An Bord Pleanála Oral Hearing

Córas Iompair Éireann/Iarnród Éireann

Dublin to Cork Railway Line Level Crossings

Brief of Evidence

Biodiversity

Dr Susie Coyle

Cork Line Level Crossings Oral Hearing
Brief of Evidence of Dr Susie Coyle
Biodiversity

1. QUALIFICATIONS AND ROLE IN THE PROPOSED PROJECT

1 My name is Susie Coyle. I am an Associate Director in Jacobs. I hold a Bachelor of Science (Hons) degree in Aquatic Bioscience from the University of Glasgow (2001) and a Doctor of Philosophy degree in the inheritance of body armour and risk taking behaviour in a freshwater fish from the University of Glasgow (2007). I am a Chartered Biologist with the Royal Society of Biology (since 2014). I am a full member of the Chartered Institute of Ecology and Environmental Management (since 2014) and a member of the Institute of Fisheries Management (since 2007). I have been a committee member for the Chartered Institute of Ecology and Environmental Management Irish Branch since 2019.

2 In accordance with Section 39(1)(a) of the Transport (Railway Infrastructure) Act 2001 as amended and substituted (including by SI 743 of 2021), I confirm that I have 15 years' consultancy experience managing ecological survey and assessment contracts as part of Environmental Impact Assessment Directive and Habitats Directive assessment processes. One of my primary roles is drafting, checking and reviewing Preliminary Impact Appraisal Reports, Environmental Impact Assessment Reports, Appropriate Assessment Screening Reports and Natura Impact Statements. I also coordinate the delivery of all ecological components of projects in Ireland and the UK. I have undertaken ecological surveys for multiple species to inform impact assessment. I have inputted to biodiversity chapters of Environmental Impact Assessment Reports, Appropriate Assessment Screening Reports and Natura Impact Statements for a range of projects. I have extensive field survey skills and technical knowledge and have held several personal licenses for freshwater pearl mussel and great crested newt. I am or have been a named agent on protected species licences for bats, kingfisher, badger, otter and red squirrel. Together with the other Assessments which comprise the Environmental Impact Assessment Report, this Statement reflects the assessment prepared in chapters [7, 8 and 13] which comprise part of the assessments which comprise the environmental impact assessment report for this Railway Order Application and which inter alia contains:-

i. A description of the proposed railway works comprising information on the site, design, size and other relevant features of the proposed works;

ii. A description of the likely significant effects of the proposed railway works on the environment;

iii. The data required to identify and assess the main effects which the proposed railway works are likely to have on the environment;

iv. A description of any features of the proposed railway works, and of any measures envisaged to avoid, prevent or reduce and, if possible, offset likely significant effects on the environment;

v. A description of the reasonable alternatives studied by CIÉ which are relevant to the proposed railway works and their specific characteristics and an indication of the main reasons for the option chosen, taking into account the effects of the railway works on the environment; and

vi. A summary in non-technical language of the above information.

3 I can confirm that, consistent with the other chapters of the EIAR, Chapter 7 dealing with biodiversity effects takes into account the available results of other relevant assessments, under European Union or national legislation with a view to avoiding duplication of assessments

4 I have been involved in the Project since 2019 and have advised Iarnród Éireann on biodiversity constraints since the Preliminary Design stage of the Project which considered alternative options for the proposed access routes at each level crossing location. I have carried out field surveys for the proposed Project

and my involvement culminated in the collation and preparation of the biodiversity Chapter (Chapter 7) in Volume 3 of the EIAR which was submitted to An Bord Pleanála in April 2021.

5 The EIAR was prepared with the benefit of inputs from a number of biodiversity specialists, including Corey Cannon, Anthony Robb and Dr Peter Gilchrist.

6 I confirm that this statement of evidence addresses the potential impacts on biodiversity in the context of the Environmental Impact Assessment [EIA] to be carried out by An Bord Pleanála in respect of the Project.

7 This Statement, which An Bord Pleanála considers as part of the carrying out of its environmental impact assessment, has been prepared in accordance with the Transport (Railway Infrastructure) Act 2001, as amended, including as amended by the European Union (Railway Orders) (Environmental Impact Assessment (Amendment) Regulations 2021) S.I. No. 743/21. Additionally, the EIAR has been prepared in accordance with Directive No. 2011/92/EU of the European Parliament and of the Council on 13th December 2011; on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16th April 2014 and in in accordance with inter alia Section 39(1) and (2) of the Transport (Railway Infrastructure Act) 2001, as amended and substituted.

2. SUBMISSIONS/OBJECTIONS RECEIVED AND RESPONSES

8 Eleven submissions were received, and the main areas of concern raised in submissions related to the loss of vegetation negatively impacting on protected species, impacts on bats in particular, otter and aquatic species, the loss of Annex I habitat and potential impacts to European sites.

9 Through the implementation of well-established approaches to mitigation, including specific mitigation at a number of locations, and in accordance with best practice guidance, the proposed Project will have no residual significant effects.

10 The following is a response to the specific submissions made.

XC212

Submission: Michael O Kelly and the Diocese of Cloyne (2021 submission and 2022 addendum)-various reg lands raised the issue of impacts to bats.

11 The large scale removal of trees and hedgerows would negatively impact bats. There would be impact to a long established and large maternity bat colony in the parochial house that was not mentioned in the EIAR.

Response

12 During the desk based review there were no records of bat roosts within 5km of the proposed crossing; the closest bat roosts records from Bat Conservation Ireland were over 6km from the proposed crossing. No information on bat roosts was highlighted during the consultation process.

13 Field surveys assessed the area for bat roost potential. One tree and one building was assessed as requiring further survey. No roosts were recorded in the building or tree with roost potential or in nearby trees during dawn/dusk surveys near Beechwood Drive on the L1533 road. The trees themselves are not protected and activity surveys of bats along this tree line did not record high levels of activity which is well lit by street lighting.

14 Where vegetation is lost this will be reinstated. Page 67 in the EIAR Biodiversity chapter states the following - Areas of existing vegetation will be retained and enhanced insofar as possible. Hedgerows will be retained or reinstated where possible. Where hedgerows will need to be removed to facilitate the footprint of the proposed Project, these will be replaced with areas of planting throughout the site. Mitigation measures for the loss of habitat at Newtown and Ballycoskery, replacement with three semi-mature tree planting within the treeline along Beechwood Drive and planting of native scrub and trees, are incorporated into the landscape plan (see Volume 3, Chapter 13: Landscape and Visual). Plant species will be selected to complement the existing broadleaf hedgerow species mix around the site and will be native species replaced on a like for like basis. Any residual space between the landscape measures will be planted with a wild grass seeding mix to reflect the local vegetation.

15 All bat species are protected under national legislation through the Wildlife Act 1976. All bat species are also protected under the Habitats Directive. The parochial house building itself, and in turn the roost, is not being directly affected by the proposed Project and as such was not subject to survey. Trees and hedgerows immediately surrounding the parochial house and to the north, will be retained ensuring existing foraging and commuting habitat for bats will remain unchanged. As noted above, the trees along the L1533 road from Beechwood Drive were surveyed as these will be directly impacted and bats were recorded in low numbers. Species recorded were common and soprano pipistrelles and Leislers bat. Street lighting was present along this road and this may be contributing the low numbers of bats recorded. Loss of trees and hedgerows will be mitigated through replanting.

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XC212

Submission: Bernadette Leahy, David and Geraldine McNamara, Margaret McNamara, Michael O Kelly, Trustees of The Diocese of Cloyne (2021 submission and 2022 addendum) -various reg lands, Noel Hanleys raised the issue of Annex I habitat loss.

16 There is an Annex I area of Hydrologous [sic] habitat very close to the Ballycoskery gates. From reading of CIE's report, it seems that the proposed bridge at Ballycoskery has been designed with little or no consideration of alternative options that would have a lesser impact on the environment or none at all.

17 The loss of an area of Annex I habitat was raised several times along with the proposed translocation being without foundation or precedence. It was also noted that there is no professional literature on the translocation of an entire portion of this kind of habitat. Also noted was that the proposed receptor area for the translocated does not currently contain any signs of the constituent flora for a number 6430 habitat. Concern was raised that the proposed mitigation strategy would not be successful, that there was no hydrology report and translocated turves placed in the proposed receptor area, is likely to perish. A comment was also made on the professional persons qualifications. Lack of references to established sources and to current literature was also noted.

Response

18 Tall Herb Swamps (FS2), including the Annex I habitat (6430) Hydrophilous tall herb swap communities that was recorded at Ballycoskery was associated with a wet ditch at the base of the existing railway embankment and covered an area of approximately 200m2. The habitat corresponding to Hydrophilous tall herb that was identified at Ballycoskery is not associated with any SAC in the area. An area of 40m2 will be lost under the footprint of the proposed Project.

19 The wetness of the Annex I habitat site is artificially enhanced due to the presence of the railway embankment which creates a physical barrier at this location to both runoff (topographical obstacle) and shallow sub-surface flows (compacted ground). The key condition for the development of this habitat is the lack of regular biomass removal. The narrow strip of Annex 1 habitat is fenced preventing animal access.

20 The appropriate response/mitigation is a like for like replacement of this habitat on lands to create conditions which will allow for the establishment of this habitat.

21 Guidelines for the restoration, maintenance and/or management of Hydrophilous Tall Herb are available. Chapter 16 of Protected Habitat Management Guidelines For Latvia which can be found at the following website - https://www.daba.gov.lv/lv/media/8469/download. If local conditions within the habitat creations are the same: fertility (including phosphorus and nitrogen content), pH is similar, soil moisture is similar, and water flow or occasional waterlogging is similar to that within the site that is going to be lost such site will be assumed as suitable for habitat creation. Habitat creation should include translocation of turves from the donor site – with perennials being the most important part of this. It is possible to collect the seed of season and reseed any gaps after stratifying the seedbank. In addition to that, the site should be safeguarded from grazing, and additional nutrient influx.

22 The Mitigation Strategy provided three options that could be taken forward depending on prevailing conditions, as follows. These were a) fencing off the receptor site and allow the site to self-generate, b) fencing off the receptor site and enhance through seeding from the existing seed bank and c) translocate all vegetation and turves (including seed bank) from the donor site. Since the swale at the receptor site location will be designed to replicate the ground conditions at the donor site, the agreed option for the loss of the Annex I habitat is habitat translocation. My colleague will provide further information on swale design.

23 The Mitigation Strategy was sent to the National Parks and Wildlife Services for comment. No amendments were required.

24 As noted in the EIAR with the proposed mitigation measures as outlined in Section 7.7.2 the predicted impacts will be 'not significant' in terms of residual impacts.

25 All ecologists involved in field surveys and/or production of associated reports i.e. Chapter 7 Biodiversity of the EIAR for the proposed Project are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) who can demonstrate competency in the relevant areas.

26 A full list of references is provided in Volume 3, Chapter 3 Biodiversity of the EIAR.

XC212

Submission: Trustees of The Diocese of Cloyne (2021 submission and 2022 addendum) -various reg lands

27 The EIAR also acknowledges that, during construction, there is a risk of release of contaminated surface water runoff and sediments into the River Blackwater SAC which would be likely to result in a significant effect on this European site at a local to county geographical scale. While there is a hydrological link to the Freshwater Pearl Mussel colonies in the SAC, the EIAR concludes that any pollution events due to the works would be likely to dissipate long before reaching the freshwater pearly mussel population downstream.

Response

28 As presented in Section 7.6.5 of EIAR Biodiversity chapter 'Freshwater Pearl Mussel is known to occur within the Blackwater (Cork/Waterford) SAC. There will be no discharges of contaminated water with mitigation in place as presented in Section 7.7.1 of the EIAR and no potential effects from a pollution event are predicted. Mitigation measures to protect Freshwater Pearl Mussel are presented in Section 5.3.8 of the Natura Impact Statement the conclusion of which was that with the implementation of mitigation measures the Conservation Objectives for the SAC would not be adversely affected.

XC219

Submission: Cork County Council

29 There is a significant embankments/retaining walls involved in the engineering of these works, but appropriate planting can screen/break up this feature, and choice of native species and pollinator friendly planting plans can be addressed by condition for visual amenity and biodiversity gain.

Response

30 Chapter 7, Section 7.7.2: Mitigation measures for the loss of habitat at Buttevant, planting of native scrub and trees will be incorporated into the landscape plan (see Volume 3, Chapter 13: Landscape and Visual). Plant species will be selected to complement the existing broadleaf hedgerow species mix and trees around the site and will be native species replaced on a like for like basis. Any residual space between the landscape measures will be planted with a wild grass seeding mix to reflect the local vegetation.

XC219

Submission: Cork County Council Ecology/Heritage

31 There will be permanent loss of available foraging habitat and hedgerows/treelines and is predicted to have significant impacts for commuting bats and breeding birds. Where hedgerows will need to be removed to facilitate the footprint of the proposed Project, these will be replaced with areas of additional planting throughout the site. Having regard to the loss of trees and hedgerows on-site, it is recommended that there will be a 'no net loss of trees and hedgerows on-site.'

Response

32 Chapter 7, Section 7.7.2: Mitigation measures for the loss of habitat at Buttevant, planting of native scrub and trees will be incorporated into the landscape plan and will be the equivalent of what will be lost throughout the proposed Project (see Volume 3, Chapter 13: Landscape and Visual). Plant species will be selected to complement the existing broadleaf hedgerow species mix around the site and will be native species replaced on a like for like basis. Any residual space between the landscape measures will be planted with a wild grass seeding mix to reflect the local vegetation.

XC219

Submission: Cork County Council

33 An area of High Conservation Value corresponding to Annex I habitat 'Lowland Hay meadows' will be lost. This habitat type is important for pollinators and supports a number of invertebrate species including a population of the red-tailed bumblebee (Bombus lapidarius) as species which has near threatened conservation status in Ireland. Details on the method for translocating the area of dry meadows and grassy verges (GS2), including the habitat corresponding to Annex I habitat (6510) Lowland hay meadows, which would be lost under the footprint of the proposed Project. The extent of the receptor site will be greater than a like for like area to include an area that will be enhanced for invertebrates, reptiles and birds. Proposals for translocation of Annex I habitat is noted and should be carried out in consultation with NPWS and in accordance with detailed construction method statements.

Response

34 Noted. There will be a loss of 300m2 of Lowland Hay Meadows and this will be replaced with an equivalent area by translocation in the manner as suggested by Cork County Council and as set out in the Mitigation Strategy. NPWS will continue to be engaged during detailed design and construction. As noted in the EIAR, the area of habitat that would be lost under the footprint would be 300m2 of the existing 340m2 area. The extent of the receptor site will be greater than a like for like area, to include an area that will be enhanced for invertebrates, reptiles and birds.

XC219

Submission: Cork County Council and Colm Moore

35 A box culvert could be considered the least desirable type of water crossing from an ecological perspective. EIAR notes the presence of otters, and potential for lampreys and white clay [Sic] crayfish. These culverts should be redesigned to protect and enhance local biodiversity via arched culverts with mammal ledges as per National Road Authority Guidelines for the Crossing of Watercourse During Construction of National Road Schemes.

36 The issue of wildlife passage has also been raised.

Response

37 Consultation was undertaken with Inland Fisheries Ireland (IFI) who considered that a box culvert crossing of sufficient dimension would be appropriate at the location. Also noting that given the general topography of the location and its proximity to the main Awbeg floodplain calculations on culvert dimension will be very much "flood" driven and that the relevant culvert size will adequately allow for fish passage.

Submission: Cork County Council

38 As works at this crossing is arguably at risk of the most significant potential effects on water quality during construction works adjacent to and in-stream (Pepperhill stream), and as such, necessary works should be restricted to specified period outside of fishery sensitive months and ecological perspective.

Response

39 Consultation was undertaken with IFI on the proposed mitigation measures formulated by our specialists to protect Pepperhill Stream. It was confirmed that best practice for pollution control will be followed, and there will be an Ecological Clerk of Works on site during in-stream works and fish passage during culverting would be maintained. Inland Fisheries Ireland was satisfied that all appropriate measures during the construction phase had been considered and included in the assessment. In-stream works will be carried out between July and September inclusive where the works location overlaps salmonid spawning habitat or where similar habitat is situated close to the works footprint as agreed with IFI.

XC219

Submission: Cork County Council and Colm Moore

40 In recognition of the presence of otters, and potential for lampreys and white clay crayfish, the proposed culverts should be redesigned to protect and enhance local biodiversity via arched culverts with mammal ledges as per National Road Authority Guidelines for the Crossing of Watercourse During Construction of National Road Schemes.

41 Provide wildlife passes under the railway and each new road and at bridges and culverts.

Response

42 Consultation was undertaken with Inland Fisheries Ireland (IFI) who considered that a box culvert crossing of sufficient dimension would be appropriate at the location. Also noting that given the general topography of the location and its proximity to the main Awbeg floodplain calculations on culvert dimension will be very much "flood" driven and that the relevant culvert size will adequately allow for fish passage. The current design does not include a mammal ledge.

Generic

Submission: Comment No1

43 Include conditions relating to the continued protection of the natural heritage of the area, with particular regard to the Blackwater River (Cork/Waterford) Special Area of Conservation, and the Kilcolman Bog Special Protection Area and specify full and strict adherence to the proposed mitigation as set out in the submitted Natura Impact Statement and shall be incorporated into the Construction Environmental Management Plan and all related project management plans and method statements.

Response

44 Noted. Mitigation measures as set out in the EIAR and NIS will be incorporated into the final Construction Environmental Management Plan and all relevant documents and will be adhered to in full. With full implementation of all mitigation measure there is no impact on the SAC or the SPA.

4. CONCLUSION

45 In relation to the issues raised in submissions and observations, 11 submissions were made. A number raised concerns about the potential effects upon terrestrial and freshwater aquatic biodiversity features as a result of the project. The concerns raised are specific in some cases but general in nature in others and relate to issues such as:

- Impacts that the project will have on local wildlife and its habitats;
- Pollution of the surface waters crossed by the project;
- Impacts from the loss of Annex I habitat outside of an SAC; and
- Designated sites (European sites and their qualifying interests).

46 Irish Rail's response to these general issues may be summarised as follows:

- Sections 7.4, 7.5 and 7.6 of the EIAR identify and evaluate the likely significant construction and operational phase effects of the project on biodiversity. Section 7.7 details the measures required to mitigate potential impacts.
- Appendix 7G of the EIAR sets out the mitigation strategies to avoid impacts to protected species and habitats including Annex I habitats.
- Data collected and analysed in the NIS confirms to the standard required in the Habitats Directive that on the basis of the best scientific information that the project will have no adverse effects on the conservation objectives of any European site. The conclusion of both the EIAR and the NIS is that the proposed Project with have no significant adverse effects on the receiving environment or in respect of biodiversity in general.

47 Section 7.8 of the EIAR concludes that in "*Through the implementation of well-established approaches to mitigation, which will be implemented in accordance with best practice guidance, it will be possible to reduce the impacts to at least not significant for the KERs.*"

48 I and my team in this Brief of Evidence, in response to the submissions made, as Irish Rails specialists on biodiversity have considered and assessed the potential impacts. Following this review, I have concluded that all such impacts were identified and that by incorporation of the mitigation measures outlined in the documentation the issues raised in by respondents can be appropriately addressed.

APPENDIX 1: Mitigation Strategy

MITIGATION STRATEGY

PURPOSE OF DOCUMENT

This document is intended to inform discussion of mitigation strategies required to avoid impacts to protected species and habitats from the Cork Line Level Crossings Project. This includes the proposed translocation of habitats corresponding to Annex I habitat identified at two locations. The document presents information on the location, value, extent and potential mitigation for the loss of these habitats. The proposed receptor sites are identified and a draft method for translocation provided. With implementation of this mitigation there should be no residual impacts from the loss of these habitats. This document also presents mitigation measures for aquatic species, bird, amphibians and reptiles; providing details on protective measures for white-clawed crayfish and fish, habitat enhancement and installation of bird boxes including the proposed mitigation locations.

INTRODUCTION

Baseline surveys undertaken in July 2019 for the Cork Rail line project identified habitats with potential links to Annex I types at two locations; Ballycoskery and Buttevant (see **Figure 1**). These areas were not part of any Special Area of Conservation. A species list was generated for each site as per the Project scope and is provided below. A site condition assessment was not carried out however the number of positive and negative species indicators was identified during the desk based review and is detailed for each habitat type. This document sets out a preliminary method for translocating these two areas of habitat which will be permanently lost under the footprint of new roads that will facilitate level crossing closures.

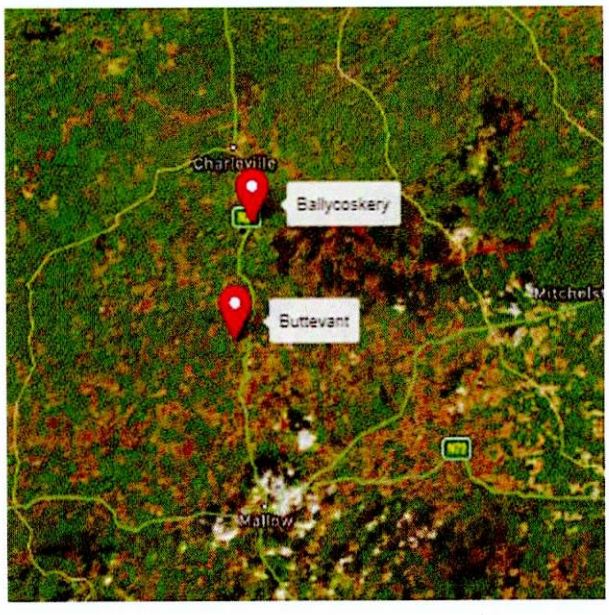

Figure 1: Two locations of habitat corresponding to Annex I types.

BASELINE

BALLYCOSKERY

<u>Tall Herb Swamps (FS2), including the Annex I habitat (6430) Hydrophilous tall herb swap communities</u>

This habitat was rare within the study area only being recorded at one location, namely Ballycoskery. This strip of tall herb swamp habitat was associated with a wet ditch at the base of the existing railway embankment and covered an area of approximately 60m x 3m or around 200m^2 (**Photograph 1**). Tall-herb swamps are comparatively species-rich stands of herbaceous vegetation that often occur in wet areas where the water table is above the ground surface. However, this habitat is not necessarily wet all year round; the key condition for the development of this habitat is the lack of regular biomass removal.

Photograph 1: Tall herb swamp (FS2) links with with EU HD Annex I habitat 6430 Hydrophilous tall herb.

This habitat supported a variety of species and was dominated by tall herbs such as yellow iris (*Iris pseudacorus*), meadowsweet (*Filipendula ulmaria*), wild angelica (*Angelica sylvestris*) and great willowherb (*Epilobium hirsutum*) while other smaller vascular plants were recorded including water mint (*Mentha aquatica*), water forget-me-not (*Myosotis scorpioides*) marsh bedstraw (*Galium palustre*), hoary willowherb (*Epilobium parviflorum*), hemlock water-dropwort (*Oenanthe crocata*) and greater bird's-foot-trefoil (*Lotus pedunculatus*). Common spotted orchid (*Dactylorhiza fuchsia*) was rare within the sward while grasses and sedges were also present in lower densities including reed canary grass (*Phalaris arundinacea*), soft-rush (*Juncus effuses*) and sharp-flowered rush (*Juncus acutiflorus*).

Species data collected from this habitat inputted into ERICA (Perrin *et al.*, 2018) showed that this habitat is closely linked to the IVC community FW3F Meadowsweet – Common Reed tall-herb swamp (*Filipendula ulmaria – Phragmites australis tall-herb swamp*). According to the community synopsis[1] this is a species-rich community compared to other swamp types, being transitional to wet grassland. Examples of this vegetation are likely to correspond with EU HD Annex I habitat 6430 Hydrophilous tall herb.

[1] http://www.biodiversityireland.ie/wordpress/wp-content/uploads/FW3F.pdf *(Accessed December, 2019)*

Although a detailed conservation assessment was not undertaken this habitat type is considered to correspond to the Annex I habitat Hydrophilous tall herb (6430) based on the criteria set out in O'Neill et al. 2013). This habitat supported eight positive indicator species of this Annex I habitat i.e. *Angelica sylvestris, Epilobium hirsutum, Epilobium parviflorum, Filipendula ulmaria, Galium palustre, Iris pseudacorus, Mentha aquatica, Myosotis scorpioides*. One negative indicator species (*Phalaris arundinacea*) was recorded, although in low abundance.

Pressures on the habitat include invasive species; and agricultural intensification and drainage in the lowlands. Based on the latest Article 17 reporting[2] the Overall Status is assessed as Bad with a deteriorating trend. This change in trend since the 2013 report represents a genuine decline due to range contraction and a decline in structure and functions. At Ballycoskery no invasive species were recorded on site during field surveys. If the project were not to progress it is unlikely then that there would be any change to this habitat given its location fenced off from grazing, and topography of the site water draining from the field to the north and from the railway embankment.

This habitat is valued as being of National Importance. It is a habitat of high conservation concern.

BUTTEVANT

Dry meadows and grassy verges (GS2), including the Annex I habitat (6510) Lowland hay meadows

This habitat type was uncommon within the study area mainly associated with unmanaged grass verges dominated by a variety of grasses and forbs. Frequently recorded grasses comprised false oat-grass (*Arrhenatherum elatius*), cock's-foot (*Dactylis glomerata*), sweet vernal-grass (*Anthoxanthum odoratum*) and Yorkshire fog (*Holcus lanatus*). While commonly recorded forbs comprised creeping cinquefoil (*Potentilla reptans*), clovers (*Trifolium* spp.), common knapweed (*Centaurea nigra*), lady's bedstraw (*Galium verum*), yarrow (*Achillea* millefolium), and wild carrot (*Daucus carota*).

This habitat (where it is associated with grassy verges) is valued at Local Importance (High Value) as it is uncommon in the wider area and provides habitat for a range of invertebrate and pollinator species.

This habitat type was also recorded within an abandoned/disused area of land immediately adjacent the railway at Buttevant embankment with an approximately length of 50m and approximately 5m wide and covered an area of around 340m^2 (**Photograph 2**). This area of grassland was relatively species rich supporting a variety of grasses and forbs including common knapweed, wild carrot, bird's-foot trefoil, false oat-grass, ribwort plantain (*Plantago lanceolata),* red and white clover, yarrow (*Achillea millefolium),* sweet vernal grass *(Arrhenatherum elatius),* red fescue *(Festuca rubra),* creeping thistle *(Cirsium arvense),* black medick *(Medicago lupulina),* creeping cinquefoil (*Potentilla reptans*) and ox-eye daisy *(Leucanthemum vulgare).* Pyramidal orchid (*Anacamptis pyramidalis)* was also abundant within this area of grassland (**Photograph 3**). Species data collected from the grassland at this location and inputted into ERICA showed that this habitat is closely linked to the IVC community GL3C Red Fescue – Ribwort Plantain grassland (*Festuca rubra – Plantago lanceolata grassland).* According to the community synopsis[3] it is considered to be a community of medium to high species richness to which belong some swards of two EU HD Annex I habitats, the priority habitat 6210 Orchid-rich calcareous grassland*, on the more base-rich soils, and 6510 Lowland hay meadows. Grasslands of these types are important for pollinators. A number of invertebrate species were recorded within this area of grassland including a population of the red-tailed bumblebee (*Bombus lapidarius*) as species which is has near threatened conservation status in Ireland (NBDC, 2016).

[2] https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol1_Summary_Article17.pdf

[3] http://www.biodiversityireland.ie/wordpress/wp-content/uploads/GL3C-.pdf *(Accessed December 2019)*

Photograph 2: Area of species rich grassland (GS2) at Buttevant.

Photograph 3: Pyramidal orchid was abundant within the grassland at Buttevant.

This habitat type is considered to correspond to the Annex I habitat Lowland Hay meadows (6510) although it is considered to be a degraded example due to lack of management (grazing or mowing). Consequently, it is possible that over time there may be an increase in scrub encroachment into this habitat resulting in the reduction or loss of this habitat type.

This habitat supported three high quality positive indicator species (O'Neill et al., 2013) namely *Leucanthemum vulgare, Lotus corniculatus* and *Anacamptis pyramidalis* (any orchid species present is considered a high-quality indicator) and four positive indicator species including *Centaurea nigra, Daucus carota, Plantago lanceolate* and *Trifolium pratense.* However, three negative indicator species *Arrhenatherum elatius, Cirsium arvense and Trifolium repens* were also recorded although in low abundance. The presence of such species is likely a result of the lack of management at the site.

This habitat is valued as being of County to National Importance. It is a habitat of high conservation concern.

EXTENT OF HABITAT LOSS AND PROPOSED RECEPTOR SITES

The area of permanent FS2 habitat loss at Ballycoskery is approximately 40m^2 of the northern end of the existing 200m^2 strip (existing habitat (approximation) shown in yellow in **Figure 2** below for illustrative purposes only).

At Buttevant the majority of the existing GS2 habitat will be lost and this equates to an area of approximately 300m^2 of the existing 340m^2 area (existing habitat (approximation) shown in yellow in **Figure 3** below for illustrative purposes only).

Suitable areas have been identified as potential receptor sites that are contiguous with the existing habitats and these are identified in **Figures 2** and **3** below. The extent of the receptor site at Ballycoskery is based on a like for like area basis. The receptor site would increase the extent of the existing site westward (running east to west) into the adjacent field to mitigate for the loss of habitat at the northern end.

The extent of the receptor site at Buttevant includes an additional area that will be enhanced for invertebrates and birds. For each proposed location the pre- and post-construction methodology would be as described below.

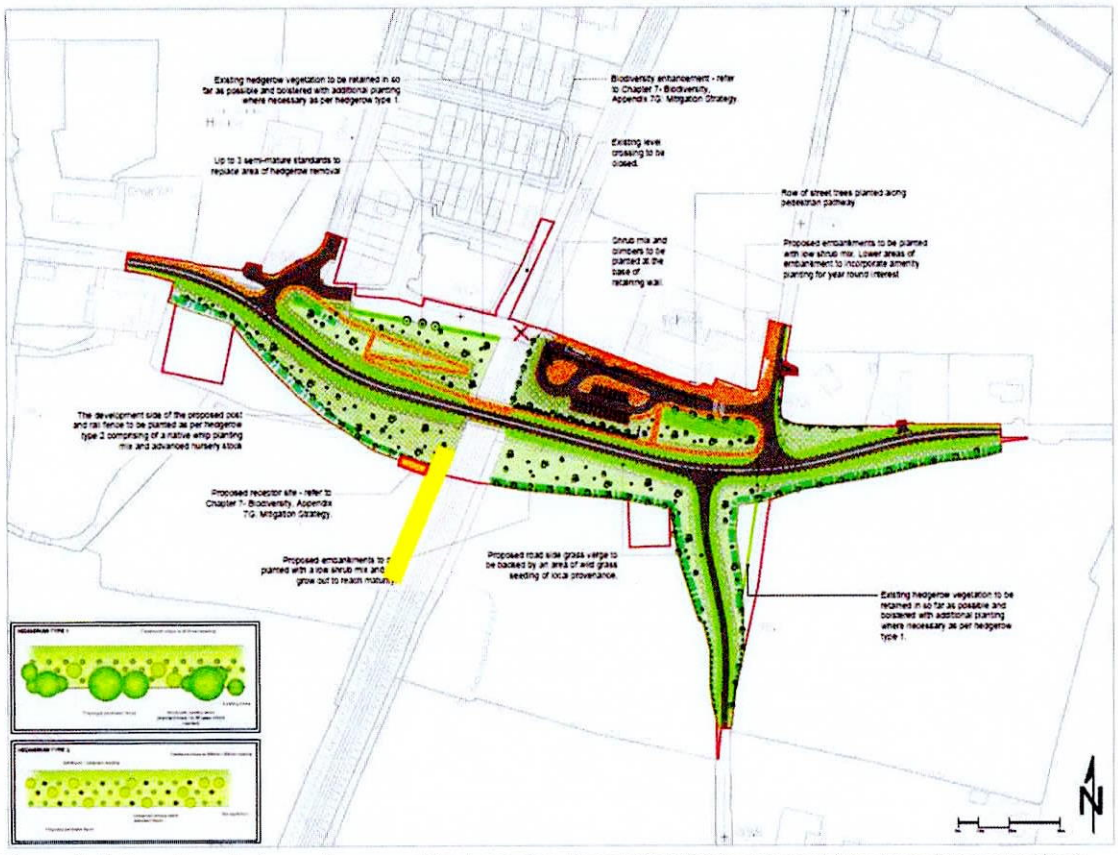

Figure 2: Ballycoskery design and proposed land-scaping. Annex I habitat in yellow and proposed receptor site in orange.

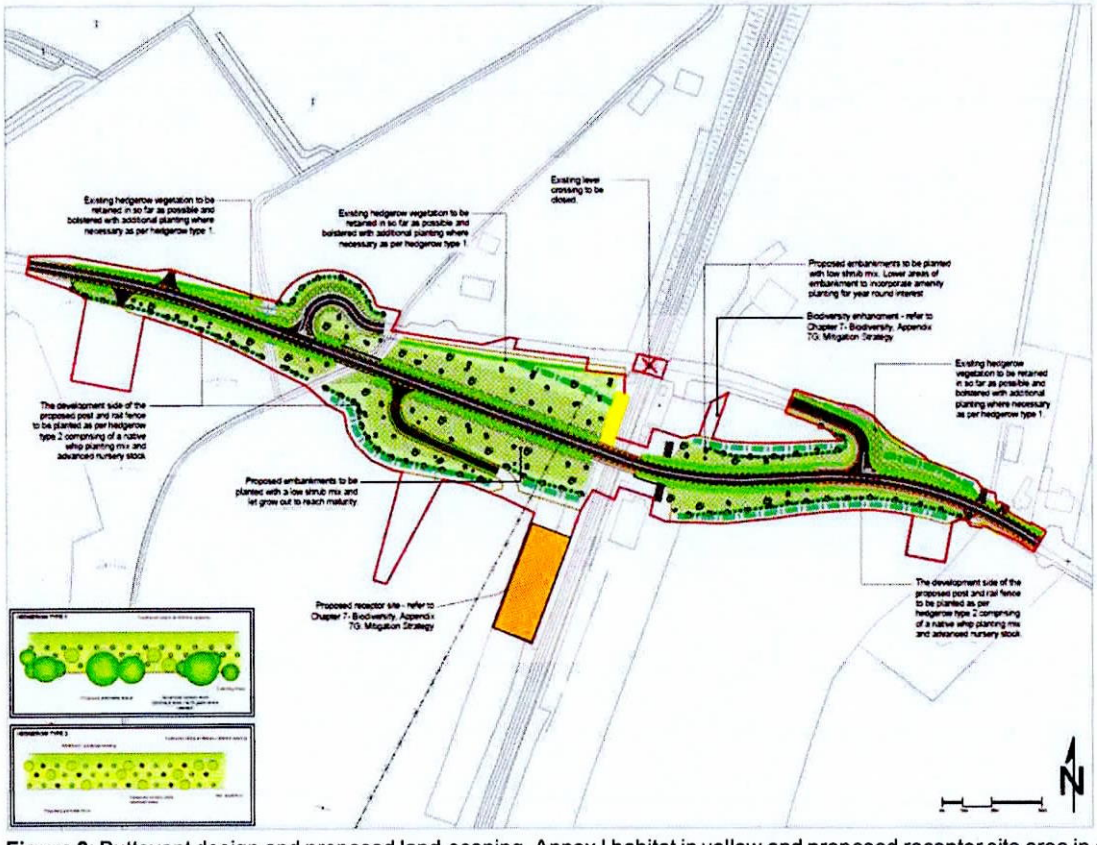

Figure 3: Buttevant design and proposed land-scaping. Annex I habitat in yellow and proposed receptor site area in orange.

PRE-CONSTRUCTION

A detailed site inspection, including condition assessment, at donor and receptor sties will be undertaken. Sites will be surveyed by an experienced botanist in June and the existing habitat mapped in detail. The substrate will be assessed by digging soil pits to determine rooting depth to aid the design of the translocation. Any constraints present at the donor and receptor sites will be identified, e.g. soil testing to identify soil pH along with nitrogen, phosphorus and potassium (NPK) values for the soils. Each site will be assessed for any issues such as nutrient seepage and any issues that may carry implications for further management of this habitat. If a site is determined though the above assessment as being not-suitable as a receptor site, an alternative site will be identified and consultation/agreement with NPWS obtained.

BALLYCOSKERY

At Ballycoskery an assessment by a hydrologist is also required to determine whether conditions at the receptor site would be suitable for habitat translocation. The drainage pattern will be assessed and whether alterations to drains may be required to support translocation at this site. Preparation of receptor site and translocation of turves (seed bank, above ground vegetation and below ground roots) should be undertaken in early autumn when vegetation is dying back and the ground is still dry enough to disturb. Turves will not be removed and stored prior to translocation to increase potential of success.

At Ballycoskery stock fencing will be installed to prevent grazing and poaching by livestock. Where present overhanging vegetation, scrub comprising small bushes and trees, will be trimmed back to reduce leaf litter. Depending on prevailing conditions, including extent of ground water, one of three options can be taken forward:

1. The fenced-off receptor site is left as is and allowed to generate naturally with no interventions. This will be the preferred option if the detailed site inspection results indicate that it is likely to develop into the target habitat without intervention.

2. The receptor site is enhanced through seeding using the existing seed bank at the donor site. This option will be advised by the site inspection and the findings of the botanist, given that seed banks can contain a high percentage of weeds and some target species may not have persistent seed banks.

3. The receptor site is cleared of all vegetation and turves (including seed bank) and replaced with all vegetation and turves (including seed bank) from the donor site.

For option 2 plugs or turves containing seed bank will be removed from the donor site and placed in pre-prepared plots within the receptor site. This will be advised by the findings of the site inspection. For option 3 the entire donor site area will be removed to an appropriate depth, to be determined by detailed site inspection and pre-construction survey, and moved to the cleared receptor site. Under the direction of an experienced Ecological Clerk of Works (EcoW), turves will be laid by hand or with the use of specialist plant on the pre-prepared bare ground and staked-in to prevent movement. Turves will not be translocated when the ground is water-logged or frozen. Translocation of the habitat at Ballcoskery will be completed within one day where possible.

BUTTEVANT

At Buttevant the existing wall between the adjacent field and the receptor site will be retained. An area corresponding to that which will be lost, or greater as directed by the experienced ECoW, will be cleared of dense vegetation using hand-tools. The receiving ground will be prepared by striping back and removing all vegetation to a suitable depth. This activity must be undertaken outside the breeding bird period. Where this is not possible checks for breeding birds will be carried out at within three days of commencement of clearance and by an experienced ornithologist or EcoW. Where nests are present, the ornithologist/EcoW will make a decision as to whether a licence is required for vegetation removal. Alternatively, the ecologist can demarcate a suitable buffer around an active nest and clearance within this area will be postponed until the chicks have fledged. A suitable exclusion zone will be established dependant on the species identified. Areas found not to contain nests must be cleared within three days of the inspection; otherwise repeat inspections will be required. If vegetation is to be cleared in the breeding season (under supervision of an ecologist) it will be chipped, removed or covered (ideally) on the same day to prevent birds from nesting.

The grassland should be mown when the plants become dormant (August/September) and the hay should be retained. Once the ground is prepared at the receptor site turves will be removed by hand or with the use of specialist plant and to an appropriate depth. The hay from the meadow will be scattered over the receptor site. Correct depth of turves and scattering of hay will ensure that the entire seed bank is removed and will reduce the impact to ground-living insects. Turves will not be removed when the ground is frozen or water-logged. Mowing, preparation of the receptor site and translocation of the grassland will be completed within three days where possible.

POST-CONSTRUCTION

Receptor sites will be monitored for a period of three years. Corrective measures such as vegetation trimming or annual mowing may be required to maintain conditions at receptor sites. At Buttevant the receptor site is currently dominated by scrub which will need to be managed for the translocation to succeed. Management should include the removal of scrub species fully through clearance of scrub to ground level and maintenance of scrub at this level. This site should be mowed yearly initially, and every second year once it has established and its condition has been assessed as good.

OTHER MITIGATION MEASURES

Aquatic species

To protect aquatic species, white-clawed crayfish and fish, specific mitigation measures as follow will be implemented at Buttevant:

- where culverts are to be installed the area will be dewatered to provide a dry working area. The Pepperhill River and the ditch at Buttevant will have culverts installed in succession so that flows can be maintained downstream during installation;

- netting, sandbags and/or dumpy-bags filled with rock will be installed upstream to prevent fish travelling downstream into the working area;

- fish will be removed from the working area through electrofishing and moved upstream of the dammed area;
- hand searches will be conducted by the licenced ECoW and any crayfish found will be removed and moved upstream of the dammed area;
- water will then be over pumped continually to ensure a dry working area. This must be pumped through a silt buster or onto the field to avoid sediment from becoming suspended within the watercourse; and
- once construction is completed the watercourse will be re-wetted under the direction of the EcoW. Water will be released slowly and silt mats, sediment traps and haybales will be used to avoid a sudden influx of sediment to the system. A silt buster will be used where required.

Breeding birds

To mitigate for loss of nesting habitat trees, hedgerows and scrub will be incorporated into the landscape plan at Thomastown, Newtown and Ballycoskery, Shinanagh and Buttevant. This will ensure that there are no residual effects from the operational phase of the project. Nest boxes will also be provided to compensate for passerine habitat loss. In total, twenty-eight nest boxes to accommodate different species will be provided and these will be erected under supervision of a suitably qualified ecologist at appropriate locations. Suitable nest box locations have been proposed taking the following into consideration;

- Some of the bird boxes are designed for trees while others are designed for lower scrubby areas in order to target different species. Therefore, both trees and scrub areas have been proposed for installing nest boxes.
- There may be potential for boxes to be installed on Irish Rail properties however this should be avoided where swallows or house martins are already nesting as these species are territorial and will chase other birds away. Additionally, any boxes on buildings should be at a sufficient height, away from disturbance and unable to be accessed by predators from above or below. In general boxes should be placed on trees or in scrub as several species will not nest unless the box is within vegetation.
- Bird boxes should be placed on mature trees as they are approximately 15cm wide and may not be accommodated by all semi-mature trees.
- Birds boxes on poles would need to be between 3m and 5m in height. These can appear unusual/unsightly and there are issues with maintenance of such boxes,
- Boxes should be placed facing north and ideally only one box should be installed per tree.

Proposed locations for bird boxes at each site shown below in **Figures 4-8**.

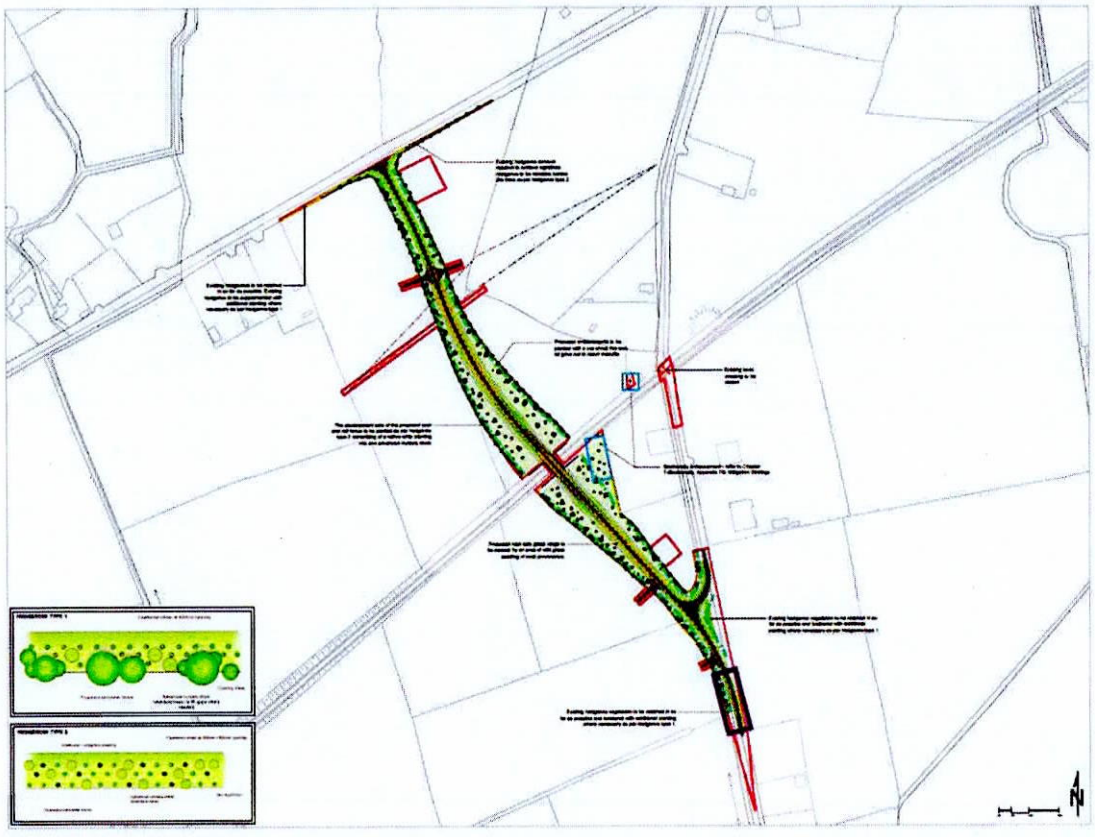

Figure 4: Proposed locations for four bird boxes at Thomastown. One area of scrub, along with one mature tree within Irish Rail owned lands (shown by blue boxes) are locations proposed for bird box installation. The purple box shows the location of one large mature tree which will be lost.

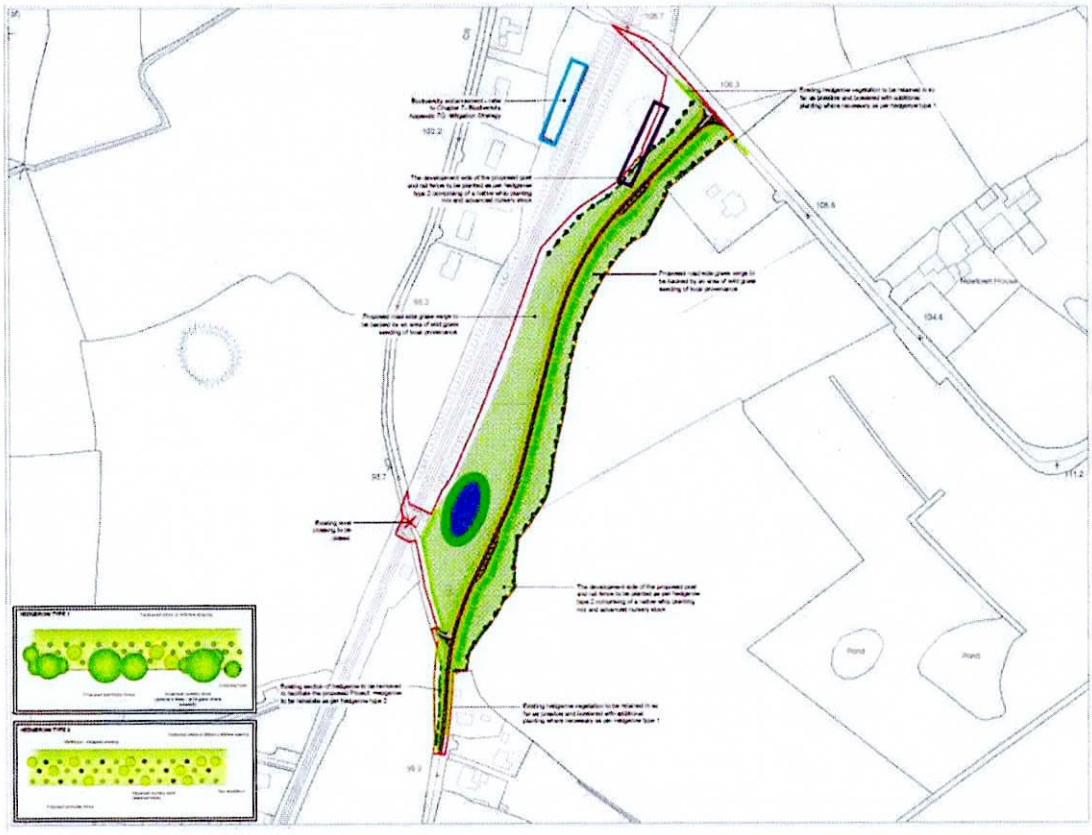

Figure 5: Proposed locations for two bird boxes at Newtown within an area of scrub within Irish Rail owned lands (shown by the blue box). The purple box shows the location of a small area of scrub which will be lost. The blue oval surrounded by green shows the location of an existing pond which will be discussed further below.

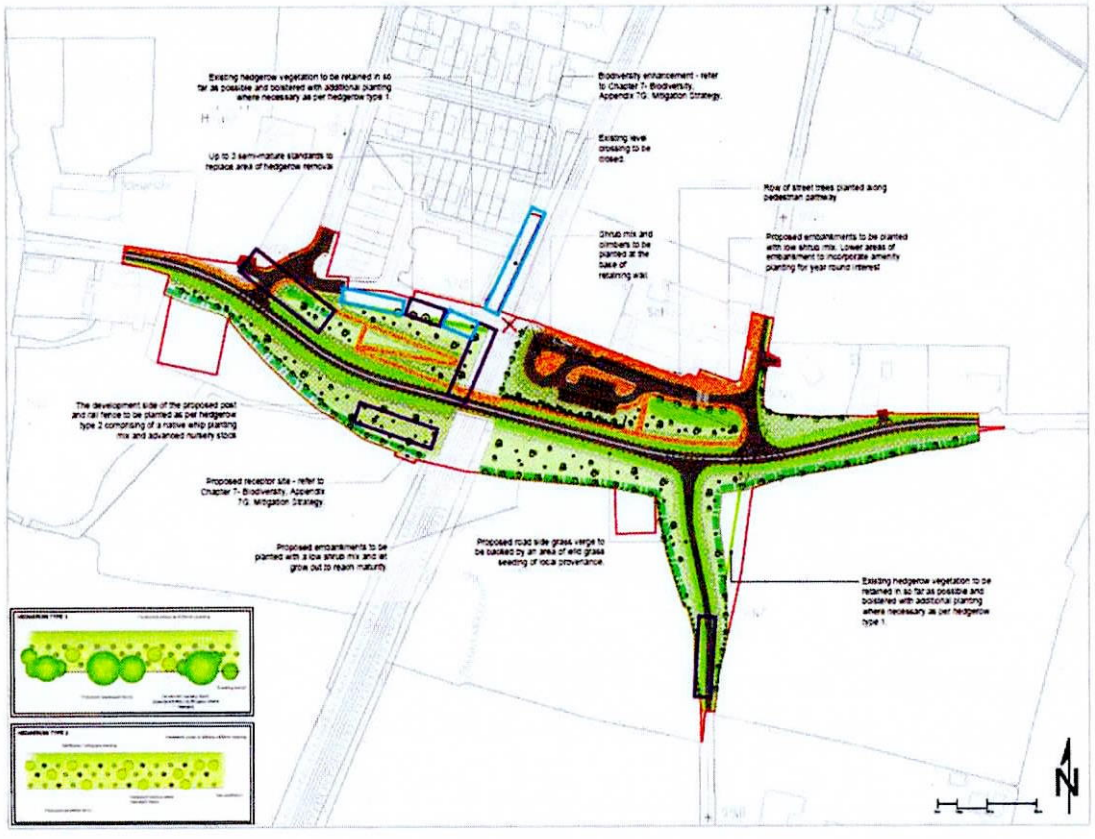

Figure 6: Proposed locations for fifteen bird boxes at Ballycoskery within several mature treelines (shown by blue boxes). The purple boxes indicate the locations of approximately fifteen large mature trees which will be lost.

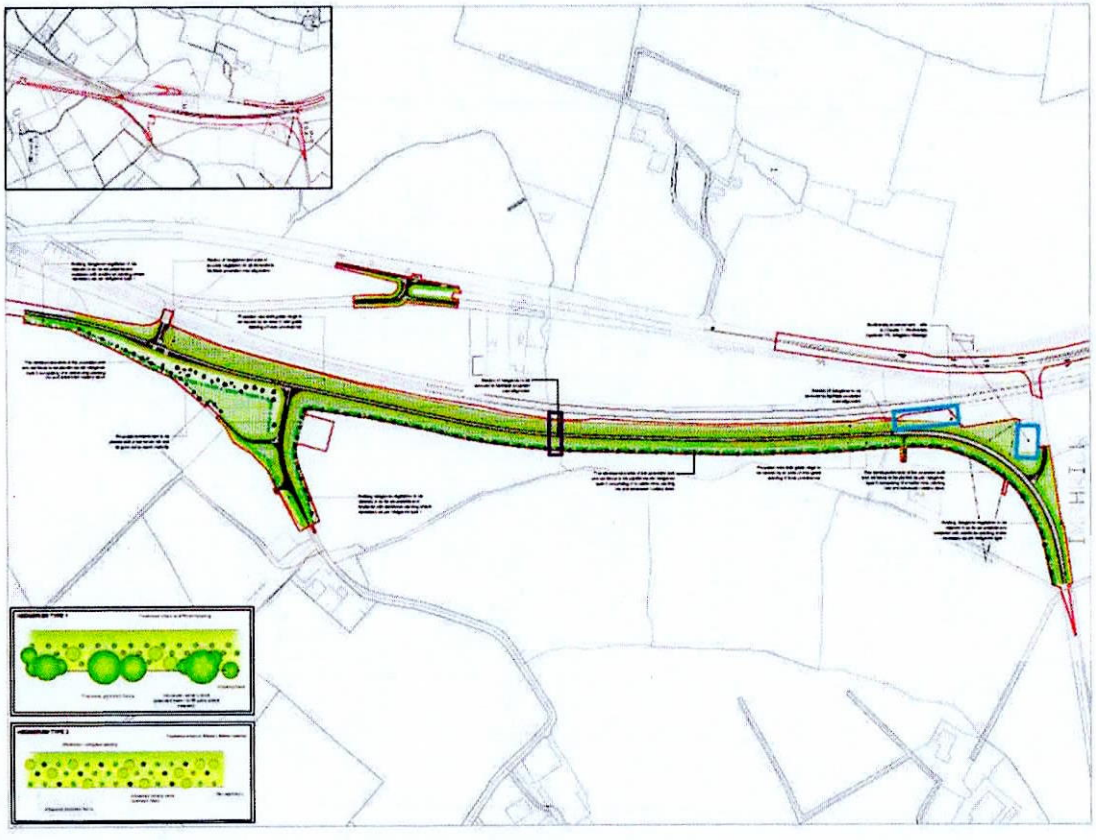

Figure 7: Proposed locations for four bird boxes at Shinanagh within two areas of scrub/hedgerow (shown by blue boxes). The purple box indicates the location of three large mature trees which will be lost.

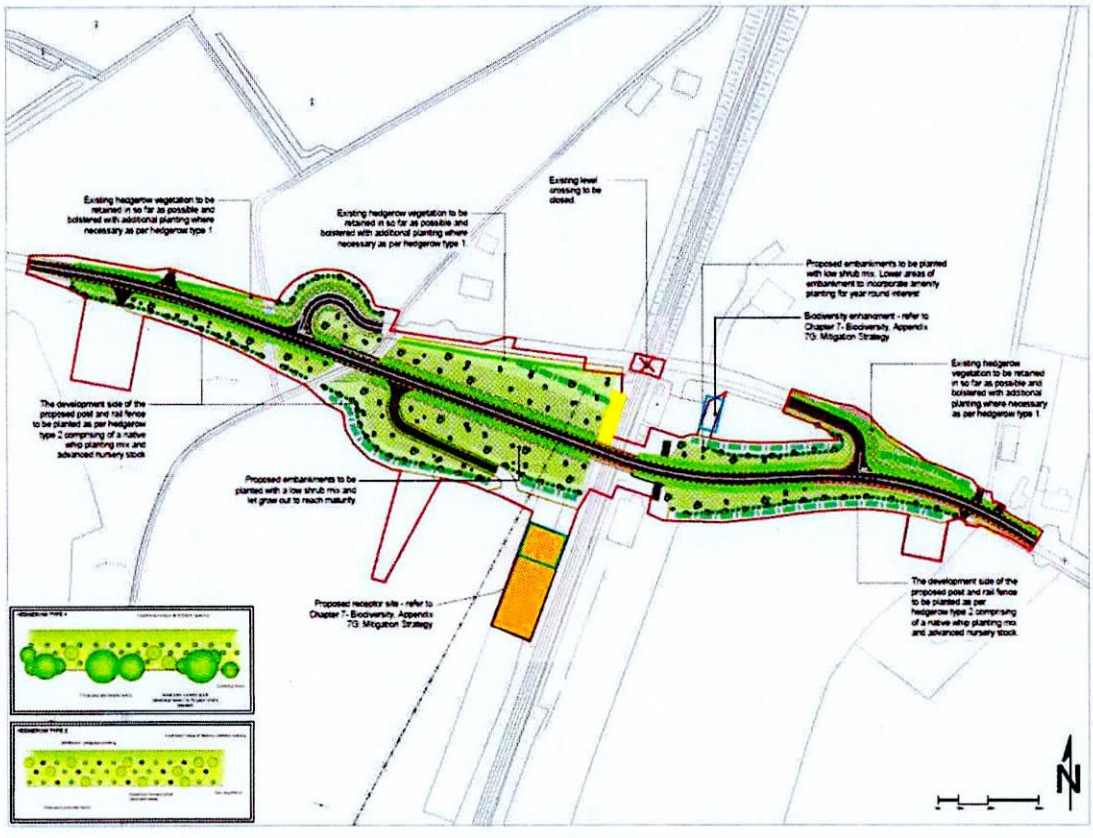

Figure 8: Proposed locations for three bird boxes at Buttevant within an area of scrub and mature trees (shown by blue boxes).

Amphibians and Reptiles

At Newton there is an existing pond where frogs have been recorded and which contains suitable habitat for newts (see **Figure 5**). Enhancement of this feature should be included as part of the landscape plan, including planting around the edges to enhance this feature. Plants to include emergent and floating vegetation to encourage frogs and newts. The existing stone wall at Buttevant will be retained where possible. One section will be removed however, the stones will be retained and moved to the lowland hay meadow receptor site to create refugia for reptiles. An EcoW will be present during these works to check for reptiles and a licence may be required if reptiles are found to be present.

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