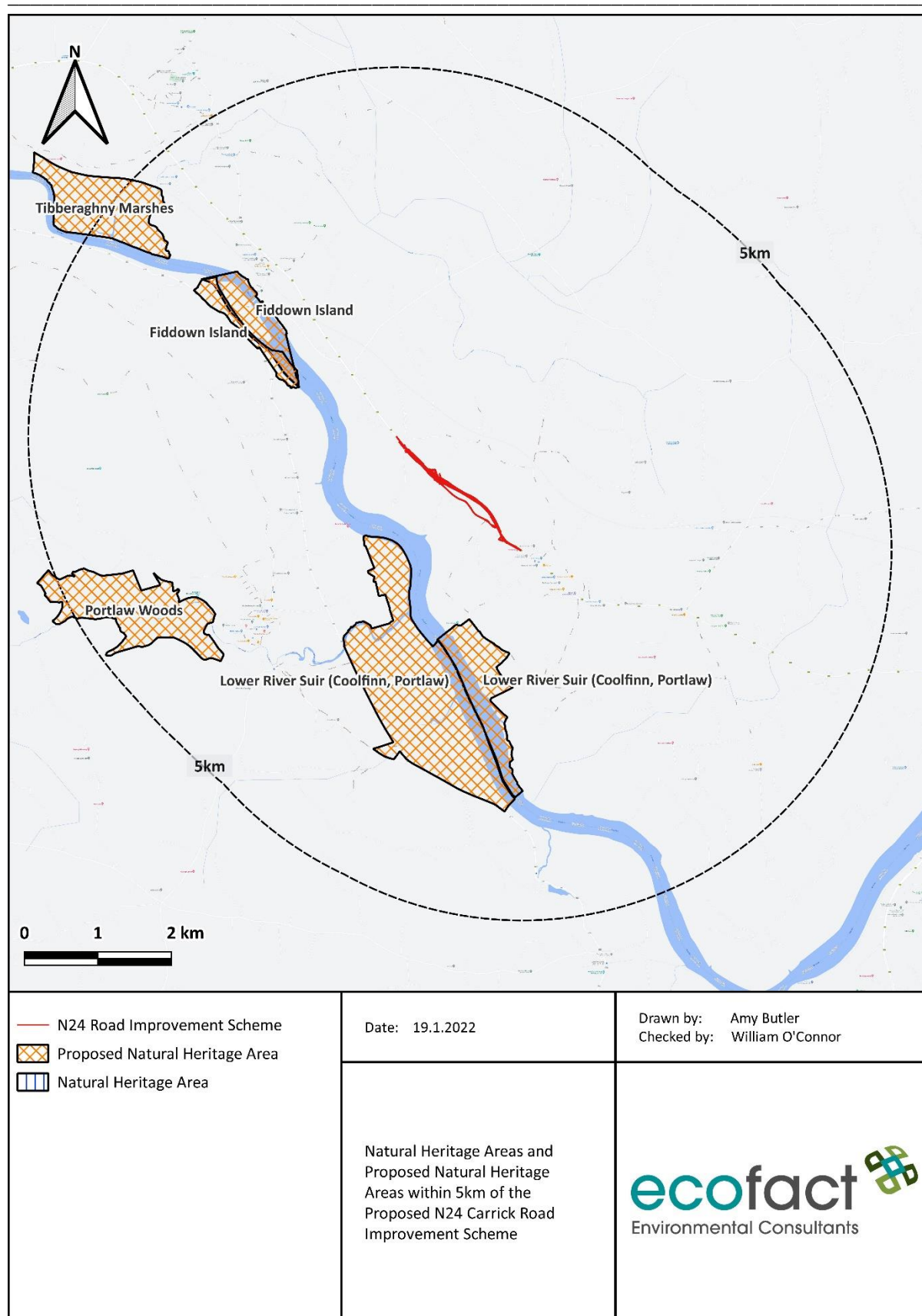


Figure 3 NHAs and pNHAs within 5km of the proposed N24 Carrick Road Improvement Scheme.



Table 1 List of the habitat types recorded from the proposed site along the N24 Carrick Road Improvement Scheme (according to Fossitt, 2000).

Habitat name	Habitat Code	Ecological importance
Arable Crops	BC1	Local Importance
Wet Grassland	GS4	Local Importance
Amenity Grassland	GA2	Local Importance
Improved Agricultural Grassland	GA1	Local Importance
Buildings and Artificial Surfaces	BL3	No Ecological Importance
Hedgerows	WL1	Local Importance, Higher Value
Mixed Broadleaved / Conifer Woodland	WD2	Local Importance, Higher Value
Horticultural Land	BC2	Local Importance
Treelines	WL2	Local Importance, Higher Value
Scrub	WS1	Local Importance
Eroding / Upland River	FW1	Local Importance

4.2.1 Arable Crops (BC1)

The Arable Crops habitat type is found mainly to the south of the scheme northwest of Mooncoin town, with one section located to the north of scheme on the left hand side.

This habitat type encompasses agricultural land that is cultivated and managed for the production of arable crops, including cereals (wheat, barley, oats, maize) and root, leaf, energy or fibre crops such as beets, turnips, rape and flax. Common species that may be abundant in this habitat type include: Common Poppy (*Papaver rhoeas*), Bladder Campion (*Silene vulgaris*), Common Corn Marigold (*Chrysanthemum segetum*) and knotgrasses (*Polygonum* spp.) (Fossitt, 2000).

Evaluation: This habitat is evaluated as being of 'Local Importance'.

4.2.2 Wet Grassland (GS4)

Wet Grassland occurs in the northern section of the scheme mostly to the right hand side, with one small section located on the left hand side just north of the scheme. This habitat is found to be generally species-poor and of low quality in the study area.

Wet grassland typically occurs on wet or waterlogged mineral or organic soils that are poorly drained, and can be found on sloping or flat ground in upland and lowland areas. In some cases this habitat type can be influenced by seasonal or periodic flooding such as in the River Shannon Callows or the wet grasslands of turlough basins. This habitat type also consists of areas of poorly-drained farmland that has not recently been improved. The most common species that can be found in this type of habitat include rushes (*Juncus effusus*, *J. acutiflorus*, *J. articulatus*, *J. inflexus*), Yorkshire-fog (*Holcus lanatus*), Marsh Foxtail (*Alopecurus geniculatus*) and small sedges (*Carex flacca*, *C. hirta*, *C. ovalis*) (Fossitt, 2000).

Evaluation: This species-poor grassland habitat has been evaluated as being of 'Local Importance'.

4.2.3 Amenity Grassland (improved) (GA2)

Amenity Grassland in the study area occurs mostly to the southern and middle sections of the scheme, in the form of recreational or landscaped grasslands. It is also present in the form of residential gardens, but are all of a small size. It mainly consists of well managed grass.



This habitat type is typically species-poor or improved, and is managed for purposes other than grass production. It encompasses amenity, recreational or landscaped grasslands, but excludes farmland. Broadleaved herbs such as Daisy (*Bellis perennis*), Dandelion (*Taraxacum* spp.), clovers (*Trifolium* spp.) and plantains (*Plantago* spp.) are common. Amenity grassland is typically associated with lawns and other managed grassland areas in gardens, parks, grounds of various buildings or institutions, golf course fairways, grassy sports fields and race courses.

Evaluation: This habitat is evaluated as being of 'Local Importance'.

4.2.4 Improved Agricultural Grassland (GA1)

Improved Agricultural Grassland is the most abundant habitat type on the proposed development site. This is used primarily for grazing and is well managed. Common species Meadow grasses are found in abundance here.

Improved Agricultural Grassland (GA1) consists of heavily modified or intensively managed grassland typically used for grazing and / or silage making. This habitat type is generally species-poor with abundant Rye-grass (*Lolium* sp.) often associated with White Clover (*Trifolium repens*). Improved Agricultural Grassland comprises of monoculture grasslands and rye-grass leys which typically form part of an arable rotation. Common species which can be found in this type of habitat include Meadow grasses (*Poa* spp.), Dandelion (*Taraxacum* spp.), thistles (*Cirsium arvense*, *C. vulgare*), and docks (*Rumex* spp.) (Fossitt, 2000).

Evaluation: This species-poor grassland habitat has been evaluated as being of 'Local Importance'.

4.2.5 Buildings and Artificial Surfaces (BL3)

Buildings and Artificial Surfaces were present on the site in the form of roads, residential housing and commercial buildings.

Buildings and artificial surfaces is a broad habitat category that includes areas of built land comprising of domestic, industrial, agricultural and community buildings as well as derelict stone buildings and ruins. This habitat category also consists of artificial surfaces such as cement, tarmac, bricks, blocks, paving stones, astroturf, pavements, runways etc. Greenhouses, polytunnels and refuse dumps are not included in this category (Fossitt, 2000).

Evaluation: This habitat is evaluated as being of no ecological value.

4.2.6 Hedgerows (WL1)

Hedgerows are common in the study area however those located close to the N24 road were considered to be sparse, highly maintained and of poor quality. Species such as Hawthorn and Gorse are common throughout the study area. Many of the hedgerows are low in height and are only present to delineate field boundaries.

Hedgerows typically form field or property boundaries and consist of linear strips of shrubs and occasional trees. The majority of hedgerows are planted and can occur on raised banks created from the digging of drainage ditches. Typical species that occur in hedgerows include Hawthorn (*Crataegus monogyna*), Gorse (*Ulex europaeus*), Dog-rose (*Rosa canina*), Blackthorn (*Prunus spinosa*). Species



of trees which can be frequently found within hedgerows are Hazel (*Corylus avellana*), Ash (*Fraxinus excelsior*) and Willows (*Salix* spp.)(Fossitt, 2000).

Evaluation: This habitat is evaluated as being of 'Local Importance, Higher Value'. This type of habitat is valuable to wildlife for protection and movement.

4.2.7 Mixed Broadleaved / Conifer Woodland (WD2)

Mixed Broadleaved / Conifer Woodland occurs on the site in small scattered sections with the most notable section located on the right hand side to the north of the scheme. This habitat type is very fragmented in the study area and typical species include Common Ash *Fraxinus excelsior* and Willow *Salix* sp.

This habitat type includes woodland areas with mixed stands of broadleaves trees and conifers, where both types have a minimum cover of 25%, and a maximum of 75%. The trees may either be native or non-native species.

Evaluation: This habitat is evaluated as being of 'Local Importance, Higher Value'. This habitat type is valuable to wildlife for protection and movement.

4.2.8 Horticultural Land (BC2)

Horticultural land exists on the proposed development site on the left hand side of the scheme to the north. This habitat type is present in the form of orchards.

Horticultural land includes areas of land that are cultivated and managed for the production of vegetables, fruit crops, culinary or aromatic herbs, flowers and other ornamental plants. It also comprises market gardens, tree nurseries, garden centres, greenhouses, polythene tunnels and smaller vegetable plots in gardens and allotments (Fossitt, 2000).

Evaluation: This habitat is evaluated as being of 'Local Importance'.

4.2.9 Treelines (WL2)

Treelines are relatively sparse and scattered on the proposed development site and occur mostly to the north of the scheme. The most common species present here include Common Ash *Fraxinus excelsior* and Sycamore *Acer pseudoplatanus*.

Treelines includes a single or narrow line of trees that are greater than 5m in height and like hedgerows; they typically occur at field or property boundaries. Hedgerows that are dominated by trees greater than 5m in height are also included within this category. Most treelines are planted and are spaced apart. The majority of treelines comprise non-native tree species such as Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*), limes (*Tilia* spp.), some poplars (*Populus* spp.), Horse Chestnut (*Aesculus hippocastanum*) and conifers (Fossitt, 2000).

Evaluation: This habitat is evaluated as being of 'Local Importance, Higher Value'. This type of habitat is valuable to wildlife for protection and movement.



4.2.10 Scrub (WS1)

This habitat type is sparse within the proposed development area and occurs in scattered areas mostly to the southern section of the scheme. The most common species encountered were Hawthorn *Crataegus monogyna* and Gorse *Ulex* sp.

Scrub encompasses areas that are dominated by at least 50% cover of shrubs, stunted trees or brambles. The canopy height is generally less than 5m, or 4m in the case of wetland areas. Common species found in this habitat type include spinose plants such as Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Gorse (*Ulex europaeus*) (Fossitt, 2000).

Evaluation: This habitat is evaluated as being of 'Local Importance'.

4.2.11 Eroding / Upland Rivers (FW1)

The Skelpstown 16 stream on the proposed development site is classified as an Eroding / Upland River and is located within the Suir catchment; shown in plate 4. This stream flows from northeast to southwest and crosses through the scheme at Ch 1530. It was noted during the walkover survey that this stream has a low sluggish flow and lots of instream vegetation. It is also noted that this stream flows into the River Suir at which point it is classified by the WFD as a transitional waterbody, i.e. an estuary. The proposed N24 road improvement scheme also includes for a realignment of the Skelpstown 16 stream with the inclusion of a box culvert, and adjacent combined underbridge / underpass at the location of the Local Road L7416.

Eroding / Upland Rivers consist of watercourses that are actively eroding and where there is little to no sediment deposition. This typically includes the upland sections of natural watercourses where gradients are steep and water flow is fast and turbulent. The watercourses included in this habitat type are typically smaller and shallower than 'depositing / lowland rivers' (FW2) and include small mountain streams that can dry out periodically if a distinct channel exists or wetland plants are present (Fossitt, 2000).

Evaluation: This habitat is evaluated as being of 'Local Importance'. This evaluation is due to the fact that this stream has a low flow and is not considered to have the potential to support salmonids or lampreys.

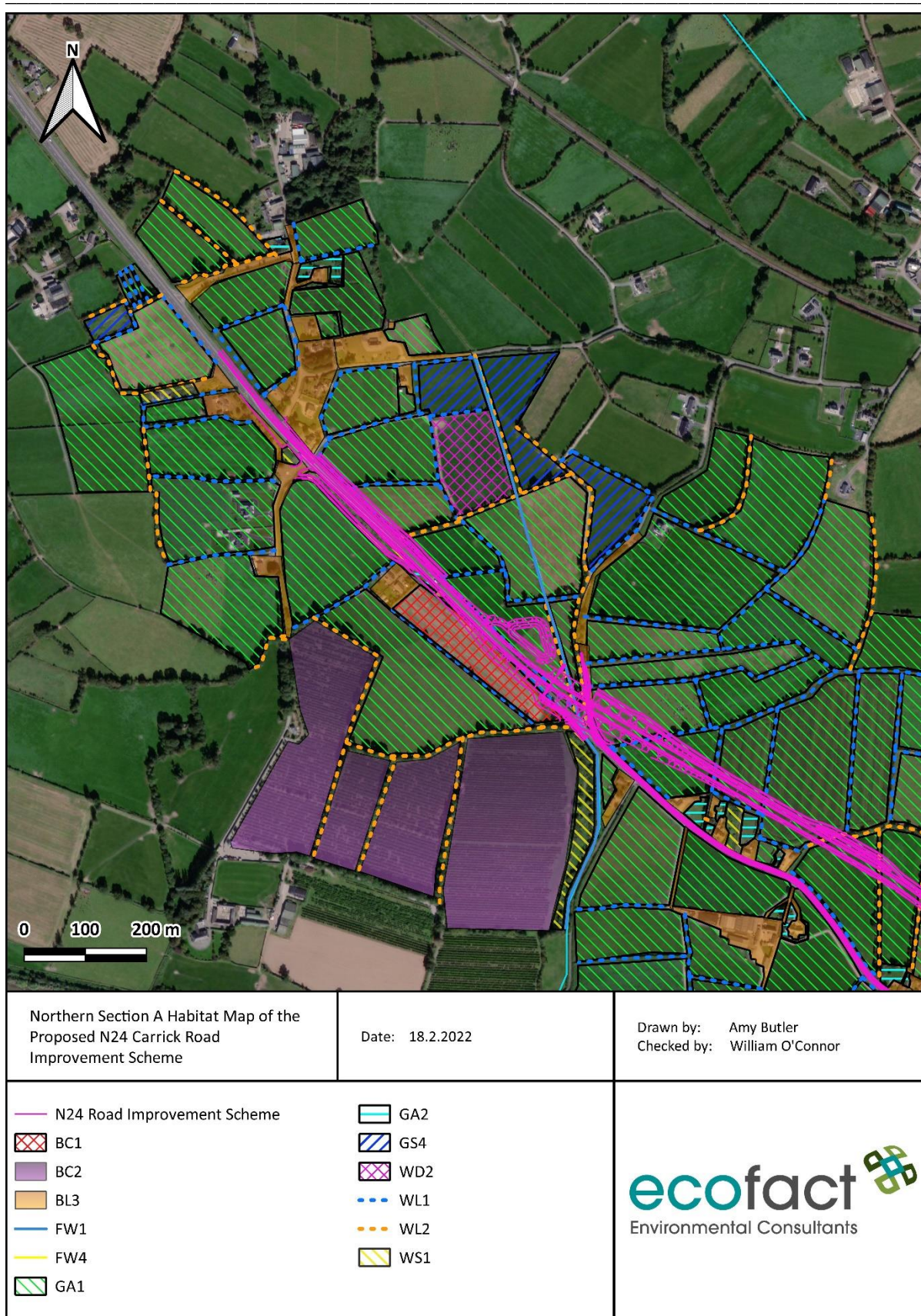


Figure 4a Northern Section A Habitat Map of the proposed N24 Carrick Road Improvement Scheme.

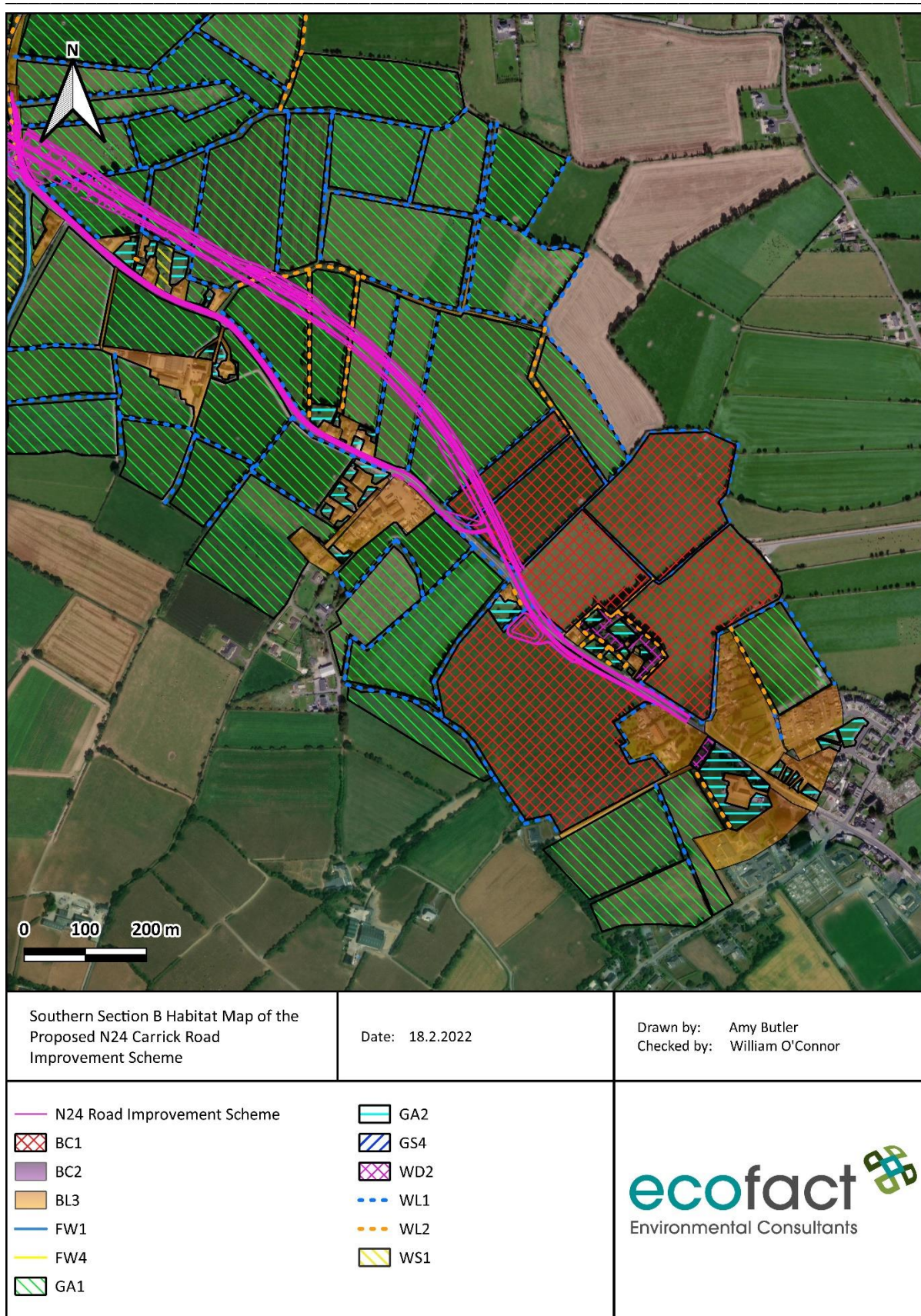


Figure 4b Southern Section B Habitat Map of the proposed N24 Carrick Road Improvement Scheme.



4.3 Fauna

4.3.1 Non-volant Mammals

No signs of Otter *Lutra lutra* holts were found in the vicinity of the scheme. The bridge over the Skelpstown 16 stream within the site was found to be blocked, with a wooden crate present which would block access for Otters through the bridge to gain access to areas upstream. No otter spraints or footprints were noted in the vicinity of this bridge during the current surveys. Further downstream, some areas of the Skelpstown 16 stream close to where it flows into the Suir were inaccessible due to dense vegetation. However, most of this watercourse corridor was walked and no signs of otter activity was recorded. As with any watercourse there is some potential that Otters could use it for occasional commuting but it is very unlikely to be regularly used by Otters. According to the NBDC database Otter has been recorded in the 1km grid square (S4917) which covers the section of the Skelpstown 16 stream within the proposed development site. However, the date of the last record of the species at this location was in 1981 (Otter Survey of Ireland, 1982) and this record was almost certainly from the River Suir. The stream is not considered to be large enough to be of any fisheries importance, and therefore could not be of use to Otter for foraging.

Rabbit *Oryctolagus cuniculus* is the most common mammal species in the study area. Rabbits were found to be using agricultural fields adjacent to the proposed road development site, as can be seen in plate 13. Rabbit burrows and droppings were common in parts of the study area, as can be seen in the plate 11. Rabbits are widespread and common throughout Ireland and is not a protected species. During the walkover survey fox droppings were also found which indicated that foxes are using the proposed development site; shown in plate 14. Road-kill remains of a fox were also observed on the existing N24. However, there are no fox dens in the footprint of the proposed scheme. A dead Greater White-toothed Shrew *Crocidura russula* was also found during the October 2020 visit; shown in plate 15. Greater White-toothed Shrew is not a protected species; this is a non-native, medium impact, invasive species.

No evidence of Badger *Meles meles* setts were found during the site surveys and there are no badger setts in the study area. This species is present within the wider study area and Co. Kilkenny holds the highest badger density in Ireland (Chris Smal, 1995). However, they do not use the footprint of the road scheme – possibly due to the fragmentation of this area by the existing N24 and the generally poor cover in the area. The NBDC online maps also hold records of Badger within the study area. NBDC online maps also hold records of Irish Stoat *Mustela erminea hibernica* at Curraghmore House in Portlaw which is located c. 3km southwest of the proposed development on the opposite side of the River Suir. It is possible that Stoats use the study area to prey on the numerous Rabbits.

Evaluation: Currently the fragmented landscape and sub-optimal habitats present at the proposed development are not considered favorable for mammals and there were no indications of the presence of species of particular conservation interest such as Badger or Otter. Non-volant mammals in the study area are evaluated as being of 'Local Importance, Higher Value'.

4.3.2 Bats

The National Biodiversity Data Centre (NBDC) maps landscape suitability for bats based on Lundy *et al.*, (2011). The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats. Table 2 below gives the suitability of the study area for the bat species found in Ireland (based on NBDC) along with their Irish Red List Status (from Marnell *et al.*, 2009). The overall assessment of bat



habitats for the current study area is given as 42.11. This is considered to be a medium rating however, the ratings for some individual species, such as 67 for Brown Long-eared Bat, is considered to be high.

Table 2 Suitability of the study area for the bat species previously recorded in the study area (based on the NBDC data). Irish Red list status also indicated (based on Marnell et al., 2009).

Common name	Scientific name	Suitability index	Irish red list status
All bats	-	42.11	
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	61	Least Concern
Leisler's bat	<i>Nyctalus leisleri</i>	52	Near Threatened
Natterer's bat	<i>Myotis nattererii</i>	59	Least Concern
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	48	Least Concern
Brown long-eared bat	<i>Plecotus auritus</i>	67	Least Concern
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	4	Least Concern
Whiskered bat	<i>Myotis mystacinus</i>	40	Least Concern
Daubenton's bat	<i>Myotis daubentonii</i>	40	Least Concern
Nathusius's pipistrelle	<i>Pipistrellus nathusii</i>	8	Least Concern

The overall rating of 42.11 is considered to be a medium rating. The ratings for some species are considered to be high, such as the Brown long-eared bat which is given a rating of 67. However, the Brown long-eared bat is generally a species that prefers woodlands, of which there is a general paucity in the study area. The majority of habitats here are typical agricultural type habitats. There are some fragmented sections of woodland on the opposite side of the Suir estuary here but are located a distance from the proposed development site. The bat suitability rating seems to increase closer to the estuary and decreases as you move away from the estuary towards the N24. The existing N24 already fragments the habitat and is a barrier to bats moving from the bat-suitable area around the estuary to the area north of the road which is less suitable. The N24 realignment section is proposed to be positioned to the north of the existing road, i.e. further away from the River Suir than the existing N24 road.

The National Bat Database of Ireland as viewed through the National Biodiversity Data Centre online maps does not show any records of bats along the proposed development site or the immediate surrounds. The closest record is near a bridge immediately west of Fiddown town. There are multiple records at this location as it appears to be part of the Bat Conservation Ireland Car-based Monitoring Scheme. The species recorded here were Common pipistrelle, Soprano pipistrelle, Leisler's bat. These are records over years of monitoring at this site, from 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2013 and 2014. There are other records closer to Portlaw on the opposite side of the estuary, comprising of multiple records of Daubenton's bat, Soprano pipistrelle, Common pipistrelle, Leisler's bat and Brown long-eared bats. Approximately 4.5km east of Mooncoin town, there are records of a Brown long-eared bat once in 2006.

In general, the habitats on the proposed development site are agricultural habitats that are well maintained. Hedgerows and treelines are present here delineating field boundaries, but are not overgrown and are considered to be low in height. These linear features in the landscape are not considered to be of high quality when considering potential foraging or commuting routes. These habitats are considered to be suboptimal at best, with considerable fragmentation present as well with the existing N24 road nearby. There are no areas of mature woodland, large rivers or lakes or other optimal bat habitat in the study area. Habitat connectivity was assessed as being relatively low. Two buildings adjacent to the road. However, there was no evidence that they were being used by bats. A small number of trees and mature hedgerows along field boundaries in the proposed works area have some bat potential if considered independently from the surrounding environment. However, bats rely on habitat connectivity to commute safely from roost sites to suitable foraging areas. Due to the fact



that any potential bat roost habitat present in the proposed works area is fragmented by the existing N24 road, as well as the maintained pastures and farmland with low cut hedgerows, the area is not favourable for bat use.

The bat activity surveys did not identify any roosts in the study area and bat activity was low-moderate. Three species of bat were recorded: Leisler's bat, Soprano pipistrelle, and Common pipistrelle. Overall no significant bat activity was recorded during the course of the survey. The most frequently recorded species was Leisler's bat, and the activity of which was more consistent towards the start of the survey, suggesting that the bats move on to more optimal foraging areas for the night. Activity was considered to be generally low with low densities of bats recorded. Leisler's bat are high-flying species and could be found over any area of Co Kilkenny. The numbers recorded were relatively low. The standalone Bat Assessment Report is included in Appendix 5.

Table 3 Assessment of the habitat at the site of the proposed road scheme for each species of bat recorded at the site; relative abundance of each species based on the activity results is also shown.

Species Recorded	Relative Abundance	Habitat	Habitat Assessment
Common pipistrelle <i>Pipistrellus pipistrellus</i>	0.26	Favour linear features for commuting and foraging along mature hedgerows, treelines, edges of woodlands and within woodlands. Broad foraging niche but often occur near water and other natural land covers. Also positively associated with pasture near roosts. Roost in crevices; the most frequently recorded type of roosting site is buildings but also use trees.	Some mature hedgerows and treelines provide foraging and commuting habitat. Relatively limited however due to most being low and well maintained and general fragmentation with open agricultural land and the existing N24.
Leisler's bat <i>Nyctalus leisleri</i>	0.52	Favour woodland habitat and areas near freshwater but frequently travel up to more than 5km from roost to forage. High-flying species and doesn't rely on linear landscape features for commuting. Roosts in crevices and holes in trees and buildings.	Area is suitable for Leisler's bat which does not rely on the linear landscape features of mature hedges and treelines as this species forages in open landscape as it flies at greater heights than other bat species. It is also therefore, not likely to be affected by the existing N24. As this species flies a considerable distance overhead the road and traffic does not cause significant disturbance or pose a threat of collision to the bat.
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	0.13	Favours roosting in areas near freshwater and woodland. Flies low (2-6m) along linear landscape features such as treelines and mature hedgerows. Broad foraging niche but often occur near water and other natural land covers. Roost in crevices; the most frequently recorded type of roosting site is buildings but also use trees.	Some mature hedgerows and treelines provide foraging and commuting habitat. Relatively limited however due to most being low and well maintained and general fragmentation with open agricultural land and the existing N24.



Evaluation: The proposed works area is fragmented by the existing N24 road, as well as the maintained pastures and farmland with low cut hedgerows. The area is sub-optimal for bats but is used by them to some extent. All bats are strictly protected (Annex IV). Bats in the study area are evaluated as being of 'Local Importance, Higher Value'.

4.3.4 Birds

The landscape of the proposed development site consists mainly of managed agricultural land. This includes several hedgerows and treelines along field boundaries which mostly appear to be well-maintained and regularly trimmed back and are not overgrown. Hedgerows and trees in the landscape are not considered to be of high quality when considering potential birds. Most of the hedgerows and treelines are sub-optimal and there is no specimen trees noted to be of particular importance for bird nesting. There is also considerable fragmentation present in the landscape with the presence of the existing N24 road. This is not particularly favourable habitat for birds. It is also noted that any estuarine species that would be associated with the River Suir Estuary would not occur on the proposed site due to this fragmentation and general sub-optimal landscape. The existing N24 lies between the River Suir Estuary and the proposed realignment, acting as a barrier to birds that are supported in the estuary from moving into the site of the proposed works.

According to the NBDC bird records for the 10km grid square S41, which are listed in Appendix 4, there are 10 red-listed Birds of Conservation Concern that have occurred within the 10km national grid square of the proposed development. There are records of 9 species listed on Annex I of the EU Birds Directive also. This area includes the River Suir Estuary where most of these records are expected to be from. Most of the threatened and protected species recorded in the 10km area are associated with estuarine habitats or wetlands and moorlands. The habitat at the site of the proposed development does not support these species and is separated from such areas due to fragmentation, in particular due to the existing N24 which separates the lands adjacent to the estuary from the proposed development site further northeast. Common Kingfisher *Alcedo atthis* is one of the species recorded in the 10km square which occurs on freshwater rivers and streams. The only freshwater channel on the proposed development site is the Skelpstown 16 stream. This watercourse would not support Kingfisher, it is small, with no suitable nesting banks, and also poor quality and would not provide a sufficient supply of food.

Raptor species such as Merlin *Falco columbarius* (EU Birds Directive Annex I), Peregrine Falcon *Falco peregrinus* (EU Birds Directive Annex I) and Barn Owl *Tyto alba* (Red-listed Bird of Conservation Concern) were also featured on the NBDC list. Barn owls and Peregrine falcons can be found in a range of habitats, however, the proposed road scheme area is not considered favourable or optimal and there is no suitable nesting opportunity for these species. The only raptors recorded during the current survey were Buzzards were seen a number of times - and a few very occasional sightings of Kestrels.

The other Annex I and red-listed species for which there are NBDC records are species associated with either estuaries or freshwater lakes / marshes, again the habitat on the proposed road scheme site is therefore not suitable to support such species.

During the current survey, Buzzards were observed soaring over the proposed development area on a number of occasions. There is no potential breeding or nesting habitat for Buzzards on the site. Buzzard is a widespread and common species throughout Ireland. The main bird species recorded in the study area were a variety of common passerine species associated with hedgerow, scrub and grassland habitats.



Evaluation: Due to the fact that habitats present in the proposed works area are fragmented by the existing N24 road, as well as the low-quality of the cut hedgerows and trees, the area is not favourable for birds. It is certainly not expected that any important species that may be associated with the River Suir Estuary would be found at the proposed development site. Birds in the study area are evaluated as being of 'Local Importance, Higher Value'.

4.3.5 Aquatic Ecology

Fish species for which the Lower River Suir SAC is designated are assessed in the accompanying Screening Report and Natura Impact Statement (Ecofact, 2022a, 2022b). The only stream on the proposed development site is the Skelpstown 16 stream, which is noted to be of a small size. As can be seen in the plates section, this stream is small and heavily vegetated in parts. The stream is too small to be of significant fisheries importance. Therefore, it is likely to support small common species such as Three-spined Sticklebacks *Gasterosteus aculeatus*. Nonetheless, it is noted that this small stream does flow into the River Suir, c. 660m downstream, which would be considered to have significant fisheries importance, although out of the study area.

The EPA do not carry out biological monitoring on the Skelpstown 16 stream, likely because it is very small with little flow and a low gradient. This small stream does not provide suitable habitat for protected macroinvertebrates. The aquatic macroinvertebrate community found in the stream would be common and widespread species in Ireland. There is a cattle drink also present at the stream in the proposed development site and the surrounding habitat use is predominantly agricultural. There is no suitable habitat for salmonids, lampreys, or crayfish.

Evaluation: The River Suir would be evaluated as being of 'International Importance', due to its designation as an SAC. The River Suir however, is not within the proposed development site, it is located downstream, connected via the small Skelpstown 16 stream. The Skelpstown 16 stream provides the only aquatic habitat within the proposed development site. Aquatic Ecology in the study area is evaluated as being of 'Local Importance'.

4.3.6 Reptiles and Amphibians

No reptile habitat was recorded within the study area during the current survey. There are no records of Common Lizard *Lacerta vivipara* or Smooth Newt *Lissotriton vulgaris* within the study area according to the NBDC online maps. There are some records of Common Frog *Rana temporaria* from the 10km grid square from 2003 noting its presence in 'Skelpstown / Mooncoin', from the Irish National Frog Database. This is noted as frog spawn at grid reference S4718, which is the opposite side to the River Suir than the N24 and not within the vicinity of the proposed road scheme. It is noted that there is the potential for Common Frog to be present in the Skelpstown 16 stream due to suitable habitat.

Evaluation: Common frog may use the Skelpstown 16 stream. It is noted that this stream is isolated and fragmented from any other suitable habitat, and therefore is considered to be sub-optimal for the species.

4.3.7 Terrestrial Invertebrates

There are no records of butterflies from the proposed development site according to the Irish Butterfly Monitoring Scheme database. The Distribution Atlas of Butterflies in Ireland 1979 shows records of the following species in Portlaw, c. 3km southwest of the proposed development site on the opposite side of the River Suir, all from 1976: Painted Lady, Red Admiral, Large White, Meadow Brown, Peacock and



Silver-washed Fritillary. There are no recent records of these species. Approximately c. 18km north of the proposed development site, there is an area called Silverspring which also holds records of Butterflies from the Distribution Atlas. This shows records of the following species: Small tortoiseshell, Orange-tip, Ringlet, Silver-washed Fritillary, Peacock, Small Copper, Meadow Brown, Speckled Wood, Large White, Green-veined White, Common Blue, Red admiral, Painted Lady. The most recent of these records is from 1976.

More recently, there are records of the Holly blue (2011) and Clouded Yellow butterfly (2006) near Mooncoin from the Butterflies of Ireland database. Holly blue butterflies are generally found in woodlands and gardens. The Clouded Yellow butterfly can be found in various habitats such as hedgerows, meadows and woodlands but where flowers are plentiful. The proposed development site mainly consists of low-quality agricultural habitats with little vegetation variation and flowers. The existing N24 road also fragments the habitats, another undesirable characteristic for any sensitive invertebrates. The proposed development site does not support any protected or threatened species of interest. The terrestrial invertebrates expected to be present are those of a general farmland community that are not considered to be of any particular ecological or conservation importance. The current site survey determined that the terrestrial macroinvertebrate species present would be common species typical of the Co. Kilkenny countryside, no formal terrestrial invertebrate survey is required.

Evaluation: The habitat on the site is not suitable to support terrestrial invertebrates of particular ecological / conservation interest. Terrestrial Invertebrates within the study area common farmland invertebrates and are not considered to be of any significant importance.

4.4 Key ecological receptors

The key ecological receptors identified from the ecological interests (designated sites, habitats, flora and fauna) recorded within the study area are presented in Table 3.

Table 3 Identification of key ecological receptors in the study area (based on NRA, 2009).

Ecological receptors	Summary description of the ecological receptors	Evaluation of the ecological receptors (Key ecological receptors are those identified as being > local importance (lower value))
Lower River Suir SAC	The River Suir is designated as the Lower River Suir SAC. This site is designated for the presence of a variety of conservation interests including fish communities and aquatic macroinvertebrates. A Screening for Appropriate Assessment Report and Natura Impact Statement has been prepared, which assessed impacts on the following Qualifying Interests: Atlantic Salt Meadows, Mediterranean Salt Meadows, Alluvial Forests, Sea lamprey, River lamprey, Twaite Shad, Salmon and Otter.	This SAC is of International Importance and supports Annex II species. The River Suir is designated within the SAC.
Hedgerows (WL1)	Network of hedgerow habitats which function as wildlife corridors.	Local Importance, Higher Value
Treelines (WL2)	Network of treeline habitats which function as wildlife corridors.	Local Importance, Higher value
Mixed Broadleaved /	Scattered woodland habitats within the site are important to wildlife for protection and movement.	Local Importance, Higher Value



Ecological receptors	Summary description of the ecological receptors	Evaluation of the ecological receptors (Key ecological receptors are those identified as being > local importance (lower value))
Conifer Woodland (WD2)		
Bats	Bats may use the hedgerows in the study for foraging and commuting. Bats are protected under Annex IV of the E.U. Habitats Directive. A standalone Bat Assessment Report was completed and is included in Appendix 5. The species found using the site were: Leisler's bat (most common), Soprano pipistrelle, Common pipistrelle and Brown long-eared Bat. Activity was found to be low, low densities of common species and habitats not found to be of particular importance.	Local Importance, Higher Value
Birds	Buzzard was the only bird of prey noted during the walkover surveys, along with common passerine and corvid species	Local Importance, Higher Value
Reptiles and Amphibians	Common frog is likely to be present in the Skelpstown 16 stream. This is a protected species, under Annex V of the E.U. Habitats directive.	Local Importance, Higher Value



5. POTENTIAL IMPACTS

5.1 Designated Areas

The potential impacts on designated areas arising from the proposed N24 Carrick Road Improvement scheme are discussed and assessed in the accompanying Screening for Appropriate Assessment and Natura Impact Statement report (Ecofact, 2022a; 2022b). The Skelpstown 16 stream is a potential pathway for both water quality and non-native species dispersion to the SAC.

The proposed N24 Carrick Road Improvement Scheme does not lie within any SAC or SPA. However, the Lower River Suir SAC is located approximately 510m southwest of the development, and c. 660m via the Skelpstown 16 stream which runs through the proposed development footprint.

The Natura Impact Statement assessed the impacts on the Lower River Suir SAC, which were identified as construction phase water quality impacts, non-native invasive species, disturbance and air quality and dust impacts, as well as operational phase water quality impacts (Ecofact 2022b). The construction phase impacts may arise during instream works on the Skelpstown 16 stream and run-off from excavated areas and soil deposition areas resulting in increased suspended solids, as well as accidental spillages of hydrocarbons (oils and fuels) from machinery and waste materials such as concrete. Non-native invasive species impacts could be introduced to the SAC through vectors such as machinery. Noise and disturbance impacts and air quality and dust impacts were also identified, although these impacts are both not considered to be significant. Disturbance impacts on Otters were also noted. Operational phase water quality impacts were identified as road surface run-off (Ecofact, 2022b).

No NHAs are located within 5km of the proposed scheme and therefore no impacts on NHAs are envisaged to arise as a result of the development.

The Lower River Suir (Coolfinn, Portlaw) pNHA is located ca. 1km from the proposed scheme area, and the Fiddown Island pNHA is located ca. 1.7km northwest. As part of the boundary of the Lower River Suir (Coolfinn, Portlaw) pNHA is located within the Lower River SAC, impacts on the pNHA are similar to those affecting the SAC. Impacts on the Lower River Suir SAC are summarised above, and are discussed and assessed in the Screening and Natura Impact Statement Reports (Ecofact, 2022a, 2022b).

5.2 Habitats and Flora

During the construction phase of the proposed road improvement scheme direct loss of habitat will occur. All habitats present along the proposed realignment section will be impacted by habitat loss. The proposed realignment section is c. 1.25km in length. The habitats that will be directly affected by this realignment habitat loss are as follows: Buildings and Artificial Surfaces (BL3); Improved Agricultural Grassland (GA1); Hedgerows (WL1); Treelines (WL2); Eroding / upland Rivers (the Skelpstown 16 stream) (FW1) and Arable Crops (BC1). Treelines and Hedgerows will be severed here and this habitat loss is unavoidable.

However, all the habitats in the study area of the proposed N24 Carrick Road Improvement Scheme are typical and common habitats that can be found in Co. Kilkenny and throughout Ireland. All of the habitats that the scheme will likely sever are evaluated as being of 'Local Importance', with the exception of Hedgerows, Treelines, and Buildings and Artificial Surfaces, which are evaluated as being of 'Local Importance, Higher Value', and of no ecological value, respectively. Habitat loss is unavoidable however



it is not considered to have the potential to have a significant effect on the study area due to their low ecological importance. Hedgerows and Treelines in the study area in particular are well maintained in general and not of significant ecological importance. Landscaping will also be included for the proposed development that is considered to mitigate for this loss. Nonetheless, the impact of habitat loss in the absence of mitigation is evaluated as being slight negative, long-term to permanent and in the local context.

Non-native invasive species could also be introduced and dispersed by construction works in the absence of mitigation.

5.3 Fauna

5.3.1 *Non-volant Mammals*

Impacts on non-volant mammals primarily concern disturbance impacts, that could arise during the construction phase due to increased machinery on site, human activity and noise. Site clearance works for the realignment sections would also result in a removal of Rabbit burrows that were identified during the current surveys. Rabbits are not protected in Ireland. However, mitigation can be provided which will reduce the potential for disturbance impacts to arise. The site itself is not considered to be of any significant importance to mammals in the study area, due to the existing N24 road and fragmentation, as well as the poor quality surrounding agricultural habitats. Disturbance impacts are also likely to arise during the operational phase as the road will facilitate traffic in the area, however, the N24 is already an existing road and therefore this is not considered to significantly add to the disturbance relating to traffic in the study area. Disturbance impacts on mammals are evaluated as being slight negative, temporary to short-term and in the local context.

5.3.2 *Bats*

Some potential for minor impacts on bats were identified in this report. Impacts were identified in relation to potential roost habitat loss, if small numbers do use some of the mature trees on the site, minor loss of foraging / commuting habitat, disturbance, lighting and collision impacts, none of which were found to be significant. Due to the low activity and densities of the common species recorded and the existing N24 road on the site, some best practise mitigation is therefore considered to be sufficient to avoid impacts on bats in the local area. Impacts on bats are evaluated as being imperceptible negative, short-term and in the local context.

5.3.3 *Birds*

There is potential for some disturbance impacts to common bird species to arise. However site clearance and vegetation removal will be undertaken outside of the bird nesting season to minimise this. The landscaping proposed as part of the new road scheme will benefit the common passerine birds that use the study area.

Again, it is noted that only common species were recorded during the walkover survey and the habitats on the site of the proposed development are not of significant ecological importance, therefore impacts on birds are assessed as being slight negative, temporary to short-term and in the local context.



5.3.4 Aquatic Ecology

The Skelpstown 16 stream is not an important aquatic habitat. No habitat for salmonid, lampreys, or crayfish occurs in the Skelpstown 16 stream.

Construction phase water quality impacts may arise during instream works – however these can be effectively mitigated. Run-off from excavated areas and soil deposition areas could also potentially result in increased suspended solids and accidental spillages of hydrocarbons (oils and fuels) from machinery could also occur in the absence of mitigation. This Skelpstown 16 stream provides a pathway for water quality impacts to the River Suir – however these impacts can be avoided with best-practice mitigation

Operational phase water quality impacts were identified as road surface run-off. However the drainage design for the proposed road scheme includes the direction of all surface water run-off through a controlled drainage system which includes attenuation ponds to allow for the settlement of run-off and capture of suspended solids and pollutants, unlike the existing N24.

5.3.5 Reptiles and Amphibians

No records of reptiles and no suitable reptile habitat are present in the study area, as determined from the desk study and walkover survey results. Common frog may be present in the Skelpstown 16 stream however, as there are records nearby and suitable habitat is present. Frogs will be protected with the implementation of the proposed water quality protection measures.

5.3.6 Terrestrial Invertebrates

The terrestrial macroinvertebrate species present in the proposed scheme area would be common species – a generalised community typical of the Co. Kilkenny countryside. There are no records of protected terrestrial macroinvertebrates on the site and the habitats present are suboptimal. No mitigation is required.



6. MITIGATION MEASURES

6.1 Designated Areas

Mitigation measures prescribed to avoid impacts on the Natura 2000 network are provided in the Natura Impact Statement for the proposed N24 Carrick Road Improvement Scheme (Ecofact, 2022b)

Mitigation included in the NIS comprises the following: a final Construction Environmental Management Plan and detailed Method statement following guidelines outlined in the NIS, a site ecologist, limiting works areas, timing of works only during daylight hours, silt fences will be erected around the Skelpstown stream, drainage ditches as well as around the site compound, any oils or fuels that may be required for minor machinery used during the proposed works will be stored appropriately in bunded tanks in the site compound to ensure no spillages occur, machinery will be well-maintained and checked for leaks prior to its use on site, any tool washing and waste / grey water from the site will be stored securely until it can be removed from site, contained portaloo toilets will be used and all sewage appropriately removed from the site to an authorised treatment plant, storage areas for concrete / cement and grout required for the works will be included in the site compound, waste from any site clearance works will be dealt with appropriately away from the Skelpstown 16 stream, no concrete / cement mixing will be carried out at the river bank area, mixing within a mixing area in the site compound will be controlled by the contractor, with all wash water, tool washings and any waste/grey water stored securely and removed, no waste will be stored beside the watercourse, concrete / cement work must be carried out behind the silt fencing and sandbags, in the dry works area, works in the Skelpstown 16 stream will take place during dry weather and low flow conditions to minimise run-off and water contamination / sedimentation, any hired equipment and machinery used on site will be treated with an approved biocide / cleaning agent prior to its arrival on site and the NRA guidelines for Biosecurity will be followed.

No NHAs are located within 5km of the proposed scheme and no impacts on NHAs are envisaged to arise, therefore mitigation measures are not required for NHAs.

The closest pNHA to the proposed realignment is the Lower River Suir (Coolfinn, Portlaw) pNHA, followed by the Fiddown Island pNHA. Potential impacts, and therefore mitigation, for the Lower River Suir (Coolfinn, Portlaw) pNHA would be the same as for the Lower River Suir SAC discussed in the Screening for Appropriate Assessment and Natura Impact Statement report (Ecofact, 2022a; 2022b).

6.2 Habitats and Flora

The manuals '*A Guide to Landscape Treatments for National Road Schemes in Ireland*' (NRA, 2006b) as well as the NRA publication '*Guidelines on the Implementation of Landscape Treatments on National Road Schemes in Ireland*' will be followed for the proposed development. Landscaping and new habitat creation will use native species only and will mitigate for the minor habitat loss envisaged. Planting shall take place along the new proposed N24 improvement scheme. This will be of some benefit and is likely to result in a minor positive impact on flora and fauna in the study area in the medium to long-term.

Regarding non-native invasive species, the '*Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*' (NRA, 2010), will be followed, as in the mitigation for the NIS (Ecofact, 2022b).



Mitigation to avoid impacts on water quality are detailed in the Natura Impact Statement (Ecofact, 2022b). These mitigations, as listed above in section 6.1. are considered to be sufficient to avoid any potential water quality impacts affecting flora.

6.3 Fauna

Mitigation for avoid impacts on Otters is provided in the Natura Impact Statement (Ecofact, 2022b). This includes limiting the timing of the works to daylight hours only to avoid impacts on potential commuting Otters using the Skelpstown 16 stream, as well as the water quality protection mitigation listed above in section 6.1 (Ecofact, 2022b). To minimise disturbance on other mammal species, particularly during site clearance and the removal of hedgerows and treelines, the site ecologist will complete a pre-construction mammal survey of the affected realignment areas. This is to ensure that no mammal dwellings are present in the affected areas, given the time elapsed. Following this, the work for site clearance of hedgerows and treelines shall be done slowly, to allow any mammals present sufficient time to escape if needed. The following guidelines by the NRA will be followed during construction: *'Guidelines for the treatment of Badgers prior to the construction of National Road Schemes'* (NRA, 2005a); *'Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes'* (NRA, 2006a). Mammal fencing landscaping will also be used around the proposed road realignment as a further protection to deter mammals from crossing the road and risking collision with on-coming traffic and directing them instead towards suitable crossing points under the road via the proposed livestock underpass and the realigned Skelpstown 16 stream box culvert for otters.

The mitigation measures for bats include the following: NRA guidelines for protection of bats are followed, pre-construction bat survey of mature trees by suitably qualified bat ecologist (and derogation licence obtained if required following this survey), tree removal shall take place in the period from late August to late October / early November, warning must be given to any tree-roosting bats prior to felling which is done by nudging the tree two to three times, with a pause of approximately 30 seconds between nudges, to warn bats that may be present and encourage them to become active and escape, guidelines highlight that the rate of fall of cut trees should not be accelerated by the use of chain and vehicle, knocked / cut trees shall be left for a period of 24hrs or overnight before they are sawn up or mulched to ensure bats that could have been present have escaped, planting of native trees and hedgerows along the boundaries of the proposed scheme will be of benefit to bats in the local area, by enhancing the commuting and foraging habitat, sections of existing hedgerows in the surrounds of the proposed road scheme, along field boundaries and local lanes etc., may also be reinforced with planting of a native mix to enhance these features for bat commuting in the area, any additional lighting, if required, shall follow Bat Conservation Ireland's lighting guidelines, light spill shall be minimised by using shields, masking or louvres, light columns shall be kept as low as possible, some light restrictions may be considered during dark hours, mercury or metal halide lamps should be avoided as these have a greater impact on bats, as they attract high levels of insects and low pressure sodium lights have a minimal effect on bats and therefore would be preferred.

To minimise disturbance impacts on birds, any site clearance works shall take place outside the bird nesting season, from the 1st of March to the 31st of August. Again, site clearance works being undertaken slowly will also benefit birds.

Water quality mitigation listed in the NIS and above in section 6.1 will be sufficient to avoid potential water quality impacts affecting fish and amphibians (Ecofact, 2022b). No further mitigation is required to minimise impacts on terrestrial invertebrates as disturbance levels will be minimised as far as possible using the above mitigation.



7. Residual Impacts

Residual impacts are those which occur following the implementation of mitigation measures. The majority of habitats in the study area are considered to be of low ecological value, with the exception of some hedgerows, treelines, and a small fragmented section of woodland, which are important to local wildlife. The mitigation measures proposed will provide robust and effective protection to each species/habitat identified and as a result residual impacts are not anticipated to occur.

7.1 Designated Areas

The residual impacts on affected Natura 2000 sites are discussed in the Natura Impact Statement for the proposed development prepared by Ecofact (Ecofact, 2022b). Based on information provided in the NIS, it was concluded that after mitigation, there is no potential for residual effects on any of the affected Natura 2000 Sites (Ecofact, 2022b).

The proposed development will not result in significant direct, indirect or cumulative impacts on NHAs, pNHAs or other designated sites and no residual impacts are identified.

7.2 Habitats and Flora

Subject to the implementation of mitigation measures, the proposed development will not result in the spread of non-native invasive species. Water quality mitigation measures implemented during the construction phase will ensure no significant impacts occur to the aquatic habitats in the study area. Habitat loss will be minor and not significant, with planting mitigation included. The residual impacts on habitats and flora are therefore assessed as 'none'.

7.3 Fauna

7.3.1 *Non-volant mammals*

Subject to the implementation of the targeted measures outlined above, there will be no residual impacts on non-volant mammals. The residual impact on non-volant mammals is assessed as 'none'.

7.3.2 *Bats*

Mitigation measures listed above will ensure that impacts on bats are reduced insofar as possible. Even with the implementation of mitigation measures, some collision impacts may remain. However, the N24 is already an existing road here so there will be no significant change in the landscape. Additionally, the site is used by common species of low densities, as determined in the car based activity survey for the scheme. Therefore, residual impacts on bats are assessed as being imperceptible negative, long-term and in the local context.

7.3.3 *Birds*

Subject to the implementation of the targeted measures outlined above, there will be no residual impacts on birds. The residual impact on birds is assessed as 'none'.

7.3.4 *Aquatic Ecology*

With the implementation of appropriate mitigation as discussed above, the residual impact on aquatic ecology is assessed as 'none'.



7.3.5 *Reptiles and Amphibians*

Provided mitigation measures listed above are followed correctly, the residual impact on reptiles and amphibians is assessed as 'none'.

7.3.6 *Terrestrial Invertebrates*

Provided mitigation measures listed above are followed correctly, the residual impact on terrestrial invertebrates is assessed as 'none'.



8. CONCLUSION

The proposed N24 Carrick Road Improvement Scheme is approximately 2.2km in length, with 950m of this being along the existing road. As well as the realignment, the proposal includes for a new box culvert over the realigned Skelpstown 16 stream, and a new combined underbridge and cattle underpass at the location of the local road L7416. The plans for the scheme are presented in Appendix 1. The potential impacts on the Lower River Suir SAC are discussed and assessed in the separate Screening for Appropriate Assessment and Natura Impact Statement Report (Ecofact, 2022a; 2022b).

It is considered that Hedgerows and Treelines are likely to be severed during the construction of the proposed road scheme, as well as the habitat loss and disturbance of other habitats of 'Local Importance'. Potential impacts affecting water quality in the Skelpstown 16 stream are considered likely to arise due to the construction of the box culvert. Non-native invasive species impacts may also arise in the absence of mitigation measures. Disturbance impacts on fauna were also identified. Mitigation measures are provided to offset or reduce potential impacts on flora and fauna.

Providing mitigations and guidelines are followed correctly, residual impacts have been assessed as ranging from 'none' to 'imperceptible negative' at most. It is concluded therefore that the proposed N24 Carrick Road Improvement Scheme can be appropriately built and operated without significant adverse effects on, designated areas, flora and fauna, providing mitigation is strictly followed.



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PLATES



Plate 1 Existing N24 road near Mooncoin in County Kilkenny.



Plate 2 Skelpstown 16 stream (Segment Code: 16_10766) which crossed the existing N24 road, December 2017.



Plate 3 Cattle drink area on the Skelpstown 16 stream beside the N24, pictured in September 2020.



Plate 4 The Skelpstown 16 stream is small, overgrown and had almost no flow in it along a field boundary at the north side of the existing N24 in September 2020. It may be used by Common frog.



Plate 5 The bridge over Skelpstown stream is low, overgrown with bramble and passage underneath is blocked with a wooden palette.



Plate 6 Improved agricultural grassland adjoining the existing N24 road.



Plate 7 Farm lanes on maintained agriculture lands to the north side of the N24.



Plate 8 Bare arable land adjacent to existing N24 road in 2017.



Plate 9 Improved agricultural land on the north side of the existing N24 with an orchard on the opposite, south side.



Plate 10 Section of scrub with thick bramble growth adjacent to existing N24 road.



Plate 11 Mammal trails; likely rabbits adjacent to existing N24 road.



Plate 12 Rabbit burrows are common in the study area.



Plate 13 Rabbits observed in study area in 2017; stoats and foxes also likely to occur.



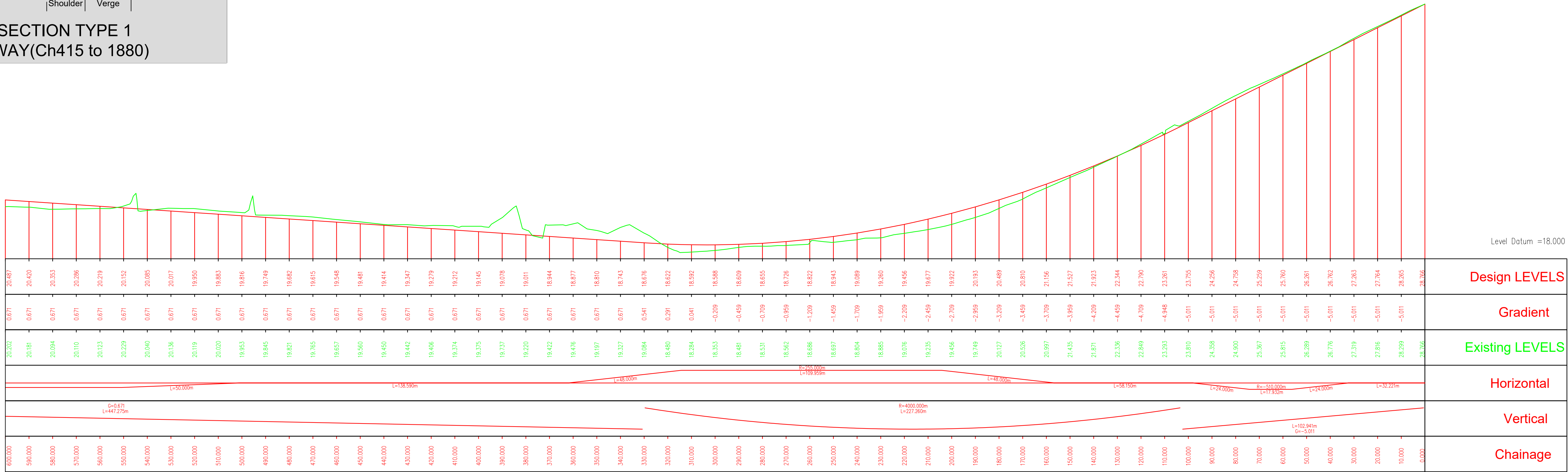
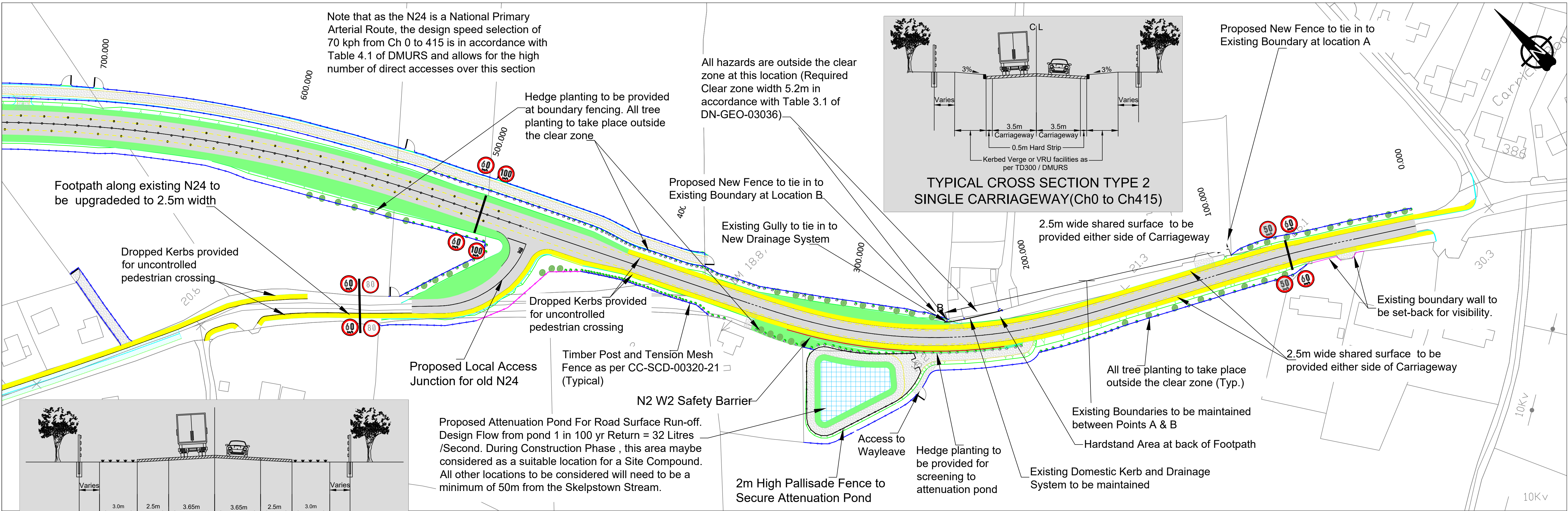
Plate 14 Fox scat found in the fields adjacent to the N24.



Plate 15 A dead Greater White-toothed shrew, a non-native species, was found in agricultural land adjacent the N24.



APPENDIX 1 PROJECT DRAWINGS



NOTES:

- Actual extent of scheme land acquisition to be determined at a later date.

DO NOT SCALE

F1	4/12/2019	First Issue	JL	DR	GJ
F2	5/2/2020	Revised for issue further to comments received from Client	JL	CD	GJ
F3	11/3/2020	Revised to include Details of Underbridge	JL	CD	GJ
F4	24/3/2020	Revised further to comments received from Client	JL	CD	GJ
F5	09/9/2020	Revision to farm access roads	JL	CD	GJ
F6	22/4/2021	Further alterations to layout further to TII review	JL	AM	GJ
F7	31/1/2022	Identification of Potential Site Compound Construction Phase	JL	CD	GJ
F8	23/2/2022	Further alterations to layout further to final review	JL	CD	GJ
Revision	Date	Description	Drawn by	Checked by	Approved by

Client

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Checked by:

C.Daly (CD)

Drawn by:

J.Leacy (JL)

Scale:

Horizontal: 1:1000 (A1)

Vertical: 1:100 (A1)

Rev. Date:

23/02/2022

Project Title:

N24 Carrick Road Improvement Scheme

Drawing Title:

General Arrangement Drawing
Ch 0 to 600

Drawing Number: KK1613403-P3-GA-002

NRA Project No.:

KK/16/13403

TH Project No.:

TH/16/030

Project Folder No.:

7.6.1

Rev.:

F8

PDF Drawing:

KK1613403-P3-GA-002F8



Construction of Combined Underbrige and Cattle Underpass shall be in accordance with the requirements of the TII approved Structures Options Report.



1. Actual extent of scheme land acquisition to be determined at a later date.

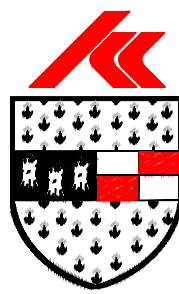
DO NOT SCALE

F1	11/03/2020	First Issue	JL	CD	GJ
F2	24/3/2020	Revised further to comments received from Client	JL	CD	GJ
F3	09/9/2020	Revision to farm access roads	JL	CD	GJ
F4	22/4/2021	Further alterations to layout further to TII review	JL	AM	GJ
F5	16/5/2021	Further alterations to layout further to TII review	JL	CD	GJ
F6	1/6/2022	Further alterations to layout further to Client review	JL	CD	GJ
Revision	Date	Description	Drawn by	Checked by	Approved by

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Scale:
Horizontal: 1:1000 (
Vertical: 1:100 (A1)

Rev. Date:
1/06/2022

Drawing Title:
Indicative Details for combined
Under-bridge & Cattle Underpass

Drawing Number: KK1613403-P3-GA-006

F6

Pdf Drawing:
KK1613403-P3-GA-006F6



APPENDIX 2 NPWS SITE SYNOPSIS

SITE NAME: LOWER RIVER SUIR SAC **SITE CODE: 002137**

Lower River Suir SAC consists of the freshwater stretches of the River Suir immediately south of Thurles, the tidal stretches as far as the confluence with the Barrow/Nore immediately east of Cheekpoint in Co. Waterford, and many tributaries including the Clodiagh in Co. Waterford, the Lingaun, Anner, Nier, Tar, Aherlow, Multeen and Clodiagh in Co. Tipperary. The Suir and its tributaries flow through the counties of Tipperary, Kilkenny and Waterford.

Upstream of Waterford city, the swinging meanders of the Suir criss-cross the Devonian sandstone rim of hard rocks no less than three times as they leave the limestone-floored downfold below Carrick-on-Suir. In the vicinity of Carrick-on-Suir the river follows the limestone floor of the Carrick Syncline. Upstream of Clonmel the river and its tributaries traverse Upper Palaeozoic Rocks, mainly the Lower Carboniferous Visean and Tournaisian. The freshwater stretches of the Clodiagh River in Co. Waterford traverse Silurian rocks, through narrow bands of Old Red Sandstone and Lower Avonian Shales, before reaching the carboniferous limestone close to its confluence with the Suir. The Aherlow River flows through a Carboniferous limestone valley, with outcrops of Old Red Sandstone forming the Galtee Mountains to the south and the Slievenamuck range to the north. Glacial deposits of sands and gravels are common along the valley bottom, flanking the present-day river course.

Alluvial wet woodland is a declining habitat type in Europe as a result of drainage and reclamation. The best examples of this type of woodland in the site are found on the islands just below Carrick-on-Suir and at Fiddown Island. Species occurring here include Almond Willow (*Salix triandra*), White Willow (*S. alba*), Rusty Willow (*S. cinerea* subsp. *oleifolia*), Osier (*S. viminalis*), with Yellow Iris (*Iris pseudacorus*), Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Pendulous Sedge (*Carex pendula*), Meadowsweet (*Filipendula ulmaria*) and Common Valerian (*Valeriana officinalis*). The terrain is littered with dead trunks and branches and intersected with small channels which carry small streams to the river. The bryophyte and lichen floras appear to be rich. A small plot is currently being coppiced and managed by the National Parks and Wildlife Service. In the drier areas species such as Ash (*Fraxinus excelsior*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*) and Blackthorn (*Prunus spinosa*) occur.

Eutrophic tall herb vegetation occurs in association with the various areas of alluvial forest and elsewhere where the floodplain of the river is intact. Characteristic species of the habitat include Meadowsweet, Purple Loosestrife (*Lythrum salicaria*), Marsh Ragwort (*Senecio aquaticus*), Ground Ivy (*Glechoma hederacea*) and Hedge Bindweed (*Calystegia sepium*).

Old oak woodlands are also of importance at the site. The best examples are seen in Portlaw Wood which lies on both sides of the Clodiagh River. On the south-facing side the stand is more open and the oaks (mainly Pedunculate Oak, *Quercus robur*) are well grown and spreading. Ivy (*Hedera helix*) and Bramble (*Rubus fruticosus* agg.) are common on the ground, indicating relatively high light conditions. Oak regeneration is dense, varying in age from 0-40 years and Holly (*Ilex aquifolium*) is fairly common but mostly quite young. Across the valley, by contrast, the trees are much more closely spaced and though taller, are poorly grown on average. There are no clearings; large oaks extend to the boundary wall. In the darker conditions, Ivy is much rarer and Holly much more frequent, forming a closed canopy in places. Oak regeneration is uncommon since there are as yet few natural clearings. The shallowness of the soil on the north-facing slope probably contributes to the poor tree growth there. The acid nature of the substrate has induced a 'mountain' type oakwood community to develop. The site is quite



species-rich throughout, including an abundance of mosses, liverworts and lichens. The rare lichen *Lobaria pulmonaria*, an indicator of ancient woodlands, is found here.

Inchinsquillib Wood consists of three small separate sloping blocks of woodland in a valley cut by the young Multeen River and its tributaries through acidic Old Red Sandstone and Silurian rocks. Two blocks, both with an eastern aspect, located to the north of the road, are predominantly of Sessile Oak (*Quercus petraea*) and Hazel, with Downy Birch (*Betula pubescens*), Ash and Holly. The ground flora is quite mixed with, for example, Wood-sedge (*Carex sylvatica*), Bluebell (*Hyacinthoides non-scripta*), Primrose (*Primula vulgaris*), Wood-sorrel (*Oxalis acetosella*), Pignut (*Conopodium majus*) and Hard Fern (*Blechnum spicant*). The base poor nature of the underlying rock is to some extent masked by the overlying drift. The third block, to the south of the road, and with a northern aspect, is a similar although less mature mixture of Sessile Oak, Birch and Holly. Here the influence of the drift is more marked, with the occurrence of Wood Anemone (*Anemone nemorosa*) amongst the ground flora.

Two stands of Yew (*Taxus baccata*) woods, a rare habitat in Ireland and the E.U., occur within the site. These are on limestone ridges at Shanbally and Cahir Park. Both are in woods planted with non-native species, including conifers. However, the area at Cahir Park is fairly substantial in size and includes some relatively undisturbed patches of wood and some very old trees. Regeneration of the Yew trees is mostly poor, due to competition from species such as Sycamore (*Acer pseudoplatanus*) and, at Shanbally, due to heavy grazing by goats. Other native species which occur with the Yew trees include Ash, Pedunculate Oak, Hazel and Spindle (*Euonymus europaeus*). Future prospects for these Yew woods are good as the sites are proposed for restoration under a Coillte E.U. LIFE programme.

Floating river vegetation is evident in the freshwater stretches of the River Suir and along many of its tributaries. Typical species found include Canadian Pondweed (*Elodea canadensis*), water-milfoils (*Myriophyllum* spp.), Fennel Pondweed (*Potamogeton pectinatus*), Curled Pondweed (*P. crispus*), Perfoliate Pondweed (*P. perfoliatus*), Pond Water-crowfoot (*Ranunculus peltatus*), other crowfoots (*Ranunculus* spp.) and the moss Fontinalis antipyretica. At a couple of locations along the river Opposite-leaved Pondweed (*Groenlandia densa*) occurs. This species is protected under the Flora (Protection) Order, 1999.

The Aherlow River is fast flowing and mostly follows a natural unmodified river channel. Submerged vegetation includes the aquatic moss Fontinalis antipyretica and Stream Water-crowfoot (*R. pinnatifidus*), while shallow areas support species such as Reed Canary-grass (*Phalaris arundinacea*), Brooklime (*Veronica beccabunga*) and Water Mint (*Mentha aquatica*). The river bank is fringed in places with Alder (*Alnus glutinosa*) and willows (*Salix* spp.).

The Multeen River is fast flowing, mostly gravel-bottomed and appears to follow a natural unmodified river channel. Water-crowfoots occur in abundance and the aquatic moss Fontinalis antipyretica is also common. In sheltered shallows, species such as Water-cress (*Nasturtium officinale*) and water-starworts (*Callitriche* spp.) occur. The river channel is fringed for most of its length with Alder, Willow and a narrow strip of marshy vegetation.

Salt meadows occur below Waterford City in old meadows where the embankment is absent, or has been breached, and along the tidal stretches of some of the inflowing rivers below Little Island. There are very narrow, non-continuous bands of this habitat along both banks. More extensive areas are also seen along the south bank at Ballynakill, the east side of Little Island, and in three large salt meadows between Ballynakill and Cheekpoint. The Atlantic and Mediterranean sub-types are generally intermixed. The species list is extensive and includes Red Fescue (*Festuca rubra*), oraches (*Atriplex* spp.), Sea Aster (*Aster tripolium*), Sea Couch (*Elymus pycnanthus*), frequent Sea Milkwort (*Glaux*



maritima), occasional Wild Celery (*Apium graveolens*), Parsley Water-dropwort (*Oenanthe lachenalii*), English Scurvygrass (*Cochlearia anglica*) and Sea Arrowgrass (*Triglochin maritima*). These species are more representative of the Atlantic sub-type of the habitat. Common Cord-grass (*Spartina anglica*), is rather frequent along the main channel edge and up the internal channels. The legally protected (Flora (Protection) Order, 1999) Meadow Barley (*Hordeum secalinum*) grows at the landward transition of the saltmarsh. Sea Rush (*Juncus maritimus*), an indicator of the Mediterranean salt meadows, also occurs.

Other habitats at the site include wet and dry grassland, marsh, reedswamp, improved grassland, coniferous plantations, deciduous woodland, scrub, tidal river, stony shore and mudflats. The most dominant habitat adjoining the river is improved grassland, although there are wet fields with species such as Yellow Iris, Meadowsweet, rushes (*Juncus* spp.), Meadow Buttercup (*Ranunculus acris*) and Cuckooflower (*Cardamine pratensis*).

Cabragh marshes, just below Thurles, lie in a low-lying tributary valley into which the main river floods in winter. Here there is an extensive area of Common Reed (*Phragmites australis*) with associated marshland and peaty fen. The transition between vegetation types is often well displayed. A number of wetland plants of interest occur, in particular the Narrow-leaved Bulrush (*Typha angustifolia*), Bottle Sedge (*Carex rostrata*) and Blunt-flowered Rush (*Juncus subnodulosus*). The marsh is naturally eutrophic but it has also the nutritional legacy of the former sugar factory which discharged into it through a number of holding lagoons, now removed. Production is high, which is seen in the size of such species as Celery-leaved Buttercup (*Ranunculus sceleratus*), as well as in the reeds themselves.

Throughout the Lower River Suir site are small areas of woodland other than those described above. These tend to be a mixture of native and non-native species, although there are some areas of semi-natural wet woodland with species such as Ash and willow. Cahir Park Woodlands is a narrow tract of mixed deciduous woodland lying on the flat-lying floodplain of the River Suir. This estate woodland was planted over one hundred years ago and it contains a large component of exotic tree species. However, due to original planting and natural regeneration there is now a good mix of native and exotic species. About 5 km northwest of Cashel, Ardmayle pond is a long, possibly artificial water body running parallel to the River Suir. It is partly shaded by planted Lime (*Tilia hybrids*), Sycamore and the native Alder. Growing beneath the trees are shade tolerant species such as Remote sedge (*Carex remota*).

The site is of particular conservation interest for the presence of a number of Annex II animal species, including Freshwater Pearl Mussel (both *Margaritifera margaritifera* and *M. margaritifera* subsp. *durrovensis* occur), White-clawed Crayfish, Salmon, Twaite Shad (*Alosa fallax fallax*), three species of Lampreys - Sea Lamprey, Brook Lamprey and River Lamprey, and Otter. This is one of only three known spawning grounds in the country for Twaite Shad.

The site also supports populations of several other animal species. Those which are listed in the Irish Red Data Book include Daubenton's Bat, Natterer's Bat, Pipistrelle Bat, Pine Marten, Badger, Irish Hare, Smelt and Common Frog. Breeding stocks of Carp are found in Kilsheelan Lake. This is one of only two lakes in the country which is known to have supported breeding Carp. Carp require unusually high summer water temperatures to breed in Ireland. As the site is therefore unusual in this regard, it may also support interesting invertebrate populations.

Parts of the site have also been identified as of ornithological importance for a number of Annex I (E.U. Birds Directive) bird species, including Greenland Whitefronted Goose (10), Golden Plover (1,490), Whooper Swan (7) and Kingfisher. Figures given in brackets are the average maximum counts from four count areas within the site for the three winters 1994-1997. Wintering populations of migratory birds use the site. Flocks are seen in Coolfinn Marsh and also along the reedbeds and saltmarsh areas of



the Suir. Coolfinn supports nationally important numbers of Greylag Goose on a regular basis, with numbers between 600 and 700 recorded. Other species occurring include Mallard (21), Teal (159), Wigeon (26), Tufted Duck (60), Pintail (4), Pochard (2), Little Grebe (2), Black-tailed Godwit (20), Oystercatcher (16), Lapwing (993), Dunlin (101), Curlew (195), Redshank (28), Greenshank (4) and Green Sandpiper (1). Nationally important numbers of Lapwing (2,750) were recorded at Faithlegg in the winter of 1996/97. In Cabragh marshes there is abundant food for surface feeding wildfowl which total approximately 1,000 in winter. Widgeon, Teal and Mallard are numerous, and the latter has a large breeding population, with up to 400 in summer. In addition, less frequent species like Shoveler and Pintail occur and there are records for both Whooper and Bewick's swans. Kingfisher, a species that is listed on Annex I of the E.U. Birds Directive, occurs along some of the many tributaries throughout the site.

Land use at the site consists mainly of agricultural activities including grazing, silage production, fertilising and land reclamation. The grassland is intensively managed and the rivers are therefore vulnerable to pollution from run-off of fertilisers and slurry. Arable crops are also grown. Fishing is a main tourist attraction on stretches of the Suir and some of its tributaries, and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. The Aherlow River is a designated Salmonid Water under the E.U. Freshwater Fish Directive. Other recreational activities such as boating, golfing and walking are also popular. Several industrial developments, which discharge into the river, border the site including three dairy related operations and a tannery.

The Lower River Suir contains excellent examples of a number of Annex I habitats, including the priority habitats alluvial forest and Yew woodland. The site also supports populations of several important animals species, some listed on Annex II of the Habitats Directive or listed in the Irish Red Data Book. The presence of two legally protected plants (Flora (Protection) Order, 1999) and the ornithological importance of the site adds further to the ecological interest and importance.



APPENDIX 3 CRITERIA USED TO EVALUATE HABITATS AND IMPACTS

Table A.1 Criteria used to determine the value of ecological resources (taken from NRA, 2009).

Criteria	
International Importance	<p>'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.</p> <p>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).</p> <p>Features essential to maintaining the coherence of the Natura 2000 Network</p> <p>Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.</p> <p>Resident or regularly occurring populations (assessed to be important at the national level) of the following:</p> <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).
National Importance	<p>Site designated or proposed as a Natural Heritage Area (NHA).</p> <p>Statutory Nature Reserve. Refuge for Fauna and Flora protected under the Wildlife Acts.</p> <p>National Park.</p> <p>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.</p> <p>Resident or regularly occurring populations (assessed to be important at the national level) of the following:</p> <ul style="list-style-type: none"> • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. • Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
County Importance	<p>Area of Special Amenity. Area subject to a Tree Preservation Order.</p> <p>Area of High Amenity, or equivalent, designated under the County Development Plan.</p> <p>Resident or regularly occurring populations (assessed to be important at the County level) of the following:</p> <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; • 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. <p>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.</p> <p>County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local BAP; if this has been prepared.</p> <p>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.</p> <p>Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.</p>
Local Importance (higher value)	<p>Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;</p> <p>Resident or regularly occurring populations (assessed to be important at the Local level) of the following:</p> <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; • 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. <p>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;</p> <ul style="list-style-type: none"> • Sites or features containing common or lower value habitats, including naturalised species that are essential in maintaining links and ecological corridors between features of higher ecological value.



Criteria	
Local Importance	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.

Table A.2 Criteria for assessing impact magnitude (NRA, 2009).

Impact magnitude	Definition
No change:	No discernible change in the ecology of the affected feature.
Imperceptible Impact:	An impact capable of measurement but without noticeable consequences.
Slight Impact:	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Impact:	An impact that alters the character of the environment that is consistent with existing and emerging trends.
Significant Impact:	An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Profound Impact:	An impact which obliterates sensitive characteristics.



APPENDIX 4 PROTECTED / THREATENED BIRDS

Table A.3 List of protected / threatened bird species recorded in S41 national 10km grid squares.

Group	Species	Scientific name	Designation
Bird	Barn Owl	<i>Tyto alba</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Red List
Bird	Barn Swallow	<i>Hirundo rustica</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Black-headed Gull	<i>Larus ridibundus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Red List
Bird	Common Coot	<i>Fulica atra</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	Common Grasshopper Warbler	<i>Locustella naevia</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Common Greenshank	<i>Tringa nebularia</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Common Kestrel	<i>Falco tinnunculus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Common Kingfisher	<i>Alcedo atthis</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	Common Linnet	<i>Carduelis cannabina</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Common Pheasant	<i>Phasianus colchicus</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section I Bird Species
Bird	Common Pochard	<i>Aythya ferina</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	Common Redshank	<i>Tringa totanus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Red List
Bird	Common Sandpiper	<i>Actitis hypoleucos</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Common Shelduck	<i>Tadorna tadorna</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Common Snipe	<i>Gallinago gallinago</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	Common Starling	<i>Sturnus vulgaris</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List



Group	Species	Scientific name	Designation
Bird	Common Swift	<i>Apus apus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Common Wood Pigeon	<i>Columba palumbus</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section I Bird Species
Bird	Corn Crane	<i>Crex crex</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern - Red List
Bird	Eurasian Curlew	<i>Numenius arquata</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern - Red List
Bird	Eurasian Reed Warbler	<i>Acrocephalus scirpaceus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Eurasian Teal	<i>Anas crecca</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	Eurasian Tree Sparrow	<i>Passer montanus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Eurasian Wigeon	<i>Anas penelope</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	European Golden Plover	<i>Pluvialis apricaria</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive >> Annex I Bird Species EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern - Red List
Bird	Great Bittern	<i>Botaurus stellaris</i>	Protected Species: Wildlife Acts
Bird	Great Black-backed Gull	<i>Larus marinus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Greater White-fronted Goose	<i>Anser albifrons</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive >> Annex I Bird Species EU Birds Directive >> Annex II, Section II Bird Species EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	Herring Gull	<i>Larus argentatus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Red List



Group	Species	Scientific name	Designation
Bird	House Martin	<i>Delichon urbicum</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	House Sparrow	<i>Passer domesticus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Little Egret	<i>Egretta garzetta</i>	Protected Species: Wildlife Acts EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Mallard	<i>Anas platyrhynchos</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section I Bird Species
Bird	Merlin	<i>Falco columbarius</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	Mew Gull	<i>Larus canus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Mute Swan	<i>Cygnus olor</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern - Red List
Bird	Northern Shoveler	<i>Anas clypeata</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern - Red List
Bird	Peregrine Falcon	<i>Falco peregrinus</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Bird Species
Bird	Red Grouse	<i>Lagopus lagopus</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section I Bird Species Threatened Species: Birds of Conservation Concern - Red List
Bird	Red-billed Chough	<i>Pyrrhocorax pyrrhocorax</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	Rock Pigeon	<i>Columba livia</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section I Bird Species
Bird	Sand Martin	<i>Riparia riparia</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Sky Lark	<i>Alauda arvensis</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Spotted Flycatcher	<i>Muscicapa striata</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List



Group	Species	Scientific name	Designation
Bird	Stock Pigeon	<i>Columba oenas</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Tufted Duck	<i>Aythya fuligula</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex II, Section I Bird Species EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	Water Rail	<i>Rallus aquaticus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Amber List
Bird	Whooper Swan	<i>Cygnus cygnus</i>	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern - Amber List
Bird	Yellowhammer	<i>Emberiza citrinella</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern - Red List



APPENDIX 5 BAT ASSESSMENT REPORT

N24 Carrick Road Improvement Scheme



BAT ASSESSMENT

Version (23-3-22)



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EXECUTIVE SUMMARY

Ecofact were commissioned to carry the current Bat Habitat Assessment to determine if there is potential for bats at the site of a proposed N24 road improvement scheme in County Kilkenny. The proposed road scheme involves the upgrade and realignment of a section of the N24 road, located between Carrick-on-Suir and Waterford City, near the village of Mooncoin. The proposal also includes for two no. attenuation ponds, as well as realignment of the Skelpstown 16 stream within the site with box culvert for stream crossing at the road development. It is proposed to construct a new combined underbridge and cattle underpass at the location of the local road L7416 underneath the new road. This report assesses the potential for the proposed road improvement scheme to cause adverse impacts on bats.

The site of the proposed road scheme was assessed in terms of the suitability of the site for different bat species based on the landscape setting, habitat present and the bat species that were recorded at the site. The site was surveyed over a week in September 2020. The habitat and landscape features along the entire proposed road scheme (along the existing and proposed realignment) were analysed. Any potential roost features (PRFs) were inspected for any evidence of bats. Activity surveying was undertaken at night to record bat activity at the site and identify bat species that occurred in the study area.

Overall the habitat at the site was sub-optimal for bats, comprising predominantly managed agricultural land with low quality hedgerows and treelines providing poor habitat connectivity. The site was generally fragmented and disturbance levels were high due to the existing busy N24 and maintained farmland. Any potential commuting and foraging habitat along the proposed road scheme was therefore not considered to be of significant importance in terms of bat use.

No significant roosting potential was identified at the site either. No bat roosts were found in any of the trees along the proposed road scheme. There were some mature trees with bat potential noted but no signs of bat use were found. The only buildings in the study area were situated along the existing N24. There were two building with some bat potential noted on the southern side of the existing N24 road, these were just outside of the proposed boundary of works and will not be directly affected by the proposed works. The proposed realignment will be constructed further north of the existing road. Therefore, the proposed realignment will be expected to reduce disturbance near these buildings with traffic diverted away from these potential roosts on the Suir Estuary side of the N24. It was noted also that the general fragmentation of the landscape and existing disturbance at the site is unfavourable for bats and any potential roosting habitat on the site is unlikely to be utilised to any great extent due to the lack of habitat connectivity.

The abundance of bats recorded in the study area was low. The Leisler's bat was found to be the most abundant bat species at the study site. This was considered to be due to the lack of good quality linear landscape features which are favoured by other bat species. Leisler's bat is not considered to be significantly affected by the road and traffic on the ground, which is common here given the busy existing N24 road.

Although the site is not of significant value for bats, there is nonetheless some small potential for minor impacts in the absence of any mitigation relating to roost habitat loss (if small numbers do use some of the mature trees at the site as bat use can change over time), loss of sub-optimal foraging / commuting habitat, disturbance, lighting and collision impacts. No potential impacts are considered to be significant. Some best practice mitigation is considered to be sufficient to avoid impacts on bats and is provided in the current document. The mitigation includes following the NRA guidelines in relation to tree felling and



site clearance, including an inspection of mature trees by a suitably qualified ecologist prior to works commencing. If bats are found, a derogation licence will be required for the felling of trees. If bats are not found, felling may commence following the guidelines. Mitigation is also provided for landscaping, to improve connectivity away from the road, including using native species. Furthermore, measures are included to reduce lighting impacts, if lighting is included in the proposal for the road realignment.

Overall, no significant impacts on bats are envisaged, and following the implementation of best practice mitigation, residual impacts on bats would be imperceptible negative. It is therefore concluded that the N24 Carrick Road Improvement Scheme can be successfully completed without significant impacts on bats provided mitigation is followed.



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1. INTRODUCTION

The purpose of this assessment was to determine if there is potential for bats at the site of a proposed N24 road improvement scheme in County Kilkenny. The proposed road scheme involves the upgrade and realignment of a section of the N24 road. The section of the road where the works are proposed for is located between Carrick-on-Suir and Waterford City, near the village of Mooncoin. The proposal also includes for two no. attenuation ponds, as well as realignment of the Skelpstown 16 stream within the site with box culvert for stream crossing at the road development. It is proposed to construct a new combined underbridge and cattle underpass at the location of the local road L7416 underneath the new road. This report assesses the potential for the proposed road improvement scheme to cause adverse impacts on bats. Figure 1 shows the location of the proposed development.

1.1 Legislation Relating to Bats

Bats are strictly protected under both national and international law. The purpose of this legislation is to maintain and restore bat populations within their natural range. This implies that the habitats on which they rely and the ecology of their life cycles should not be compromised by human activities. Where activities have the potential to compromise bat populations, measures are required to be put in place to avoid impacts or compensate and mitigate for those impacts. The key legislation which provides protection to bats is outlined below.

1.1.1 Wildlife Act 1976

In the Republic of Ireland, all bats and their roosts are protected under Schedule 5 of the *Wildlife Act 1976* (amended 2000). It is unlawful to disturb either without the appropriate Licence.

1.1.2 EU Habitats Directive

In addition to domestic legislation bats are also protected under the *EC Directive on the Conservation of Natural habitats and of Wild Fauna and Flora* (Habitats Directive 1992). This Directive seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All bat species are protected under Annex IV of the EU Habitats Directive, while the lesser horseshoe bat (*Rhinolophus hipposideros*) is listed under Annex II. Member states are required to designate Special Areas of Conservation for all species listed under Annex II in order to protect them. The EU Habitats Directive has been transposed into Irish law with the European Communities (Birds and Natural Habitats) Regulations 2011.

1.1.3 Bern and Bonn Conventions

Ireland has also ratified two international conventions which afford protection to bats amongst other fauna. These are known as the 'Bern' and 'Bonn' Conventions. *The Convention on the Conservation of European Wildlife and Natural Habitats* (Bern Convention 1982), in relation to bats, exists to conserve all species and their habitats. *The Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries, which covers certain species of bat.



1.2 Bat Roost Habitat

Bats roost in a variety of structures and certain species can show some preferences for roost types. For example, some species may be more likely to choose joints and crevices in buildings and stone structures for roosting, other species may display a higher tendency for roosting in trees. Although certain species may have preferences for types of roosts most bats will roost in a variety of roost types based on what is available and suitable. Nearly all bat species in Ireland are known to have been found roosting in trees (Andrews and Gardener, 2016).

Trees are an important ecological component for supporting bat populations. Mature trees are highly important in providing ideal roosts for bat species such as Soprano pipistrelles *Pipistrellus pygmaeus*, Common pipistrelles *Pipistrellus pipistrellus*, Leisler's bat *Nyctalus leisleri*, and are particularly favoured by Brown long-eared bats *Plecotus auritus*. Bats will roost in cracks, crevices, holes, under peeling bark and in amongst thick ivy on mature trees (Kelleher and Marnell, 2006). These are the characteristics that are noted during the assessment of trees in terms of their potential as bat roosts. Certain tree species may have higher probability of being used by roosting bats due to being more prone to forming cracks and cavities such as Ash *Fraxinus* sp., Oak *Quercus* sp., Willow *Salix* sp. and Beech *Fagus* sp.. Younger trees provide less opportunity for optimal roosting and are generally of less importance for bats (Burgar *et al.*, 2015).

The location of a suitable tree or structure for bat roosting is also an important factor in its selection. The surrounding environment of the roost ideally should provide suitable and safe foraging grounds and commuting routes to support the roosting bat(s). Bats have a tendency to follow linear landscape features in commuting to and from foraging and roosting habitats. Treelines, hedgerows and river corridors are examples of such commuting routes that are generally favoured by bats. Mature woodlands, particularly mixed and broad-leaved woodlands, are typical foraging habitats used by bats and larger forest area is associated with larger bat populations (Reiter, 2002). Rivers and wetlands are also suitable foraging habitats due to the occurrence of large insect communities which supports the bats (NRA, 2006a).

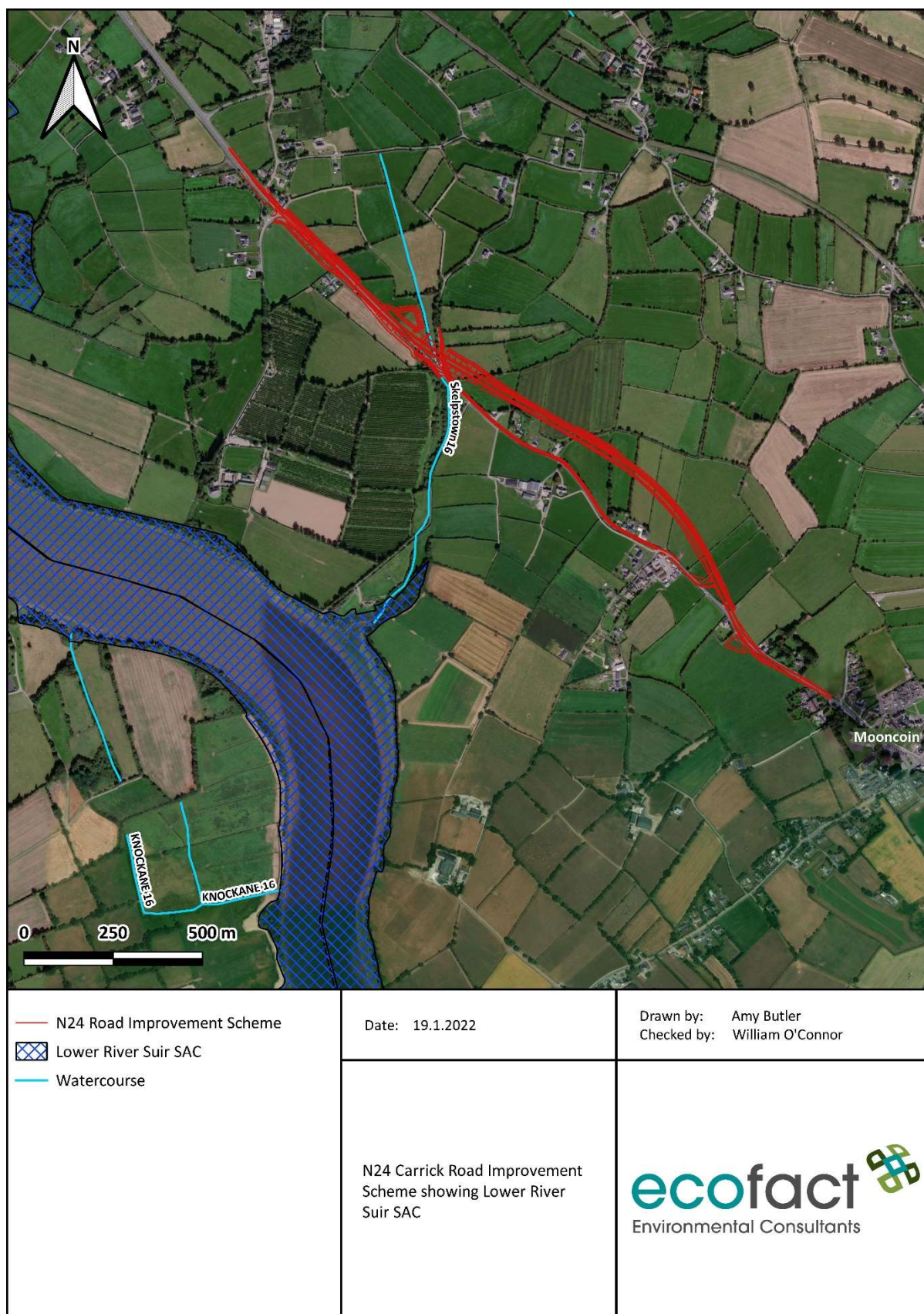


Figure 1 Location of N24 Carrick Road Improvement Scheme showing Lower River Suir SAC (0021337).



2. METHODOLOGY

2.1 Desktop review

The bat suitability of habitat in the study area for bats was obtained from the National Biodiversity Data Centre database. This map provides a picture of the broad scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species. The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats (Lundy *et al* 2011).

2.2 Field Surveys

Field surveying was undertaken during the week commencing the 14th of September 2020 by two ecologists from Ecofact Environmental Consultants. The entire length of the proposed scheme, including the existing N24 and proposed realignment sections, were walked and assessed for their bat potential and night-time activity surveying was also carried out. The proposed scheme is illustrated in Figure 1.

All potential roost features (PRFs) for bats, which includes trees and built structures, that were considered likely to be disturbed or removed during the project, i.e. those within the footprint of the proposed road scheme area, were assessed in the current investigation. The survey had regard to the methodology outlined in *Bat Mitigation Guidelines for Ireland* by Kelleher & Marnell (2006), *Bat Surveys for Professional Ecologists: Good Practice Guidelines* by Collins (2016) and *Bat Tree Habitat Key* by Andrews and Gardener (2016). The assessment of features involved careful inspection from the ground to identify evidence indicating the level of potential of each feature as a bat roost and / or the presence of bats. Key indications of potential as a roost habitat that were searched for in the inspection included, rot / knot / woodpecker holes, cracks and splits in stems and branches, cavities from branch tearing, detached bark, ivy growth, gaps between overlapping stems or branches and other hollows.

Night-time bat activity surveys (n=3 full nights) were completed during mild conditions with no rain within the appropriate bat survey season (September 2020). The night-time surveys commenced 30 minutes before dusk and lasted until 2+ hours after dusk, with additional surveys completed at from 1 hour before dawn. The range of bat detectors used was: the BatBox 3 Heterodyne bat detector, BatBox Duet Bat Detector (both Heterodyne and Frequency Division) and Echo Meter Touch 2 Pro detector. The surveys included both walkover and targeted surveys, and also car-based monitoring (following the methods in Catto *et al.*, 2004).

3. RESULTS

3.1 Desk study

The National Biodiversity Data Centre (NBDC) maps landscape suitability for bats based on Lundy *et al.*, (2011). The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats. Table 1 below gives the suitability of the study area for the bat species found in Ireland (based on NBDC) along with their Irish Red List Status (from Marnell *et al.*, 2009). The overall assessment of bat habitats for the current study area is given as 42.11.



Table 1 Suitability of the study area for the bat species previously recorded in the Carrick Road area (based on the NBDC data). Irish Red list status also indicated (based on Marnell *et al.* 2009).

Common name	Scientific name	Suitability index	Irish red list status
All bats	-	42.11	
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	48	Least Concern
Brown long-eared bat	<i>Plecotus auritus</i>	67	Least Concern
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	61	Least Concern
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	4	Least Concern
Leisler's bat	<i>Nyctalus leisleri</i>	52	Near Threatened
Whiskered bat	<i>Myotis mystacinus</i>	40	Least Concern
Daubenton's bat	<i>Myotis daubentonii</i>	40	Least Concern
Nathusius's pipistrelle	<i>Pipistrellus nathusii</i>	8	Least Concern
Natterer's bat	<i>Myotis nattererii</i>	59	Least Concern

The overall rating of 42.11 is considered to be a medium rating. The ratings for some species are considered to be high, such as the Brown long-eared bat which is given a rating of 67. However, the Brown long-eared bat is generally a species that prefers woodlands, of which there is a general paucity in the study area. The majority of habitats here are typical agricultural type habitats. There are some fragmented sections of woodland on the opposite side of the Suir estuary here but are located a distance from the proposed development site. The bat suitability rating seems to increase closer to the estuary and decreases as you move away from the estuary towards the N24. The existing N24 already fragments the habitat and is a barrier to bats moving from the bat-suitable area around the estuary to the area north of the road which is less suitable. The N24 realignment section is proposed to be positioned to the north of the existing road, i.e. further away from the River Suir than the existing N24 road.

The National Bat Database of Ireland as viewed through the National Biodiversity Data Centre online maps does not show any records of bats along the proposed development site or the immediate surrounds. The closest record is near a bridge immediately west of Fiddown town. There are multiple records at this location as it appears to be part of the Bat Conservation Ireland Car-based Monitoring Scheme. The species recorded here were Common pipistrelle, Soprano pipistrelle, Leisler's bat. These are records over years of monitoring at this site, from 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2013 and 2014. There are other records closer to Portlaw on the opposite side of the estuary, comprising of multiple records of Daubenton's bat, Soprano pipistrelle, Common pipistrelle, Leisler's bat and Brown long-eared bats. Approximately 4.5km east of Mooncoin town, there are records of a Brown long-eared bat once in 2006.

3.2 Field surveys

The proposed road scheme starts on the existing N24 at a cluster of dwelling houses at Clonmore. These buildings were relatively modern and well-sealed; they were assessed as having no potential for bats. The proposed road scheme continues along the existing road as far as the Skelptown 16 stream. This stretch of the road is lined by well-maintained hedgerows at the north side separating the road from agricultural fields. The proposed scheme is expected to only encroach slightly into the adjacent fields which are separated from each other by mature hedgerows with a small number of mature trees noted. The mature trees showed no signs of bat use and the hedgerows are not considered particularly favourable in terms of bat habitat due to the proximity to the existing road and the associated disturbance as well as the fragmentation of the general area. On the south side of this stretch there is a c. 200m section of scrub / bracken, followed by two dwelling houses with no bat potential and an



agricultural field that is separated from the existing road by a very low grassy hedge / embankment. There is no potential bat habitat along the south side of this section of the scheme.

The scheme then crosses the Skelpstown 16 stream over a low culvert that has no potential for bat use. Just after the Skelpstown 16 stream there is a narrow access lane to the south of the N24 that is lined with thin trees and overgrown bramble. The trees are not suitable for roosting and the barrier of the existing road as well as the proximity to this road in terms of disturbance impacts, this lane is not optimal habitat for bats. The proposed road scheme veers north of the existing N24 at this point moving away from this lane and crossing a small local road on the opposite side of the existing N24. This local road has tree lines at either side. The area here is not as well maintained as the rest of the site. This is considered to be the most suitable area for bats along the proposed road scheme. However, the fragmentation of the broader area and the existing road disturbance was not ideal. The trees in this area were also inspected for Potential Roost Features (PRFs) but were found to be suboptimal again. The trees, although mature, were thin and in good condition. No knotholes or crevices, signs of decay were noted along the bark. Some mature Ivy did cover parts of the tree which may provide some potential for bats but overall the habitat here was not considered to be favourable.

The proposed scheme cuts across a small section of it directly beside the existing N24, there will be no major encroachment or loss of this lane; there is already the existing barrier and disturbance of the existing road immediately beside it. The existing N24 already acts as a barrier to commuting if bats were to use either of the lanes / roads at either side of the N24 at this point. The proposed road scheme just beginning to veer off the existing route slightly here would therefore have no major effect on any potential commuting route here as it is already fragmented and thereby not a suitable commuting / foraging route to bats.

Approximately 75m after (east of) the Skelpstown 16 stream on the south side of the existing N24 there is a small disused dwelling. This building was one of the two considered to have some limited bat potential due to dense ivy growth and potential ingress / egress points via gaps in the roof tiles and in the eaves of the building. No signs of bat use were found. It was also noted that due to proximity to the existing road and the associated disturbance it was not a favourable site for bats. Also there was no suitable commuting habitat to the building from the north side due to the barrier of the existing N24. If the building was to be used by bats it is therefore expected commuting and foraging would be limited to the south side of this building where there is less disturbance and fragmentation. In any case as the proposed road scheme will veer off the existing road to the north before this building it is not expected to be affected by the proposed scheme.

The proposed realignment to the north of the existing road cuts through an area of agricultural land consisting of a number of improved grassland fields used for livestock grazing and some arable corn fields also and the treeline and hedgerow boundaries of these fields. The first hedgerow after the local road crossing to the east of the Skelpstown 16 stream is of no ecological significance. It is a low broken hedge of bramble and grass with two mature ivy covered trees. These trees were assessed for bats and no evidence of bats was found; it was considered unfavourable for bats as the trees were isolated with a lack of commuting corridors and habitat connectivity. The second field boundary was a treeline of low trees, unsuitable for bat roosting. One mature ash tree was inspected and no suitable roosting gaps were found and there was no indication of use. The next hedgerow was a low bramble hedge of no significance between two corn fields at the back of residential properties. The next field boundary was another minor low value broken hedge with a couple of small trees of no major importance in terms of ecological significance. This hedge progress into an overgrown bohieren to the north of the propose road realignment extends along the north boundary of the next number of fields. This bohieren is proposed to be closed off as part of the proposed scheme as it is not used by or suitable for any farm



vehicle. This bohoreen could be considered as a potential commuting corridor for bats however the bohoreen is isolated by the lack of habitat connectivity in the wider landscape surrounding it which is dominated by open improved grassland fields with low maintained hedgerow boundaries.

South of the existing bohoreen the proposed road cuts through another field boundary consisting of a broken treeline. The mature trees showed no signs of bat use and again the general fragmentation of the area lend it to being unfavourable for bats. The scheme crosses another treeline after the next field north of a cluster of houses adjoining the N24. Again there were no indications of bats use. Continuing through several more agricultural fields of improved grassland used for grazing livestock the road scheme cut through a number of hedgerows. These hedgerows were all very low and well-maintained and so provided no bat commuting habitat. The proposed road then realigns with the existing road to the east of Polerone Lane which is situated to the south of the existing N24. At the junction of Polerone Lane and the N24 there is a large yard with sheds which were considered to have some potential for bats. Upon an external inspection no indications of bat use was found. Heavy machinery and lorries were in use in this yard. The yard was well lit during the night with several outdoor lights on the shed buildings. It is also situated directly adjacent to the existing N24. The disturbance level at the site would be a deterrent to bats and there is a lack of habitat connectivity. Also the proposed road scheme will be located to the north of this site at the opposite side of the existing N24. Therefore, even if the site was used by bats the N24 already acts as a separation barrier between the yard and the proposed development influencing any bats commuting to / from this yard to restrict activity to the area to the south of the N24 and away from the proposed road scheme site. As the proposed road joins back onto the N24 into Mooncoin it passes a number of dwelling houses, none of which have potential for bat roosting.

After dark no significant light spill was noted in the area or along the existing road. Some minor light spill from the adjacent houses in some sections was noted but in general, the site was found to be mainly dark. The bat activity surveys did not identify any roosts in the study area and bat activity was low-moderate. Three species of bat were recorded: Leisler's bat, Soprano pipistrelle, and Common pipistrelle. Overall no significant bat activity was recorded during the course of the survey. The most frequently recorded species was Leisler's bat, and the activity of which was more consistent towards the beginning of the dusk surveying, suggesting that the bats move on to more optimal foraging areas for the night. Activity was considered to be generally low with low densities of bats recorded. Leisler's bat is a high-flying species and could be found over any area of Co. Kilkenny. The numbers recorded were relatively low.

3.3 Site Evaluation

The site was assessed in terms of suitability for different bat species based on the habitat present and the bat species that were recorded at the site. The habitat at the site was sub-optimal for bats, comprising predominantly managed agricultural land. There are no areas of ancient woodland, large rivers or lakes or other optimal bat habitat in the study area. Linear features along field boundaries, i.e. hedgerows and treelines, were low in height and well-maintained. They were also heavily fragmented by the existing N24 road and the maintained pastures and farmland with trimmed/cut-back hedgerows, and therefore were not considered favourable or of any significant importance for bat use. Disturbance was also considered a deterring factor due to proximity to the existing busy road. A small number of trees and mature hedgerows along field boundaries in the proposed works area have some bat potential if considered independently from the surrounding environment. This can be seen in plate 5. However, bats rely on habitat connectivity to commute safely from roost sites to suitable foraging areas. The fragmentation of the site ensures the habitat connectivity is very low. No structures / buildings along the along the path of the proposed road scheme are of importance to bats either. Two buildings (grid



references: S 49261 17192 and S 49781 16740) adjacent to the existing N24 were considered to have some potential for bat roosting; as can be seen in plates 6 and 7. However, there was no evidence that they were being used by bats. Also, these buildings were located along the south side of the existing N24 where the proposed road realignment will be located to the north of the existing road, i.e. these buildings will not be directly affected by the proposed road scheme. Again, the fragmented surrounding also leads to the conclusion that these buildings are unlikely to be used by bats.

The focused assessment of the proposed works area has determined that the proposed development site provides unsuitable habitat for Brown Long-eared bats, which was assigned the highest NBDC rating. Leisler's bat on the other hand which was assigned a lower landscape suitability rating was found to be the most abundant species in the study area according to the activity survey. The current surveys also considered the landscape to be most suited to Leisler's bats, due to the paucity of good quality linear landscape features, woodland or waterbodies. Most bats, including the Pipistrelle species recorded less frequently in the survey, rely on suitable linear features in the landscape to provide commuting corridors. Leisler's however, fly in open areas high above such features and are therefore largely unaffected by the road and traffic on the ground, which is common here given the busy existing N24 road. Although the lane adjacent to the Skelpstown 16 watercourse was identified as having bat potential, there was very little activity recorded at this location.

Roosting potential in the study area is also considered to be limited. No bat roosts were found in any of the trees along the proposed road scheme. There were some mature trees with bat potential noted but no signs of bat use were found. The only buildings in the study area were situated along the existing N24. There were two building with some bat potential noted on the southern side of the existing N24 road, these were just outside of the proposed boundary of works and the locations are given above. There are no buildings being removed in the proposed scheme so these potential roosts would be largely unaffected. In fact the proposed realignment will be constructed further north of the existing road. Therefore, the proposed realignment will be expected to reduce disturbance near these buildings with traffic diverted away from these potential roosts on the Suir Estuary side of the N24.

A summary of the habitat assessment for the recorded species is presented in Table 2.



Table 2 Assessment of the habitat at the site of the proposed road scheme for each species of bat recorded at the site; relative abundance of each species based on the activity results is also shown.

Species Recorded	Relative Abundance	Habitat	Habitat Assessment
Common pipistrelle <i>Pipistrellus pipistrellus</i>	0.26	Favour linear features for commuting and foraging along mature hedgerows, treelines, edges of woodlands and within woodlands. Broad foraging niche but often occur near water and other natural land covers. Also positively associated with pasture near roosts. Roost in crevices; the most frequently recorded type of roosting site is buildings but also use trees.	Some mature hedgerows and treelines provide foraging and commuting habitat. Relatively limited however due to most being low and well maintained and general fragmentation with open agricultural land and the existing N24.
Leisler's bat <i>Nyctalus leisleri</i>	0.52	Favour woodland habitat and areas near freshwater but frequently travel up to more than 5km from roost to forage. High-flying species and doesn't rely on linear landscape features for commuting. Roosts in crevices and holes in trees and buildings.	Area is suitable for Leisler's bat which does not rely on the linear landscape features of mature hedges and treelines as this species forages in open landscape as it flies at greater heights than other bat species. It is also therefore, not likely to be affected by the existing N24. As this species flies a considerable distance overhead the road and traffic does not cause significant disturbance or pose a threat of collision to the bat.
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	0.13	Favours roosting in areas near freshwater and woodland. Flies low (2-6m) along linear landscape features such as treelines and mature hedgerows. Broad foraging niche but often occur near water and other natural land covers. Roost in crevices; the most frequently recorded type of roosting site is buildings but also use trees.	Some mature hedgerows and treelines provide foraging and commuting habitat. Relatively limited however due to most being low and well maintained and general fragmentation with open agricultural land and the existing N24.



4. IMPACTS

4.1 Roost Habitat Loss

The site, due to lack of habitat connectivity and availability of suitable foraging habitat, is not considered to be favourable for bat roosting and is largely unsuitable. The site consists of a busy existing national road with adjoining agricultural type habitats that are well maintained. Some mature trees just outside the site do have some potential for bat roosting, due to the presence of dense ivy, but no knotholes or other suitable features were noted. It is possible for a small number of bats to be present in a tree in any given day and bat usage can change over a season. Therefore there is the potential for some minor roost habitat loss relating to site clearance for the offline sections. Guidelines will be provided for the felling of trees required for the proposed road realignment to minimise the potential risk.

4.2 Foraging / Commuting Habitat Loss

No significant impacts regarding foraging or commuting habitat loss are envisaged to arise. No foraging / commuting habitat of major importance was identified and the habitat in the study area is already considerably fragmented, particularly due to the presence of the existing N24. Bat activity was considered to be low over the survey and of low density. Leisler's bats were the most frequently recorded and are a species that flies high over open landscapes, i.e. does not require linear features for commuting. The habitats affected by the realignment are not considered to be of significant importance to bats in the study area; hedgerows are low and well maintained. As noted the bat suitability decreases moving away from the River Suir Estuary; and the proposed new road realignment will be situated further north, i.e. further away from the River Suir, it will not have a significant adverse impact on the bat landscape. The existing N24 is already a barrier to bats moving from the more suitable River Suir Estuary area. Therefore, by moving traffic further away from the estuary the proposed development would not be causing any more significant fragmentation to the already fragmented landscape.

4.3 Disturbance

During construction there may be some disturbance if a small number of bats happen to be present in some of the trees that may be felled. If bats are present in the buildings adjacent noted as having potential for bats, they may be disturbed by the adjacent works. Although again, no signs of bats were identified and it is considered unlikely for bats to be present. Mitigation can be easily provided to reduce disturbance risks and ensure that precautions are taken with any tree felling works. In terms of the operational stage of the scheme, disturbance is already present in the area due to the existing N24 so impacts will not be significant. Suitable landscaping will also buffer potential disturbance from traffic during the operational phase of the proposed road scheme.

4.4 Lighting

During the current survey it was noted that the site itself is mainly dark, with no significant lighting or light spill recorded. The only light spill along the road is minor, consisting of low levels of light spill from the adjoining houses along some sections of the road. If significant lighting is proposed along the proposed road improvement scheme, this could lead to lighting impacts on bats. Artificial lighting can displace bats from areas and can also attract them to feed on insects around lights which may increase the risk of collision with traffic. Again, bat activity was generally low throughout the survey and only low densities of common species were recorded. These species are not considered to be particularly



sensitive to lighting so impacts are unlikely to be significant. Nonetheless, lighting can be easily reduced to minimise impacts on bats.

4.5 Collision

As the proposed development is for a road improvement scheme, there is a risk of collision with bat species during dark hours. However, this is not considered to have the potential to be significant. The current survey demonstrated that the proposed development site is used by low densities of common species and activity was found to be generally low. Leisler's bat were the most common species recorded, and are a bat that typically flies high over open landscapes, and therefore would not be considered to be at any particular risk of collision. Soprano pipistrelles and Common pipistrelles are also small and agile bats, which are generally not considered to be of a high risk relating to collisions with vehicles. Nonetheless, these species were recorded in low densities on the site. It must also be noted that the N24 is already an existing road, so the proposed development does not have the potential to add significantly to the current collision risk of the existing situation on the site.

5. MITIGATION

Mitigation provided for the proposed road scheme is informed by the NRA *'Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes'* (NRA, 2006a) and *'Guidelines for the Treatment of Bats during Construction of National Road Schemes'* (NRA, 2006b).

5.1 Tree Felling and Site Clearance

Although there is a low risk of impacts on bats associated with the proposed development, measures can be taken to reduce any possible risk to bats due to tree-felling to a negligible level. It is recommended that the proposed tree-felling follows the tree-felling procedures outlined in the NRA (2006) *'Guidelines for the Treatment of Bats during Construction of National Road Schemes'*.

According to NRA guidelines, features identified as having bat roost potential should also undergo a close-up re-inspection immediately prior to the commencing of felling / removal. This will include the mature trees that are required to be felled for the realignment scheme. Inspections of these mature trees will be carried out by a suitably qualified bat ecologist. If no indications of bat presence are found, removal can commence. If bats are found, works may not commence and NPWS will have to be contacted.

If bats are found, a derogation licence will likely then be required. This derogation licence is required under Regulation 25 of the European Communities (Natural Habitats) Regulations 1997 and will have to be obtained from the *National Parks and Wildlife Service* in advance of any works. Disturbance of a known bat roost is a notifiable action under current national and European legislation.

Tree removal shall take place in the period from late August to late October / early November. During this time all bats (young and old) are capable of flight and are not yet in hibernation, therefore would be capable of escaping. Warning must be given to any tree-roosting bats prior to felling which is done by nudging the tree two to three times, with a pause of approximately 30 seconds between nudges, to warn bats that may be present and encourage them to become active and escape. The guidelines highlight that the rate of fall of cut trees should not be accelerated by the use of chain and vehicle. This would cause a heavy impact which any occupying bat would not survive. Also, as a precaution, knocked / cut trees shall be left for a period of 24hrs or overnight before they are sawn up or mulched to ensure bats that could have been present have escaped.



As it is likely that some of the mature trees on the site will be used by birds for nesting, any site clearance works shall take place outside the bird nesting season, from the 1st of March to the 31st of August inclusive.

5.2 Landscaping

Landscaping shall be included in the works on the proposed road improvement scheme. Planting of native trees and hedgerows along the boundaries of the proposed scheme will be of benefit to bats in the local area, by enhancing the commuting and foraging habitat. Linear planting of native vegetation directing bats along commuting routes outside and away from the proposed road scheme will not only reduce the potential for causing harm due to collision of bats with traffic if flying across the proposed road, but will also act as a buffer for the disturbance from the road in terms of noise and light produced by the traffic and / or any street lighting.

Some sections of existing hedgerows in the surrounds of the proposed road scheme, along field boundaries and local lanes etc., may also be reinforced with planting of a native mix to enhance these features for bat commuting in the area.

5.3 Lighting

LED lighting is proposed for the improvement scheme extending from Mooncoin out to Store Road, a distance of c. 1.3km. Additional lighting shall follow Bat Conservation Ireland's *Bats & Lighting: Guidance Notes for Planners, Engineers, Architects and Developers* (2010). Light spill shall be minimised by using shields, masking or louvres. Light columns shall be kept as low as possible, with low height bollards preferred. Some light restrictions may be considered during dark hours, especially during the summer months when bats are active. Motion sensor lights may also be considered.

6. CONCLUSIONS

The bat survey undertaken at the proposed development site, as well as the desk study research and habitat assessment, concludes that the site is not of any particular importance to bats, and is used mostly by common species, with low densities and activity recorded. Species recorded include Leisler's bat, Soprano pipistrelle and Common pipistrelle. The most common species recorded on the site was Leisler's bat, which is well suited to the study area.

In general, the habitats on the proposed development site are agricultural habitats that are well maintained. Hedgerows and treelines are present here delineating field boundaries, but are not overgrown and are considered to be low in height. These linear features in the landscape are not considered to be of high quality when considering potential foraging or commuting routes. These habitats are considered to be suboptimal at best, with considerable fragmentation present as well with the existing N24 road nearby. There are no areas of ancient woodland, large rivers or lakes or other optimal bat habitat in the study area. Habitat connectivity was assessed as being relatively low. Two buildings adjacent to the road were found to show some potential for bats in terms of suitable entry / exit points, but no evidence of use was found and these buildings will not be directly affected by the proposed development. A small number of trees and mature hedgerows along field boundaries in the proposed works area have some bat potential if considered independently from the surrounding environment. However, bats rely on habitat connectivity to commute safely from roost sites to suitable foraging areas. Due to the fact that any potential bat roost habitat present in the proposed works area



is fragmented by the existing N24 road and maintained agricultural fields with low cut hedgerows, the area is not favourable for bat use. The car based monitoring survey also correlates with these findings.

Nonetheless, there is some potential for minor impacts in the absence of any mitigation. Impacts were identified in relation to potential roost habitat loss, if small numbers do use some of the mature trees on the site, minor loss of foraging / commuting habitat, disturbance, lighting and collision impacts, none of which were found to be significant. Some best practice mitigation is therefore considered to be sufficient to avoid impacts on bats in the local area; relevant mitigation measures have been outlined. The mitigation includes following the NRA guidelines in relation to tree felling and site clearance, including an inspection of mature trees by a suitably qualified ecologist prior to works commencing. If bats are found, a derogation licence will be required for the felling of trees. If bats are not found, felling may commence following the guidelines. Mitigation is also provided for landscaping, to improve connectivity away from the road, including using native species. Furthermore, measures are included to reduce lighting impacts, if lighting is included in the proposal for the road realignment.

Overall, no significant impacts on bats are envisaged, and following the implementation of best practise mitigation, residual impacts on bats would be imperceptible negative. It is therefore concluded that the N24 Carrick Road Improvement Scheme can be successfully completed without significant impacts on bats provided mitigation is followed.



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PLATES



Plate 1 Area of heavy bramble growth alongside the existing N24. Landscaping around the boundary of existing N24 is not bat-friendly with many areas with an absence of suitably high hedgerows and treelines.



Plate 2 Mature trees at along proposed road scheme; no crevices or heavy ivy suitable for bat roosting.



Plate 3 The bridge on the existing N24 over Skelpstown 16 stream is very low and does not have potential for bats.



Plate 4 A mature tree with some roosting potential due to ivy cover but unlikely to be used by bats due to proximity to the existing N24 and the associated disturbance.



Plate 5 Farm lane off the N24 with some bat commuting / foraging potential due to mature hedgerows and trees, located on the south side near the Skelpstown 16 stream. Trees are relatively thin and not considered to provide ideal gaps / crevices for roosting. Bat activity was low here during the night-time survey.



Plate 6 Building on the south side of the existing N24 with some bat potential with heavy ivy growth and gaps and holes around roof tiles. No activity was recorded here during the night-time survey. This building will not be affected by the proposed development.



Plate 7 Building located on the southern side of the existing N24 with potential for bats. Agricultural land opposite this building on the north side where the proposed road realignment will be is unsuitable for bats. This building will not be affected by the proposed scheme.



Plate 8 Any sections with mature trees and hedgerows are fragmented by low cut vegetation boundaries on well-maintained farmland limiting habitat connectivity and contributing to the overall lack of suitability for bats in the study area.



Plate 9 Most of hedgerows through which the proposed realignment will be positioned, are low, well-maintained pasture field boundaries that are not suitable for bat roosting or connectivity.