IN THE MATTER OF AN APPLICATION TO

AN BORD PLEANÁLA

FOR APPROVAL OF (I) THE N6 GALWAY CITY RING ROAD PURSUANT TO SECTION 51 OF THE ROADS ACT 1993 (AS AMENDED); (II) THE N6 GALWAY CITY RING ROAD MOTORWAY SCHEME 2018; and (III) THE N6 GALWAY CITY RING ROAD PROTECTED ROAD SCHEME 2018

ABP Ref. ABP-302848-18 and ABP-302885-18

ORAL HEARING

Statement of Evidence

Responses to EIA Biodiversity

Objection/Submissions

by

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assisted by

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19 February 2020

1 Qualifications and Experience

1.1 Lead Ecologist - Aebhín Cawley

1.1.1 My name is Aebhín Cawley. I am managing director of Scott Cawley. I hold a degree in Zoology and a postgraduate diploma in Physical Planning both from the University of Dublin (Trinity College). I am a Chartered Environmentalist (CEnv) with the Society for the Environment (Soc Env) and a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). I am the vice-convenor of the Irish Section of CIEEM and I was recently appointed by Minister Bruton to the EPA's Advisory Committee.

1.1.2 I have 19 years' professional experience, 17 of which have been in ecological surveying and impact assessment for public and private sector projects including road and other large infrastructure projects. I have been undertaking Appropriate Assessment work in Ireland since 2002 and regularly provide training on Appropriate Assessment to the public sector.

1.2 Senior Ecologist - Andrew Speer

1.2.1 Andrew Speer is Technical Director with Scott Cawley. He holds an honours degree in Zoology from the National University of Ireland, Galway and a post-graduate diploma in Geographic Information Systems (GIS). He is a full member of the CIEEM. Andrew has over 14 years' professional experience in preparing Ecological Impact Assessments (EcIAs), Flora & Fauna/Biodiversity chapters of Environmental Impact Statements/Environmental Impact Assessment Reports (EISs/EIARs), Appropriate Assessment Screening reports (AA Scr) and Natura Impact Statements/Reports (NISs/NIRs) for a range of projects and development plans, including strategic infrastructure projects such as national road schemes. This includes designing, undertaking and managing a wide range of complex ecological field survey programmes, assessing impacts and designing/implementing mitigation measures for protected species and habitats.

2 Role in Proposed Road Development

2.1 Scott Cawley's role in the N6 Galway City Ring Road (GCRR) Project involved undertaking the biodiversity appraisal in respect of the proposed road development and providing expert ecological advice to Galway County Council and the project team throughout all stages of the proposed road development since 2013, from constraints and route selection through to the development of the design and compilation of the EIAR and NIS. Scott Cawley was responsible for designing and delivering the ecological surveys carried out at the constraints, route selection and EIA phases and preparing both the ecological sections of the Chapter 8, Biodiversity, of the EIAR and the associated appendices, the Provision of Information for Appropriate Assessment Screening Report and the NIS.

2.2 I, Aebhín Cawley had overall responsibility for the delivery of all of the ecological services for the proposed road development and had a supervisory role in the design of survey methodologies and scope, assessment of impacts, and development of the mitigation strategy. I also undertook specific elements of the field survey work across all sections of the proposed road development over the course of the project.

2.3 Andrew Speer has been responsible for the delivery of the ecological surveys, assessment of impacts, and development of the mitigation strategy. He was responsible for coordinating the ecological field survey team and was the lead author of Chapter 8, Biodiversity of the EIAR and the associated appendices, the Provision of Information for Appropriate Assessment Screening Report and the Natura Impact Statement (NIS). As well as managing the field survey team, Andrew undertook substantial elements of the field survey work himself across all sections of the proposed road development over the course of the project.

2.4 Myself and Andrew were supported by a team of in excess of 50 field ecologists, which included a variety specialists (refer to Table 8.2 of Chapter 8 of the EIAR for scope of surveys and survey team), as well as a team of ecologists who are employed by Scott Cawley.

3 Key issues in relation to Biodiversity

3.1 It should be stated at the outset that this statement of evidence addresses issues raised in submissions and observations in relation to the Environmental Impact Assessment which must be carried out in respect of Biodiversity by the Board as competent authority for the purposes of the Environmental Impact Assessment Directive and Part X of the Planning and Development Act 2000, as amended. A separate statement has been prepared in response to issues raised in submissions and observations in relation to the assessments which must be carried out by the Board as competent authority for the purposes of the Habitats Directive and Part XAB of the Planning and Development Act 2000, as amended.

Chapter 8 of the EIAR is to be taken as read in its entirety and is not replicated here. To assist the Board in its consideration of this application for approval and for the convenience of all participants at this hearing, and to put some context to the responses to submissions/objections the key items pertaining to the biodiversity assessment of the proposed road development detailed in Chapter 8 of the EIAR are summarised briefly below.

3.2 The description of the receiving biodiversity environment is set out in detail in Section 8.3 of Chapter 8 of the EIAR.

3.3 The ZoI of the proposed road development includes four European sites (which are considered in a separate statement of evidence), one Natural Heritage Area (NHA) and two proposed Natural Heritage Area (pNHA) as follows:

- Lough Corrib Lough Corrib cSAC
- Lough Corrib SPA

- Galway Bay Complex cSAC
- Inner Galway Bay SPA
- Moycullen Bogs NHA
- Lough Corrib pNHA
- Galway Bay Complex pNHA

3.4 Other receptors considered in the ecological assessment for the proposed road development are habitats, rare and protected flora species mammal species including in particular otter, bats and badgers, mollusc species, marsh fritillary butterfly, breeding birds, wintering birds, amphibians, reptiles and fish.

3.5 The principal characteristics of the proposed road development that are likely to give rise to potential biodiversity impacts are set out under Section 8.4 of Chapter 8 of the EIAR, separately under construction phase (Section 8.4.1) and operational phase (Section 8.4.2).

3.6 The potential biodiversity impacts of the proposed road development, in the absence of mitigation, are set out and evaluated in Section 8.5 of Chapter 8 of the EIAR.

3.7 Measures for the mitigation of biodiversity impacts are set out in Sections 8.6 and 8.9 of Chapter 8 of the EIAR. This includes a detailed suite of measures to avoid significant impacts on all key ecological receptors including internationally and nationally designated sites, habitats of local to international value a range of fauna species. A draft Bat Derogation Licence is included in Appendix A.8.25 of the EIAR and has been reviewed by the National Parks and Wildlife Service.

3.8 In response to the submissions made to An Bord Pleanála, including by the Department of Culture, Heritage and the Gaeltacht (S_018 and S_018.2), and in an effort to further reduce residual impacts, it is proposed to implement additional mitigation measures which have been added to the Schedule of Commitments and are described at relevant points throughout this statement of evidence.

3.9 The following summarises the residual effects with respect to Biodiversity in the EIAR (refer to Section 8.7 and Section 8.9 of Chapter 8 of the EIAR, as updated by results presented in the RFI Response[1] submitted to An Bord Pleanála August 2019 in Section 4.2 of the main report as well as Appendix A.3.1 *Habitat Survey Results 2019 for N6 Galway City Ring Road*):

- The only significant residual effects which will remain as a result of the proposed road development relate to loss of certain habitat types, impacts on bats and impacts on Peregrine falcon

[1] The corrigenda submitted at the oral hearing for the proposed road development, contains corrigenda relating to the RFI Response (submitted to An Bord Pleanála August 2019) in Section 4.2 of the main report as well as in Appendix A.3.1 *Habitat Survey Results 2019 for N6 Galway City Ring Road*. Any corrections presented in the corrigenda have been taken into account in the information presented in this statement of evidence.

- In relation to habitat loss, the significant residual effects (refer to Section 8.7.2 of the EIAR, as updated by Section 4.2 of the RFI Response as well as Appendix A.3.1 *Habitat Survey Results 2019 for N6 Galway City Ring Road*) arise from the loss of areas of four priority Annex I habitats outside of European sites (Petrifying springs *7220, Residual alluvial forests *91E0, Limestone pavement *8240 and active Blanket bog *71302), four Annex I habitat types outside of European sites (Wet heath 4010, Dry heath 4030, Molinia meadow 6410 and Calcareous grassland 6210), and six other non-Annex habitat types of a local biodiversity value (Calcareous springs FP1, Dry-humid acid grassland GS3, Poor fen and flush PF2, Mixed broadleaved woodland WD1, Hedgerows WL1 and Treelines WL2)

- In relation to the loss of areas of four Annex I habitats (Residual alluvial forests *91E0, Dry heath 4030, Molinia meadows 6410 and Calcareous grassland 6210), as well as the loss of areas of Mixed broadleaved woodland WD1, Hedgerows WL1 and Treelines WL2, there will not be any significant residual effects on these habitat types due to the creation of areas of these habitat types greater than that being permanently lost to the proposed road development (refer to Section 8.9.1 of Chapter 8 of the EIAR, as updated by Section 4.2 of the RFI Response as well as Appendix A.3.1 Habitat Survey Results 2019 for N6 Galway City Ring Road)

- In relation to the loss of areas of Limestone pavement *8240 and Wet heath 4010 habitat which cannot be recreated elsewhere, areas of related habitats (i.e. Dry heath 4030 and Calcareous grassland 6210) will be created to provide a biodiversity gain for both peatland and limestone associated habitats local. These habitats will be greater than the combined losses of Wet heath 4010 habitat and Limestone pavement *8240 (refer to Section 8.9.1 of Chapter 8 of the EIAR, as updated by Section 4.2 of the RFI Response as well as Appendix A.3.1 Habitat Survey Results 2019 for N6 Galway City Ring Road)

- In summary, with the implementation of detailed mitigation and with the creation of certain habitat types, the proposed road development will have the following significant residual effects on habitats:

    - A likely significant residual effect, at the international geographic scale, for the permanent loss of Blanket bog (active) [*7130][3] **outside of European sites**
    - A likely significant residual effect, at the international geographic scale, for the permanent loss of the priority Annex I habitat Limestone pavement [*8240] **outside of European sites**

[2] A significant residual effect on Blanket bog arises due to survey work in summer 2019, as outlined in the RFI Response, Appendix A.3.1 Habitat Survey Results 2019 for N6 Galway City Ring Road, RFI Volume 2.
[3] Additional information in relation to this significant residual impact, which is not presented in the EIAR, arises due to additional surveying work undertaken in summer 2019, as outlined in the RFI Response, Appendix A.3.1 Habitat Survey Results 2019 for N6 Galway City Ring Road, RFI Volume 2.

- A likely significant residual effect, at the national geographic scale, for the permanent loss of the Annex I habitat Wet heath [4010] **outside of European sites**
- A likely significant residual effect, at the county geographic scale, for the permanent loss of a Petrifying spring [*7220] feature at Lackagh Quarry **outside of European sites**
- A likely significant residual effect, at the local geographic scale, for the permanent loss of 15 calcareous springs (FP1) at Lackagh Quarry, of Dry-humid acid grassland (GS3) and of Poor fen and flush habitat (PF2)

- In relation to bats, significant residual effects arise from a range of impacts including habitat loss and severance, disturbance from noise and lighting, and mortality risk (refer to Section 8.7.4.2 of Chapter 8 of the EIAR). Design and mitigation measures have been proposed, including provision of a series of underpasses and the Castlegar Wildlife Overpass to allow bats to cross the proposed road development away from traffic, reducing the mortality risk and any permanent barrier effects (refer to Section 8.6.7.2 of Chapter 8 of the EIAR). Despite the implementation of these mitigation measures there will be a significant residual effect on the local Lesser horseshoe bat population at the national geographic scale, and on all other bat species at the local geographic scale (refer to Section 8.7.4.2 of Chapter 8 of the EIAR). To further reduce the effects of the residual impacts on the local bat populations, measures are also proposed including provision of new roosting sites along with measures to protect these roosts during construction, and habitat mitigation measures (e.g. planting). With these mitigation measures implemented, the residual impacts of the proposed road development on bats will be reduced from a likely significant residual negative effect on the local bat populations at the national geographic scale to a local geographic scale (refer to Section 8.9.2 and Section 8.10 of Chapter 8 of the EIAR)

3.10 Although the Peregrine falcon nest sites at Lackagh Quarry will be retained, they will be subject to high levels of disturbance during construction and operation (Section 8.5.8.1.1 and Section 8.5.8.1.2 of the EIAR). Mitigation measures will be implemented to minimise any disturbance effects (seasonal constraint during construction – refer to Section 8.6.9.1.1 of the EIAR). However, in the operational phase, there remains a risk that the Peregrine falcon will abandon Lackagh Quarry as a nesting site as a result of the proximity of the road carriageway to the existing nest sites and due to the lack of suitable alternatives ledges in the quarry post-construction. This is likely to have long-term effects on the Peregrine falcon population at a local and county geographic scale (Sections 8.7.6.1 and 8.9.3 and 8.10 of the EIAR).

3.11 In response to submissions made by the Department of Culture, Heritage and the Gaeltacht to An Bord Pleanála (S_018.2 and S_018.2), and in an effort to reduce this residual impact, it is proposed to implement additional mitigation in the form of the provision of an alternative nest site for Peregrine on Galway City Council owned lands to the south-east of Lackagh Quarry as indicated on drawing GCRR-SK-PP-067 in Appendix A of this statement of evidence. The objective of this

mitigation is to ensure that Peregrines, if displaced from the previously used nesting ledges in the quarry, can remain and breed in the area. This artificial nest site will be in place prior to the commencement of works which have the potential to disturb or displace breeding Peregrine. The provision of this site will increase the likelihood of the continued occupation of breeding Peregrine in Lackagh Quarry and its surrounds which would mitigate the significant negative residual effect on Peregrine at the local and county geographic scale.

Designated Sites (European Sites)

3.12 In the context of assessing whether the proposed road development is likely to result in an impact on the integrity of any European sites, the tests and assessment presented in the NIS (as updated by results presented in the RFI Response[4] submitted to An Bord Pleanála August 2019 and by responses to submissions presented in the statement of evidence prepared by myself and Andrew Speer, dealing separately with Appropriate Assessment) have been submitted to enable the Board to carry out the relevant Habitats Directive assessments. As the Stage One Screening Assessment and Stage Two Appropriate Assessments to be conducted are dealt with in a separate statement of evidence, this information is not repeated in this statement of evidence which deals solely with the biodiversity assessment for the purposes of the EIA to be conducted by the Board.

3.13 The assessment of impacts on European sites for the purposes of the EIAR (as separate and distinct from the Appropriate Assessment), found that although the proposed road development will not adversely affect the integrity of any European sites, the proposed road development will have some level of residual impact on biodiversity – other than qualifying interests – within the boundary of Lough Corrib cSAC (Section 8.7.1.1 of the EIAR). This is not the case for Galway Bay Complex cSAC, Inner Galway Bay SPA and Lough Corrib SPA, which are remote from the proposed development boundary, and the potential impact pathways connecting the proposed road development to these European sites are fully mitigated, as assessed in the NIS (and throughout Chapter 8 of the EIAR).

3.14 Section 8.7.1.1 of the EIAR concludes that the residual impacts on non Qualifying Interest (QI) habitats and species within Lough Corrib cSAC include:

- the loss of areas of non QI grassland, scrub, woodland and built land habitats at the proposed River Corrib bridge crossing, at the proposed drainage outfall for the N59 Link Road North, in the Menlough/Coolagh Lakes area and in the vicinity of the proposed Lackagh Tunnel
- impacts on the local bat populations

[4] The corrigenda submitted at the oral hearing for the proposed road development, contains corrigenda relating to the RFI Response (submitted to An Bord Pleanála August 2019) in Section 4.2 of the main report as well as in Appendix A.3.1 *Habitat Survey Results 2019 for N6 Galway City Ring Road*. Any corrections presented in the corrigenda have been taken into account in the information presented in this statement of evidence.

None of these residual biodiversity effects compromise the overall biodiversity resource of Lough Corrib cSAC in any way that relates to the integrity of that site and, therefore, no likely significant effects are predicted at any geographic scale.

Designated Sites (National)

3.15 With respect to pNHAs/NHAs, the EIAR identifies:

- a likely significant effect at the national geographic scale on the Moycullen Bogs NHA as a result of air quality, non-native invasive plant species and hydrological impacts
- a likely significant effect at the national geographic scale on two pNHAs (Galway Bay Complex pNHA and Lough Corrib pNHA) as a result of:
    - loss of habitat and potential for indirect impacts (i.e. habitat degradation due to tunnelling, hydrogeological, hydrological and air impacts, risks from invasive species, and risks to fauna species of mortality and barrier effects) at one location within the pNHA boundary at the proposed River Corrib crossing
    - indirect impacts at three additional locations (the proposed drainage outfall for the N59 Link Road, the vicinity of the proposed Lackagh Tunnel and the Menlough/Coolagh Lakes area)
    - impacts of the proposed road development on the local bat populations

3.16 However Section 8.7.1.2 of the EIAR concludes that the proposed road development will not affect the integrity of, or result in a likely significant negative residual effect on, any Natural Heritage Areas or proposed Natural Heritage Areas as a result of the mitigation measures which have been proposed. In particular mitigation measures will be implemented to ensure that the peatland habitats for which Moycullen Bogs NHA is designated, and the species they support, will not be affected by the proposed road development during construction or operation.

3.17 Finally, the corrigenda submitted at the oral hearing for the proposed road development, contains information relating to the RFI Response (submitted to An Bord Pleanála August 2019) in Section 4.2 of the main report as well as in Appendix A.3.1 Habitat Survey Results 2019 for N6 Galway City Ring Road. Any corrections presented have been taken into account in the information presented in this statement of evidence and none change the conclusions regarding Biodiversity or the significant residual effects presented in the EIAR.

Proposed Parkmore Link Road Modification

3.18 The proposed Parkmore Link Road Modification will directly affect areas of amenity grassland, species poor wet grassland, buildings and artificial surfaces, part of a drainage ditch and a small patch of scrub. The loss of these habitat areas will not affect the conclusion of the habitat impact assessment presented in Chapter 8, Biodiversity of the EIAR and the RFI Response. The loss of these habitat areas, and any direct or indirect effects of construction or operation, will also not affect the conclusions of the impact assessment presented in Chapter 8, Biodiversity of the EIAR and the RFI Response in relation to fauna species. Therefore, the

proposed Parkmore Link Road Modification has no effect on the conclusions of the assessment presented in the Chapter 8, Biodiversity of the EIAR and the RFI Response with regard to the likely significant residual biodiversity effects (direct, indirect or cumulative) that are associated with the proposed road development.

Proposed Modification of Mitigation at NUIG Sporting Campus

3.19 The proposed removal of the sports pitches, as part of the mitigation measures at NUIG Sporting Campus from the design of the proposed road development will reduce the overall area of land being directly affected and, therefore, reduce the potential biodiversity effects in the area (e.g. habitat loss and extent of construction related disturbance effects to fauna species). As a result, this modification in the design of the proposed road development will have no effect on the conclusions of the assessment presented in the Chapter 8, Biodiversity of the EIAR and the RFI Response with regard to the likely significant residual biodiversity effects (direct, indirect or cumulatively) that are associated with the proposed road development.

3.20 The proposal to remove the NUIG Sports Pitches from the design of the proposed road development arises in response to the making of a separate planning application by NUIG for additional pitches (Planning Ref 19372). This is a live application with no decision made yet.

4 Responses to Submissions/Objections

4.1 Overview

4.1.1 Approximately 47 of the 296 submissions made to An Bord Pleanála (ABP) in respect of the N6 Galway City Ring Road (GCRR) Environmental Impact Assessment Report (EIAR), Natura Impact Statement (NIS), Motorway Scheme (MS) and Protected Road Scheme (PRS) relate to biodiversity and appropriate assessment. Only three of the 17 submissions made to ABP in respect to the RFI Response submitted August 2019 are relevant to biodiversity. The key items raised in relation to biodiversity are:

- Moycullen Bogs NHA and hydrogeological connections and interactions
- Impacts on linear habitats
- Changes in agricultural land use management
- Impacts on Annex I habitat
- Mammal passage facilities and mammal fencing
- Marsh fritillary butterfly mitigation measures
- Barn owl mitigation measures
- Peregrine falcon mitigation measures
- Mitigation Measures – Birds
- Mitigation measures and monitoring
- Valuation of Annex I habitats
- Route selection process and habitats/biodiversity over humans
- Extent of lands acquired for mitigation/and the management of newly created habitat areas
- Stone walls and loss of wildlife habitat
- Impacts on bees in the Coolough area
- Impacts on bats and mitigation measures
- General references to biodiversity, wildlife and habitat impacts
- Impacts on green/blue infrastructure
- Potential for marsh fritillary butterfly at Menlo Castle
- Impacts on curlew
- Badger disturbance and TB

Each of these issues is responded to in detail below.

4.2 Moycullen Bogs NHA and Hydrogeological Connections and Interactions

Issues

4.2.1 The following issues were raised:

- Possible effects on bog ecohydrology in the Moycullen Bogs NHA due to proximity of the proposed road development and dewatering in cutting areas during construction and operation, in particular potential for lowering the peatland water table
- Clarification is sought on where dewatering/drainage are proposed in relation to the NHA area and mitigation measures if required

4.2.2 The following submission raised these points:

Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018 and S_018.2]

Response

4.2.3 The hydrogeological zone of influence for groundwater drawdown during construction works in the vicinity of Moycullen Bogs NHA is shown on Figure 10.7.106 of the EIAR; the zone of influence of groundwater drawdown during operation is shown on Figure 10.8.106 of the EIAR.

4.2.4 As assessed in Section 8.5.3.2.1 of the EIAR, and as set out in the hydrogeological Statement of Evidence prepared by Dr. Leslie Brown, the zone of influence of groundwater drawdown does not extend to the boundary of Moycullen Bogs NHA, therefore the proposed road development poses no risk of affecting the water table that supports the peatland habitats in the NHA and therefore will not have any impact on the NHA.

4.3 Impacts on Linear Habitats

Issues

4.3.1 The following issues were raised:

- *The combined length of linear habitats recorded (11.8km) includes hedgerows and treelines, but not stone walls (which are not the boundaries of properties). It is unclear if the figures represent the total resource of these habitats in the area of the proposed development, or those that will be affected*
- *Based on figures quoted, it appears that the entire linear habitat resource, which was recorded, will be lost and further clarification would be useful in this regard*

- *The Report states that for mixed broadleaved woodland, hedgerows and treelines an area greater than that which will be permanently lost is being provided for in the landscape design (see page 30). It would be useful if the area of woodland and the length of hedgerow and treeline to be provided can be clearly set out*

4.3.2 The following submission/objection raised these points:

Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018 and S_018.2]

Responses

4.3.3 To clarify, there are c.19km of stone walls present within the proposed development boundary; some of which will be retained (refer to Chapter 12 Landscape and Visual of the EIAR and the accompanying Figures 12.1.01 to 12.1.15). Stone walls, as a habitat type, are not a Key Ecological Receptor and are not, therefore, assessed in the EIAR in terms of habitat loss impacts. However, the loss of stone walls is considered with regard to potential effects on fauna species such as small mammals and common lizard (see Section 8.5.6.4.1 and Section 8.4.10.1 of the EIAR).

4.3.4 To clarify, accounting for the results of the 2019 habitat surveys (as presented in the RFI Response submitted to An Bord Pleanála the 30 August 2019), there are c.10.2km of hedgerows and c.5.2km of treelines present within, or along the proposed fenceline of, the proposed development boundary. Of those lengths of linear habitat, approximately 3km of the hedgerows and approximately 1km of treelines will be retained. Therefore, the net losses of hedgerow and treeline habitat associated with the proposed road development are likely to be approximately 7.2km and 4.2km, respectively (and not the c.7.8km and c.4km quoted in the EIAR). This does not change the conclusions of the impact assessment presented in Section 8.5.4, 8.7.2 and 8.9.1 of Chapter 8 of the EIAR.

4.3.5 The loss of Hedgerows WL1 and Treelines WL2 will be replaced by a significantly greater area of similar vegetation to that being permanently lost to the proposed road development and as a result there will not be any significant residual effects on these habitat types (refer to Section 8.9.1 of Chapter 8 of the EIAR, as updated by Section 4.2 of the RFI Response as well as Appendix A.3.1 Habitat Survey Results 2019 for N6 Galway City Ring Road).

4.3.6 The planting proposed for the proposed road development is described in Thomas Burns' statement of evidence on Landscape and Visual and in summary provides for:

- 68km of boundary native hedgerow planting established along the full extent of the proposed development boundary of the proposed road development (excluding at structures – bridges, tunnels etc., or where retained hedgerows form the new boundary but including around attenuation ponds). All hedgerow planting will comprise native species including blackthorn, hawthorn, holly, elder and willow and others local to the area. On the western

portion of the proposed road development there will be more emphasis on use of blackthorn while on the eastern portion of the proposed road development there will be more emphasis on hazel, in keeping with the existing local ecology. In total this will result in the planting of c.275,000 hedgerow trees and shrubs, which includes over 2,700 half-standard sized (i.e. 2.5-2.5m high) trees

- 66km of native screen planting in planting belts of 3m to 6m, or more, in locations as set out on Figures 12.1.01 to 12.1.15 of the EIAR. All screen planting will comprise native species including tree (alder, birch, rowan and Scots pine) and shrub species (blackthorn, elder, geulder rose, holly, hawthorn, hazel and willow) as set out in table 12.8 of the EIAR. In total this will result in the planting of over 300,000 sqm of screen planting with c.300,000 trees and shrubs, which includes c.40,000 standard/half-standard-sized (i.e. 2.5-2.5m high) trees

- 2.3km of native hedgerow planting for bats in Menlough. This planting will comprise native species including alder, birch, oak, rowan, blackthorn, hawthorn, hazel, elder, holly, spindle and willow) as set out in table 12.8 of the EIAR. In total this will result in the planting of c.47,840 hedgerow trees and shrubs, which includes over 700 half-standard sized (i.e. 2.5-2.5m high) trees

- 1km of native tree planting (between Ch. 9+600 – Ch. 10+100) and 8km of native scrub planting (between Ch. 8+550 – Ch. 17+540), proposed as part of measures for barn owl. This planting will comprise native tree species (alder, birch and rowan) and native scrub species (blackthorn, hawthorn, hazel, holly, elder and willow) as set out in Table 12.8 of Chapter 12 of the EIAR. In total this will result in the planting of over 81,500m^2 of native planting, with c.320,000 native trees and shrubs, which includes over 1,000 half-standard sized (i.e. 2.5 - 2.5m high) trees

4.3.7 In overall terms, the proposed planting proposals as detailed in Chapter 12 of the EIAR and Thomas Burns' statement of evidence on Landscape and Visual, will result in the establishment of over 500,000m^2 of new planting using approximately one million native trees and shrubs.

4.4 Changes in Agricultural Land Use Management

Issues

4.4.1 The following issues were raised:

- *It is unclear if abandonment of grazing and/or mowing, including because of fragmentation and isolation of land holdings, has been included among the potential significant effects on habitats that were considered and assessed*
- *The habitats of species such as Marsh Fritillary could also be affected by such changes arising in connection with the development of the road and could lead to loss of habitat in 'favourable management'. Further clarification should be provided*

4.4.2 The following submission/objection raised these points:

Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018 and S_018.2]

Responses

4.4.3 This response should be read in conjunction with Response 4.7 which addresses the Marsh Fritillary element of the issue raised.

4.4.4 The existing trend of agricultural abandonment and the resultant scrub encroachment is acknowledged in Section 8.5.2 of the EIAR (pg.480). In all cases where landholdings have been severed by the proposed road development, access is being provided to the severed lands or in some instances the severed lands are required to facilitate the construction and operation of the proposed road development. Therefore, for the purposes of the assessment presented in the EIAR, it is assumed that land use practices will continue as they are at present as there is no reason to suggest otherwise over the short to long term.

4.5 Annex I habitat Losses

Issues

4.5.1 A table with details of donor and receptor sites has been requested, including areas and habitat types present in each, and clarification on what habitats will be lost in the receptor sites and what habitat gains are predicted to accrue.

4.5.2 Clarification is sought regarding the volume of peat to be deposited in Material Deposition Area DA28.

4.5.3 Clarification is sought regarding how calcareous grassland habitat will be created and how the proposed alterations to the material deposition areas will impinge on the creation of calcareous habitat.

4.5.4 Confirmation is sought on how the future management of the newly created habitats will be achieved and delivered in the short- to long-term.

4.5.5 Clarification is sought regarding the time required for the newly created habitats to establish, including in particular Alluvial forest [*91E0].

4.5.6 The following submission/objection raised these points:

Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018 and S_018.2]

Responses

Table with details of donor and receptor sites

4.5.7 Details of the donor and receptor sites including information on areas and the habitat types present are provided in Appendix B of this statement of evidence. A summary of this information is provided below. The accompanying figures provided in Appendix B of this Statement of Evidence confirms their locations. Information on the habitats present within each donor and receptor site and the corresponding area has been determined based on the habitat data presented in the RFI Response.[5] Donor sites were selected based on the presence of the targeted Annex I habitat (i.e. 4010, 4030, 6210, 6410, *7130 and *91E0), while receptor sites were selected based on criteria presented in Appendix A.8.26 of the EIAR and habitat data presented in the RFI Response. As is outlined in Appendix A.8.26 of the EIAR (Section 2.5.1, pg. 12, Section 3.5.1, pg. 30, Section 5.4.1, pg. 57), receptor sites were considered suitable for a range of reasons, including being well matched in terms of their environmental conditions. One of these reasons also included distance between donor and receptor sites, with a preference for shorter distances.

4.5.8 The Annex I habitat European dry heaths [4030] is present in each 4030 donor site. The following additional habitats are also present in some of the 4030 donor sites (see Appendix B for more specific details per donor site):

- Dry meadows and grassy verges (GS2)
- Dry-humid acid grassland (GS3)
- Wet grassland (GS4)
- Wet heath (HH3)6
- Dense bracken (HD1)
- Scrub (WS1)
- Exposed siliceous rock (ER1)

[5] The corrigenda submitted at the oral hearing for the proposed road development, contains information relating to the RFI Response (submitted to An Bord Pleanála August 2019) in Section 4.2 of the main report as well as in Appendix A.3.1 *Habitat Survey Results 2019 for N6 Galway City Ring Road*. Any corrections presented in the corrigenda have been taken into account in presenting the information in Appendix B to this statement of evidence.

[6] This habitat corresponds to Annex I habitat Northern Atlantic wet heaths with *Erica tetralix* [4010] and is present in a mosaic with the Annex I habitat European dry heath [4030], and other non-Annex I habitats, at three of the 4030 donor sites.

- Stone walls and other stonework (BL1)

4.5.9 The Annex I habitat Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) [6210] is present in each 6210 donor site. The following additional non-Annex I habitats are also present in some of the 6210 donor sites (see Appendix B for more specific details per donor site):

- Dense bracken (HD1)
- Scrub (WS1)
- Ornamental/non-native shrub (WS3)
- Stone walls and other stonework (BL1)

4.5.10 The Annex I habitat *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] is present in the 6410 donor site. No other habitats are present.

4.5.11 The Annex I habitat Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)* [*91E0] is present in each *91E0 donor site. No other habitats are present.

4.5.12 Areas dominated by Annex I habitat Northern Atlantic wet heaths with *Erica tetralix* [4010] and one relatively small area dominated by Annex I habitat blanket bogs (*if active bog) [*7130], which will be removed to facilitate the construction of the proposed road development, will also be utilised as peatland donor material for the 4030 receptor sites. In the case of some of the areas of 4010, the following additional habitats are also present:

- Wet grassland (GS4)
- Dry heath (HH1)
- Dense bracken (HD1)
- Poor fen and flush (PF2)
- Scrub (WS1)
- Exposed siliceous rock (ER1)
- While in the case of *7130, dry heath (HH1) is also present

4.5.13 Areas of the habitat type dry calcareous and neutral grassland (GS1) classified as being of local importance higher value, which will be removed to facilitate the construction of the proposed road development, will also be utilised as calcareous grassland donor material for the 6210 receptor sites. In the case of some of these areas of GS1, the following additional habitats are also present:

- Dry meadows and grassy verges (GS2)
- Dense bracken (HD1)
- Hedgerow (WL1)

- Treeline (WL2)
- Scrub (WS1)
- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)

4.5.14 The following habitats are present at the receptor sites (see Appendix B for more specific details per receptor site):

- Other artificial lakes and ponds (FL8)
- Eroding/upland rivers (FW1)
- Drainage ditches (FW4)
- Improved agricultural grassland (GA1)
- Dry calcareous and neutral grassland (GS1)
- Dry meadows and grassy verges (GS2)
- Dry-humid acid grassland (GS3)
- Wet grassland (GS4)
- Dry heath (HH1)7
- Wet heath (HH3)8
- Dense bracken (HD1)
- Poor fen and flush (PF2)
- Wet willow-alder-ash woodland (WN6)9
- (Mixed) Broadleaved woodland (WD1)
- Scrub (WS1)
- Treeline (WL2)
- Exposed siliceous rock (ER1)
- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)
- Stone walls and other stonework (BL1)

[7] This habitat corresponds to Annex I habitat European dry heath [4030].
[8] This habitat corresponds to Annex I habitat Northern Atlantic wet heaths with *Erica tetralix* [4010].
[9] This habitat corresponds to Annex I habitat Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)* [*91E0].

- Buildings and artificial surfaces (BL3)
- Residential10

4.5.15 The total areas of habitat loss and predicted areas of habitat gain for each of the Annex I habitats are presented in Table 1 below and are described in Section 4.2 of Volume 1 of RFI Response submitted to An Bord Pleanála in August 2019 as well as in Appendix A.3.1 of the RFI Response.[11]

Table 1: Total areas of habitat loss and gain

Annex I habitat	Total area of habitat loss (ha)	Total area of habitat gain (ha)	Total area of net gain/loss (ha)
4010 Wet Heath	2.47	n/a12	2.47 loss
4030 Dry Heath	2.22	7.06	4.84 gain
6210 Calcareous Grassland	0.25	7.14	6.89 gain
6410 Molinia Meadow	0.07	0.49	0.42 gain
*7130 Active Blanket Bog	0.01	n/a19	0.01 loss
*91E0 Alluvial forest	0.14	0.18	0.04 gain

Clarification regarding the volume of peat to be deposited in Material Deposition Area DA28

4.5.16 Juli Crowley's statement of evidence on Soils and Geology provides clarification on the volume of peat to be deposited in Material Deposition Area DA28. In summary, up to 14,000m^3 of peat can be placed in DA28.

Clarification regarding how calcareous grassland habitat will be created and how the proposed alterations to the material deposition areas will impinge on the creation of this calcareous grassland habitat

4.5.17 Juli Crowley's statement of evidence on Soils and Geology provides clarification this issue that should be read in conjunction with this response.

4.5.18 It is not intended to create any peatland habitat within DA24 or any other part of Lackagh Quarry. Any habitat to be created within DA24, DA25 and DA28 within Lackagh Quarry will be calcareous grassland.

[10] As described in the EIAR, this "*non-Fossitt classification is used to represent residential properties along the proposed road development and generally consist of a mosaic of buildings and artificial surfaces (BL3), amenity grassland (GA2), flower beds and borders (BC4) and ornamental shrubs (WS3), with unmanaged rank grassland areas also occasionally present (GS2)*".

[11] The corrigenda submitted at the oral hearing for the proposed road development, contains corrigenda relating to the RFI Response (submitted to An Bord Pleanála August 2019) in Section 4.2 of the main report as well as in Appendix A.3.1 *Habitat Survey Results 2019 for N6 Galway City Ring Road*. Any corrections presented in the corrigenda have been taken into account in presenting the information in Table 1.

[12] Although the habitat creation proposed does not reduce the residual impact associated with the loss of 4010 or *7130, it will provide an overall biodiversity gain for peatland habitats.

4.5.19 Where an area of habitat planting has a requirement for a free draining layer beneath the surface and it corresponds with a proposed Material Deposition Area where peat maybe placed (including Material Deposition Areas DA24, DA25 and DA28 in Lackagh Quarry), the free draining layer will be placed between the peat placement layer and the habitat to be created layer. The free drainage material will be contained within a filer separator layer (e.g. geotextile), above and below to prevent the migration of fines sediment therefore ensuring the functionality of the layer.

4.5.20 As confirmed in Juli Crowley's statement of evidence on Soils and Geology, the principles to be employed when handling peat are presented in the Material Deposition Areas – Baseline Report, included in Annex 2 of Appendix A.1.11 of the RFI Response. These include minimising plant movements, using appropriate temporary storage areas close to areas of excavation and minimising delay between final placement and excavation. This report also describes the peat reinstatement options including:

- Peat placement in the upper central portion of the MDA only (U1 material placed in the bund slopes and base)
- Peat blending with a more consolidated peat, granular material or cement
- Drying of peat to reduce the natural moisture content
- Containment, separating the placement area into a series of cells, with the cell structure constructed from impermeable material
- Covering of the peat with subsoils or topsoil to prevent dust generation and to allow for appropriate ecological/landscape finish to surface
- The surface of the MDAs is finished with an ecological/landscape treatment. The treatment should have regard to the local environment and may provide for seeding to meadow grass, for heath development, with or without shrub planting

4.5.21 Details of the donor and receptor sites for calcareous grassland are provided in Appendix B of this Statement of Evidence. A summary of this information has been provided above at paragraphs 4.10.7 to 4.10.15. The accompanying figures provided in Appendix B of this Statement of Evidence confirms their locations.

4.5.22 Details of how this habitat will be created are outlined in the EIAR Appendix A.8.26 (refer to Section 3.5.2.4, 3.5.2.5 and 3.5). As noted in Section 3.5.2.4 *"In the case of the receptor sites that are also Material Deposition Areas (MDA), the following measures will also be implemented to ensure the successful creation of 6210. This will include the placement of suitable soils on top of the MDA to allow water to freely drain and to provide a suitable substrate for the habitat to establish upon (via measures described in Section 3.4.3). Due to the proposed management requirements of 6210 (outlined in Section 3.5 below), the side-slopes of the MDAs will not be used to create this habitat type."*

4.5.23 It should be noted that the reference to "…*measures described in Section 3.4.3*…" was a typographical error and should have read "…*Section 3.5.3*…". Section 3.5.3 of Appendix A.8.26 of the EIAR outlines the specific measures proposed to ensure the successful creation of calcareous grassland at the receptor sites. These include measures for translocation of turves, translocation of suitable soils, seeding, hay-strewing and natural colonization. As outlined in Section 3.5.3 of Appendix A.8.26 of the EIAR these measures will be implemented either in-combination or alone, as determined by the Contractor under the supervision and advice of the Project Ecologist and/or Ecological Clerk of Works.

4.5.24 Any changes proposed to the locations or sizes of material deposition areas since those presented in the EIAR have been fully captured in the information presented in the RFI Report and are reflected in Appendix B of this statement of evidence.

Confirmation on how the future management of the newly created habitats will be achieved and delivered in the short- to long-term

4.5.25 The development of site-specific details on the future management of newly created habitat areas, over both the short and long-term is a requirement of the measures set out in Appendix A.8.26 of the EIAR. Confirmation of the long-term management details in respect of the relevant habitat areas will be included in the finalised Ecology Site Management Plan, as determined by the Project Ecologist and/or Ecological Clerk of Works appointed for the proposed road development. Appendix A.8.26 of the EIAR is a live document which will be updated by the appointed contractor by way of pre-construction surveys as is committed to in the updated Schedule of Environmental Commitments submitted at this Oral Hearing.

Clarification regarding the time required to establish newly created habitats, including in particular Alluvial forest [*91E0]

4.5.26 We accept the Department's comment in this regard that the worst-case scenario timeframe for the establishment of *91E0 habitat, may be 30 to 50 years, rather than 20 to 50 year as stated in Section 4.11 of the RFI Response and the first and last line of Section 4.11.2.3 of the RFI can be taken to read as "30 to 50 years" rather than "20 to 50 years".

4.5.27 This change in timeframe does not affect any other statements in the RFI Response nor the conclusions set out in the EIAR on the residual impact on this habitat, i.e. the loss of *91E0 will not be likely to result in a significant residual effect, at any geographic scale, over the long-term (i.e. >50 years).

4.6 Mammal Passage Facilities and Mammal Fencing

Issues

4.6.1 The following issues were raised:

- *The general locations and details of the animal underpasses and the wildlife overbridge are noted. While not always clear from the scheme drawings, underpasses must extend as far as, and integrate with the boundary fencing to be effective and fit for purpose, and to mitigate fragmentation and the barrier effects of the proposed development*
- *All relevant details and specifications for underpasses, fencing and guide planting in relevant TII/NRA guidance should be followed, and underpasses should be confirmed (by an ecologist) to be correctly installed and fully functional before the road becomes operational*
- *Mammal-proof fencing should be installed to the minimum extent necessary for safety and to exclude animals from the road. All other fencing provided should allow the general passage of wild animals (e.g. sheep wire or larger mesh) so that the overall extent of fragmentation and barrier effects resulting from the road are reduced*
- *In the case of the wildlife overbridge, the general configuration and planting, including guide planting, should facilitate and encourage its use by wildlife in general, including (but not only) bats*
- *There does not appear to be provision for ledges for passage by mammals in the drawings for culverts (see drawing GCOB-1700-D-GEN-011). The Department recommends that where culverts are designed to allow water flows through them, provision for mammal ledges should be included*

4.6.2 It is stated that there are few mammal underpasses in the Bearna Section of the route.

4.6.3 The following submissions/objections raised these points:

Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018 and S_018.2] and Ob_116.2

Responses

4.6.4 As stated in Section 8.6.7.3.2 of the EIAR, mammal-resistant fencing will be provided and will be installed in accordance with the specification outlined in *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes*, and TIIs mammal resistant fencing specification (currently CC-SCD-00320/00319), and will include badger proofing of emergency access roads and other similar access points, where located in areas where mammal-resistant fencing is to be installed. This includes mammal proofing the paladin security fencing proposed around all attenuation ponds/water ponds (see Section 2.6 of the RFI Response submitted to ABP 30 August 2019). The extents of mammal-resistant

fencing is shown on Figures 8.23.1 to 8.23.15 of the EIAR and Figures 1.6.1 to 1.6.30 in Appendix A.1.9 of the RFI Response. To confirm, mammal underpasses will extend as far as, and integrate with, the mammal resistant fencing. Details of the mammal resistant fencing in also included in Appendix A.1.9 of the RFI Response.

4.6.5 The mitigation strategy also includes a monitoring commitment to check the successful installation of the underpasses and mammal resistant fencing during the first year after operation. In addition, in response to the submissions/objections, a commitment has been included that all underpasses and mammal passage facilities will be checked by an ecologist prior to the operation of the proposed road development, to ensure that they are constructed in accordance with the *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* (National Roads Authority, 2008) and *Guidelines for the Treatment of Badgers during the Construction of National Road Schemes* (National Roads Authority, 2006), and that in the case of bats, to ensure they are constructed in accordance with the design requirements set out in Section 8.6.7.2 and Section 8.9.2 of the EIAR. This additional commitment has been included in the updated Schedule of Commitments (SoCs) submitted at the oral hearing (refer to 8.23 and 8.39 in the SoCs).

4.6.6 The dense network of mammal passage facilities along the entire length of the proposed road development will ensure that landscape permeability is maintained to the highest degree possible, minimising any residual fragmentation and barrier effects. This includes the section of the proposed road development in the Bearna area where mammal passage facilities are provided for Badger, Otter and bats, as shown on Figures 8.23.1 to 8.23.4 and 8.24.1 to 8.24.4 of the EIAR.

4.6.7 Although its primary purpose is to ensure the safe passage for Lesser horseshoe bats across the proposed road development, the landscaping design for the Castlegar Wildlife Overbridge and absence of artificial lighting will ensure that it will also facilitate use of the structure by wildlife in general. To confirm mammal resistant fencing will integrate with the Castlegar Wildlife Overbridge. Details of the mammal resistant fencing in included in Appendix A.1.9 of the RFI Response.

4.6.8 The mammal passage facilities proposed in relation to all structures (culverts and bridges) are set out in Table 8.36 of the EIAR Biodiversity chapter. As described in Section 8.6.7.1.2 of the EIAR in relation to Otter, mammal ledges have been provided for at those culverts on watercourses that were used by Otter (C04/01 and C04/02), based upon the findings of the mammal surveys undertaken. These structures (C04/01 and C04/02), and the mammal ledges, are also proposed to provide for Badger passage. As described in Section 8.6.7.3.2 and in Table 8.36 of the EIAR, in addition to providing mammal passage facilities at structures C04/01 and C04/02, culverts and dedicated 600m pipes are provided at strategic locations along the proposed development to allow safe Badger passage across the proposed road development. As there was no evidence of Otter use on any of the other watercourses being culverted, or a need to provide passage for Badgers based on the survey results, it is not necessary to provide passage facilities (e.g. raised ledges within structures or separate dry 600mm pipes installed adjacent to culverts) at all culverts which are designed to allow for water flow through them.

4.7 Marsh Fritillary Butterfly Mitigation Measures

Issues

4.7.1 The following issues were raised:

- *Details of mitigation measures could benefit from more clarity and consideration would need to be given to the extent to which they may be deliverable*
- *A key element of mitigation is the translocation of larval webs that occur along the proposed development. Translocation sites need to contain suitable habitats and should also have good long-term prospects*
- *In the case of any predictions made regarding the long-term survival of Marsh Fritillary, including in relation to the areas of habitat required within a network of sites, it should be clear that any figures quoted refer to habitat in favourable management (presumably meaning good or optimal condition) and with good long-term future prospects*

4.7.2 The following submission/objection raised these points:

Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018 and S_018.2].

Responses

4.7.3 We agree that the translocation sites need to contain suitable habitat to support any translocated larval webs. The mitigation strategy detailed in the EIAR is clear in that any Marsh fritillary larval webs present within habitat areas to be cleared as part of the construction works for the proposed road development must be translocated to another area of suitable habitat that is outside the proposed development boundary and as such will remain unaffected by construction works.

4.7.4 The purpose of the mitigation strategy is to ensure that site clearance works do not result in the mortality of Marsh fritillary eggs, larvae or caterpillars during the single site clearance event.

4.7.5 As explained in Section 8.5.7.4 of Chapter 8, Biodiversity of the EIAR, given that the use of habitat patches by the Marsh fritillary butterfly naturally fluctuates and varies year on year, both within and across habitat areas, it is not necessary that the translocation sites themselves have good long-term prospects – provided that the overall network of suitable habitat patches supporting the local Marsh fritillary butterfly metapopulation is large enough and connected enough to ensure that the population is maintained on a long-term basis. What is critical to the success of the mitigation strategy is that the translocation site is suitable and of a good, or ideally optimal, condition for a single season following any translocation event to allow the larvae/caterpillars to survive and complete their life-cycle.

4.7.6 Given the extent of suitable Marsh fritillary habitat present locally, we are confident that a translocation site in favourable management will be available to accept any larval webs that need to be relocated during construction.

4.7.7 Over the survey period for the N6 GCRR there are core areas at Lough Inch, Cappagh and Tonabrocky where the highest densities of larval webs were recorded. These are likely to be important in supporting the local metapopulation, as stated in the EIAR (Section 8.5.7.4.1 of the EIAR, p.568 and Figure 8.6.1). These core areas are along the margins of what are relatively stable peatland blocks (in terms of land use management and potential for land use change). Those at Tonabrocky are designated for nature conservation and lie within the Moycullen Bogs NHA and are, therefore, subject to the legal protection from damage afforded to such sites under the Wildlife Acts. Overall, it is extremely likely that these sites will remain in a suitable condition for the translocation of larval webs over the long-term.

4.7.8 Outside of these 'core areas' there is also an extensive network of suitable habitat areas within the study area for the proposed road development. There is no evidence from the survey results to suggest that land use and farming practices will result in a significant reduction in the availability of suitable Marsh fritillary butterfly across those sites. The findings of the surveys were that habitat quality on many sites remains stable with some areas fluctuating in suitability for the Marsh fritillary butterfly year on year in response to changes in land use management practices. As an example, it was noted in 2016 that, when compared with the 2015 results, most habitat areas retained a similar level of suitable Marsh fritillary habitat. One area, formerly of suitable habitat condition, was overgrazed in 2016 and had declined in habitat quality whereas the extent of suitable habitat in another had increased since 2015.

4.7.9 In addition to the areas of suitable Marsh fritillary habitat recorded within the study area, based on a review of orthophotos for the area, there is also likely to be suitable Marsh fritillary habitat associated with the margins of the numerous and extensive peatland habitat blocks that extend to the north and north-west from the study area, given their similarity to the mosaic of habitats present in the vicinity of the proposed road development where larval webs were recorded. Given their proximity to the core areas within the study area, these habitat areas are also likely to be important in supporting the local Marsh fritillary butterfly metapopulation that will be affected by habitat loss associated with the proposed road development.

4.7.10 In summary, the mitigation strategy is that translocation site(s) to which larval webs will be translocated must be suitable and, therefore, in favourable management at the time of translocation. To clarify, they also must have good prospects of remaining in a good or optimal condition for a period long enough to allow those translocated larval webs to complete their life-cycle. The evidence supports the view that there is sufficient suitable Marsh fritillary butterfly habitat present locally, and in the wider area beyond the study area for the proposed road development, that it is certain that a suitable translocation site can be identified and utilised at the time construction commences to ensure that the mitigation strategy can be delivered and will be successful.

4.8 Barn Owl Mitigation Measures

Issues

Habitat measures for Barn owl

4.8.1 It is requested that in order to counterbalance the likely reduction of foraging opportunities for the local Barn Owl population, foraging habitat should be conserved and enhanced in key areas close to the most suitable sites identified as active or potential nest sites for the species.

4.8.2 It is stated that the objective of such long-term habitat management would be to provide alternative foraging opportunities to the north and northwest of the proposed road development, thereby further reducing the risk of road-related mortality events impacting the local population.

4.8.3 It is stated that such long-term habitat management areas should dictate where the three Barn Owl nest boxes would be sited.

Nature and extent of planting and avoidance of attracting Barn owl to the proposed road development

4.8.4 It is stated that it is important that the nature and extent of the proposed planting (likely to provide foraging habitat for general bird species) in close proximity to the proposed development does not act to attract foraging Barn Owl and thereby increase the risk of road collision mortality events.

4.8.5 The following submission/objection raised these points:

Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018 and S_018.2]

Responses

Habitat measures for Barn owl

4.8.6 The area where it is proposed to erect the Barn owl nest boxes lies to the north and north-west of the proposed road development and the nest site at Menlo Castle, and is shown on Figure 8.23.7 of the EIAR. In terms of enhancing and providing additional foraging habitat for Barn owls, this area is the most suitable location within the proposed development boundary given it is largely improved agricultural grassland at present, and therefore suboptimal Barn owl foraging habitat at present.

4.8.7 Habitat creation and management is already proposed for this area as a key element of the Lesser horseshoe bat mitigation strategy (see Figure 8.24.7 of the EIAR) and it is imperative that any measures to conserve or create Barn owl foraging habitat are compatible with that strategy. The aim of the Lesser horseshoe bat mitigation strategy is to augment the existing hedgerow network through supplementary planting and by ensuring grazing continues in those fields through long-term management.

4.8.8 Optimal foraging habitat for Barn owls includes rough grassland and wetland habitat within a network of vegetated field boundaries, such as hedgerows and treelines, and woodland edge habitat; as these habitats support an abundance of small mammal prey.

4.8.9 The area proposed for habitat creation and management for Lesser horseshoe bat to the north and north-west of the proposed road development (shown on Figure 8.23.7 of Chapter 8 of the EIAR) already offers extensive woodland edge habitat (hence its selection for the erection of the proposed Barn owl nest boxes) and the additional linear planting proposed under the bat habitat creation and management measures will also serve to increase the quality of the Barn owl foraging habitat in those fields. In addition, in response to the submission/objection, a commitment has been included that an unmanaged grass margin (at least 1m in width) will be retained along all field boundaries in the area of habitat to be retained that lies to the north-west of the proposed road carriageway at Menlo Castle, to further increase the cover of small mammal habitat in the vicinity of the proposed nest boxes, it is proposed, as part of the management regime for this area. This additional commitment has been included in the updated Schedule of Commitments (SoCs) submitted at the oral hearing. This measure will be compatible with the measures that are proposed as part of the Lesser horseshoe bat mitigation strategy.

Nature and extent of planting and avoidance of attracting Barn owl to the proposed road development

4.8.10 The risk of the proposed planting attracting foraging Barn owl to the road side verges has been fully considered in developing the Barn owl mitigation strategy detailed in Section 8.6.9.1.2 of the EIAR which, through the proposed landscaping design, will discourage Barn owl from foraging along the road margins through avoiding the establishment of rank grassland habitat; an important foraging habitat for Barn owls as it supports small mammal prey species such as mice and shrews. The locations where planting will be used to reduce the risk of Barn owl mortality from road traffic are shown on Figures 8.23.1 to 8.23.15 of the EIAR and on the landscape drawings (Figures 12.2.01 to 12.2.15).

4.9 Peregrine Falcon Mitigation Measures

Issues

4.9.1 The following issues were raised:

- To address the potential loss of Lackagh Quarry as a breeding site for Peregrine falcon it has been requested that a suitable alternative nest site be created
- Clarification is requested regarding the efficacy of the mitigation measure to temporarily dissuade active breeding of Peregrine at Lackagh Quarry by commencing works from the Lackagh Tunnel to the N84 Headford Road Junction prior to mid-February. In this regard, it is stated that if an alternative

suitable Peregrine nesting resource was created prior to any road development works being undertaken, then the possibility of temporarily rendering the nesting ledges at Lackagh Quarry unavailable for Peregrine during the construction period as a mitigation measure to avoid the disruption of a breeding attempt could be considered.

4.9.2 The following submission/objection raised these points:

Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018]

4.9.3 In subsequent correspondence the Department raised the following issues in relation to Peregrine falcon in its submission Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018.2]

- need for suitable high ledges for prospecting Peregrine pairs and any active Peregrine nest site/ledge must be left undisturbed
- frequency, the location and intensity of the blasting could influence the outcome in terms of success/failure. Therefore monitoring of Peregrine breeding activity at the site through the season should ideally be carried out)

Responses

4.9.4 The Department states that if suitable high ledges for prospecting pairs remain available and if any active Peregrine nest site/ledge is left undisturbed, then the proposed works should not prohibit Peregrine breeding at the site. While the existing known nest ledges will not be removed by the proposed road development, it is likely that at least one would not remain at a suitable height for Peregrine falcon.

4.9.5 In light of the comments from the Department, a review of the potential to provide an alternative artificial Peregrine falcon nest site has been undertaken by BirdWatch Ireland and a report has been included at Appendix C making recommendations. The findings of their review identified two locations in the vicinity of Lackagh Quarry that would be suitable for the installation of an artificial nest box. Based on the recommendations in that report and in response to the submissions/objections, it is proposed to provide an alternative nest site for Peregrine on Galway City Council owned lands to the south-east of Lackagh Quarry as indicated on drawing GCRR-SK-PP-067 in Appendix A of this statement of evidence. The alternative nest site will be provided in accordance with the design requirements set out in that report and will be in place prior to the commencement of works which have the potential to disturb or displace breeding Peregrine in Lackagh quarry.

4.9.6 On balance, it is preferred not to temporarily make the existing nesting ledges unavailable for nesting Peregrine for the duration of construction. The combination of providing an alternative nest site in advance of construction works commencing, in conjunction with construction works in Lackagh Quarry commencing in advance of the breeding season, will allow the Peregrine falcon a choice of nest sites during

the construction period. This strategy will maximise the opportunities for the local breeding pair of Peregrine falcon to retain occupancy of their breeding territory throughout the duration of the construction period.

4.9.7 The existing Peregrine falcon nest sites in Lackagh Quarry will be retained. The precise locations have not been divulged in the EIAR due to the risk of persecution to the species. Galway County Council and/or BirdWatch will need to be consulted to ascertain the precise location to ensure its retention and protection from works.

4.9.8 The objective of the mitigation is to ensure that Peregrines, if displaced from the previously used nesting ledges in the quarry, can remain and breed in the area. Although it is not possible to guarantee uptake of the artificial nest site, the provision of this site will increase the likelihood of the continued occupation of breeding Peregrine in Lackagh Quarry and its surrounds which would mitigate the significant negative residual effect on Peregrine at the local and county geographic scale.

4.9.9 In response to the Department's recommendation, it is proposed to undertake monitoring of Peregrine breeding activity at both the quarry and the alternative nest site for Peregrine to be provided on Galway City Council owned lands to the south-east of Lackagh Quarry, through the season to ascertain any nest success/failure and to determine if blasting is also affecting numbers of common prey species for Peregrine (i.e. Feral Pigeon).

4.9.10 These additional commitments for peregrine falcon have been included in the updated Schedule of Commitments (SoCs) submitted at the oral hearing.

4.10 Mitigation Measures - Birds

Issues

Timing of construction activities at Lackagh Quarry

4.10.1 Clarification is sought regarding the timing of works at Lackagh Quarry as a mitigation measure for wintering birds at Ballindooley Lough and how this relates to impacts from blasting on Peregrine falcon. It has been queries whether there is a conflict between the mitigation for these two separate groups; wintering birds in Ballindooley lough and Peregrine falcon in Lackagh Quarry.

Breeding Birds – nest boxes

4.10.2 *"It is proposed to install 20 nest boxes to further minimise the effects of breeding bird habitat loss. Post construction monitoring and reporting with regard to the rate of uptake of the boxes by birds and their breeding outcomes is recommended in order to determine the efficacy of this mitigation measure."*

4.10.3 The following submission/objection raised these points:

Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018]

4.10.4 In subsequent correspondence the Department raised the following issues in its submission Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018.2], the Department also raised issues in relation to the potential for impacts to Peregrine Falcon and to wintering birds at Ballindooley Lough arising from blasting activity at Lackagh Quarry (and Castlegar), and the mitigation measures proposed to address such impacts.

Responses

Timing of construction activities at Lackagh Quarry

4.10.5 Notwithstanding the Department's subsequent correspondence [S_018.2], in the interest of completeness, a full response to all issues raised the Department's first submission [S-018] has been provided.

4.10.6 To clarify, there is no requirement to restrict the timing of blasting to avoid disturbance to nesting Peregrine falcon. The mitigation measures relating to Peregrine falcon at Lackagh Quarry (in Section 8.6.9.1.1 of the EIAR) require that construction works between the proposed Lackagh Tunnel to the N84 Headford Road Junction commence prior to mid-February to ensure that disturbance influences the nest site selection rather than displacing an incubating female from the nest.

4.10.7 The timing of blasting is included only in relation to wintering birds at Ballindooley Lough (as set out in Section 8.6.9.2.1 of the EIAR). The blasting works associated with the construction of the proposed road development between the eastern approach to Lackagh Quarry (Ch. 11+800 to Ch. 12+100) will be carried out between the months of April to September (inclusive) to minimise disturbance effects on wintering birds at Ballindooley Lough. Blasting relating to the Lackagh Tunnel construction is outside the zone of influence for the wintering birds at Ballindooley Lough. Therefore, the construction works at Lackagh Tunnel can commence prior to mid-February.

Breeding Birds – nest boxes

4.10.8 A commitment to monitor and report on the usage of bird nest boxes erected as part of the mitigation strategy has been included in Chapter 21, Schedule of Commitments of the EIAR as commitment number [8.58] as follows:

Nest boxes will be monitored annually by an ecologist, and the results reported to Galway County Council, to record their usage by breeding birds for a period of three years post-construction.

4.10.9 In addition, in response to the submissions/objections, a commitment has been included that nest boxes will be monitored annually by an ecologist, and the results reported to Galway County Council, to record their usage by breeding birds for a period of three years post-construction. This additional commitment has been included in the updated Schedule of Commitments (SoCs) submitted at the oral hearing.

4.11 Mitigation Measures and Monitoring

Issues

4.11.1 The following issues were raised:

- It should be clear that all relevant mitigation measures and commitments must apply, from the outset, to all parts of the development as permitted, including enabling works, site preparation and advance contracts, as well as at construction stage
- Competent ecologists will need to be involved directly at all project stages. There is a commitment to having a Project Ecologist as part of the Employer's team; references to an Ecological Clerk of Works are also noted in appendices. The main contractor will also require ecologists, and ecological supervision of other contractors will be necessary
- Potential for conflict in relation to the timings of some of the ecological mitigation measures
- Provision of a clearer schedule of monitoring commitments and responsibilities
- Resurveys in advance of works being carried out may introduce additional and new considerations, and it should be clear how these will be addressed and managed
- The importance of monitoring and the taking of timely and effective corrective action if problems arise is acknowledged in the successful delivery of the mitigation measures
- Interactive or real-time/live mapping systems should be developed, possibly in conjunction with 'permits to work' and sign off by the Project Ecologist of the correct completion and functioning of the measures
- Consideration should be given to making reports on implementation and monitoring of measures available, including to NPWS, via a dedicated website
- Locations of key ecological mitigation measures should be mapped with records kept that are able to interface with, for example, the Councils' GIS and planning systems, so they can be taken into account and safeguarded in future projects and plans
- Any non-performance, non-compliances or other issues that arise should be addressed in a timely manner
- Monitoring of certain measures, such as the wildlife overpass and hedgerow planting, is to continue for 5 years. After the monitoring period, maintenance and management of various features will be required in the long-term

- The conclusions in the EIAR are contingent on i) the effective and timely implementation of these measures at or prior to construction stage, ii) their continued effective functioning for the lifetime of the project, and iii) their safeguarding in any future projects and development planning

4.11.2 The following submission/objection raised these points:

Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018]

Responses

4.11.3 To confirm, all relevant mitigation measures and commitments will apply, from the outset, to all parts of the development as permitted, including enabling works, site preparation and advance contracts, as well as at construction stage.

4.11.4 The requirement to engage the services of ecologist(s) is set out in Section 5 of the Construction Environmental Management Plan (CEMP), included as Appendix A.7.5 of the EIAR. It will be the responsibility of the Site Environmental Manager (SEM) to procure the advice and services of suitably qualified ecological experts to oversee ecologically sensitive elements of the construction works, ecological derogation licensing requirements and ecological monitoring. Any non-performance, non-compliances or other issues that arise shall be promptly addressed to ensure compliance with the mitigation strategy and all derogation licence requirements.

4.11.5 Galway County Council/TII will have a Site Monitoring Team which will include a Project Ecologist (refer to Section 1.1 and Section 5 of the CEMP). The Project Ecologist will be available for the duration of the construction phase for the proposed N6 Galway City Ring Road, including any advanced works such as service diversions or archaeological test trenching.

4.11.6 It is assumed that the construction contract will be Design & Build (D&B) or Public Private Partnership (PPP). Based on this, the overall responsibility for works during the construction contract, including implementing the mitigation strategy and any monitoring required, will be with Galway County Council/Transport Infrastructure Ireland (TII), with potentially a third-party consultant team reporting to Galway County Council/TII.

4.11.7 To provide additional clarity on the seasonal restrictions and timings relating to the various ecological mitigation measures, an outline schedule of the mitigation measures and monitoring commitments is included as Appendix D.

4.11.8 Any new considerations that may arise as a result of pre-construction surveys will be addressed and managed in accordance with the mitigation measures outlined in the Section 8.6 of the EIAR. For example, any new Otter holts will be afforded protection and dealt with in accordance with the protocols and methods set out in the Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (National Roads Authority, 2008). Additional Badger setts will be afforded protection and dealt with in accordance with the protocols and methods

set out in the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (National Roads Authority, 2006).

4.11.9 The importance of monitoring and the taking of timely and effective corrective action as problems arise is acknowledged in the successful delivery of the mitigation measures detailed in the Schedule of Commitments (SoCs). Monitoring and maintenance form a key part of many of the mitigation strategies detailed in the EIAR and NIS. For example, in relation to the Barn owl planting (refer to 8.53 in the SoCs), mammal passage facilities (refer to 8.23 and 8.39 in the SoCs) and the bat mitigation measures (refer to 8.29).

4.11.10 Galway County Council and Transport Infrastructure Ireland (TII) will be responsible for implementing and delivering the post-construction monitoring programme, and any maintenance required in relation to same, for the lifetime of the proposed road development.

4.16.11 In response to the requests for real-time/live mapping systems, making reports on the implementation and monitoring of measures available, mapping locations of key ecological mitigation measures and interfacing with the planning authority's GIS and planning systems, and monitoring of the wildlife overpass and hedgerow planting to continue for 5 years, Galway County Council propose the following:

- A GIS mapping system will be developed, to allow the Project Ecologist to track the progress, completion and monitoring of the ecological mitigation measures
- At the end of each month, any mapping relating to ecological mitigation measures, including results of pre-construction surveys (e.g. locations of badger setts) or design changes for mitigation measures (e.g. change in location of artificial Badger sett), will be uploaded to the dedicated project website. In addition, at the end of each month any ecological monitoring reports will be uploaded to a dedicated project website
- Notwithstanding the point above ecological monitoring reports will be submitted to the Planning Authority and copied to the NPWS
- The Project Ecologist in conjunction with 'permits to work' will sign off the correct completion and functioning of the measures, where works are in ecologically sensitive locations and/or are ecologically sensitive activities, which are likely to include, but may not be limited to, the following:
    - works involving vegetation removal/site clearance
    - works involving installation of site fencing
    - works in or adjacent to the Lough Corrib cSAC,
    - works in or adjacent to any watercourses
    - works in or adjacent to any known breeding, resting or hibernating locations of any species protected under either the Birds and Habitats Regulations 2011 or Wildlife Act, in particular bats and otter

- works in areas where mitigation measures (including either habitat creation/mitigation or provision of nest and bat boxes) are proposed
- works in or adjacent to donor and receptor sites identified for the creation of habitats, until such time as any donor material required for the receptor sites has been transported

- Once ecological mitigation measures have been implemented and installed, GIS mapping files of their final as-built locations will be sent to the Project Ecologist to be uploaded into the Local Authority's GIS and planning systems
- Interactive or real-time/live mapping systems would be onerous to provide and manage. It is not deemed either necessary or appropriate to provide such systems given the above proposals which together will achieve the same function, purpose and results as a real-time/live mapping system

4.12 Valuation of Annex I Habitats

Issues

4.12.1 The following issues were raised:

The valuation of Annex I habitats is overly precautionary, does not take into account the current condition, quality, size and viability of Annex I habitat areas, and is inconsistent with the approach set out in the Guidelines for assessment of Ecological Impacts of National Rood Schemes (National Roads Authority, 2009).

4.12.2 The following submissions/objections raised these points:

NUI Galway [Ob_528, 541, 543 & 557]

Responses

4.12.3 In the context of considering a geographic valuation for biodiversity receptors, including Annex I habitat areas, in environmental impact assessment, it is important to note that the TII guidance was published ten years ago; the current best-practice guidance document used by practitioners within the industry to value and assess ecological impacts is *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018).

4.12.4 To clarify, the ecological valuation examples referred to from Table 1 of the TII guidance document are "criteria" that must be strictly followed and applied when valuing Annex I habitats. These are clearly provided in the TII guidance document as *examples*, and not criteria – refer to page 15 of the TII guidance document where it states that the "*examples are indicative and that all ecological resources should be valued and selected by competent experts having regard to the guidance provided* [elsewhere in the document]".

4.12.5 The criteria used to value Annex I habitat areas lying outside of and not connected with any European Site are set out in Section 8.2.5 of Chapter 8, Biodiversity of the EIAR. The distinction in the valuation of Annex I habitats as nationally

important, versus a valuation of international importance for priority Annex I habitats, considers the difference in conservation status between these habitat types reflected in the Habitats Directive – the legislation which defines Annex I habitats and sets out their conservation importance. Priority Annex I habitats are defined separately to Annex I habitats in the Habitats Directive, on the basis that there is a particular responsibility noted for their conservation Article 1(d).

4.12.6 To clarify, habitat condition was an important consideration in the EIAR when classifying and valuing Annex I habitats.

4.12.7 The precautionary principle is a key consideration in that regard where, in most cases, it could not be established or supported by scientific evidence whether areas of poor quality/degraded Annex I habitats recorded during the field surveys had been compromised since 1992.

4.12.8 In effect, even currently small, fragmented and/or degraded area of Annex I habitat could, following appropriate mitigation or restoration measures, contribute to the restoration of the favourable conservation status of a given Annex I habitat type. This is particularly relevant in relation to the Annex I habitat types potentially affected by the proposed road development, whose national favourable conservation statuses are all currently assessed as either "bad" or "inadequate" by the National Parks and Wildlife Service[13].

4.12.9 Therefore, this approach to valuing Annex I habitat types is not overly precautionary and is consistent with both the TII (formerly known as the National Roads Authority) and CIEEM guidance[14].

4.13 Route Selection Process and Habitats/Biodiversity over Humans

Issues

4.13.1 The following issues were raised:

- Ecological constraints were prioritised over human beings in the route selection process for the N6 GCRR
- Measures for biodiversity impacts prioritised over addressing human impacts
- Whilst the 2006 GCOB Scheme was refused planning permission for the ecological impacts it would have, the proposed N6 GCRR will significant impacts on human beings

[13] *The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments.* (NPWS, 2019).
[14] Section 3.3.5 of the National Roads Authority guidance states that "[for habitats] … *that are currently below favourable conservation status, their potential to be restored and the potential value they could reasonably attain should be taken into account, and described, in the valuation process*."
Para. 4.17 of the CIEEM guidance states that "*There may be cases where important habitat types are affected but they are currently in a degraded or unfavourable condition. Whilst the current baseline condition of a habitat may be suboptimal, its potential value should be considered, including its possible contribution to conservation objectives. It is essential not to under-estimate the importance of habitats in sub-optimal condition where there is potential for restoration*."

- Consideration of 2006 GCOB route in the route selection process was flawed

4.13.2 The following submissions/objections raised these points: Ob_116; Ob_220; Ob_152; Ob_O_517.11_1; Ob_519; Ob_521_O_517.14.01; Ob_531.01; Ob_531.02; Ob_534; Ob_569; Ob_612; Ob_613_657; S_049; S_068; and S_070.

Responses

4.13.3 Given the built environment and the unavoidable proximity of the proposed road development to residential areas, there will unfortunately and unavoidable result in a number of property demolitions and business acquisitions. From the outset of the design of the proposed road development every effort was made to avoid these impacts and there are areas where more adverse impacts on biodiversity will be incurred to lessen the impacts on people and their homes – such as at Cloughscoilte.

4.13.4 The alternatives considered, and the selection of the preferred route corridor is addressed by Eileen McCarthy in her Statement of Evidence.

4.14 Extent of Lands Acquired for Mitigation and the Management of Habitat Areas

Issues

4.14.1 The following issues were raised:

- Long-term management of lands proposed for Annex I habitat
- Lands at Menlough proposed for bat planting
- Objection to the extent of lands been acquired at Menlough for bat mitigation measures
- Lands at Lackagh Quarry proposed for Annex I habitat creation
- Issues in relation to extent of land acquisition at Lackagh Quarry and the habitat planting proposed at this location. The submission/objection requests that consideration be given to an alternative site located in Kinvara which has been assessed by McCarthy Keville O'Sullivan's ecology department as a potential alternative site to for habitat creation

4.14.2 The following submissions/objections raised these points: Ob_111; Ob_134; Ob_583; Ob_566_598; and Ob_648.

Responses

4.14.3 All lands included within the acquisition boundary are required to facilitate the construction and operation/maintenance of the proposed road development including, inter alia, the construction of the proposed road, working area for the contractor, service diversions, signs and associated foundations, severed holdings, environmental mitigation measures, traffic management, and accommodation works.

4.14.4 The measures proposed are to address the residual impacts on habitats and bats; each of these is discussed separately below in relation to the points raised in the submissions/objections.

Long-term management of lands proposed for Annex I habitat creation

4.14.5 The creation of Annex I habitat has two distinct elements to it: direct, like-for-like replacement for the losses of certain Annex I habitat types (e.g. 6210 Calcareous grasslands); and, creation of habitat to provide some level of biodiversity gain to offset the losses of Annex I habitats that cannot be directly replaced (e.g. *8240 Limestone pavement).

4.14.6 In all cases the area of lands proposed for habitat creation are those necessary to ensure the aims and targets set out in Appendix A.8.26 of the EIAR are achieved in terms of habitat creation and mitigating the likely significant effects on Annex I habitats associated with the proposed road development. In the cases of heathland habitats, for example, this includes the management of scrub and bracken encroachment. Best practice is to have habitat replacement ratios greater than one-to-one to ensure delivery of the target habitat type in terms of extent, quality and diversity due to the uncertainties inherent in habitat creation (i.e. the habitat creation sites should be greater than the sites being translocated or removed). To confirm, Appendix A.8.26 of the EIAR includes for the long-term management and maintenance of the created habitat areas so they achieve the desired habitat type and quality in each location for the life of the proposed road development.

Lands at Menlough proposed for bat planting

4.14.7 It is proposed to enhance lands at Menlo to enhance feeding areas for bats as a result of impacts to Lesser horseshoe bats potentially caused by the construction and operation of the proposed road development.

4.14.8 The proposed road development entails the removal of c.7ha of woodland and scrub within the core foraging area of the breeding population of this species whose maternity roost is located at Menlo Castle. A variety of measures have been proposed in the EIAR (Section 8.6.7.2 and Section 8.9.2) as part of the proposed road development including provision of artificial roost structures, underpasses and landscape planting. A derogation licence is required to address the unavoidable loss of roosts and mortality due to road collisions and a draft of the same has been prepared and included in Appendix A.8.25 of the EIAR.

4.14.9 At a meeting between Scott Cawley Ltd. and the National Parks and Wildlife Service (NPWS) on 18 April 2017, regarding the proposed mitigation measures for bats, the NPWS stated that the loss of approximately 7ha of foraging habitat for lesser horseshoe bats would need to be mitigated for by provision of "like-for-like" foraging habitats. This measure was designed and integrated into the overall bat mitigation strategy. The opinion of the NPWS to the proposal was issued in January 2018 and was as follows:

4.14.10 "*The enhanced foraging around Menlo has been well thought out and though the habitat being created is not directly comparable with that being lost, it is the type of habitat used extensively in Ireland by LHB. There is little, if any previous experience in Ireland with this type of mitigation, however, on first principles what is proposed is likely to enhance the foraging opportunities for all bats in the area*

and especially for female LHBs during the critical nursing period at Menlo. It appears to be a pragmatic and proportionate response to the expected habitat loss".

4.14.11 The project team analysed the usage of lands near the maternity roost at Menlo Castle to identify if they met the following requisite criteria to allow them to be considered as part of the lands for this purpose:

a) The lands must be capable of being accessed by the Lesser horseshoe bats roosting at Menlo Castle and from the proposed artificial roost nearby. Linear features such as hedgerows and woodland edges must connect the roost and the newly created habitat

b) The lands must show some evidence of use by Lesser horseshoe bats to demonstrate that they can access the area

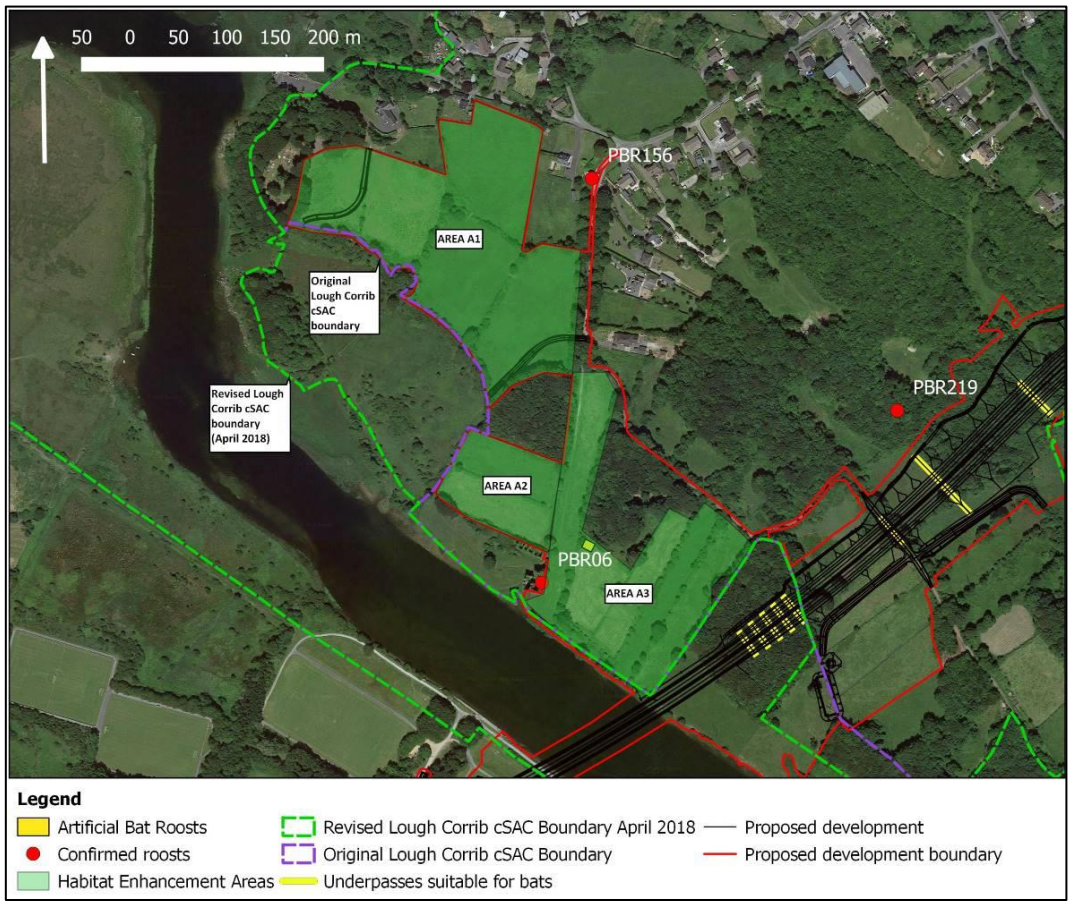
c) The lands should not already contain areas of optimal Lesser horseshoe bat foraging habitat such as woodland, scrub and wetlands and should be capable of being enhanced using planting and landscaping to increase the suitability as a feeding resource

d) Any proposed changes to the lands must not depreciate its ecological value and there is a general assumption that lands within a Special Area of Conservation (SAC) should not be used for planting purposes

4.14.12 Agricultural grassland to the northwest of Menlo Castle (Area A1 and A2 in Plate 1 below) and lands immediately adjacent to the proposed road development was identified for enhanced foraging habitat, as it was within the known core foraging area of the Menlo Castle roost (PBR06) as suggested by the radiotracking data. These lands amounted to c. 6ha. It is composed of open fields of varying size used for low density cattle grazing. The Lough Corrib cSAC lies to the west and south of these lands and all the proposed area for habitat planting for bats was deliberately designed to be outside of the cSAC to minimise the footprint within the designated site.

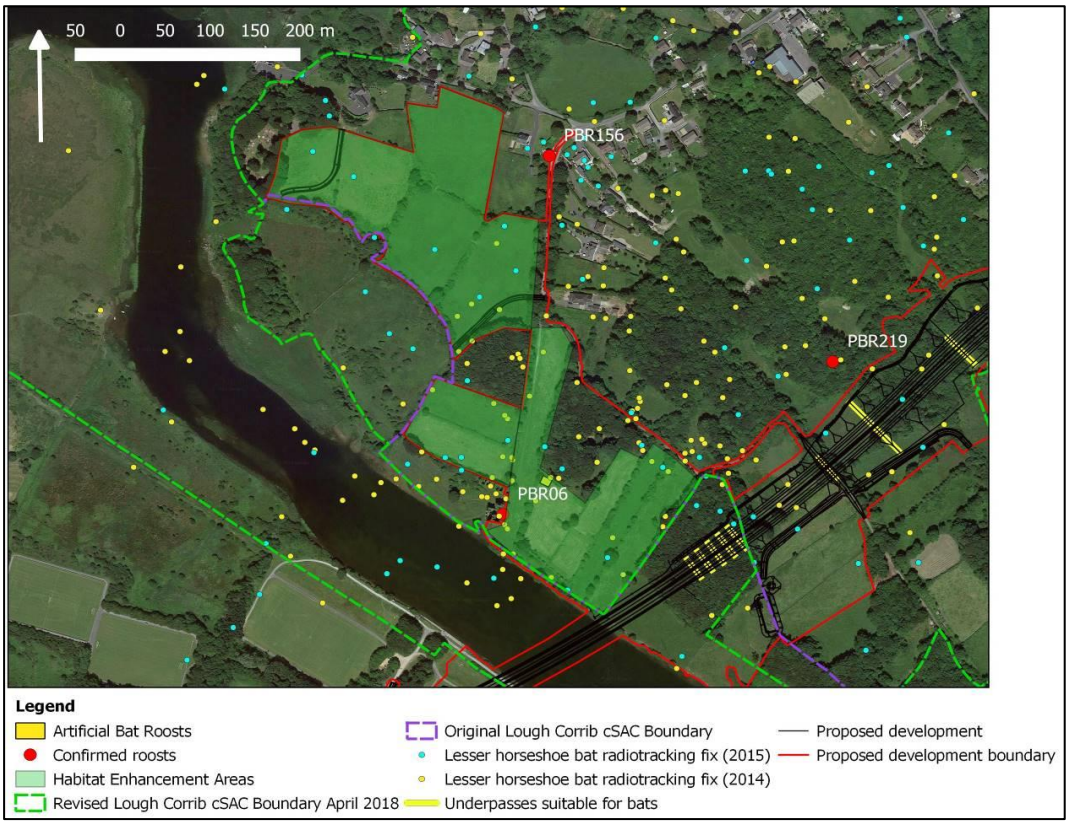
4.14.13 In addition to these fields to the north west, smaller fields to the east of Menlo Castle and the proposed artificial roost (Area A3 in Plate 1) were identified as being capable of further subdivision to provide enhanced foraging habitat and connectivity close to the roost (PBR06) and possibly reduce the need for bats to cross the proposed road development. Planting of these fields covered an additional c.3ha.

Plate 1: Proposed lands for bat habitat planting



4.14.14 Plate 2 shows the radiotracking "fixes" for several lesser horseshoe bats that were trapped and tagged with radio transmitters from Menlo Castle and Cooper's Cave and tracked over three periods in the summer of 2014 and 2015. This data was used to identify areas preferred by the tagged bats for foraging. The data suggested a lower density of fixes in the fields to the north west of the castle (Area A1 in Plate 1). This would suggest a lower level of usage by the tagged bats.

Plate 2: Radiotracking fixes for lesser horseshoe bats (2014/2015)



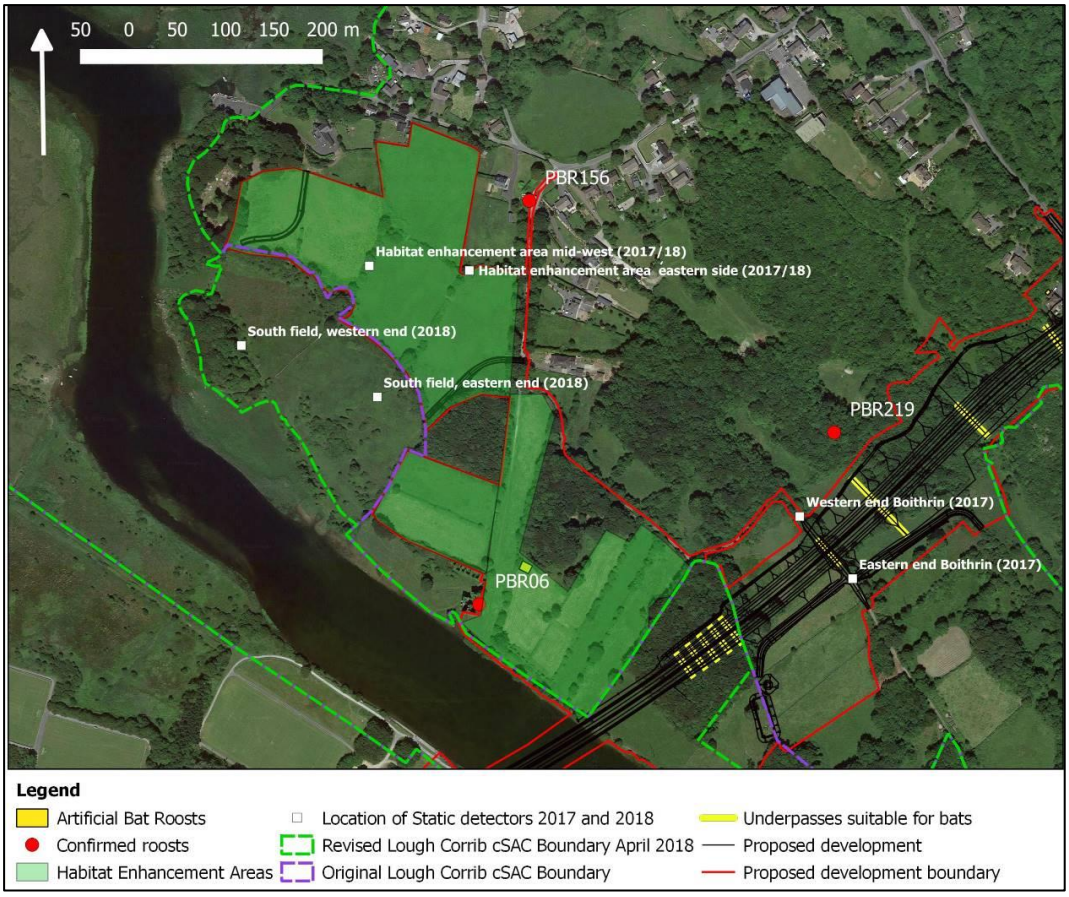
4.14.15 It was noted, that the apparently low level of usage by bats in the open fields to the north west suggested by radio-tracking data may have been a consequence of the basin-type topography of the lands which can disrupt radio telemetry signal reception. Therefore, the actual bat activity in these fields was measured using unattended automatic bat detectors from 28 July to 11 August 2017. Two detectors were placed in the fields and two in the location of the proposed road development where it crosses the Menlo Bóithrín. The locations are shown in Plate 3 below, and the results summarised in Table 3. This monitoring demonstrated that Lesser horseshoe bats were able to access the interior of the proposed planting areas.

Table 3: Static Detector results (2017)

Location	No. of Survey nights[15]	Lesser horseshoe bat recordings (manually verified)	Average Calls per night
Bóithrín western end	12	20	1.67
Bóithrín eastern end	14	61	4.35
Planting area eastern side	10	108	10.8
Planting area mid-west	14	24	1.71

[15] Comparisons between locations was not possible due to differences in recording nights as some units ran out of power earlier than others.

Plate 3: Locations of static bat detectors 2017 and 2018



4.14.16 In April 2018, the boundary of the Lough Corrib cSAC was revised to exclude the lands southwest of the proposed bat habitat planting area from the European site designation. It was decided to investigate the level of bat activity in this area using static detectors so as to inform the final delineation of the bat habitat planting area. An inspection of the area on foot on 2 May 2018 by Scott Cawley Ltd. showed that there was wet grassland, marsh and scrub habitat present in this area which would suggest a higher degree of suitability for foraging Lesser horseshoe bats than the open field to the north. It was also noted that there had been records of rare molluscan fauna[16] recorded within the wet grassland areas as part of the baseline surveys to inform the EIA ecological assessment of the proposed road development.

4.14.17 In May 2018, two automatic bat detectors were placed in these wet grassland fields in the former Lough Corrib cSAC area and an additional two static detectors were placed to the north in the same locations as July/August 2017. The results of these second series of bat activity surveys is shown below in Table 4.

[16] *Vertigo antivertigo* is listed as Vulnerable, in *Ireland Red List No. 2 – Non-Marine Molluscs* (Byrne et al., 2009) and is not a species protected under the EC Habitats Directive.

Table 4: Static Detector results (2018)

Location	No. of Survey nights	Lesser horseshoe bat recordings	Average number of lesser horseshoe bat recordings per night
South field, eastern end	12	92	7.67
South field, western end	12	24	2
Planting area eastern side	7	63	9

4.14.18 One of the units in the northern (planting area mid-west) failed to record. Nonetheless, the 2018 bat activity survey results demonstrated that Lesser horseshoe bats were already foraging in these fields to the south, within the former Lough Corrib cSAC area.

4.14.19 By reference to the criteria presented above, it was decided that it would not be appropriate to include this area within the proposed habitat planting area for bats.

4.14.20 Whilst there was evidence to show that Lesser horseshoe bats could access the fields to the southwest, bats were already foraging in this area at similar levels to that experienced in the surrounding area. This land was deemed to have suitable foraging habitat for Lesser horseshoe bats and finally, there were sensitive wetland habitats and species present which could be adversely affected by interventions associated with the measures such as planting or alteration to local drainage.

4.14.21 It is proposed to augment the hedgerows in the proposed bat habitat planting area and to provide thickets of hazel, hawthorn, holly and oak in the fields to create pockets of wood and grassland habitat. Grazing will continue on the lands as it has been shown that foraging over grazed land is preferred to ungrazed lands (Downes et al, 2016[17]).

4.14.22 The planting of additional native hedgerows across the existing fields to increase the lengths of hedgerows close to the proposed new roost for Lesser horseshoe bats between the proposed road development and Menlo Castle will improve the foraging resources of this core foraging area. The fields will still be grazed, and the hedgerows can be fitted with field gates as required providing gaps are kept to a minimum. By reference to the criteria presented in paragraph 4, the proposed habitat planting area is accessible for lesser horseshoe bats but contains sub-optimal habitats (large open fields) and its ecological value will not be depreciated as a result of the proposed bat habitat planting.

Lands at Lackagh Quarry proposed for Annex I habitat

4.14.23 Lands at Lackagh Quarry are required to create additional Annex I Calcareous grassland habitat as detailed in Appendix A.8.26 of the EIAR (and with additional updated details provided in Appendix B of this statement). These additional areas

[17] "*Sex-Specific Habitat Preferences of Foraging and Commuting Lesser Horseshoe Bats Rhinolophus hipposideros (Borkhausen, 1797) in Lowland England*," 18(2) Nick C. Downs, Warren J. Cresswell, Paola Reason, Giles Sutton, David Wells, Stephanie Wray Acta Chiropterologica (1 December 2016)

of Annex I Calcareous grassland habitat are being created to address the losses of this habitat type associated with the proposed road development and to provide an overall biodiversity gain for limestone associated habitats locally.

4.14.24 The rationale for the final layout of Lackagh Quarry is described in Section 2.8.2.1 of the RFI Response submitted to An Bord Pleanála the 30 August 2019. As described in the RFI Response, the Material Deposition Areas (MDAs) in Lackagh Quarry that are being utilised as sites for the creation of Annex I Calcareous grassland habitat have been revised following consultation with the property owner. To clarify, and as explained in Section 2.8.2.1 of Chapter 8 of the RFI Response, whilst the Material Deposition Areas in Lackagh Quarry are being used to facilitate the creation of Annex I Calcareous grassland habitat they are also included within the proposed development boundary for reasons other than habitat creation – i.e. to provide stability to the existing blast damaged quarry rock face and to make the area safe during construction and operation of the proposed road development). The lands proposed for creation of Annex I Calcareous grassland habitat are sufficient for the purposes of the overall biodiversity gain proposed in the EIAR and there is no requirement for any additional lands for this purpose.

4.15 Stone Walls and Loss of Wildlife Habitat

Issues

4.15.1 Loss of stone walls as habitat for wildlife.

4.15.2 The following submissions/objections raised these points: Ob_311; Ob-254; Ob_255_ 256; Ob_481; Ob_521_O_ 517.14_01; Ob_116 and S_074.

Responses

4.15.3 A response to the general comments on wildlife are addressed in Section 1.21 below.

4.15.4 The impact of stone wall clearance on Common lizard is assessed in Section 8.5.10.1 of the EIAR and mitigation measures are proposed in Section 8.6.11.1 of the EIAR to minimise the risk of site clearance and construction works disturbing, or causing the mortality of, Common lizard.

4.15.5 More generally, and although stone walls are not explicitly mentioned, the loss of stone wall habitat and the associated mortality risk to small mammal species would also fall within the consideration of habitat loss and mortality risk presented in Section 8.5.6.4.1 of the EIAR (e.g. Irish stoat and Wood mouse). As assessed in that section, habitat loss and site clearance work to remove stone walls is unlikely to result in a level of mortality that would affect the species' conservation status, and result in a significant negative effect, even at a local geographic scale.

4.15.6 Although stone walls are not explicitly mentioned, the potential effects of habitat loss, loss of breeding/resting sites and mortality risk during site clearance on breeding birds, which would include stone walls, is assessed in Section 8.5.8.1.1 of the EIAR. The assessment found that these impacts were unlikely to affect the

local range of the breeding bird species present nor were they likely to affect the ability of these breeding bird populations to maintain their local populations in the long-term. Nevertheless, mitigation measures will be implemented to reduce the effects of habitat loss on breeding bird species locally (see Section 8.6.9.1.1 of the EIAR).

4.16 Impacts on Bees in the Coolough Area

Issues

4.16.1 Impacts on local bee populations in the Coolough area.

4.16.2 The following submission/objection raised this point: S_074.

Responses

4.16.3 It is acknowledged in Section 8.5.4.3 of the EIAR that the proposed road development will result in the loss of a range of habitat types in the Menlough-Coolagh area, some of which are likely to support the local bee populations in providing both nesting opportunities and a food resource. However, it is worth noting that in this area, between the River Corrib and Lackagh Quarry, the proposed road development impacts upon woodland, scrub and relatively low diversity and improved agricultural fields – habitats that play a limited role in supporting local bee populations compared with, for example, species rich meadows.

4.16.4 The extensive landscape planting and the creation of extensive areas of species-rich calcareous grassland habitat in the Menlough-Coolagh area will improve the extent and availability of pollinator friendly plant species and habitat as a food resource for the local bee populations. As a result, significant residual effects on the local bee populations are not predicted to occur.

4.17 Impacts on Bats and Mitigation Measures

Issues

4.17.1 It is stated that it is unlikely that bats would make use of alternative roosts provided and as a result bat populations will be reduced or eradicated from the area permanently.

4.17.2 The following submission/objection raised this point: S_074.

4.17.3 The Department stated that the conclusions in the EIAR in relation to bats are contingent on i) the effective and timely implementation of the mitigation measures at or prior to construction stage, ii) their continued effective functioning for the lifetime of the project, and iii) their safeguarding in any future project and development planning.

The Department also stated that monitoring and resulting corrective action if problems arise are integral to the success of the mitigation measures and to the EIAR assessment and conclusions. It is recommended that any uncertainties regarding mitigation measures should be taken into account in the context of the EIA.

4.17.5 The following submission/objection raised these points: S_018.2.

Responses

4.17.6 To clarify, whilst the proposed road development will have residual effects on the local bat populations, through the implementation of the bat mitigation strategy detailed in the EIAR, it will not result in those populations being permanently lost from the locality.

4.17.7 The mitigation strategy, which is based on best practice, including the provision of artificial roosting structures, has been reviewed by the National Parks & Wildlife service. In their consultation response of the 18 January 2018 (Ref. G Pre00241/2016) they commented that the mitigation strategy is comprehensive, meets current best practice in mitigating the effects of roads on bats, and would not impact negatively on the favourable conservation status of the bat species in the area.

4.17.8 It is noted and agreed that the conclusions in the EIAR in relation to bats are contingent on the effective and timely implementation of the mitigation measures at or prior to construction stage, their continued effective functioning for the lifetime of the project, and their safeguarding in any future project and development planning. Galway County Council is aware of the requirements set out in the EIAR and has committed to undertaking them.

4.17.9 Likewise it is noted that monitoring and the taking of timely and effective corrective action if problems arise are integral to the success of the mitigation measures and to the conclusion and prediction that has been reached in the EIAR regarding impacts on bats. Galway County Council is aware of the need for monitoring requirements set out in the EIAR, the RFI Response and any additional commitments made in this statement of evidence (as included in the updated SoC) and has committed to undertaking them. Response 4.11 above should be read in

conjunction with this response for confirmation of the commitments regarding mitigation, monitoring and their implementation.

4.18 General References to Biodiversity, Wildlife and Habitat Impacts

Issues

4.18.1 Impacts on wildlife and habitats generally, including garden wildlife are queried in the following submissions/objections: S_039; S_046; S_062; S_063; S_066; S_074; Ob_136; Ob_141.2; Ob_199; Ob_311; Ob_523; Ob_630 and Ob_751.

Response

4.18.2 Section 8.5 of Chapter 8, Biodiversity of the EIAR sets out the various impacts on biodiversity associated with the proposed road development, which includes those impacts noted in the submissions/objections above (e.g. habitat loss, disturbance to wildlife and pollution). The impact assessment is focussed on key ecological receptors, as explained in the impact assessment methodology in Section 8.2.5 of the EIAR.

4.18.3 The identification and evaluation of these key ecological receptors is presented in Section 8.3 of Chapter 8 of the EIAR and summarised in Table 8.26, therein. The key ecological receptors include a range of habitat types (e.g. Annex I habitats through to hedgerows and treelines), all bird species, and mammal species protect under the Wildlife Acts (e.g. Irish hare, Pine marten and bats).

4.18.4 Further to the information presented in the EIAR, and at the request of An Bord Pleanála, additional habitat survey work, including vegetation data in the form of relevés, were taken along the proposed road development between June and August 2019. The 2019 habitat survey results are presented in full in the Habitat Survey Report included as Appendix A.3.1 of the RFI Response submitted to An Bord Pleanála the 30 August 2019.

4.18.5 The full results of the 2019 habitat survey are shown on Figures 2.5.01 to 2.5.15 and 2.6.01 to 2.6.15 in Annex 2 to Appendix A.3.1 of the RFI Response. The findings of the 2019 habitat survey resulted in some changes to the habitat mapping and these are described in Section 4 of the RFI Response. Further assessment of the implications of those habitat changes is presented in Section 5 of the Habitat Survey Report in Annex 2 to Appendix A.3.1 of the RFI Response.

4.18.6 Section 8.6 of the EIAR described the various mitigation measures that will be implemented to either avoid or minimise the effects of the proposed road development on biodiversity. These measures include: avoiding and retaining sensitive habitat areas, pollution control measures, maintaining landscape connectivity across the road carriageway for fauna species, minimising the mortality risk to fauna species associated with the proposed road development through seasonal works restrictions and prescribed working methodologies,

measures such as landscape planting and the provision of artificial roosting/nesting sites, and a monitoring programme.

4.18.7 It is acknowledged in Section 8.7 of the EIAR that residual impacts will be associated with the proposed road development and measures have been proposed in Section 8.9 to further minimise the residual biodiversity effects – although some level of residual effects on biodiversity will remain (Section 8.10 of Chapter 8 of the EIAR). These measures include habitat creation and management and the provision of bat roosting structures, and are also supported by a monitoring programme.

4.19 Impacts on Green/Blue Infrastructure

Issues

4.19.1 The loss of "green and blue space" at Dangan and the NUI Galway sports campus is questioned in submissions/objections: Ob_630 and S_022

4.19.2 "[The Galway City Development Plan 2017 — 2023] … *also states that it aims to "protect the distinctive and diverse natural environment and strengthen green network and linkages". This proposed motorway is a complete contradiction of all the above*."

Response

4.19.3 The losses of green space at the NUIG Sporting Campus at Dangan are minor in nature and will not significantly compromise the biodiversity value of the local natural environment. The presence of the proposed road development will also not undermine the range of benefits provided by the local green infrastructure resource: i.e. recreational benefits, the potential for facilitating active and healthy lifestyles, the effect it can have on the quality of general health and well-being and the value it has for providing an attractive city setting.

4.19.4 The proposed road development will not result in the loss of any blue space in this area as the proposed River Corrib Bridge clear spans the river, avoiding any direct loss of habitat within the river channel.

4.19.5 More generally, and despite the residual biodiversity impacts associated with the proposed road development, the proposed road development will not compromise the strategic goal of the Galway City Development Plan 2017-2023 to protect the distinctive and diverse natural environment and it will not inhibit any efforts by Galway City Council to strengthen the green network and its linkages across the city.

4.19.6 A response on the impacts of the proposed road development on the NUIG Sporting Campus from a planning perspective is included in John O' Malley's statement of evidence on Planning and Policy.

4.20 Potential for Marsh Fritillary Butterfly at Menlo Castle

Issues

4.20.1 "*The Marsh Fritillary Butterfly has been found in the Bog Road area of Menlo this year after a lengthy absence. This species is known for changing its breeding location and we wonder if it is laying eggs in the Devils Bit Scabious plant which may be in the grasslands around Menlo Castle. If so, then this EU protected species' habitat must be protected from this proposed ring road development*."

4.20.2 The following submission/objection raised this point: S_041.

Response

4.20.3 The submission does not confirm the presence of the Devil's bit scabious plant in the grasslands surrounding Menlo Castle nor the presence of a breeding Marsh fritillary butterfly population. As Devil's bit scabious is the food plant for Marsh fritillary larvae, its presence is a key component of any habitat area being suitable to support the species.

4.20.4 There are no know data records of either the Marsh fritillary butterfly or the Devil's bit scabious plant in the grasslands surrounding Menlo Castle. Devil's bit scabious was not recorded in any relevés taken in that area to inform the EIAR of the proposed road development.

4.20.5 Aside from this it is also worth noting that the habitat areas surrounding Menlo Castle, which lie within the proposed development boundary (save for two farm access tracks), will not be directly impacted by the proposed road development – habitats in this area will be retained during construction and form part of the area proposed for bat habitat planting measures.

4.21 Impacts on Curlew

Issues

4.21.1 Clarification is sought regarding how the conclusion was reached in the EIAR that there would be no impact on Curlew, in particular what consideration was given to indirect impacts on adjacent habitat, impacts on their flight paths across the proposed road development, and impacts from blasting and noise during construction and disturbance during operation.

4.21.2 The following submission/objection raised this point: Ob_201.

Response

4.21.3 The impact of habitat loss on wintering birds, including Curlew, at winter bird survey sites is assessed in Section 8.5.8.2.1 of the EIAR. The conclusion of the assessment is that long-term effects on local wintering bird populations of conservation concern, such as Curlew, are not likely given the majority of each

affected habitat block supporting Curlew (WB07, WB03 and WB10[18]) will not be directly affected by habitat loss or habitat fragmentation and the low and/or infrequently records of Curlew across the affected wintering bird sites.

4.21.4 Overwintering Curlew forage away from the coast on peatland and wet marshy habitats such as wet grassland. These habitat types are abundant locally and the relative extents of these habitat types that will be permanently lost to the proposed road development are a small percentage of the surrounding habitat resource that is available to support the local Curlew population. The impact assessment of the proposed road development on habitats, which presents the relative loss of each habitat type in the local context, is presented in Section 8.5.4.3 of the EIAR.

4.21.5 As an example, it is predicted that c.4.7% of the mapped areas of wet grassland will be directly affected by the proposed road development. However, as stated in the in Section 8.5.4.3 of the EIAR, given the limited extent of the habitat map and the much greater area of wet grassland that is present locally than captured during the surveys, the quoted 4.7% is likely to be an overestimate of the percentage habitat loss.

4.21.6 The proposed road development will also result in the permanent loss of peatland habitat. However, it is also worth noting here, in the context of losses of potential Curlew foraging habitat locally, that alternative areas of peatland habitat will be created as replacement for the loss of habitat in the Cloughscoilte area.

4.21.7 Therefore, even considering the loss of habitats such as wet grassland outside of the winter bird survey sites, the proposed road development is not likely to have any long-term effects on the local Curlew population.

4.21.8 Neither the construction nor the operation of the proposed road development will present a barrier to the movement of Curlew and, as assessed in Sections 8.5.8.2.1 and 8.5.8.2.2 of the EIAR, the proposed road development will not have any long-term effects on wintering birds in the Cloughscoilte area as a result of disturbance associated with construction works or during the operation of the proposed road development.

[18] These are the winter bird survey sites in the Cloughscoilte area – see Figure 8.9.1 of the EIAR for locations.

4.22 Badger Disturbance and TB

Issues

4.22.1 Concerns are raise regarding disturbance of badgers in the Cappagh Road area which it is stated would have potential for spreading TB to livestock. Clarification is sought regarding what mitigation is proposed to address this.

4.22.2 The following submission/objection raised this point: Ob_216.

Responses

4.22.3 It is acknowledged in the EIAR (Section 8.5.6.3) that construction and operation of the proposed road development will disturb badger habitats across the study area, including the Cappagh Road area where badgers were recorded during the field surveys (Figure 8.3.3 and 8.3.4).

4.22.4 The only potential impact likely to significantly affect badger territories and their local movements is if the proposed road development were to present a permanent barrier to badger passage across the proposed road development. However, mammal passage facilities will be provided in this area (Section 8.6.7.3 of the EIAR and Figures 8.23.3 and 8.23.4) as part of the mitigation strategy to ensure that this does not occur.

4.22.5 A recent study in Co. Wicklow[19] found that roads (the N11 in that study) have a very limited effect on the ranging behaviour or home rage size of badger groups. The construction and operation of the proposed road development is, therefore, unlikely to have any significant effect on badger movements across the proposed road development and consequently is unlikely to pose any risk of TB contraction in livestock herds in that regard.

4.22.6 The mammal passage facilities that will be provided will facilitate the movement of badgers across the road carriageway and will not significantly influence badger movements in the wider local area or contribute to any increased risk of TB transmission or infection in livestock.

[19] Gaughran, A. (2018) *The impact of roadworks on the ranging behaviour of European badgers* (*Meles meles*) – PhD thesis submitted to the School of Natural Sciences (Zoology) Trinity College Dublin, The University of Dublin.

4.23 Potential Impacts on Annex I Habitats

Issues

4.23.1 The following issues were raised:

- Loss of Annex I habitats generally
- Impact on Ballindooley Lough

4.23.2 The following submission/objection raised these points: S_074.

Response

Potential Loss of Annex I habitats generally

4.23.3 Given the conservation importance of Annex I habitats, they were key constraints during the option selection process with regard to ecology and minimising effects on these sensitive habitat types, in so far as was appropriate in consideration of the other important constraints across the other disciplines (as explained in Section 5.3.3 of the Route Selection Report).

4.23.4 The impacts of the proposed road development on Annex I habitats has been fully considered in the EIAR and in the NIS (as relevant to the assessment of effects in the context of European sites). There will not be any losses of Annex I habitat from within any European sites. Where possible, loses of Annex I habitat outside of European sites associated with the proposed road development will be replaced with newly created habitat, as set out in Section 8.9 of the EIAR and detailed in Appendix A.8.26 of the EIAR. As noted in Section 8.9.1 of the EIAR, there are some habitat types that cannot be recreated or replaced (e.g. Limestone pavement) and this is acknowledged in the EIAR and reflected in the residual impacts predicted for the proposed road development in relation to Annex I habitat loss.

Impact on Ballindooley Lough

4.23.5 The importance of the Ballindooley Lough complex for biodiversity, including birds and bats, is acknowledged in the EIAR (Section 8.3.13). The ecological importance of the site for wintering birds, in particular, has informed the mitigation strategy to ensure that birds using the habitat complex at Ballindooley Lough are not disturbed or displaced as a result of the proposed road development (see Section 8.6.9.2.1 of the EIAR and Section 10.8 of the NIS in particular with regard to noise and disturbance mitigation). The full suite of mitigation measures across all sensitive ecological receptors will ensure that the effects of the proposed road development on Ballindooley Lough are minimised as far as is possible.

4.24 Planting for the Castlegar Wildlife Overpass

Issues

4.24.1 Clarification is sought regarding the proposed planting for the Castlegar Wildlife Overpass, including details on the species and soil depths proposed.

4.24.2 The following submission/objection raised these points: S_018.2.

Response

4.24.3 Details of soil depths and proposed planting and species for the Wildlife Overpass are provided in Table 12.8 of Chapter 12 of the EIAR.

4.24.4 The proposed wildlife overpass is c.30m wide. The overpass will be landscaped to provide a connective habitat across the proposed road development. Planting will provide for a central grass pathway bounded on either side by 2m wide tree-lined hedgerows of native tree and shrub species. This planting will tie-in to proposed planting leading east and west along the upper slopes of both sides of the proposed road development.

4.24.5 Soil depths will vary from a minimum of 45cm at the edges to 1.5m along the centreline of both hedgerows.

4.24.6 Tree species will be planted at 3m centres in double rows in each hedgerow and will include alder, birch, rowan, planted as standards (*i.e.* 8-10cm girth, c.2.4m high) and whips (1.25m high). Sixty percent of shrub planting will comprise blackthorn, hawthorn and hazel, augmented with elder, holly, spindle, willow etc. Hawthorn plants will be 90cm high. Other shrubs will be planted at 60cm high.

5 Conclusion

5.1 As is detailed in the Chapter 8 of the EIAR, the proposed road development will have potential to impact on a range of ecological receptors. However, with the implementation of design and mitigation measures many of these will be reduced to the extent that they will not result in any significant residual effects.

5.2 For some of those receptors the significant residual effects have been removed through measures such as creating new replacement habitat. Nonetheless some significant residual effects will remain for loss of certain habitat types.

5.3 The significant residual effects, at a local to international scale, as a result of habitat loss arise from the loss of three priority Annex I habitats, all outside of any European sites - active Blanket bog [*7130], habitat Limestone pavement [*8240] and a single Petrifying spring [*7220] feature, one Annex I habitat Wet heath [4010] and three non-Annex habitats (Calcareous springs FP1, Dry-humid acid grassland GS3 and Poor fen and flush PF2).

5.4 Although significant residual effects associated with the losses of Limestone pavement and Wet heath habitat (all outside of European sites) will remain, areas

of related habitats will be created to provide a biodiversity gain for both peatland and limestone associated habitats locally. The area of Dry heath habitat being provided is greater than the combined losses of all peatland habitats and the area of Calcareous grassland habitat being provided is greater than the combined losses of Limestone pavement and Calcareous grassland habitat.

5.5 The significant residual effects of the proposed road development on bat species which will remain, even after the implementation of mitigation, will result in a significant residual effect at the local geographic scale.

5.6 The significant residual effects of the proposed road development on Peregrine falcon which will remain, even after the implementation of mitigation, include a significant negative residual effect at the local to county geographic scale.

5.7 A number of submissions and objections made relate to biodiversity. A range of issues were raised in a single submission from the Development Applications Unit, Department of Culture, Heritage and the Gaeltacht [S_018] with additional issues raised in range of objections.

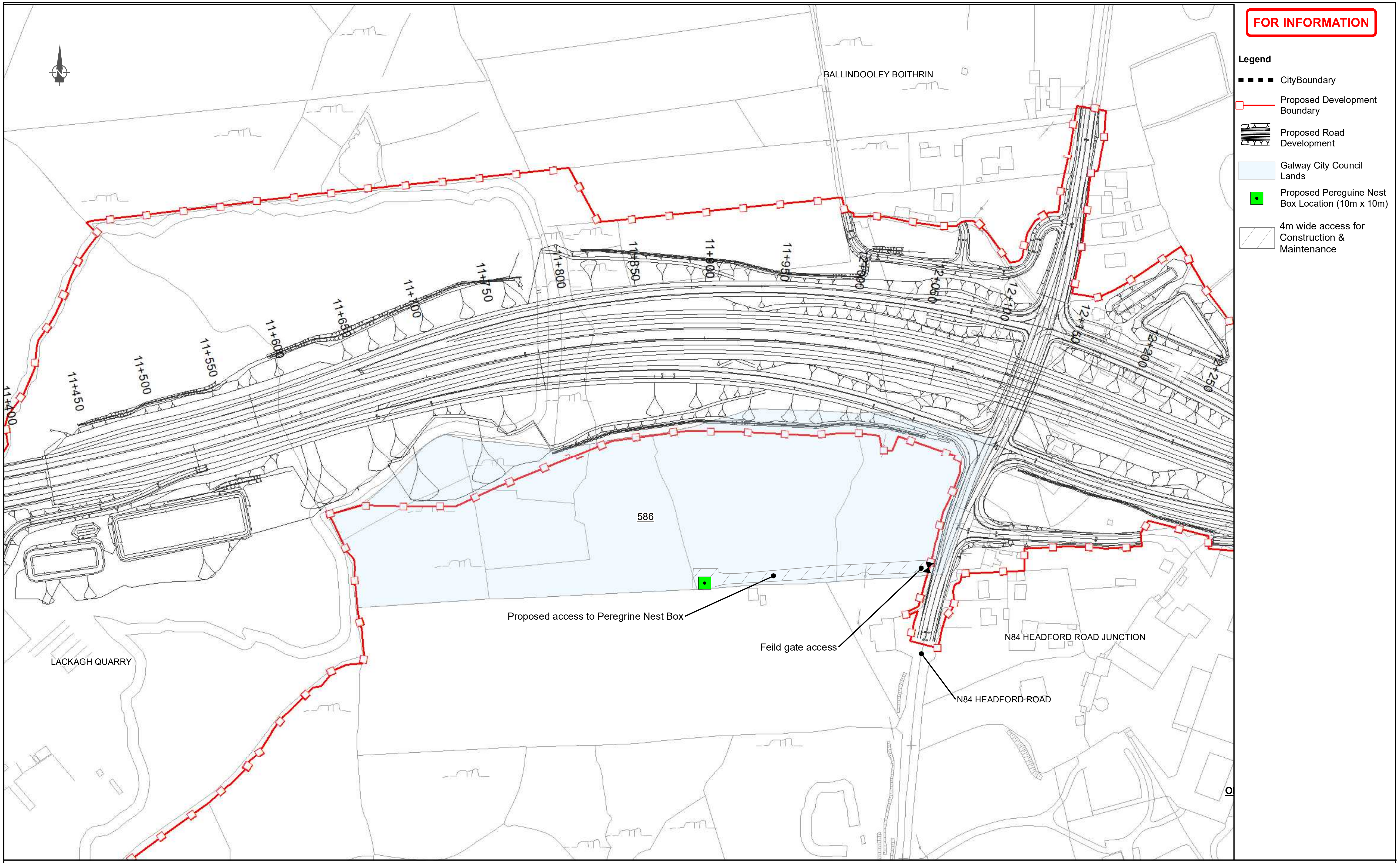
5.8 This Statement of Evidence has fully considered each of the issues raised in these submissions and objections and provides responses to each item. Having considered the issues raised and the responses provided, the conclusions of the Biodiversity Chapter 8 of the EIAR remain, which are that as a result of the inclusion of detailed mitigation measures, the only significant residual effects (remaining after the implementation of mitigation) arising from the proposed road development relate to loss of certain habitat types, impacts on bats and impacts on Peregrine falcon.

5.9 The corrigenda submitted at the oral hearing for the proposed road development, contains information relating to the RFI Response (submitted to An Bord Pleanála August 2019) in Section 4.2 of the main report as well as in Appendix A.3.1 Habitat Survey Results 2019 for N6 Galway City Ring Road. Any corrections presented have been taken into account in the information presented in this statement of evidence. None of the corrections presented change the conclusions regarding Biodiversity or the significant residual effects presented in the EIAR.

Appendix A

GCRR-SK-PP-067 Peregrine Nest Box Proposed location

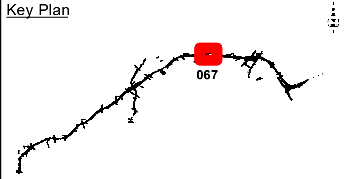
A3



Clients

Comhairle Chontae na Gaillimhe / Galway County Council
N6 Galway City Transport Project
An Roinn Iompair, Turasóireachta agus Spóirt
TII

Key Plan



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Job Title

N6 Galway City Ring Road

Scale: 1:2,500

Date: February 2020

Issue	Date	By	Chkd	Appd
D1	29/01/2020	AG	MH	EMC

Drawing Title

Proposed location of Peregrine Nest Box

Drawing Status

FOR INFORMATION

Job No	Drawing No	Issue
233985-00	GCRR-SK-PP-067	D1

Appendix B

Details of Donor and Receptor sites in Respect of Losses and Creation of Annex I habitat outside of European Sites

Appendix B Details of Donor and Receptor sites in Respect of Losses and Creation of Annex I habitat outside of European Sites

Details of donor and receptor sites, required for the purposes of creating Annex I habitat, including areas and habitat types present in each are described below in Table 1 and Table 2 respectively. The locations of each donor and receptor site are presented in the figures included within this appendix to the statement of evidence.

The location of each donor site and its corresponding approximate area has been determined by the habitat data presented in the RFI Response[2] submitted to An Bord Pleanála August 2019. Donor sites were selected based on the presence of the targeted Annex I habitat (*i.e.* 4010, 4030, 6210, 6410, *7130 and *91E0[3]).

The location of each receptor site and its corresponding approximate area has been determined by the habitat data presented in the RFI Response. Receptor sites were selected based on criteria presented in Appendix A.8.26 of the EIAR and habitat data presented in the RFI Response.

Table 1: Details of Donor Sites - areas and habitat types present.

Label[4, 5]	Dominant habitat[5] present	Mosaic of habitats present (where applicable)	Annex I habitat present	Total approximate area (ha) of donor site
4010.D1	HH3	HH3	4010	0.0153
4010.D2	HH3	HH3/HH1/WS1/ER1	4010	0.0038
4010.D3	HH3	HH3/HH1/WS1/ER1	4010/4030	0.0056
4010.D4	HH3	HH3	4010	0.0476
4010.D5	HH3	HH3	4010	0.0061
4010.D6	HH3	HH3	4010	0.3504
4010.D7	HH3	HH3	4010	0.0539
4010.D8	HH3	HH3/GS4/HH1	4010/4030	0.1725

[2] The corrigenda submitted at the oral hearing for the proposed road development, contains corrigenda relating to the RFI Response (submitted to An Bord Pleanála August 2019) in Section 4.2 of the main report as well as in Appendix A.3.1 *Habitat Survey Results 2019 for N6 Galway City Ring Road.* Any corrections presented in the corrigenda have been taken into account in the information presented in this appendix to the statement of evidence.

[3] Annex I habitat codes presented in this Appendix correspond to the following Annex I habitats: Northern Atlantic wet heaths with *Erica tetralix* [4010], European dry heaths [4030], Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) [6210], *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410], blanket bogs (*if active bog) [*7130] and Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)* [*91E0].

[4] The labels referred to in this table correspond to the location of donor sites presented in Figures 1-11 included in this appendix to the statement of evidence. Labels which include "*nD*" correspond to new donor sites that were identified in the 2019 habitat surveys undertaken to inform the RFI response. In the case of some of these new sites, they are located within the boundaries of donor sites previously identified in the EIAR; however, they comprise a reduced extent/area and as such have been assigned the "nD" code to reflect the change. According to the results of the 2019 habitat surveys, some donor sites identified in the EIAR are no longer present and as such have been omitted in this statement of evidence.

[5] The habitat classification codes presented in this table are as per those defined in The Heritage Council's *A Guide to Habitats in Ireland* (Fossitt, 2000).

Label[4, 5]	Dominant habitat[5] present	Mosaic of habitats present (where applicable)	Annex I habitat present	Total approximate area (ha) of donor site
4010.D9	HH3	HH3/WS1/GS4	4010	0.0057
4010.D10	HH3	HH3/HD1/WS1	4010	0.6420
4010.D11	HH3	HH3	4010	0.0121
4010.D12	HH3	HH3/WS1	4010	0.0126
4010.nD13	HH3	PF2/HH3	4010	0.0420
4010.nD14	HH3	HH3/GS4/WS1	4010	0.0040
4010.nD15	HH3	HH3	4010	0.0144
4010.nD16	HH3	HH3	4010	0.0017
4010.nD17	HH3	HH3	4010	0.0078
4010.nD18	HH3	HH3	4010	0.0173
4010.nD19	HH3	HD1/WS1/HH3/BL1	4010	0.1218
4010.nD20	HH3	HH3	4010	0.0636
4010.nD21	HH3	HH3	4010	0.0342
4030.D1	HH1	HH1	4030	0.0361
4030.D2	HH1	HH1	4030	0.1220
4030.D3	HH1	HH1/HD1/BL1	4030	0.0334
4030.D4	HH1	HH1/BL1	4030	0.0106
4030.nD48	HH1	HD1/GS2/HH1/ER1	4030	0.0724
4030.D5	HH1	HH1/WS1/HD1	4030	0.0113
4030.D6	HH1	HH1/HD1	4030	0.0064
4030.nD49	HH1	HH1	4030	0.0122
4030.D8	HH1	HH1/HD1	4030	0.0092
4030.D9	HH3	HH3/HH1/HD1	4030	0.0150
4030.D9	HH3	HH3/HH1/HD1/BL1	4030	0.0473
4030.D10	HH1	HH1/HD1	4030	0.0337
4030.D11	HH1	HH1	4030	0.0139
4030.D12	HH1	HH1	4030	0.0212
4030.nD50	HH1	HH1/ER1	4030	0.0049
4030.D13	HH1	HH1	4030	0.0113
4030.nD51	HH1	HH1/GS3	4030	0.0085
4030.nD52	HH1	HH1/GS3	4030	0.0091

Label[4, 5]	Dominant habitat[5] present	Mosaic of habitats present (where applicable)	Annex I habitat present	Total approximate area (ha) of donor site
4030.nD53	HH1	HH1/GS3/BL1	4030	0.0121
4030.D15	HH1	HH1/GS3	4030	0.0951
4030.nD54	HH1	HH1/GS3	4030	0.0187
4030.D16	HH1	HH1/HD1	4030	0.1627
4030.D17	HH1	HH1/GS4/WS1	4030	0.0076
4030.nD55	HH1	HH1	4030	0.0021
4030.nD56	HH1	HH1	4030	0.0029
4030.nD57	HH1	HH1	4030	0.0012
4030.D18	HH1	HH1	4030	0.0152
4030.D21	HH1	HH1/WS1	4030	0.0126
4030.D22	HH1	HH1	4030	0.0263
4030.D20	HH1	HH1/WS1	4030	0.1539
4030.nD58	HH1	HH1/WS1	4030	0.0016
4030.D24	HH1	HH1	4030	0.0121
4030.D27	HH1	HH1/BL1	4030	0.0046
4030.nD59	HH1	HH1	4030	0.0037
4030.D31	HH1	HH1/GS4	4030	0.0101
4030.D32	HH1	HH1	4030	0.0018
4030.D33	HH1	HH1	4030	0.0011
4030.D34	HH1	HH1	4030	0.0084
4030.D36	HH1	HH1/WS1	4030	0.0065
4030.D35	HH1	HH1	4030	0.0001
4030.D37	HH1	HH1/WS1	4030	0.0061
4030.D38	WS1	WS1/HH1	4030	0.0932
4030.nD60	HH1	HH1	4030	0.0114
4030.nD61	HD1	HD1/HH1/HH3/BL1	4030/4010	0.1239
4030.nD62	HH1	HH1/GS4/BL1	4030	0.1319
4030.D40	HH1	HH1	4030	0.0071
4030.nD63	HH1/HH3	HH1/HH3	4030/4010	0.0962
4030.nD64	HH1	HH1/WS1/HD1/ER1/HH3	4030	0.2542
4030.D42	HH1	HH1/WS1	4030	0.4251

Label[4, 5]	Dominant habitat[5] present	Mosaic of habitats present (where applicable)	Annex I habitat present	Total approximate area (ha) of donor site
4030.D43	WS1	HH1/WS1	4030	0.0249
6210.D1	GS1	GS1	6210	0.0932
6210.D3	GS1	GS1/WS1	6210	0.1039
6210.nD6	GS1	GS1	6210	0.0288
6210.D4	GS1	GS1/WS3/WS1/HD1/BL1	6210	0.0186
6410.nD2	GS4	GS4	6410	0.0723
*7130.nD1	PB3	PB3/HH1	*7130/4030	0.0143
*91E0.D1	WN6	WN6	*91E0	0.0036
*91E0.nD4	WN6	WN6	*91E0	0.1408
GS1.D1	GS1	GS1/BL1	-	0.6953
GS1.D2	GS1	GS1/BL1	-	1.5337
GS1.D3	GS1	GS1/BL1	-	0.4450
GS1.D4	GS1	GS1/WL1	-	0.7515
GS1.D5	GS1	GS1/WS1	-	0.0259
GS1.D6	GS1	GS1	-	0.1873
GS1.D7	GS1	GS1/WL1	-	0.2888
GS1.D8	GS1	GS1/WL1	-	0.3015
GS1.D9	GS1	GS1/WL1	-	0.4052
GS1.D10	GS1	GS1/WL1	-	0.6257
GS1.D11	GS1	GS1/WL1	-	0.4144
GS1.D12	GS1	GS1	-	0.1319
GS1.D13	GS1	GS1/WL1	-	0.2874
GS1.D14	GS1	GS1/WL2/WS1	-	0.1260
GS1.D15	GS1	GS1	-	0.0937
GS1.D16	GS1	GS1	-	0.4490
GS1.D17	GS1	GS1	-	0.0543
GS1.D18	GS1	GS1	-	0.0321
GS1.D19	GS1	GS1	-	0.0030
GS1.D20	GS1	GS1/WS1/ED2/ED3/WL1	-	1.5430
GS1.D21	GS1	GS1/WS1/WL1/BL1	-	0.1251
GS1.D22	GS1	GS1	-	0.0024

Label[4, 5]	Dominant habitat[5] present	Mosaic of habitats present (where applicable)	Annex I habitat present	Total approximate area (ha) of donor site
GS1.D23	GS1	GS1/ED3/ED2/WL1	-	0.6738
GS1.D24	GS1	GS1/WS1/WL1	-	0.2040
GS1.D25	GS1	GS1/ED3/ED2/WL1	-	0.4471
GS1.D26	GS1	GS1/WS1/GS2	-	0.2068
GS1.D27	GS1	GS1/GS2	-	0.2382
GS1.D28	GS1	WS1/GS1/HD1/BL1	-	0.4824
GS1.D29	GS1	GS1/BL1	-	0.2048
GS1.D30	GS1	GS1/WS1	-	0.8831

Table 2: Details of Receptor Sites - areas and habitat types present and clarification on what habitats will be lost in the receptor sites.

Label[6]	Mosaics of habitats[7] present	Annex I habitat present (and corresponding donor site label[8])	Total approximate area (ha) of receptor site
4030.R1	HD1/WS1 GS4/HD1	-	0.09
4030.R2	HD1/WS1/GS4 WS1 HH1/HD1 HD1/GS2/HH1/ER1 HD1 BL1	4030 (*i.e.* 4030.D6 and 4030.nD48)	0.2
4030.R3	HD1/WS1/GS4 HD1/WS1/ER1	-	0.12
4030.R4	HD1/WS1 GS3/WS1/HD1 FW1 HD1 FW1/WS1 GS4/GS3/HD1	-	0.43
4030.R5	Residential WD1 BL3 ED2	-	0.12
4030.R6	GS4/GS2/HD1/WS1/ER1 HD1 BL1	-	0.1
4030.R7	HD1/WS1/GS3/GS2/GS4/FW4 GS4/PF2 HH1/GS3 HD1/WS1 HD1/WS1/GS3/PF2 WS1 BL1	4030 (*i.e.* 4030.nD51 and 4030.nD52)	0.55

[6] The labels referred to in this table correspond to the location of donor sites presented in Figures 1-11 in this appendix to the statement of evidence.
[7] The habitat classification codes presented in this table are as per those defined in The Heritage Council's *A Guide to Habitats in Ireland* (Fossitt, 2000).
[8] There are seven receptor sites which overlap with donor sites containing Annex I habitat; four of which are Material Deposition Areas (MDAs).

Label[6]	Mosaics of habitats[7] present	Annex I habitat present (and corresponding donor site label[8])	Total approximate area (ha) of receptor site
4030.R8	GS4/GS2/FW4/WS1/HD1 GS4/GS1 HD1/WS1 GS4/PF2/GS3/WS1/FW4 HD1/WS1/GS3/PF2 WS1/HD1 WD4 HH1 BL1 WL2	4030 (*i.e.* 4030.nD55)	0.4
4030.R9	GS4/GS2/FW4/WS1/HD1 WS1/HD1 GS3/GS2/GS4/WS1 WS1/GS4/GS3/HD1 BL1	-	0.54
4030.R10	HD1/WS1/ER1/GS1/BL1 HD1/GS4/ER1/GS3 WS1 GS1 WS1/HD1/GS3 HH3 BL1	4010 (*i.e.* 4010.D6)	0.44
4030.R11	WS1/HD1/GS4/GS3 GS4 WS1	-	0.66
4030.R12	GS4 GA1	-	0.23
4030.R13	GS4/WS1/BL1 ED2/ED3/GA1 GS4/GS3 WS1	-	0.11
4030.R14	WS1 GS4/GS3 GS4/WS1/BL1 GS4	-	0.15
4030.R15	GS4/GS1/FW4/FW1	-	0.35

Label[6]	Mosaics of habitats[7] present	Annex I habitat present (and corresponding donor site label[8])	Total approximate area (ha) of receptor site
	HD1/WS1 GS4 WL2/BL1		
4030.R16	GS3/WS1/HD1 GS4/GS1/FW4/FW1	-	0.47
4030.R17	HD1/HH1/HH3 HH1/GS4	4030/4010 (*i.e.* 4030.nD61) 4030 (*i.e.* 4030.nD62)	0.12
4030.R18	HD1/WS1 WS1/HD1 HH1/WS1 GS2/WS1 GS4/WS1 GS1 WS1	4030 (*i.e.* 4030.D43)	0.81
4030.R19	GA1/WS1/BL1/ER1 WS1 GA1/GS3/GS4 GS2/WS1 WS1/HD1	-	0.4
4030.R20	GA1 WS1/HD1 GS4/WS1/GA1 BL1	-	0.35
4030.R21	GA1 BL1	-	0.39
6210.R1	GS1 WL2/GS1/BL1 BL1	-	0.83
6210.R2	GS1 BL1	-	0.98
6210.R5	ED2/ED3/WS1 ED3 GS1 FL8	-	2.03

Label[6]	Mosaics of habitats[7] present	Annex I habitat present (and corresponding donor site label[8])	Total approximate area (ha) of receptor site
	BL3 ED3/GS1/GS2 ED2/ED3 WS1/GS1		
6210.R6	ED2/ED3 ED3 GS1	-	0.37
6210.R7	GS1 WL1/BL1	-	0.48
6210.R8	ED2/ED3/WS1 WS1	-	2.45
6410.R1	HD1/WS1/GS3/GS4 GS4 WD1 Residential BL1	-	0.49
*91E0.R1	GS4 WN6	*91E0 (*i.e.* *91E0.nD4)	0.18

Figures 1 to 11 Locations of Donor and Receptor Sites in Respect of Losses and Creation of Annex I habitat outside of European Sites

Figure 1

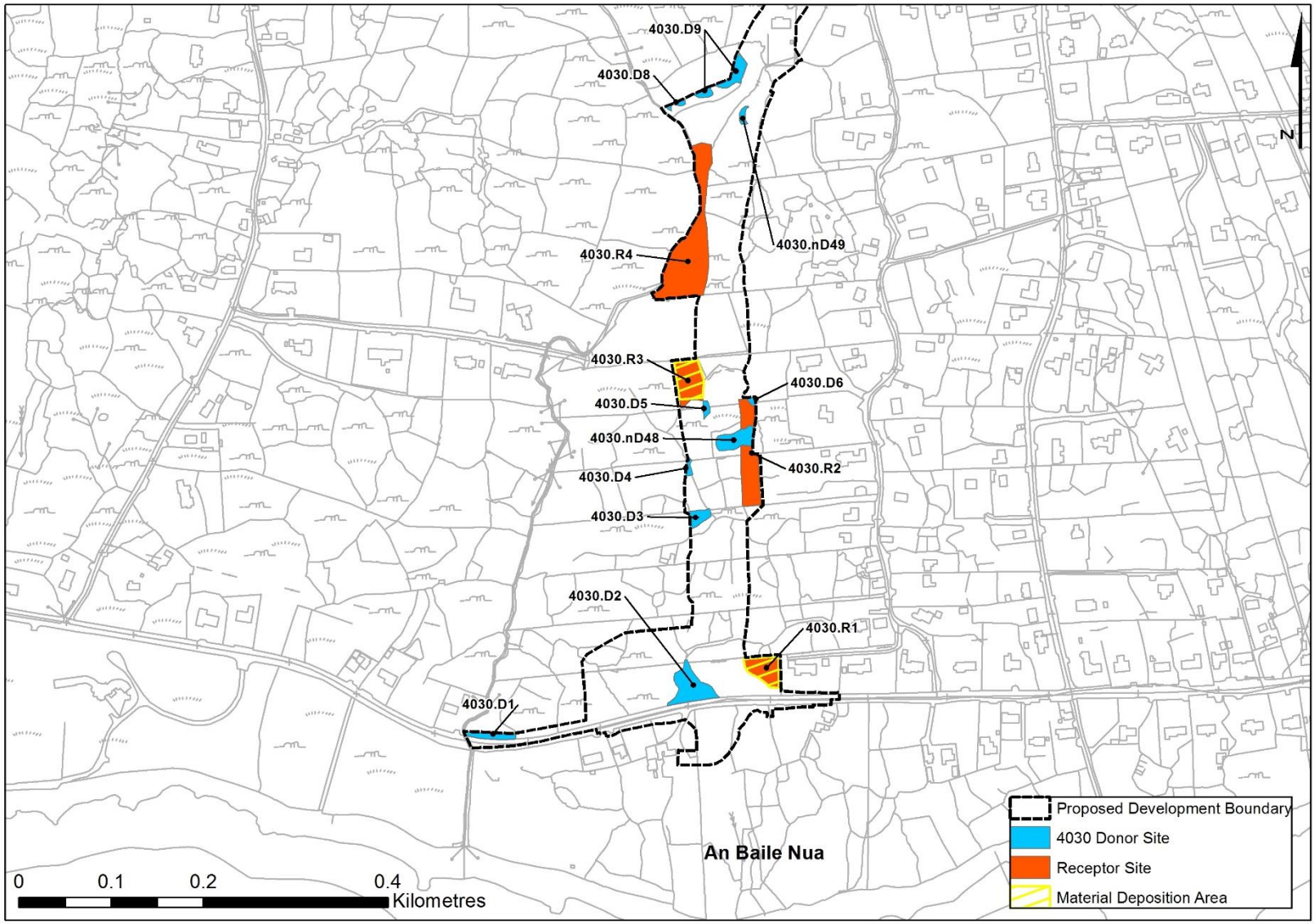

4030.D9
4030.D8
4030.nD49
4030.R4
4030.R3
4030.D6
4030.D5
4030.nD48
4030.R2
4030.D4
4030.D3
4030.D2
4030.R1
4030.D1
N
An Baile Nua
0
0.1
0.2
0.4
Kilometres
Proposed Development Boundary
4030 Donor Site
Receptor Site
Material Deposition Area

Figure 2

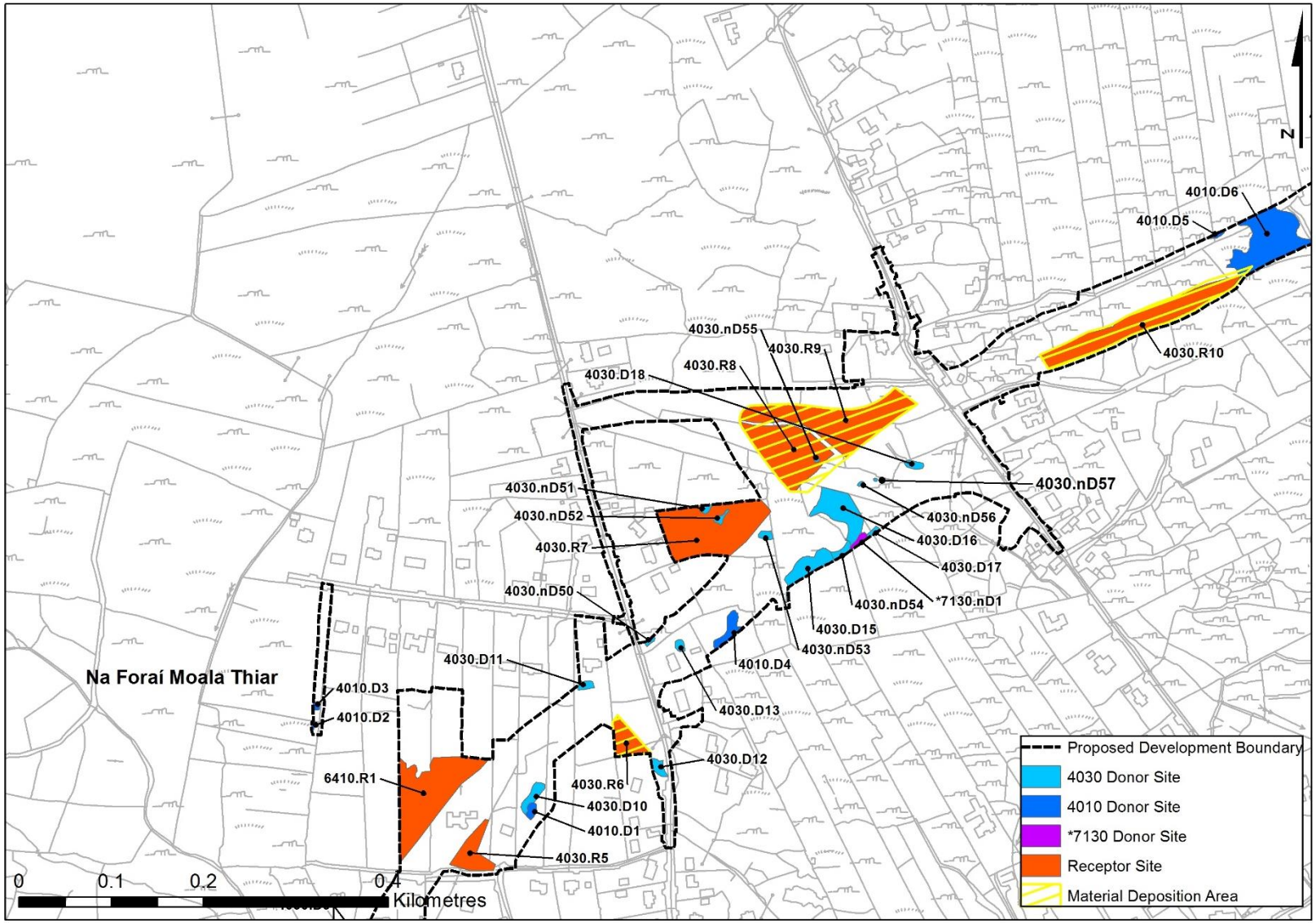

N
4010.D6
4010.D5
4030.nD55
4030.R9
4030.R8
4030.D18
4030.R10
4030.nD57
4030.nD51
4030.nD52
4030.nD56
4030.R7
4030.D16
4030.D17
4030.nD50
4030.nD54
*7130.nD1
4030.D15
4030.nD53
4030.D11
4010.D4
Na Foraí Moala Thiar
4010.D3
4010.D2
4030.D13
4030.D12
6410.R1
4030.R6
4030.D10
4010.D1
4030.R5
0
0.1
0.2
0.4
Kilometres
Proposed Development Boundary
4030 Donor Site
4010 Donor Site
*7130 Donor Site
Receptor Site
Material Deposition Area

Figure 3

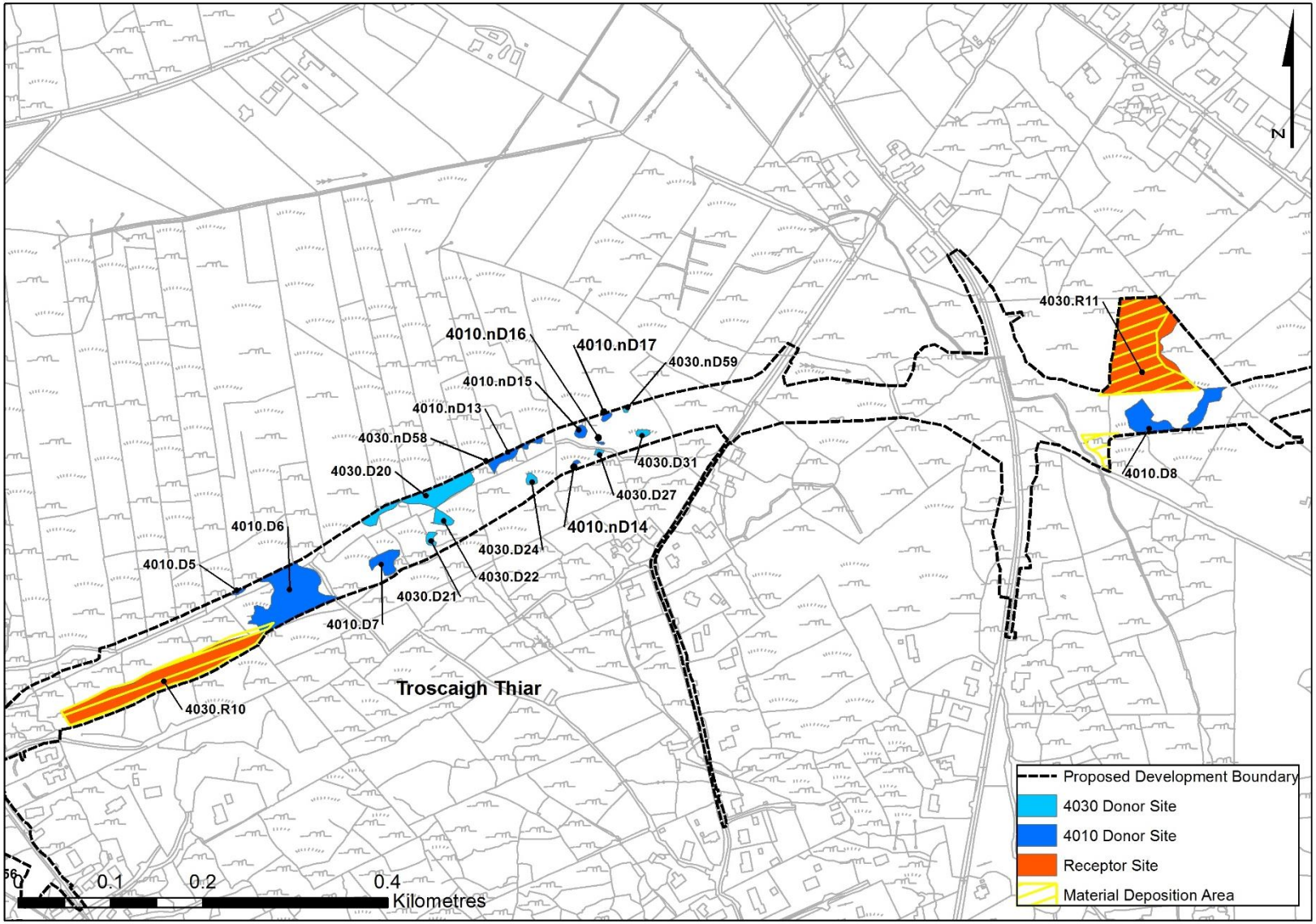

N
4030.R11
4010.nD16
4010.nD17
4030.nD59
4010.nD15
4010.nD13
4030.nD58
4030.D20
4030.D31
4030.D27
4010.nD14
4010.D8
4010.D6
4010.D5
4030.D24
4030.D22
4030.D21
4010.D7
Troscaigh Thiar
4030.R10
Proposed Development Boundary
4030 Donor Site
4010 Donor Site
Receptor Site
Material Deposition Area
0
0.1
0.2
0.4
Kilometres

Figure 4

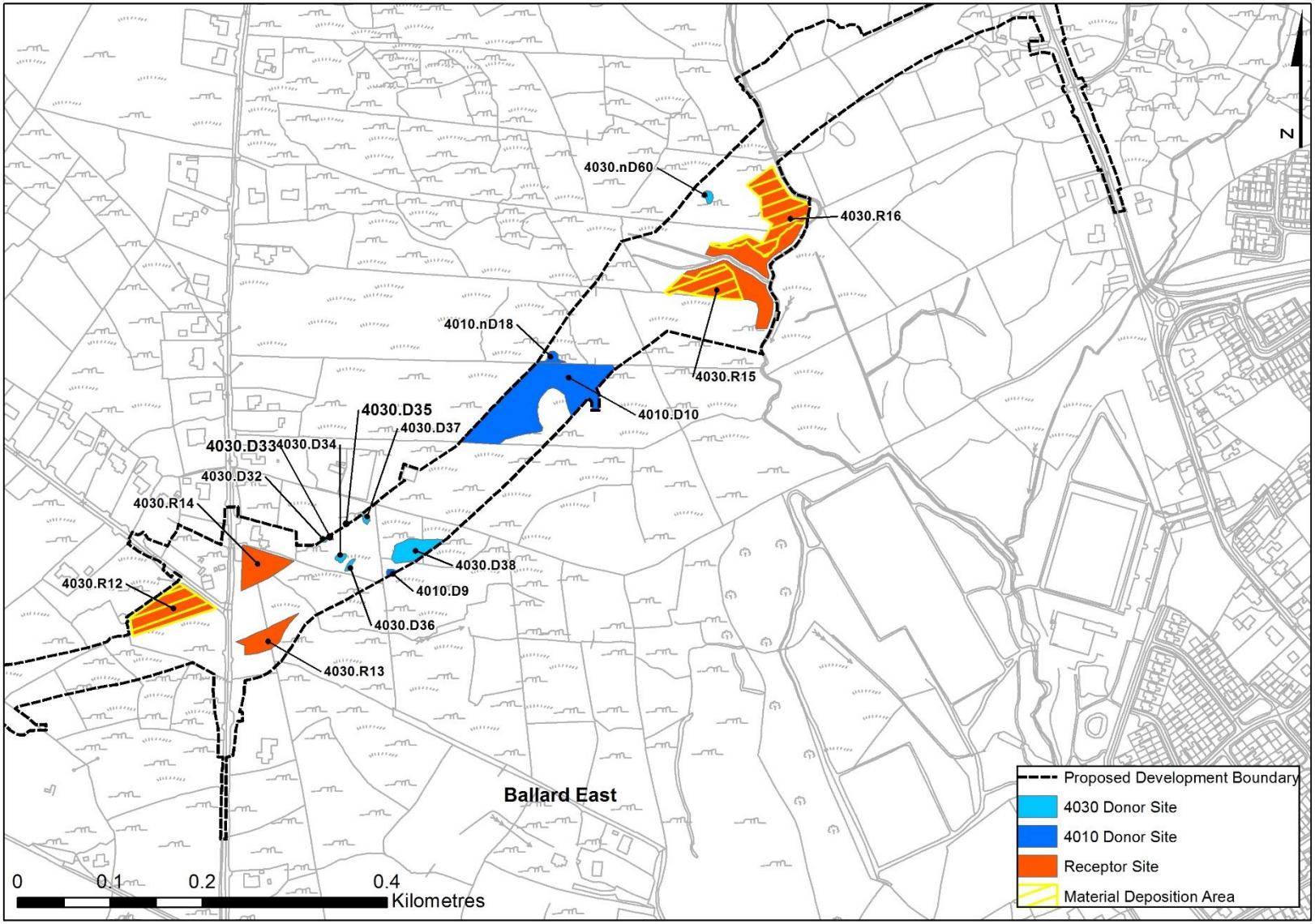

4030.nD60
4030.R16
4010.nD18
4030.R15
4010.D10
4030.D35
4030.D37
4030.D33
4030.D34
4030.D32
4030.R14
4030.D38
4010.D9
4030.R12
4030.D36
4030.R13
Ballard East
N
0
0.1
0.2
0.4
Kilometres
Proposed Development Boundary
4030 Donor Site
4010 Donor Site
Receptor Site
Material Deposition Area

Figure 5

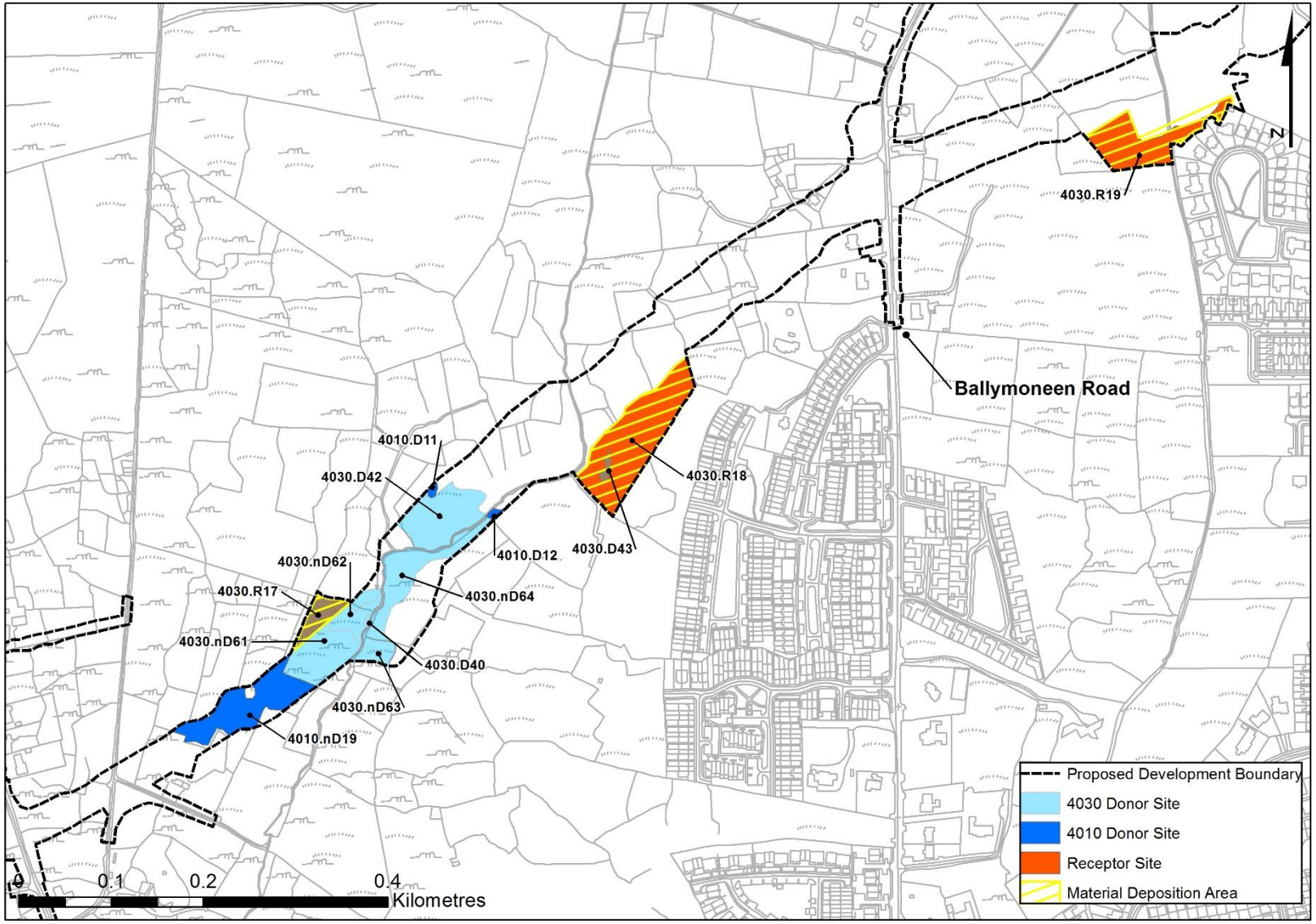

4030.R19
N
Ballymoneen Road
4010.D11
4030.D42
4030.R18
4010.D12
4030.D43
4030.nD62
4030.R17
4030.nD64
4030.nD61
4030.D40
4030.nD63
4010.nD19
0
0.1
0.2
0.4
Kilometres
Proposed Development Boundary
4030 Donor Site
4010 Donor Site
Receptor Site
Material Deposition Area

Figure 6

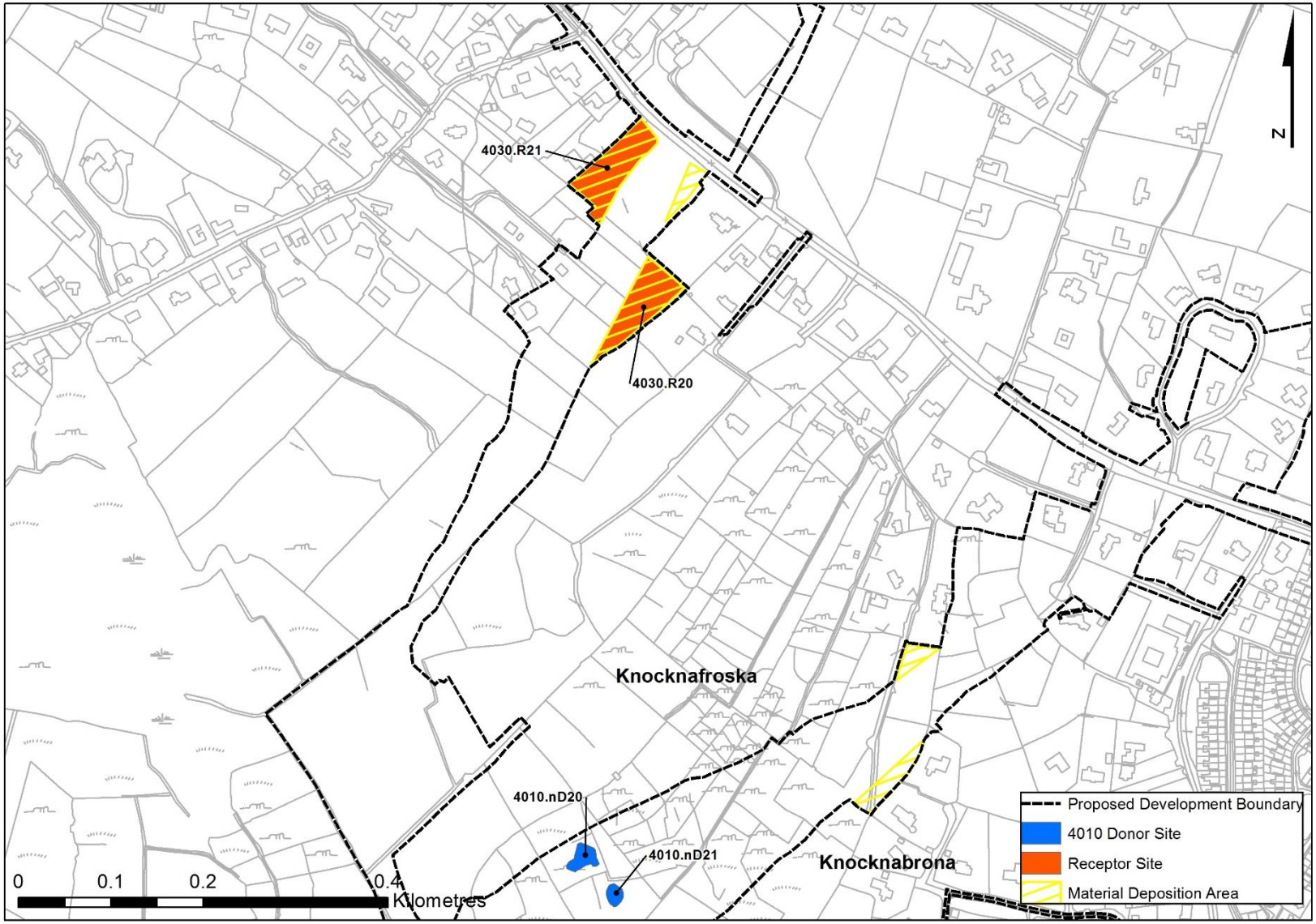

4030.R21
4030.R20
Knocknafroska
4010.nD20
4010.nD21
Knocknabrona
N
0
0.1
0.2
0.4
Kilometres
Proposed Development Boundary
4010 Donor Site
Receptor Site
Material Deposition Area

Figure 7

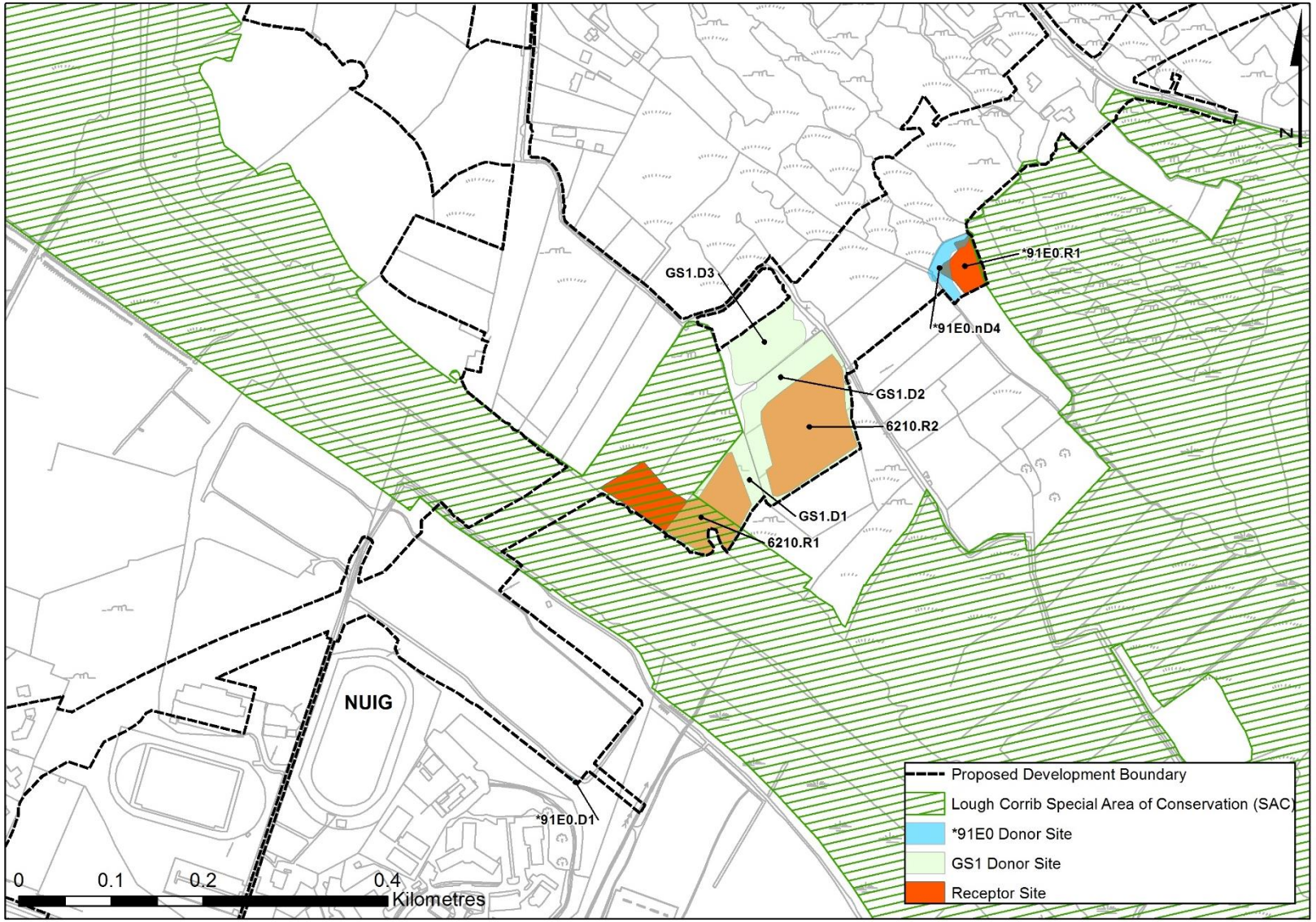

N
*91E0.R1
GS1.D3
*91E0.nD4
GS1.D2
6210.R2
GS1.D1
6210.R1
NUIG
*91E0.D1
0
0.1
0.2
0.4
Kilometres
Proposed Development Boundary
Lough Corrib Special Area of Conservation (SAC)
*91E0 Donor Site
GS1 Donor Site
Receptor Site

Figure 8

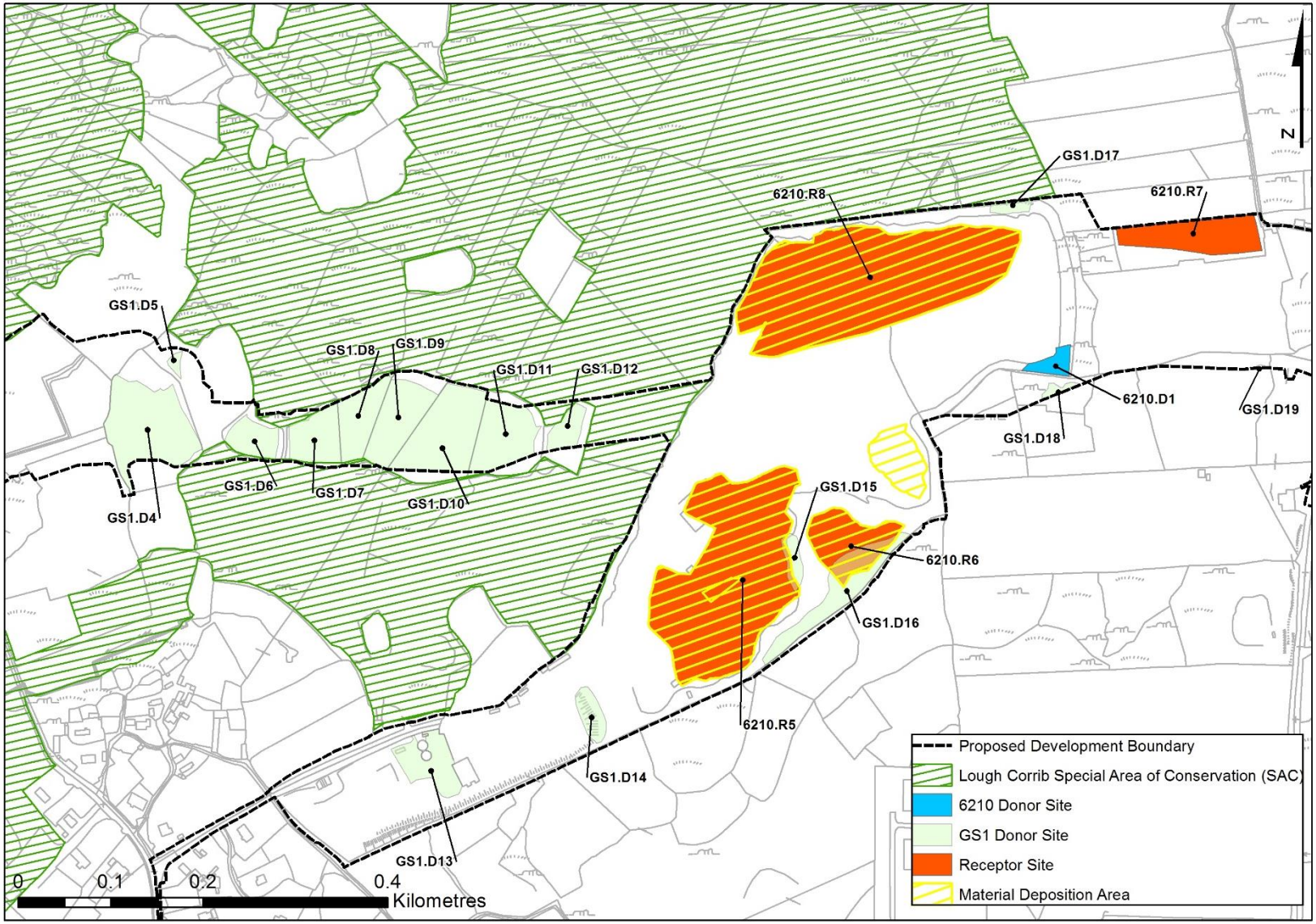

N
GS1.D17
6210.R8
6210.R7
GS1.D5
GS1.D8
GS1.D9
GS1.D11
GS1.D12
6210.D1
GS1.D19
GS1.D18
GS1.D6
GS1.D7
GS1.D10
GS1.D4
GS1.D15
6210.R6
GS1.D16
6210.R5
GS1.D14
GS1.D13
0
0.1
0.2
0.4
Kilometres
Proposed Development Boundary
Lough Corrib Special Area of Conservation (SAC)
6210 Donor Site
GS1 Donor Site
Receptor Site
Material Deposition Area

Figure 9

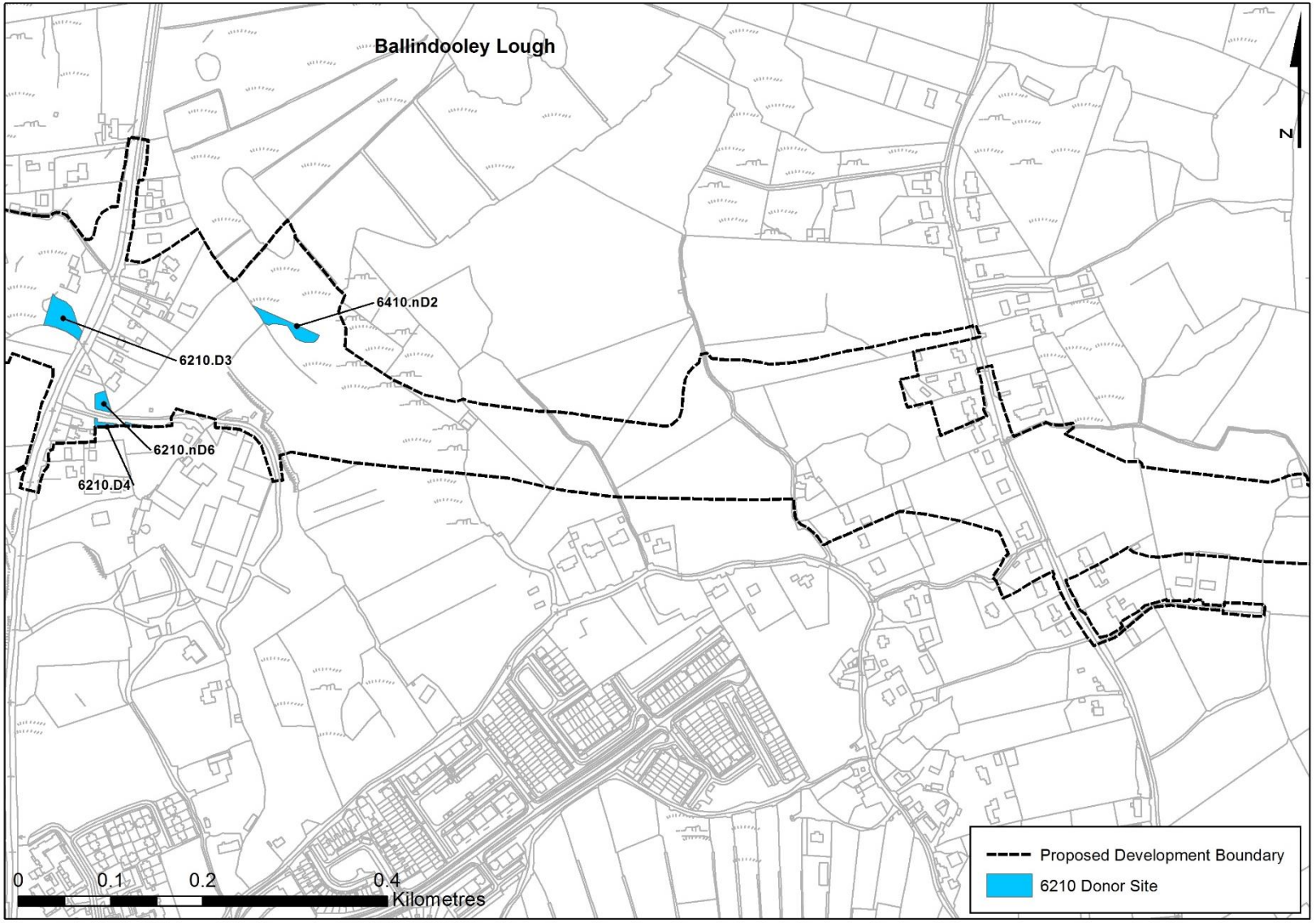

Ballindooley Lough
6410.nD2
6210.D3
6210.nD6
6210.D4
N
0
0.1
0.2
0.4
Kilometres
Proposed Development Boundary
6210 Donor Site

Figure 10

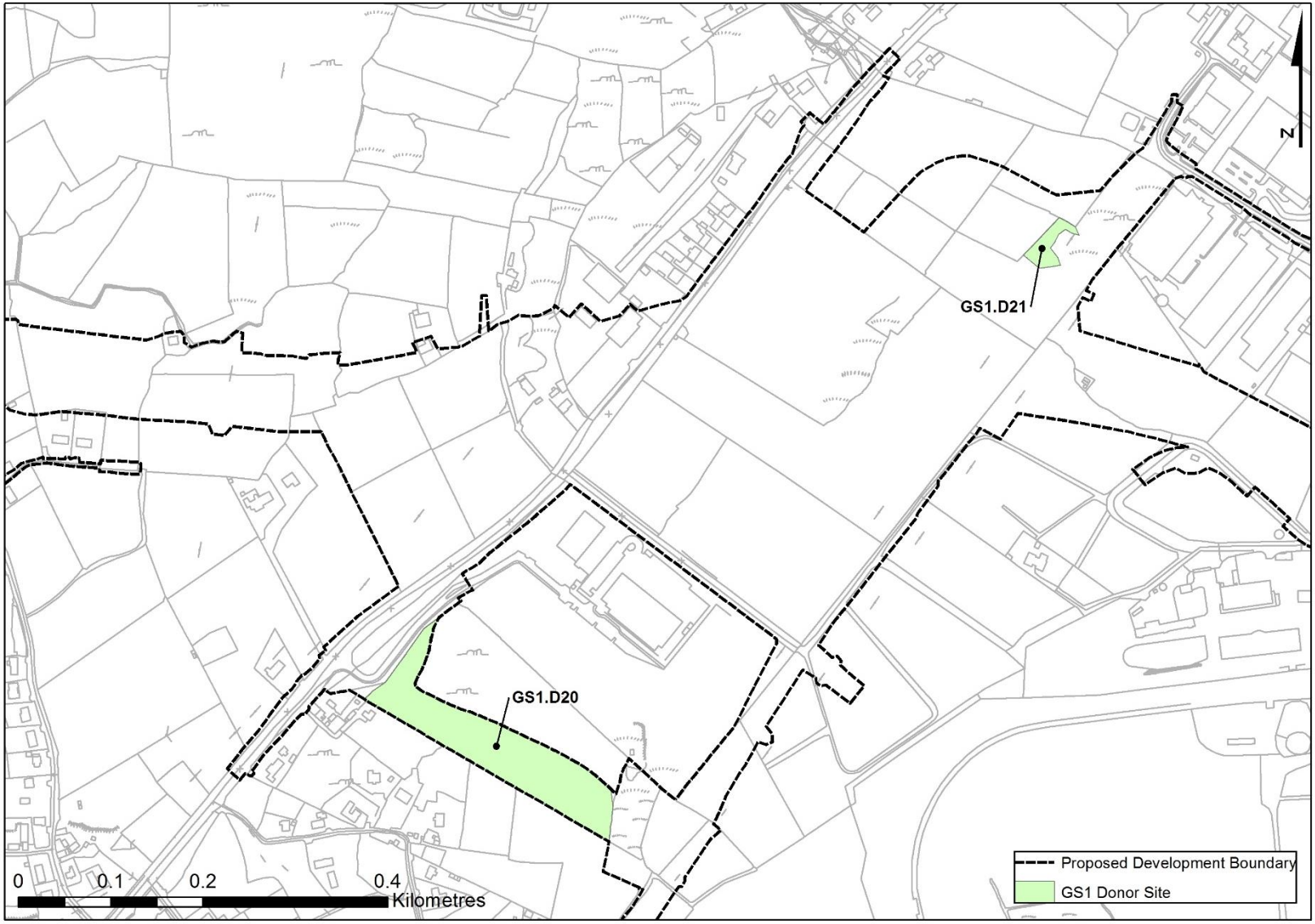
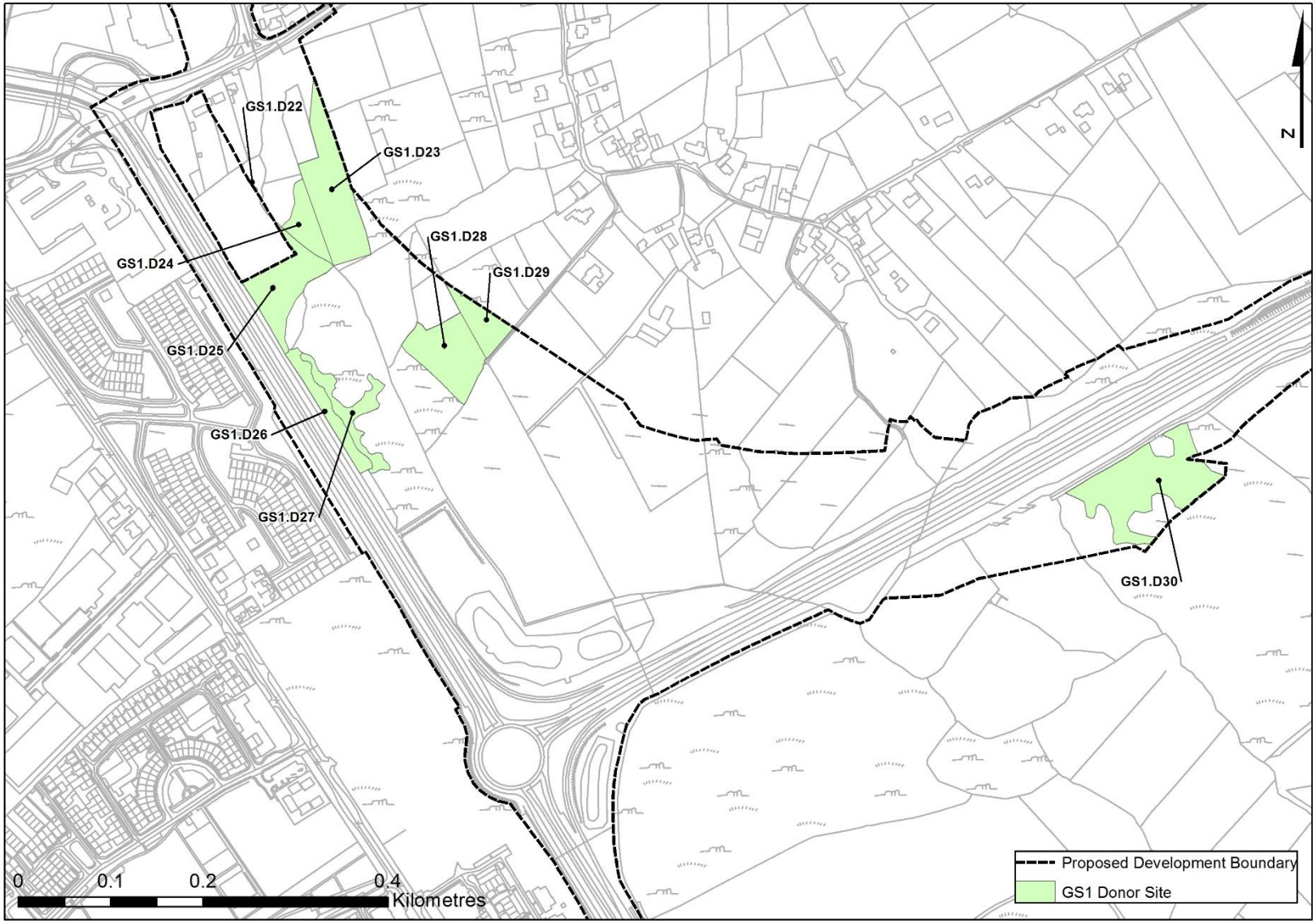

GS1.D21
GS1.D20
N
0
0.1
0.2
0.4
Kilometres
Proposed Development Boundary
GS1 Donor Site

Figure 11


GS1.D22
GS1.D23
GS1.D24
GS1.D25
GS1.D26
GS1.D27
GS1.D28
GS1.D29
GS1.D30
N
0
0.1
0.2
0.4
Kilometres
Proposed Development Boundary
GS1 Donor Site

Appendix C

C J Lusby Peregrine Report

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Recommendations for mitigation to minimise the impacts of the proposed N6 Galway City Ring Road on breeding Peregrine Falcon *(Falco peregrinus)* in Lackagh Quarry

Prepared for Scott Cawley

By
John Lusby

BirdWatch Ireland

SUMMARY

The Peregrine Falcon *Falco peregrinus* is an Annex I species listed on the EU Birds Directive (2009/147/EEC) and is protected nationally under the Wildlife Act 1976 and Amendment Act 2000. Lackagh Quarry, on the outskirts of Galway City is a traditional nesting site for Peregrine and the results of the ecological surveys undertaken for the N6 Galway City Ring Road (GCRR) identify that a breeding pair has occupied the site in each year between 2016 to 2019. The route for the proposed N6 GCRR traverses Lackagh Quarry and is therefore likely to reduce the suitability of the site for breeding Peregrine due to the existing nesting ledges becoming unsuitable and/or direct disturbance associated with construction or operation of the proposed road development. To minimise the potential impacts of the proposed road development of the N6 GCRR on breeding Peregrine in Lackagh Quarry, mitigation measures are included in the Environmental Impact Assessment Report (EIAR) for the N6 GCRR to reduce disturbance to breeding Peregrine during the nesting cycle. A seasonal constraint on construction works near Lackagh Quarry will be implemented, whereby works from the Lackagh Tunnel to the N84 Headford Road Junction will commence prior to mid-February. This will ensure that if its magnitude displaces Peregrine from the quarry, any construction related disturbance will be initiated prior to nesting and can influence nest site selection, which is targeted to reduce the likelihood of nest desertion and will not impact upon an incubating female in the nest. The installation of rock bolts on the cliff faces in the vicinity of the nest site will be undertaken in a sensitive manner (as advised by a suitably experience ecologist) so as to minimise any potential disturbance to the nest site during the breeding season. The mitigation strategy also includes for the retention of one of the two ledges previously used by breeding Peregrine (in 2016 and 2017) in Lackagh Quarry. However, there remains a risk that breeding Peregrine will be temporarily or permanently displaced from Lackagh Quarry as a result of the proximity of the road carriageway to the existing nest ledge which will be retained and due to the lack of suitable alternative ledges in the quarry post-construction as identified in the EIAR. The displacement of breeding Peregrine from Lackagh Quarry would likely result in a reduction in the breeding population of Peregrine in the survey area for the N6 GCRR, as there are no other suitable nesting opportunities available in this area which are not already occupied by breeding Peregrine. The loss of Lackagh Quarry as a breeding site for Peregrine has the potential to have long-term effects on the local population and is significant at the county geographic scale.

As identified in the EIAR for the N6 GCRR, the proposed road development will result in a significant residual impact on Peregrine falcon. In response to the submission made by the Department of Culture, Heritage and the Gaeltacht to An Bord Pleanála on the 21 December 2018 (see Appendix 1) and in an effort to reduce this residual impact, it is proposed to implement additional mitigation in the form of the provision of an alternative nest site for Peregrine at a suitable location in close proximity to Lackagh Quarry. The objective of this mitigation is to ensure that Peregrines, if displaced from the previously used nesting ledges in the quarry, can remain and breed in the area. An artificial nest site will be provided in a suitable location and will be in place prior to the commencement of works which have the potential to disturb or displace breeding Peregrine. Three locations which are suitable for the placement of an artificial nest site for Peregrine are identified. Although it is not possible to guarantee uptake of this artificial nest site, the provision of this site will increase the likelihood of the continued occupation of breeding Peregrine in Lackagh Quarry and its surrounds which would mitigate the significant negative residual effect on Peregrine at the local and county geographic scale as a result of the construction of the proposed N6 GCRR.

1. INTRODUCTION

The Peregrine Falcon *Falco peregrinus* is an Annex I species listed on the EU Birds Directive (2009/147/EEC) and is protected nationally under the Wildlife Act 1976 and Amendment Act 2000. The conservation status of the Peregrine in Ireland is currently considered to be favourable and as such they are green-listed on the Birds of Conservation Concern in Ireland (Colhoun & Cummins 2013).

The breeding population of Peregrine in Ireland is continuing to recover after a period of extensive declines during the 1950s and 1960s, which was primarily due to secondary poisoning by organochlorine pesticides that resulted in reduced breeding productivity and adult mortality (Ratcliffe 1993, Crick & Ratcliffe 1995). In 1970, only fourteen breeding pairs of Peregrine were recorded in Ireland (Temple-Lang 1970), with similar population declines documented in the UK, where direct persecution to reduce the threat posed by Peregrines to homing Pigeons during the war also contributed to the population declines (Ratcliffe 1993). After restrictions on the use of organochlorine pesticides, the Peregrine population has slowly recovered with an expansion in range and increase in numbers since the early 1970s. The Breeding Bird Atlases of 2007–11 (Balmer *et al.* 2013) shows a marked range expansion over this period, with 'confirmed' or 'probable' breeding for Peregrine recorded in 217 10km squares in Ireland in 2007-11 (Balmer *et al.* 2013), which represents an increase of 343% since 1968-1972 (Sharrock 1976). The breeding population of Peregrine in Ireland has been surveyed at intervals of approximately ten years or more since 1981, which shows a gradual increase in the population size over this period. The first national survey of Peregrine in the Republic of Ireland in 1981 recorded a total of 225 occupied territories (based on approximately 50% coverage of the breeding range in 15 representative areas) (Norriss *et al.* 1983). The third national survey of breeding Peregrine in the Republic of Ireland in 2002 estimated 390 occupied breeding territories (Madden *et al.* 2009). The fourth and most recent survey of Peregrine in the Republic of Ireland in 2017 shows a further increase to an estimated minimum population estimate of 425 occupied territories (IRSG, unpublished data).

DISTRIBUTION AND NEST SITE SELECTION

Peregrines have traditionally used a range of natural nest sites including coastal cliffs, rock faces and rocky outcrops which provide suitable ledges for nesting (Ratcliffe 1993, Norriss *et al.* 1983, Hardey *et al.* 2009). Alongside the increase in range and numbers in recent decades in Ireland (Balmer *et al.* 2013) there has been a documented increase in the use of quarries and man-made structures for nesting. The national survey of Peregrines in the Republic of Ireland in 2002 demonstrated that the number of occupied territories on natural cliff sites remained virtually stable over the previous ten years, however the number of pairs nesting in quarries increased over the same period with almost one quarter of the recorded occupied breeding territories in quarries in 2002 (Madden *et al.* 2009). Recent evidence indicates that use of buildings and other man-made structures by Peregrine in Ireland has also increased, with associated increases in Peregrine numbers in lowland areas away from the more traditional coastal and upland areas, which has included nesting within urban areas in cities and towns (J. Lusby *pers comm*.). The 2002 national survey recorded breeding pairs on 11 buildings (Madden *et al.* 2009), however the number of breeding sites on man-made structures is now substantially higher (J. Lusby *pers comm*, NPWS 2013). A similar trend has been recorded in the UK, in 2014 the breeding population of Peregrines in the UK, Isle of Man and Channel Islands was estimated at 1,769 pairs. This is 22% larger than the population estimate from the previous survey in 2002 (Wilson *et al.* 2017). Most of this increase is accounted for by increases in lowland England, whereas populations in some upland areas declined. Peregrines now breed in many towns and cities throughout the UK, using buildings, such as churches, warehouses, tall chimneys, and tower blocks; on industrial plants such as power stations, chemical processing plants and cooling towers; and in open country on pylons, radio masts, viaducts and bridges (Dixon & Shawyer, Drewitt 2014, Wilson *et al.* 2017). In North America, Peregrine populations have also increased in urban areas which has been attributed to an increase in the availability

of potential nest sites compared to those in natural and historical cliff habitats (Venu 2018). In the Eastern United States, the carrying capacity of Peregrine populations increased with an increase in urban nest sites (Gahbauer *et al.* 2015). In the Mid-west the Peregrine population is now predominantly concentrated in urban areas (Wakamiya & Roy 2009) constituting about 80% of nests on anthropogenic sites (Redig & Tordoff 1997).

PROVISION OF ARTIFICIAL NEST SITES

The provision of artificial nesting sites has also aided the population recovery of Peregrines and their colonisation of urban areas. Natural nest sites are typically located on cliffs, rocky outcrops or crags with ledges or cavities where the eggs are laid on a flat surface containing enough gravel or soil substrate for the birds to make a scrape or depression, while in the urban setting, artificial nest sites with gravel substrates located on structures serve the same purpose (Venu 2018). Artificial nesting sites are particularly beneficial in situations where traditional or existing nest sites are no longer suitable or where birds are present but where there are no suitable nesting sites (Dixon & Shawyer). The provision of artificial nest sites has facilitated a population increase and improved breeding for Peregrines in urban areas such as Cape Town, South Africa (Altwegg *et al*. 2014) and in the San Francisco Bay Area in the United States (Venu 2018). Several studies have recorded higher breeding productivity of Peregrines using artificial nest sites compared to natural sites, for example, Gahbauer *et al.* (2015) showed that nests with overhead cover had higher productivity than those without, as did nests in trays or boxes compared to sites without any human-provided nesting aids.

The most common artificial nest sites for Peregrine are large, open-fronted nest boxes made of wood or metal which are fitted to the exterior of buildings and other man-made structures including bridges, pylons and road infrastructures. There are several designs of nest boxes and the type of nest box and dimensions can be tailored to the specific requirements of the site, provided the nest box is sufficiently large, sheltered and protected from disturbance, with a suitable substrate for nesting and safe space or ledge for juveniles to move prior to fledging. In situations where there are no existing or suitable structures available, purpose-built towers fitted with a nest box can be erected. For example, a disused four-sided tower crane fitted with a nest box was installed at Battersea in the UK to provide a nest site for Peregrines which had previously nested on an adjacent building and resulted in the successful relocation of the pair (Nick Dixon *pers comm*). In addition to nest boxes, open trays can also be used where there is an existing sheltered ledge or within a structure which is protected from the elements (Dixon & Shawyer). The modification of existing ledges within quarries can also provide new or improved nesting opportunities for Peregrine. Such enhancement works have been carried out at quarries in the United States to improve sites for breeding Peregrine, including adding substrate and removing sharp objects from existing ledges. Explosives were used to increase the size and nesting potential of a traditional Peregrine eyrie in northern California, which was subsequently successfully used by breeding Peregrine (Pagel 1989). Specific cliff features to encourage nesting Peregrine have been incorporated within a quarry re-habilitation project in Hong Kong (CSI Quarry Rehabilitation Guidelines).

2. BREEDING PEREGRINE AND THE PROPOSED N6 GALWAY CITY RING ROAD

The distribution and breeding status of Peregrine Falcon in Galway City was assessed in the years between 2016 and 2018 to inform the Environmental Impact Assessment Report (EIAR) for the N6 Galway City Ring Road (GRCC). Potentially suitable nesting sites for Peregrine were identified within a 5km radius of the proposed N6 GCRR. These sites were monitored between May to July 2016 to determine the presence of Peregrine. Breeding Peregrine were confirmed at three sites within the survey area, all of which were quarries (Lusby 2017). The three quarries,

namely Angliham, Twomileditch and Lackagh were confirmed to be traditional nesting sites for Peregrine based on records of occupation in previous years, in addition to the confirmation of the presence of breeding Peregrine in these sites between 2016 to 2019 (Lusby 2018, Aonghus O'Donaill, *Pers comm*).

Of the three breeding sites confirmed within the survey area for the N6 GCRR, the Peregrine occupying Lackagh Quarry are considered to be at risk of impact from the proposed road development. The route for the proposed N6 GCRR traverses through Lackagh Quarry and is likely to reduce the suitability of the site for breeding Peregrine due to the existing nesting ledges becoming unsuitable and/or direct disturbance associated with construction or operation of the proposed road development.

BREEDING PEREGRINE IN LACKAGH QUARRY

In 2017 and 2018 additional monitoring was undertaken in Lackagh Quarry to determine the breeding status and nest location, and to assess the nest site availability to inform the impact assessments of the proposed road development on breeding Peregrine and the mitigation measures required to minimise the predicted adverse impacts.

In 2017, the Peregrine nested on a ledge close to the north corner of the east wall of Lackagh Quarry (Lusby 2017). This nest location is located less than 40m from the proposed road development. In 2018, the Peregrine nested on a ledge, over 100m to the west of the previous nest site, close to the top of the northern quarry wall (Lusby 2018). This nest site was also used in 2019 (J Lusby *pers comm*.) and is approximately 50m from the proposed road development.

Assessment of the available nesting opportunities for Peregrine in Lackagh Quarry indicated a limited availability of alternative suitable nesting ledges. The limited availability of nesting sites is also highlighted by the fact both of the ledges which have been used by breeding Peregrine in Lackagh Quarry are regarded as poor quality nest sites. The nest ledge used in 2016 and 2017 is prone to flooding (Aonghus O'Donaill *pers comm*), and the nest site used in 2018 and 2019 is situated less than one meter below the top of the quarry wall, which is not a typical nesting location for Peregrines (Ruddock & Whitfield 2007) and is considered vulnerable to human disturbance and predation (J. Lusby *pers comm*).

POTENTIAL IMPACTS OF THE N6 GALWAY CITY RING ROAD ON BREEDING PEREGRINE IN LACKAGH QUARRY

The legislative framework under the Wildlife (Amendment) Act, 2000 provides for the protection of all wild birds and their nests, eggs and young (www.npws.ie/legislation). It is an offence to intentionally cause disturbance at a nest site or to breeding Peregrine.

Peregrines are sensitive to a range of activities and can desert their nests in response to disturbances (Newton 1979), however the response to disturbance can vary between individuals and in relation to the nature, extent and timing of disturbance activities. Birds which are frequently exposed to human activities may become more accustomed and tolerant of such disturbances compared to those which do not regularly encounter human activities (Newton 1979). Peregrines nest in densely populated urban areas throughout their range (Wilson *et al.* 2014, Drewitt 2014, Venu 2018), in close proximity to human activities in active quarries (Moore *et al.* 1997, Lusby 2017) and on major road infrastructures (Venu 2018). In a survey of Peregrines in quarries in nine eastern counties in the Republic of Ireland, Moore *et al.* (1997) showed that Peregrines were equally likely to nest in active or disused quarries, and Ratcliffe (1993) observed quarry nesting Peregrines which ignored frequent rock blasting. One of the three breeding pairs of Peregrine within the survey area for the N6 GCRR nest in an active quarry (Lusby 2017). Peregrines have also been recorded nesting in close proximity to major roads in Ireland, including an active quarry which held a breeding pair located approximately 300m from the M6 motorway in 2016 (Lusby 2017). There are many examples of

Peregrines using artificial nest sites fitted to major road infrastructures such as bridges throughout their breeding range (e.g. https://www.newnybridge.com/peregrine-falcons/).

Although Peregrines can tolerate and successfully nest in proximity to human activity and associated disturbances, certain types of disturbances are tolerated over others. The impact of disturbance will vary according to many factors including the level and type of disturbance, the tolerance of an individual or pair, the stage of breeding cycle in which the disturbance occurs and the proximity of the disturbance to the nest. Breeding Peregrines are more likely to be disturbed by activities taking place above their nest (Herbert & Herbert 1969). Ratcliffe (1972) suggested Peregrines could tolerate any number of people in the nesting haunt, provided the eyrie was safe and inaccessible. The stage of the breeding cycle in which the disturbance occurs is also likely to be important, for example a pair may become accustomed to regular disturbance events over time (Ratcliffe 1993), whereas sporadic disturbance or disturbance which is initiated during a sensitive stage of the breeding cycle (e.g. laying, incubation) may be detrimental and cause desertion of the nest. Displacement to alternative nest sites can occur due to disturbance although this may be temporary depending on the disturbance source, or birds may be become reconciled to the disturbance and return to the disturbed nest site (Ratcliffe 1962).

It is not possible to determine the specific response of breeding Peregrine in Lackagh Quarry to the construction and operation of the proposed N6 GCRR, however, based on the proximity of the proposed road development to the previously used nesting ledges, the level of disturbance during the construction and operation, the fact that similar disturbance events have not recently occurred in Lackagh Quarry, and the lack of suitable alternative ledges in the quarry post-construction, it is likely that Peregrines will be temporarily or permanently displaced from Lackagh Quarry and its surrounds. To minimise the potential impacts of the proposed road development of the N6 GCRR on breeding Peregrine in Lackagh Quarry, mitigation measures are included in the EIAR for the N6 GCRR to reduce disturbance to breeding Peregrine during the nesting cycle. A seasonal constraint on construction works near Lackagh Quarry will be implemented, whereby works from the Lackagh Tunnel to the N84 Headford Road Junction will commence prior to mid-February. The seasonal constraint on construction works near Lackagh Quarry will ensure that any construction related disturbance will be initiated prior to nesting and can influence nest site selection, which is targeted to reduce the likelihood of nest desertion and impacts on an incubating female in the nest. The installation of rock bolts on the cliff faces in the vicinity of the nest site will be undertaken in a sensitive manner (as advised by a suitably experience ecologist) so as to minimise any potential disturbance to the nest site during the breeding season. The mitigation strategy also includes for the retention of one of the two ledges previously used by breeding Peregrine (in 2016 and 2017) in Lackagh Quarry. However, there remains a risk that breeding Peregrine will be temporarily or permanently displaced from Lackagh Quarry as a result of the proximity of the road carriageway to the existing nest ledge which will be retained and due to the lack of suitable alternative ledges in the quarry post-construction as identified in the EIAR. The displacement of breeding Peregrine from Lackagh Quarry would likely result in a reduction in the breeding population of Peregrine in the survey area for the N6 GCRR, as there are no other suitable nesting opportunities available in this area which are not already occupied by breeding Peregrine. The loss of Lackagh Quarry as a breeding site for Peregrine has the potential to have long-term effects on the local population and is significant at the county geographic scale.

3. RECOMMENDATIONS

As identified in the EIAR for the N6 GCRR, the proposed road development will result in a significant residual impact on Peregrine Falcon. In response to the submission made by the

Department of Culture, Heritage and the Gaeltacht to An Bord Pleanála on the 21 December 2018 (see Appendix 1) and in an effort to reduce this residual impact, it is proposed to implement additional mitigation in the form of the provision of an alternative nest site for Peregrine at a suitable location in close proximity to Lackagh Quarry. The provision of a suitable, alternative nest site, alongside the mitigation measures outlined in the EIAR, namely the seasonal constraint on the commencement of construction works at Lackagh Quarry and retention of one of previously used nest ledges, would reduce the risk of construction related disturbance effects to breeding Peregrine in the short-term (during the construction period) and reduce the risk of displacement of breeding Peregrine from Lackagh Quarry and surrounds in the long-term (during the operation of the proposed road development). Furthermore, given that the previously used nest ledges in Lackagh Quarry are deemed to be of poor quality, the provision of a suitable and safe nesting site could help to secure the future of Peregrine in this area. An artificial nest site of appropriate design will be in place prior to the commencement of works which have the potential to disturb or displace breeding Peregrine. Although it is not possible to guarantee uptake of this artificial nest site, the provision of this site will increase the likelihood of the continued occupation of breeding Peregrine in Lackagh Quarry and its surrounds which would mitigate the significant negative residual effect on Peregrine at the local and county geographic scale as a result of the construction of the proposed N6 GCRR. Should the artificial nest site be taken up by the resident pair of Peregrine (as confirmed by monitoring as outlined below) then the seasonal constraint on the commencement of construction works at Lackagh Quarry should be lifted, as this would not result in effects to breeding Peregrine.

Provision of an alternative nest site for Peregrine

It is recommended that an alternative nest site, consisting of a nest box fitted to a suitable structure is provided in close proximity to Lackagh Quarry (<1km) prior to the commencement of works which have the potential to disturb or displace breeding Peregrine. The objective of this mitigation recommendation is to ensure that Peregrines, if displaced from the previously used nesting ledges in the quarry, can remain and breed in the area. Three options are outlined as suitable locations for the installation of the artificial nest site as detailed, one of which is fitting a nest box to an existing structure and two are installing a purpose-built structure to accommodate a nest box. The nest box should be open-fronted with a sheltered cavity, containing a substrate (a mix of gravel or pea shingle and compost or woodchips) and sufficient space to allow the young to exercise in safety as they develop (Dixon & Shawyer). The nest box should be fitted with a raised edge to help retain the substrate and the juveniles as they become more active. The nest box should not be placed in locations facing full sun throughout the day (Ratcliffe 1995). The design and specifications of a nest box for Peregrine is detailed here: http://www.schwegler-natur.de/portfolio_1408366639/schwegler-wanderfalkennistkasten/?lang=en and included in Appendix 2 to this report. Two possible locations for this nest site are discussed below.

1: Communications tower

The communications tower (ITM 530660 728015) located approximately 500m to the south of the previously used nest ledges in Lackagh Quarry, and approximately 450m to the south of the proposed road development provides a suitable location and is the preference site for the provision of a nest box for Peregrine. The tower is located within sight and sufficiently close to Lackagh Quarry to increase the potential of uptake by breeding Peregrine if displaced from the quarry, while also located at a sufficient distance from the proposed road development to avoid disturbance associated with the construction and operation of the proposed road development. The nest box should be fitted close to the top of the tower (the top third of the tower) and should be in place prior to the initiation of works in Lackagh Quarry.

There are several aspects which need to be considered prior to the installation of a nest box on the communications mast. Firstly, as it is an offence to cause intentional disturbance to breeding Peregrine or their nest, this may impose a restriction on maintenance work (e.g. repairs) or other activities in close proximity to the nest site (a distance which could cause disturbance) during the nesting season, should the nest site be occupied. Secondly, it is typical for the ground level surrounding an active nest to be littered with feathers and bones of prey consumed by Peregrine.

If it is not possible to install a nest box to the existing structure, a purpose-built tower (as detailed below) could be installed in close proximity.

The location of the communications tower in relation to Lackagh Quarry is shown below in Figure 1.

Figure 1: The location of the communications tower (ITM 530660 728015) which would be suitable for the placement of a nest box for Peregrine (shown by the red pin).

2: Purpose-built tower

A purpose-built tower fitted with a nest box can be installed at either of the two locations proposed below. The purpose-built tower and nest box should be in place prior to construction activities in the quarry. The tower can be constructed from suitable materials provided it is safe, secure and long-lasting to accommodate a nest box of approximately 260kg (empty nest box). The tower can be of similar design to a pylon or tower crane, with four supporting bases, narrow four-sided tower with supporting girders. The nest box will be positioned at a minimum height of 25m above ground level. The nest box should be accessible to licensed professionals to allow maintenance and monitoring of the nest as required. A perimeter fence should be installed around the base of the tower to restrict access to the general public and to and reduce the potential for disturbance.

One example of a purpose-built tower for Peregrine which has been used to inform the design of the proposed tower at Lackagh Quarry is a disused four-sided crane tower with a nest box installed at Battersea in the UK to provide a suitable nest for Peregrine to encourage their relocation from nesting on a nearby building. The nest box in this situation was installed at 30m above ground level which was a similar height to the existing nest site on the building (Nick Dixon *pers comm*.) Images of this structure can be viewed here: http://parliamentperegrinediary.blogspot.com/, other examples of purpose built towers for Peregrine are included in Appendix 3.

Location 1 for purpose-built tower:
The Galway City Council owned lands to the south of the N6 GCRR and south east of Lackagh Quarry would provide a suitable location for an artificial nest site for Peregrine. The purpose-built tower should be sited at a minimum distance of 100m from the proposed road development, in the south west corner of the plot 586d.403 at approximately ITM 530736 728267 as shown in Figure 2 below.

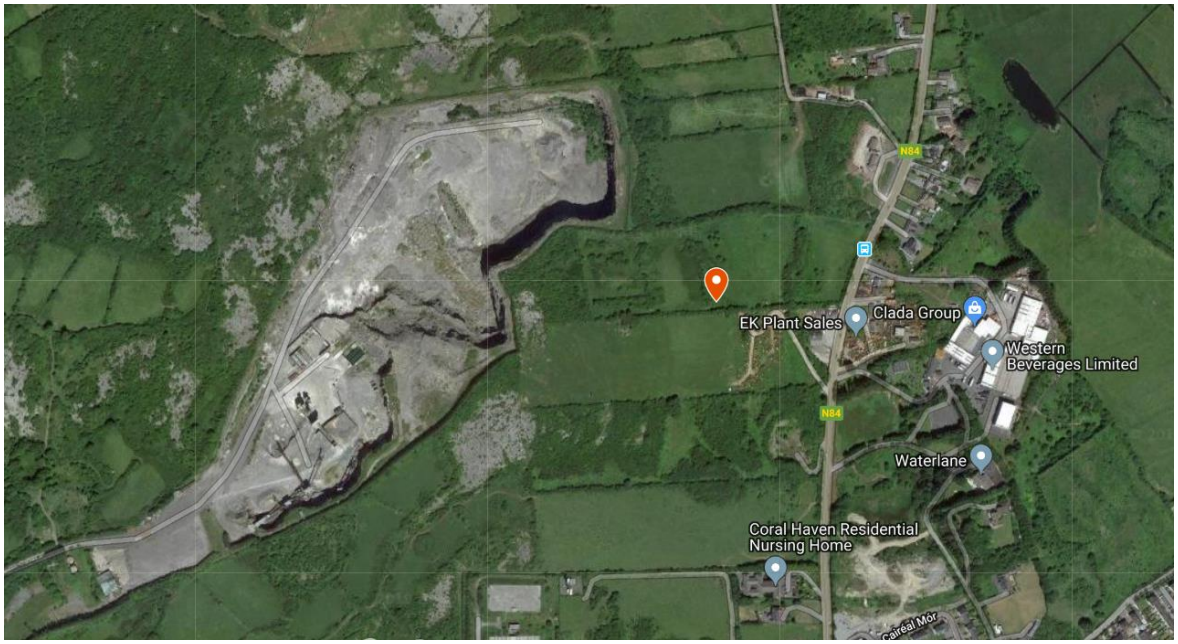

Figure 2: The proposed location for a purpose-built tower to accommodate a nest box for Peregrine (ITM 530736 728267 (shown by the red pin)).

Location 2 for purpose-built tower:
The area within the proposed development boundary for the proposed road development to the north of the nest site used in 2016/2017, in the north east corner of the quarry would provide a suitable location for the purpose-built tower, as shown in Figure 3 below.

Figure 3: The proposed location for a purpose-built tower to accommodate a nest box for Peregrine (shown by the red pin).

Mitigation recommendation: **Provide alternative nest sites for Peregrine**
Objective: Minimise the potential that Peregrine are temporarily or permanently displaced from Lackagh Quarry and surrounds as a result of the construction of the N6 Galway City Ring Road
Mitigation measures (step by step approach): - An artificial nest sites of appropriate design for Peregrine to be provided in close proximity to Lackagh Quarry (<1km) - Examples of appropriate designs of nest boxes for Peregrine are detailed here: http://www.schwegler-natur.de/portfolio_1408366639/schwegler-wanderfalkennistkasten/?lang=en - The nest box should be open-fronted with a sheltered cavity, containing a substrate (a mix of gravel or pea shingle and compost or woodchips) and sufficient space to allow the young to exercise in safety as they develop (Dixon & Shawyer). The nest box should also be fitted with a raised edge to help retain the substrate and the juveniles as they become more active. - The nest box should not be placed in locations facing full sun throughout the day (Ratcliffe 1995) - The first option is for the nest box to be fitted to the communications tower (ITM 530660 728015). The nest box should be in place prior to the initiation of works which have the potential to cause disturbance to Peregrine in Lackagh Quarry. The nest box should be

secured close to the top of the tower (the top third of the tower) in a suitable location which provides a clear flight line to the nest box.

- Should it not be possible to install a nest box on the communications tower, a purpose-built tower should be installed: 1) to the south of the N6 GCRR on Galway City Council owned lands to the south-east of Lackagh Quarry, or 2) within the proposed development boundary for the proposed road development to the north of the nest site used in 2016/2017 in the north-east corner of the quarry. The purpose-built tower should be sited at a minimum height of 25m above ground level and should be in place prior to construction activities in the quarry.

Monitoring

Monitoring should be undertaken by a suitably qualified ecologist to determine the response of Peregrine to the disturbances associated with the construction of the proposed road development and to the mitigation measures implemented to determine their success. Monitoring should be carried out during March to July over a minimum of three visits as per the methods outlined in Lusby (2018) and Hardey *et al.* (2009) to identify the nest location and outcome of breeding including determining use of the artificial nest site, during the construction phase and for a period of three years once the proposed road development is in operation.

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APPENDIX 1.

Submission by the Department of Culture, Heritage and the Gaeltacht to An Bord Pleanála

In the EIAR, there is a degree of uncertainty as to whether Lackagh Quarry will remain a suitable breeding site for Peregrine during and post-construction. No alternative breeding site for the Peregrine pair associated with this nest site is known locally. To counterbalance the potential loss of this breeding resource, a suitable alternative nest site(s) needs to be created, noting that the most recent National Peregrine Survey did not record any urban nesting pairs from Galway City. There may be opportunities to install artificial nesting platforms or boxes on other suitable features or buildings. Failing that, a bespoke nesting structure in an appropriate area should be constructed.

The EIAR could benefit from more clarity as to the efficacy of the mitigation measure to temporarily dissuade active breeding of Peregrine at Lackagh Quarry by commencing works from the Lackagh Tunnel to the N84 Headford Road Junction prior to mid-February. The appropriateness of potentially working in the vicinity of, and disturbing an active nest site to install rock bolts on the cliff face may be challenging. If an alternative suitable Peregrine nesting resource was created prior to any road development works being undertaken then the possibility of temporarily rendering the nesting ledges at Lackagh Quarry unavailable for Peregrine during the construction period as a mitigation measure to avoid the disruption of a breeding attempt could be considered.

APPENDIX 2.

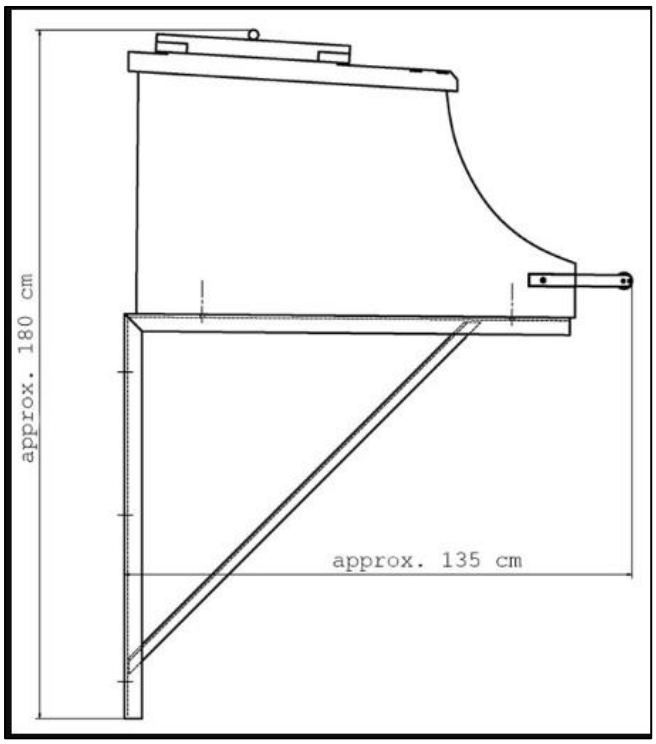
Peregrine Falcon Nest Box

(extracted from http://www.schwegler-natur.de/portfolio_1408366639/schwegler-wanderfalkennistkasten/?lang=en)

Installation height: Generally, in heights above 25 – 30 m. North- or east-facing sites have proved to be most effective. The "balcony" with its perch should be placed so that there is a clear area directly below. The box can be attached directly to a building using screws (e.g. on flat roof sections) or, by means of a mounting rack and wall plugs, onto an outside wall. Recommended litter/ bedding: Place some gravel or other loose material in the box. Peregrines do not construct nests, instead the female scrapes a hollow in which to hatch the eggs. The breeding period starts any time between mid-March and the beginning of April.

Material: Special, high-strength, reinforced lightweight concrete. This ensures that the box is very long-lasting (decades) and allows a proper and structurally correct manner of installation. The naturally grey, smooth concrete can be painted individually during installation to match the building, if required.

External dimensions: W 80 x H 73 x D 130 cm.
Nesting chamber: W 67 x H 54 x D 72 cm.
Weight: approx. 260 kg (empty box).



APPENDIX 3.

Examples of purpose-built towers which have been fitted with a nest box for Peregrines are shown below:

http://parliamentperegrinediary.blogspot.com/
http://www.friendsofcamas.org/projects/peregrine-tower-webcam-project
https://images.app.goo.gl/FsmGBHSdBwjNW1a86
https://www.gettyimages.de/detail/nachrichtenfoto/the-newly-erected-nesting-tower-designed-to-house-a-nachrichtenfoto/828929510
http://www.conservewildlifenj.org/blog/2018/02/09/photo-from-the-field-new-falcon-tower-on-bonnet-island-lbi/

Appendix D

N6 GCRR Mitigation Strategy Timeline

N6 GCRR Mitigation Strategy Timeline