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Submission on Ecology
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1 Introduction

Personal Details

- 1.1 My name is Stuart Ireland. I am a Principal Ecologist with Mouchel responsible for the planning and delivery of ecological assessments across the UK. I am a full member of the Institute of Ecology and Environmental Management (IEEM) and a Chartered Environmentalist (CEEnv). I hold a Combined Honours BSc in Zoology with Marine Zoology.
- 1.2 During my career I have been responsible for providing ecological assessment services and advice to both public sector and private sector clients including several highways projects.
- 1.3 In my work I design and implement suites of ecological surveys, including floral and faunal surveys, and have extensive experience of conducting a wide range of these surveys. I have a wide range of experience in the assessment of impacts of development schemes on ecological receptors, including road schemes. On behalf of my clients I am also fully involved in consultations with statutory and non-statutory consultees with regards to proposed works.

Role and Responsibilities on the A5 WTC Project

- 1.4 On the A5 WTC, my role is that of the Principal Ecologist working for Mouchel on behalf of the Road Service Northern Ireland, and I lead and co-ordinate the input of the ecology team in the development of the proposed scheme. This is a role I have fulfilled since July 2009 when I took over from a colleague taking a leave of absence. The field surveys were undertaken by a team of experienced specialist ecologists.
- 1.5 I have visited the area of the proposed road scheme on several occasions and am familiar with the area.

Structure of Evidence

1.6 My evidence considers the potentially significant ecological impacts of the scheme. It is presented under the following headings.

- Section 1: Introduction
- Section 2: Scope of Proof
- Section 3: Natura 2000 Sites
- Section 4: Areas of Special Scientific Interest
- Section 5: Ancient and Long Established Woodlands
- Section 6: Biodiversity Action Plan Habitats
- Section 7: Protected Plants
- Section 8: European Protected Species
- Section 9: Summary of Ecological Issues in Section 1 (Chainage 0 – 22.8km)
- Section 10: Summary of Ecological Issues in Section 2 (Chainage 27 – 57.5km)
- Section 11: Summary of Ecological Issues in Section 3 (Chainage 62 – 93.6km)
- Section 12: Conclusion

2 Scope of Evidence

- 2.1 In this document I discuss the significant findings of the Ecological Impact Assessment (EclA) which formed part of the Environmental Impact Assessment (EIA) undertaken to inform the Environmental Statement (ES) which is available at www.a5wtc.com.
- 2.2 The EclA was undertaken following the principles set out in the Design Manual for Roads and Bridges Volume 11, and used the Institute for Ecology and Environmental Management (IEEM) Guidelines on Ecological Impact Assessment (2006) process.
- 2.3 Potential impacts on sites, habitats and species have been described and quantified within the ES and appropriate mitigation has been designed as part of an iterative process. Residual impacts from the scheme have been identified, both positive and negative and these are fully described in the ES.
- 2.4 Information regarding protected sites and Biodiversity Action Plan (BAP) habitats is summarised in this document.
- 2.5 Whilst there are many protected and Biodiversity Action Plan (BAP) species identified within the survey area, this document focuses on those animals which are afforded protection under European Legislation as enacted in Northern Ireland.

Terminology

- 2.6 This document makes use of the terminology used within the IEEM EclA Guidelines to describe the value of ecological features and to characterise potential impacts upon them. Therefore, a brief description of the terminology used is provided below.
- 2.7 Biodiversity value has been described using the following geographically based scale:
- International e.g. biodiversity feature that warrants designation of an area as a SPA, SAC or Ramsar site;
 - National (i.e. Northern Ireland), e.g. biodiversity feature that warrants designation of an area as an Area of Special Scientific Interest (ASSI);

- County, e.g. biodiversity features valuable at a county (e.g. County Tyrone) level;
- District, e.g. biodiversity features of value at the district (e.g. Omagh) level;
- Local, e.g. biodiversity features of value in a local (i.e. within ~2km of the scheme extent) context; and
- Biodiversity features of value within the immediate vicinity of the Proposed Scheme only.

2.8 Potential impacts have been characterised using the following elements:

- Magnitude - the size of an impact in quantitative terms where possible;
- Extent - the area over which an impact may occur;
- Duration - the time for which an impact is expected to last;
- Reversibility - a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it; a temporary impact is one from which short-term recovery is possible; and
- Timing and frequency - whether impacts are constant ongoing, separated but recurrent or single events and whether they occur during critical seasons or lifestages of habitats and fauna.

2.9 Impacts have been defined as significant if they affect the integrity of designated sites and ecosystems and/or the conservation status of habitats and species.

2.10 The level at which impacts upon integrity or conservation status are important is defined by the geographic scale at which each receptor is valued. For example an impact upon the integrity of a site of value at a national scale would be of significance at a national scale. In some cases an effect on the integrity or conservation status of the receptor may not occur, but more localised impacts may still be significant at smaller geographic scales. Any legal implications are also described along with policy implications appropriate to the scale of the impact.

2.11 Each impact is also given one of four confidence ratings reflecting the likelihood that the impact would occur. The confidence ratings applied are:

- certain/near certain – probability estimated at 95% chance or higher;
- probable – probability estimated above 50% but below 95%;
- unlikely – probability estimated above 5% but below 50%; and
- extremely unlikely – probability estimated at less than 5%.

2.12 Impacts have been identified which may occur during construction and/or operation of the road, and have been separated in the discussion of impacts for clarity.

Statutory Context

2.13 The following legislation is most relevant to the nature and conservation features effected by the Proposed Scheme:

- The Foyle Fisheries Act (Northern Ireland) 1952 (as amended);
- The Fisheries Act (Northern Ireland) 1966 as amended;
- The Wildlife (Northern Ireland) Order 1985 (as amended) (No 171) (Northern Ireland 2) (including updates) (the Wildlife Order);
- The Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 (as amended);
- The Environment (Northern Ireland) Order 2002;
- The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended);
- The Water (Northern Ireland) Order 1999;
- The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003;

- The Surface Waters (Fishlife) (Classification) Regulations (Northern Ireland) 2007; and
- The Environmental Liability (Prevention and Remediation) Regulations (Northern Ireland) 2009 (the Environmental Liability Regulations).
- (Republic of Ireland) European Communities (Natural Habitats) Regulations 1997 (as amended).

2.14 The following EC Directives and international conventions are implemented by some of the above Northern Ireland and Republic of Ireland Acts and Regulations:

- Council Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora (“the Habitats Directive”);
- Directive 2009/147/EC on the conservation of wild birds (codified version) (“the Birds Directive”);
- Convention on Wetlands of International Importance (“the Ramsar Convention”) (1971);
- Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) (1979);
- Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention) (1979);
- Agreement on the Conservation of Populations of European Bats (1999) (EUROBATS);
- Directive 2006/44/EC on the quality of fresh waters needing protection or improvement in order to support fish life (the Fish Directive (consolidated));
- Directive 2000/60/EC, The Water Framework Directive (WFD); and
- Directive 2004/35/EC, The Environmental Liability Directive.

Methodologies

- 2.15 In addition to the IEEM (2006) guidelines on EclA reference was made throughout the assessment process to the Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 4 – Ecology and Nature Conservation, as updated by Interim Advice Note (IAN) 130/10 (Ecology and Nature Conservation: Criteria for Impact Assessment).
- 2.16 The robust survey methodologies followed for the collection of field data are noted below. All methods were discussed with Northern Ireland Environment Agency (NIEA) prior to commencing survey.
- Habitats, flora, bryophytes, macrophytes, Schedule 8 plants – National Vegetation Classification (Rodwell, 1991-2006)
 - Hedges & veteran trees – Woodland Trust (2008); DEFRA (2008); and Mouchel (2009)
 - Invertebrates – BS EN 27828:1994; ISO 7828:1995; Cooter (1991); Betts (1986); and Stubbs & Chandler (1978)
 - White clawed crayfish – Peay (2003)
 - Fish – SFCC (2007a, b and c); BS EN 14011:2003; APEM (2002); and Harvey & Cox (2003)
 - Birds – Bibby *et al* (2000); McElwaine & Spouncer (2006); Gilbert *et al* (1998); and English Nature (2002)
 - Smooth newt – Mouchel (2009)
 - Viviparous lizard – Hill *et al* (2005); Gent & Gibson (2003); HA (2006); and Mouchel (2009)
 - Otter – NIEA (2006); HA (2008); and Chanin (2009)
 - Bats – Mouchel (2009); Mitchell-Jones (2004); Bat Conservation Trust (2007)

- Red squirrel – NIEA (2009); and Gurnell *et al* (2001)
- Pine marten – O'Mahony *et al* (2005); and Balharry *et al* (1996)
- Badger – Harris *et al* (1989)
- Deer – Mouchel (2009)

3 Natura 2000 Sites

Introduction

- 3.1 Natura 2000 Sites are those which have been designated across Europe under Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (known as the Habitats Directive) adopted in 1992, and the Council Directive 2009/147/EC on the conservation of wild birds (known as the Birds Directive) which is the codified version of the amended Council Directive 79/409/EEC.
- 3.2 This legislation has been enacted into Northern Ireland (NI) legislation via The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995.
- 3.3 Sites can be designated under these regulations for hosting a priority natural habitat type or priority species as Special Areas of Conservation (SAC) or bird species listed on appropriate Annexes of the Birds Directive as Special Protection Areas (SPA).
- 3.4 SAC are areas that have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SAC, together with SPA, form the Natura 2000 network. Where projects are likely to, or there is residual uncertainty as to whether they may, have a significant effect on the ecological integrity of a Natura 2000 site, that project must fully ascertain the nature of these potential effects and be subject to an 'Appropriate Assessment' as defined by the legislation.
- 3.5 The Regulations require competent authorities to consider or review planning permission, applied for or granted, affecting a European site, and, subject to certain exceptions, restrict or revoke permission where the integrity of the site would be adversely affected. Equivalent consideration and review provisions are made with respects to highways and roads. Candidate SAC (cSAC) receive the same level of protection as full SAC.
- 3.6 SPA are areas of the most important habitat for rare (listed on Annex I to the Directive), vulnerable, and migratory birds within the European Union. SPA form part of the Natura 2000 network. All NI SPA are also designated as ASSI and therefore receive additional protection under the Part IV of The Environment (Northern Ireland)

Order 2002. Any development likely to have significant impacts upon a Natura 2000 site will have to be assessed for its implications on the site's conservation status.

- 3.7 Ninety three species are listed upon Annex I to the Birds Directive, of which approximately thirty are regularly recorded in NI (although many of these occur solely as summering migrant populations, passage migrants or scarce visitors). The presence of important populations of Annex I bird species, or non-Annex I migratory birds, is a primary consideration in the identification of SPA.

Sites Interacting with the A5 Western Transport Corridor

- 3.8 Four SAC are within the study corridor:

- River Foyle & Tributaries SAC;
- River Finn SAC (Republic of Ireland);
- Owenkillew River SAC; and
- Tully Bog SAC.

- 3.9 Three SPA are within the study corridor:

- Lough Foyle SPA;
- Lough Swilly SPA (Republic of Ireland); and
- Inch Lough and Levels SPA (Republic of Ireland).

- 3.10 Each of these sites is discussed in the following sections. In each case a summary of the site's qualifying features is provided, potential impacts during construction and operation are identified and summarised, mitigation measures committed to within the ES are described and the residual impacts are detailed.

River Foyle & Tributaries SAC

- 3.11 This SAC is designated for both its Habitats Directive Annex I habitat and Annex II species it supports. Its primary reasons for designation are:

- Water courses of plain to montane levels with the *Ranunculus fluitantis* and Callitriche-Batrachion vegetation; and
 - Atlantic salmon *Salmo salar* (the river has the largest population of in Northern Ireland, with around 15% of the estimated spawning numbers).
- 3.12 A qualifying feature, but not primary reason for designation is its population of Otter *Lutra lutra*.
- 3.13 Potential construction impacts on this site have been identified as reduction in water quality and surface water status (as defined under the Water Framework Directive (WFD)); loss of riparian habitat; alteration in the geomorphology of the watercourse; and spreading of invasive non-native plant species.
- 3.14 Potential construction impacts on Otter have been characterised as fragmentation of commuting routes; disturbance of shelter/resting places; and disturbance of individual Otter.
- 3.15 Potential construction impacts on the fish within the site have been characterised as loss of species extent, density or habitat quality; potential injury or death of individuals; fragmentation of habitat; loss of riparian cover; loss of food source; and loss of ecological functionality of migratory species, for example in the development of freshwater pearl mussel *Margaritifera margaritifera*.
- 3.16 Potential construction impacts on the designated plant communities within the site have been characterised as the loss of extent or density of aquatic flora.
- 3.17 Potential operational impacts on the site have been characterised as reduction in water quality of the watercourse; and reduction in surface water status or an element of surface water status (biological, hydromorphological and chemical and physico-chemical) under the WFD.
- 3.18 Potential operational impacts on Otter have been characterised as road mortality caused by fragmentation of commuting routes.
- 3.19 Potential operational impacts on the fish within the site have been characterised as harm to resident and migratory fish species resulting from impacts on water quality; loss of species extent, density, habitat quality and/or fragmentation of habitats;

disruption to migration and movement of fish species; indirect impacts through the ecological functionality of migratory species, for example in the development of freshwater pearl mussel.

3.20 Potential operational impacts on the designated plant communities within the site have been characterised as loss of extent or density of aquatic flora.

3.21 Mitigation for the identified potential impacts consists of:

- Adherence to relevant PPG's and development of a contingency plan in the event of a pollution incident.
- Incorporation of sediment control measures, to ensure compliance with imposed discharge concentration limits (maximum of 50mg/l of suspended solids).
- Treatment and removal of invasive and nuisance plant species following industry guidance prior to construction.
- Limit riparian vegetation removal to a minimum to avoid significant removal of riparian cover, with suitable replanting to provide new cover.
- August to September (inclusive) construction period to avoid most sensitive fish species periods, with works restricted to daylight hours to allow for overnight migration of migratory species.
- Installation of Otter ledges in culverts.
- Adherence to working practices as detailed in the Volume 3 of the ES.
- Use of clear span temporary bridges during construction over major watercourses.
- Movement of the road by c. 5m adjacent to the River Derg to avoid the Otter holt, use of temporary fencing to reduce disturbance; or
- Under licence, create artificial holt and destroy existing holt.
- Planting along watercourses to provide additional cover and resting places.

3.22 Therefore significant negative effects on the conservation status of the site, the Otter, fish or the plant communities are concluded to be very unlikely to occur.

River Finn SAC

3.23 The River Finn SAC flows into the River Foyle SAC, south of Strabane. This SAC is designated for both the Habitats Directive Annex I habitat and Annex II species it supports.

- Active blanket bog, lowland oligotrophic lakes, wet heath and transition mires.
- Atlantic salmon; and
- Otter.

3.24 None of the habitats for which the site is designated are present within the section of the River Finn SAC that is included within the study area.

3.25 There is a very small risk that some of the qualifying species which are migrating or moving downstream from the River Finn SAC into the River Foyle & Tributaries SAC where they are more at risk of receiving impacts. However, the risks are seen as minimal and with the mitigation in place for the River Foyle & Tributaries SAC are not considered to be significant.

Owenkillew River SAC

3.26 This SAC is designated for both its Habitats Directive Annex I habitat and Annex II species it supports. Its primary reasons for designation are:

- Water courses of plain to montane levels with *Ranunculion fluitantis* and Callitriche-Batrachion vegetation;
- Old sessile oak woods with Ilex and Blechnum; and
- Freshwater pearl mussel.

3.27 Habitats Directive Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site include:

- Bog woodland (priority feature).

3.28 Habitats Directive Annex II species present as a qualifying feature but not a primary reason for selection of this site includes:

- Atlantic salmon; and
- Otter.

3.29 Please note that none of the habitats for which the site is designated are present within the section of the Owenkillew SAC that is included within the ecology study area.

3.30 There is a very small risk that some of the qualifying species which are migrating or moving downstream from the Owenkillew River SAC into the River Foyle & Tributaries SAC where they are more at risk of receiving impacts. However, the risks are seen as minimal and with the mitigation in place for the River Foyle & Tributaries SAC are not considered to be significant.

Tully Bog SAC

3.31 This SAC is designated for its Habitats Directive Annex I habitats only. The primary reason for designation is:

- Active raised bogs (priority feature).

3.32 During construction potential impacts have been characterised as a potential decrease in local air quality from construction dust affecting vegetation of site.

3.33 Impacts on the hydrology of the site have been ruled out through discussion with colleagues in the Land Drainage team.

3.34 During operation potential impacts have been characterised as an increase in deposition of oxides of Nitrogen from road.

3.35 However, work carried out by the Air Quality team have modelled that the total deposition of oxides of Nitrogen is 4.1-6.2 $\mu\text{g}/\text{m}^3$ which is within EU limit of 30 $\mu\text{g}/\text{m}^3$.

In addition increase with A5 WTC is only up to 0.5 µg/m³ compared with the predicted levels without the A5 WTC.

- 3.36 Levels of Nitrogen deposition exceed threshold levels for bog habitats, but there is no modelled difference between the operational levels with or without the A5 WTC. The levels of Nitrogen deposition are anticipated to fall from 2008 baseline levels in both scenarios.
- 3.37 The active bog surface is 280m from the junction and when combined with the lack of competitive species on the bog surface it is unlikely that the conservation status of the bog will be negatively affected as a result of the scheme.
- 3.38 Mitigation for the potential impact of construction dust on the bog is the use of standard construction dust suppression methods.
- 3.39 With mitigation in place it is considered very unlikely that there will be any significant impact on the site.

Lough Foyle SPA

- 3.40 This site is designated for internationally important populations of wintering wildfowl. While this site lies some 10km from the Proposed Scheme, it is functionally linked to the scheme's locality by foraging movements of Whooper swan *Cygnus cygnus* and Greylag geese *Anser anser* into the River Foyle catchment to feed on floodplain grasslands.
- 3.41 The site is also classified under the legislation as a wetland of international importance due to the winter bird assemblage which uses the site.
- 3.42 Potential construction impacts are classified as disturbance to c.5% of the recorded populations of Whooper swan in fields within 300m of the proposed route; and disturbance to 12-21% of the total SPA population of Whooper swan located on River Foyle 600m from works.
- 3.43 As the closest flocks of Greylag geese were recorded over 600m away from the proposed road, it is very unlikely that construction would impact upon these birds.

- 3.44 Potential operational impacts of the scheme are characterised as unlikely to occur due to habituation of birds to road noise and movement.
- 3.45 Mitigation for impacts on the wintering bird populations is via avoidance of key winter months (October to January) for major construction works if practicable. Should any works be required during these months appropriate screening will be employed in consultation with Northern Ireland Environment Agency (NIEA).
- 3.46 Therefore no significant impacts are predicted on this SPA.

Lough Swilly SPA

- 3.47 This site is designated for internationally important populations of wintering wildfowl. While this site lies some 12km from the proposed scheme, it is functionally linked to the scheme's locality by foraging movements of Whooper swan and Greylag geese into the River Foyle catchment to feed on floodplain grasslands.
- 3.48 Potential impacts and mitigation are identical to those of the Lough Foyle SPA in Section 3.40 – 3.46 of this document.
- 3.49 Therefore no significant impacts are predicted for this site.

Inch Lough & Levels SPA

- 3.50 This site is designated for internationally important populations of wintering wildfowl. While this site lies some 12km from the proposed scheme, it is functionally linked to the scheme's locality by foraging movements of Whooper swan and Greylag geese into the River Foyle catchment to feed on floodplain grasslands.
- 3.51 Potential impacts and mitigation are identical to those of the Lough Foyle SPA in Section 3.40 – 3.46 of this document.
- 3.52 Therefore no significant impacts are predicted for this site.

Habitats Regulations Assessments

- 3.53 Concerns have been raised in several representations that the Habitats Directive and Birds Directive as enacted into Northern Ireland legislation have not been followed in

relation to Natura 2000 sites. I do not agree that this is the case. The potential for this scheme to impact on the Natura 2000 sites was recognised at the earliest stage. Consultations with NIEA and with the National Parks and Wildlife Service (NPWS) within the Republic of Ireland have been held to discuss the scheme in relation to these sites.

- 3.54 Information relative to these sites has been provided to the Statutory Consultees. Under the Habitats Regulations it is the Competent Authority which must determine whether an application may impact on the integrity of a Natura 2000 site, and thus whether a full HRA is required to examine alternatives and whether the scheme is of overriding public interest.
- 3.55 It is my opinion that the information which has been prepared clearly demonstrates that the integrity of each site would not be impacted by the construction or operation of this scheme and thus, that no further assessment under the HRA process would be required. It is for the Competent Authority to make the final determination based on the information provided.

4 Areas of Special Scientific Interest

Introduction

- 4.1 Seven Areas of Special Scientific Interest (ASSI) lie within the ecology study area; of these three are also SAC (River Foyle & Tributaries, Owenkillew River and Tully Bog) and are discussed in those terms above.
- 4.2 Further to the seven designated ASSI two sites are proposed as ASSI and have been included in this assessment at the same level as a fully designated ASSI.
- 4.3 The sites assessed for this document are:
- River Foyle & Tributaries ASSI (riparian woodland only)
 - McKean's Moss parts I and II ASSI
 - Strabane Glen ASSI
 - Grange Wood ASSI
 - Baron's Court Estate proposed ASSI
 - Seskinore Forest proposed ASSI

River Foyle & Tributaries ASSI

- 4.4 Features of the site other than the riparian woodland, which is prominent along some stretches of the Mourne River valley, have been discussed above and will not be discussed again here.
- 4.5 No significant impact is predicted on this habitat either during construction or operation.

McKean's Moss ASSI

- 4.6 McKean's Moss is designated as a lowland raised bog.

- 4.7 Potential construction impacts on the site are characterised as a reduction in air quality from construction dust affecting vegetation on site.
- 4.8 Potential operational impacts on the site are characterised as an increase in deposition of oxides of Nitrogen; and contamination of the ditch surrounding the ASSI from operation runoff from the outflow at Ch. 11900.
- 4.9 However, the total deposition is $5.5\mu\text{g}/\text{m}^3$ which is within EU limit of $30\mu\text{g}/\text{m}^3$. In addition increase with A5 WTC is only up to $1.1\mu\text{g}/\text{m}^3$ compared with the predicted levels without the A5 WTC.
- 4.10 Levels of Nitrogen deposition exceed threshold levels for bog habitats, but there is no modelled difference between the operational levels with or without the A5 WTC. The active bog surface is 400m from the route and when combined with the lack of competitive species on the bog surface it is unlikely that the conservation status of the bog will be negatively affected as a result of the scheme.
- 4.11 Mitigation proposed is:
- Adherence to Construction Environment Management Plan (CEMP) commitments to standard construction dust reduction techniques.
 - Possible installation of treatment system prior to outflow – subject to conditions of application to NIEA for permission for this outfall.
- 4.12 With these mitigation measures in place it is considered very unlikely that any significant negative impacts will occur within the site.

Strabane Glen ASSI

- 4.13 Strabane Glen is designated as an ASSI due to the presence of calcareous Ash/Hazel woodland and associated flora, which is atypical of this region and whose presence is related to the underlying geology.
- 4.14 Due to the location of the Glen in comparison to the proposed road corridor no significant impacts are anticipated either through construction or operation of the road.

Grange Wood ASSI

- 4.15 Grange Wood is designated for its rich plant assemblage.
- 4.16 Potential impacts during construction have been characterised as a decrease in local air quality from construction related congestion.
- 4.17 Potential impacts through the operation of the road have been characterised as a decrease in deposition of oxides of Nitrogen from traffic.
- 4.18 Total oxides of Nitrogen deposition is modelled as 4.4-8 $\mu\text{g}/\text{m}^3$, lower than current levels of 6.8-32 $\mu\text{g}/\text{m}^3$ and within EU limit of 30 $\mu\text{g}/\text{m}^3$. This is 8.9-0.1 $\mu\text{g}/\text{m}^3$ lower than the predicted levels without the A5WTC and it is therefore probable that the proposed scheme will benefit the woodland, although it should be noted that a significant reduction in oxides of Nitrogen is modelled both with and without the scheme.
- 4.19 Levels of Nitrogen deposition exceed threshold levels for woodland habitats, but there is no modelled difference between the operational levels with or without the A5 WTC. In addition the modelled levels of Nitrogen deposition with the scheme are below the 2008 baseline levels.
- 4.20 As a significant positive impact is anticipated no mitigation is proposed.

Baron's Court Estate proposed ASSI

- 4.21 Identification of high biodiversity value features within the study area and subsequent consultation with NIEA has indicated that this site is likely to be designated as an ASSI for its woodland, veteran trees, lichens and bryophytes.
- 4.22 Potential construction impacts on the biodiversity value of the site have been characterised as a decrease in local air quality from construction related congestion.
- 4.23 Potential operational impacts have been characterised as an increase deposition of oxides of Nitrogen from traffic.
- 4.24 However, total deposition of oxides of Nitrogen is modelled to be 3.7-7 $\mu\text{g}/\text{m}^3$ which is within the EU limit of 30 $\mu\text{g}/\text{m}^3$. In addition the increase with A5WTC is only up to

1.0 µg/m³ compared with the predicted levels without the A5WTC. This is therefore unlikely to affect the lichens and bryophyte communities within the estate.

- 4.25 Levels of Nitrogen deposition exceed threshold levels for woodland habitats, but there is no modelled difference between the operational levels with or without the A5 WTC. In addition the modelled levels of Nitrogen deposition with the scheme are below the 2008 baseline levels.
- 4.26 As no significant impacts are predicted for the site, no mitigation has been proposed.

Seskinore Forest ASSI

- 4.27 Identification of high biodiversity value features within the study area and subsequent consultation with NIEA has indicated that this site is likely to be designated as an ASSI for bats.
- 4.28 Potential construction impacts have been characterised as a fragmentation of commuting routes along multiple hedges and water courses.
- 4.29 Those likely to be most significant are at Ch.64400, 66000, 66500-67000 and 68000 for 3 years. The proposed ASSI for bats at Seskinore Forest is located c.1-2km to the west between Ch.66000-68000. However no species for which the pASSI is being considered were recorded using the area crossed by the route. The route avoids any mature woodland or mature trees in this stretch and is restricted to lower value improved grassland habitats.
- 4.30 Potential operational impacts are characterised as a fragmentation of commuting routes and subsequent road mortality.
- 4.31 Mitigation proposed for the above is:
- Installation of 4 x temporary false hedges at Ch.64400, 66000, 66500-67000 and 68000 during construction as a precautionary measure and 7 x bat hop overs at Ch.64100, 66500, 66700, 68000, 68500, 69100, 71500 during operation.
 - Scheme planting to include suitable hedges and woodland to guide bats to hop overs, bridges and underpasses.

- 4.32 Due to the increased potential for bat roosts in the future the residual impact is characterised as a probable local positive impact on bats at this location.
- 4.33 It is my opinion that the proposed scheme complies with the legislative requirements in relation to these sites.

5 Ancient and Long Established Semi Natural Woodlands

Introduction

- 5.1 To be classified as Ancient Woodland an areas must have been wooded since at least 1600. This definition applies across the UK and was adopted because before this time planting was less common, so woods that were present in 1600 were more likely to have developed naturally.
- 5.2 Semi natural woodlands are composed of locally native trees and shrubs which derive from natural regeneration or coppicing rather than planting.
- 5.3 Ancient Semi Natural Woodland has been recorded within the route corridor at Routing Burn (Ch. 71700) and Cottage Hill (Ch. 90500-91200).
- 5.4 Long Established Woodland are also recorded in Northern Ireland and is land that has been continuously wooded since the first comprehensive maps of Ireland were produced in 1830-44, but which cannot be proven ancient.
- 5.5 Long Established Woodland has been recorded at Mulvin Parks (Ch. 33250).

Routing Burn

- 5.6 Potential construction impacts are classified as a certain loss of 0.2ha of semi-natural ancient woodland, <5% of total local resource; and potential destruction of c.5ha of semi-natural ancient woodland c.40% of total resource at that location through construction related activities.
- 5.7 Use of clear span bridge avoids fragmentation of 1ha of woodland to the west of route from the remaining area to the east.
- 5.8 Potential operational impacts are classified as a degradation in air quality (increase in Nitrogen deposition) in the vicinity of crossing point affecting bryophytes and woodland ground flora. Modelling of other sites indicates that this will be limited to c.50m of the proposed route, c.5% of total site.
- 5.9 Mitigation proposed at this location is:

- Scheme planting of >0.5ha of native ash woodland around settlement pond at Ch.71700-71800 North Bound carriageway.
- Delineation of construction areas to avoid all woodland and adherence to CEMP.

5.10 Residual impacts on Ancient Woodland at Routing Burn are:

- Planting of replacement woodland does not replace the biodiversity value of Ancient Woodland in a reasonable timescale. However, due to the small area to be lost this is predicted to be of significance at the local level only.
- Degradation of the woodland through Nitrogen deposition at this location will remain a factor throughout the operation of the road, and will impact on a small area of woodland; this will be a significant negative impact at a local level.

Cottage Hill

- 5.11 Due to access restrictions no site survey has been undertaken at Cottage Hill woodland.
- 5.12 Potential construction impacts are classified as a permanent loss of 0.5ha of woodland <5% of local resource.
- 5.13 Potential operational impacts are classified as a degradation in air quality (increase in Nitrogen deposition) in the vicinity of crossing point affecting bryophytes and woodland ground flora. Modelling of other sites indicates that this will be limited to c.50m of the proposed route.
- 5.14 Pre-construction survey of the site will provide detailed information to ratify impact predictions and allow fine tuning of mitigation proposals.
- 5.15 Mitigation proposed at this location is:
- Scheme planting to include 1 ha of native Oak woodland.
 - Clear delineation of construction areas to avoid remaining woodland and strict adherence to CEMP.

5.16 Residual impacts predicted at this location are:

- Planting of replacement woodland does not replace the biodiversity value of Ancient Woodland in a reasonable timescale. However, due to the small area to be lost this is predicted to be of significance at the local level only.
- Degradation of the woodland through Nitrogen deposition at this location will remain a factor throughout the operation of the road, and will impact on a small area of woodland; this will be a significant negative impact at a local level.

Mulvin Park

5.17 Potential construction impacts are classified as a loss of 0.6ha of LEW, c.50% of local resource at Ch.33250. Woodland is modified with planted oak canopy and relatively little diversity in ground flora.

5.18 Due to the poor diversity of ground flora no operational impacts are anticipated.

5.19 Mitigation consists of planting of more than 1 ha of native woodland on land vested adjacent to the South Bound carriageway and the remaining Long Established Woodland.

5.20 Although it is not possible to recreate Long Established Woodland, the modified nature of this wood and the lack of diversity in the ground flora reduce the residual impact of the loss. Planting of native woodland which is more diverse than the modified wood also reduces the residual impact. However, a significant negative impact at the local scale remains.

6 Biodiversity Action Plan Habitats

Introduction

- 6.1 Biodiversity Action Plans (BAP) are a result of the signing of the Convention on Biological Diversity in Rio in 1992. They are a system for identifying, protecting and enhancing and monitoring habitats and species which are deemed threatened and important at various levels.
- 6.2 The UK BAP is set by central governments and covers all of Northern Ireland, Wales, Scotland and England. Northern Ireland has a country group facilitated by NIEA which is responsible for those species and habitats of importance in Northern Ireland.
- 6.3 In addition, local authorities and statutory bodies also set up BAP to deliver biodiversity enhancement and monitoring in their sphere of influence (e.g. Derry City Council BAP, RSNI BAP).

BAP Habitats

- 6.4 Habitats which have been identified within the study area and which are covered by one or more of these BAP are:
- Coastal Salt Marsh
 - Coastal and Floodplain Grazing Marsh
 - Mudflats
 - Reedbeds
 - Purple Moor-grass and Rush Pasture
 - Lowland Raised Bog
 - Oakwood
 - Wet Woodland
 - Hedgerows
 - Mixed Ashwoods

- Cereal Field Margins
- Ponds

Potential Impacts

- 6.5 The more valuable BAP habitats may be impacted upon through habitat loss and/or changes to hydrology. The latter is particularly important for the lowland raised bog sites and the wet woodland at Ch. 78900. There would also be an increased risk of degradation in air quality without specific control measures.
- 6.6 Approximately 5ha of woodland BAP habitat would be lost including birch/alder wet woodland and mixed ash/oak woods. Due to the small size of most affected woodland of this type the loss of even limited areas under the Proposed Scheme footprint would be certain to affect the conservation status at each location.
- 6.7 These habitats are also susceptible to temporary degradation in air quality from construction related activities. However, the temporary nature of any air quality impacts that may occur and the generally species poor ground flora recorded throughout the study area make it unlikely that this would affect the woodlands' conservation status.
- 6.8 The impacts upon woodland at each location would be of significance within their immediate vicinities only or a local scale depending upon the biodiversity value attributed to each stand. The aggregate loss of BAP woodlands across the whole scheme represents approximately 1% of the total within the local area (1-3km of the Proposed Scheme) (as detailed in Volume 3 of the ES) and as such would not be significant at a wider geographic scale when assessed together.
- 6.9 The Proposed Scheme would result in the loss of 7ha of modified bog. In addition a further 7ha are within 200m and therefore has an increased risk of impacts through degradation in air quality and changes to drainage regimes. All bogs within the construction area are currently declining in value and without conservation action are likely to succeed to scrub or grassland habitats over the coming decades. The loss and degradation related to the Proposed Scheme would be very likely to accelerate this decline and would affect the conservation status of those remaining bog fragments adjacent to the proposed scheme. However, due to their limited

biodiversity values at most sites this would be of significance within their immediate vicinities only. However the bogs at Mountjoy Ch. 46400 - 47900 are of higher value and the impacts upon these sites would be of significance at a local scale. The aggregate loss of habitat represents 3% of the total bog within the local area (as detailed in Volume 3 of the ES) and 1% of the total bog within the Omagh district (Omagh District Council Biodiversity Audit of Omagh District). As such the aggregate loss would be significant at a local scale only.

- 6.10 17.5ha of the Proposed Scheme footprint could be considered floodplain grazing marsh within the floodplains of the Rivers Foyle and Finn in Co. Londonderry. This area would be certain to be lost and would affect the conservation status of this habitat. The impact at these locations would therefore be of significance at a local scale. This represents approximately 10% of the habitat present within the local area and as such would be likely to affect the conservation status when considered together beyond the individual sites. Although the percentage of loss in the district cannot be calculated, it is considered that 17.5 ha is likely to represent a significant proportion of this habitat based upon a visual study of aerial photography and flood maps and therefore the loss would be of significance at a district scale. As the loss of this habitat within the county is estimated at 1.3% the impacts are not considered significant at this scale.
- 6.11 The rush pasture qualifying as a BAP habitat is limited throughout the Proposed Scheme, although the distribution cannot be stated with certainty owing to a lack of detailed survey data. Phase 1 and NVC surveys indicate that 1.4ha of this habitat would be lost, 5% of the local resource. Due to the small sizes of the rush pasture locations limiting their individual biodiversity values the impact at each location within the Proposed Scheme corridor would be of probable significance within their immediate vicinities only. However the loss of 5% of the local resource throughout the Proposed Scheme would be considered significant at a local scale.
- 6.12 The majority of BAP grasslands lost are grazing marsh and rush pasture. Due to their specific hydrological conditions these habitats are not easily re-created so the majority of grassland created would be dry and more similar to lowland hay meadow BAP habitats. The permanent loss of grazing marsh and rush pasture therefore remains of significance at a local - district scale. However there would be a positive impact through the creation of 11ha of lowland hay meadow type grassland which

would be of probable significance within the immediate vicinity of each location, but at a local scale when considered together.

- 6.13 7km of species rich hedges and 181km of species poor hedges would be permanently lost within the construction zone throughout the Proposed Scheme. However, this habitat is widespread within the vicinity of the Proposed Scheme and in the surrounding countryside with the NICS 2000 website stating 20826km in Co. Tyrone and 13653km in Co. Londonderry/Derry. Owing to their higher value the loss of species rich hedges would be considered to be of significance at a local scale, with the loss of species poor hedges significant within their immediate vicinities only.
- 6.14 Cereal field margins would be lost throughout the Proposed Scheme, but there is a higher percentage of arable land north of Omagh. Particular concentrations are found between Strabane and Newtownstewart. Owing to the uncertainty of their distribution and quality their loss individually and in aggregate (estimated at 6% of arable land locally), it would be of significance at a local scale.
- 6.15 Four small ponds would be lost under the Proposed Scheme construction area with certain impacts upon their conservation status. Owing to their low intrinsic values these losses would be of significance within their immediate vicinities only. This represents approximately 3% of the local resource and as such would not affect the conservation status cumulatively at any larger scale than the individual sites. However the 2ha of standing water under the route consists almost entirely of the disused quarry at Ch. 20500. The loss of this individual water body would represent over 20% of the total within the 1-5km of the Proposed Scheme and is the only large standing water body in the Strabane District. However, owing to its relatively poor flora assemblage and lack of obvious supporting value for fauna investigated in numerous surveys, its loss would be of significance at a local scale only.
- 6.16 None of the BAP habitats receive specific legal protection outside of designated sites. However, the loss of each would be counter to the aims of their respective BAPs.
- 6.17 Untreated road run-off would flow into minor water courses at Ch. 11800 and Ch. 78800. Any inundation of these habitats from the outflows during periods of high rainfall could contain salts and other chemicals harmful to plants and therefore

adversely affect their conservation status. In addition the large cutting above the woodland at Ch. 78800 may affect the hydrology of the site. The probability and frequency of such impacts is not known as they would be weather dependant, but following a precautionary principle it is assumed to be probable and would be of significance at a district scale.

Mitigation & Residual Impacts

6.18 Mitigation proposals consist of:

- Allowing reedbed to re-grow in some locations, creation of marshy conditions in some locations, potential compensation reedbed creation elsewhere in scheme to local of impact.
- Extensive species rich hedgerow planting, far in excess of the length of hedge to be lost.
- Creation of extensive woodland blocks, including oak and ash woodland areas and wet woodland areas.
- Creation of a new pond at Ch. 19500 with planting of native aquatic and emergent plants in advance of pond loss.
- Retaining and re-using floodplain grazing marsh topsoil from certain locations; creation of areas of marshy grassland.
- Creation of replacement rush pasture.

6.19 However, bog habitat loss cannot be replaced; more ponds will be lost than are created and some of the mitigation/compensation measures are prone to failure (e.g. wet woodland creation) without sensitive design and creation methods.

6.20 There will be residual negative impacts on certain BAP habitats including Ponds, Bog and Floodplain Grazing Marsh.

6.21 There will also be residual positive impacts on certain BAP habitats including Hedgerows, Reedbeds and Rush Pasture.

7 Protected Plant Species

- 7.1 Specific surveys of representative habitats within the Proposed Scheme corridor were carried out for plants which receive legal protection through listing on Schedule 8 of the Wildlife Order (1985). Other flora surveys also recorded to species level throughout the Proposed Scheme corridor. Plants listed on Schedule 8 receive specific legal protection in Northern Ireland. They are also likely to be Species of Conservation Concern and may be BAP priority species.
- 7.2 No species currently listed on Schedule 8 of the Wildlife Order (1985) were recorded in these surveys. However, the Schedule is under review and one species recorded within the landtake is on this updated list. *Orthotrichum sprucei* was recorded on trees and boulders along the banks of the River Mourne at Ch. 18000 and the River Finn in the vicinity of Ch. 19000. Details of these are contained in Volume 3 of the ES.
- 7.3 It is probable that these species are present in suitable habitats throughout the Foyle and Finn catchments. Due to their legal protection, restricted known distribution, decline and likely rarity these populations of moss are of biodiversity value at a national scale.
- 7.4 *Schistidium platyphyllum* was recorded in the River Mourne during macrophyte surveys. This is a Northern Ireland Priority Species, though it is not included or proposed for inclusion within Schedule 8 of the Wildlife Order (1985). This plant is already recorded within County Tyrone, and is of biodiversity value at a district scale.
- 7.5 The construction of the Proposed Scheme would result in the loss of *Orthotrichum sprucei* within the Proposed Scheme footprint at the Mourne crossing at Ch. 18000. This would be permanent and affect approximately 30m of riverside habitat. It is not known what percentage of the local or national population this would constitute due to insufficient historic recording of these species. It would be certain to affect their conservation status at that site, but it is not possible to state with certainty the level of any impact above this scale. Owing to their high biodiversity value this impact would be of significance at least at a national scale.

- 7.6 The population of *Orthotrichum sprucei* on the Finn would be unlikely to be impacted upon as they are outside of the construction zone. Degradation to water quality is the most likely impact pathway, but this would only affect the bryophytes if there were a combination of flooding and toxic material stored in the floodplain.
- 7.7 Mitigation for the above potential impacts proposed is:
- Vegetation clearance to be preceded by survey for Schedule 8 plants.
 - Avoidance of trees supporting bryophyte species where possible.
- 7.8 A licence will be sought from NIEA should any of the plants be impacted by the development. Such a licence may require translocation of the plants/trees on which they grow.
- 7.9 Any loss of these plants would be a negative impact at a national level; however, it is likely that such an impact can be avoided through localised refinements in the construction, and/or translocation of the trees on which the plants are growing.
- 7.10 It is my opinion that the scheme will not contravene any legislative requirement in relation to these species.

8 European Protected Species

Introduction

- 8.1 European Protected Species are afforded the highest level of protection of any species in Northern Ireland. They are designated and protected under the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended).
- 8.2 The species/groups of animals protected in this manner are defined by Schedule 2 of this legislation and are:
- Bats - Typical (all species) Vespertilionidae
 - Dolphins, porpoises and whales (all species) Cetacea
 - Otter
- 8.3 Species of plants which are protected in this manner are defined by Schedule 4 of this legislation and are:
- Killarney Fern *Trichomanes speciosum*
 - Yellow Marsh Saxifrage *Saxifraga hirculus*
- 8.4 No cetaceans were recorded within the Scheme Corridor.
- 8.5 No European Protected plants were recorded within the Scheme Corridor.
- 8.6 The following sections therefore discuss Bats and Otter.

Otter

Baseline

- 8.7 Northern Ireland is recognised as being host to the densest populations of Otter within Europe.
- 8.8 Volume 3 of the ES provides detailed information relating to the presence and distribution of Otter based on:

- the review of desk based data and surveys undertaken during the preliminary planning for the project; and
- targeted surveys undertaken as part of the assessment of the Proposed Scheme.

- 8.9 The review and surveys established known and potential presence of the species throughout the Foyle and Blackwater River catchments associated with the Proposed Scheme corridor.
- 8.10 Defined areas of specific interest include the Foyle and Tributaries SAC, Finn and Tributaries SAC and the Owenkillew River SAC. The species is noted as a qualifying feature in the citations for all three designated sites.
- 8.11 Field signs recorded during the site surveys confirmed the presence of Otter along thirty-seven watercourses with the evidence indicating particularly high levels of activity along the Rivers Strule and Blackwater.
- 8.12 Nineteen potential breeding sites were identified during the targeted surveys undertaken for the Proposed Scheme in the vicinity of sections of watercourse that would be crossed by or in close proximity to the Proposed Scheme. Two were recorded as being of high potential, one of good potential and two of moderate potential. The remaining fourteen were recorded as being of low or poor potential.
- 8.13 Three confirmed resting places and two potential resting places were also noted. Locations of these sites are provided in Section 11.4 of the ES.
- 8.14 Otter have large home ranges, with males sometimes covering 70km of water course and so it is possible that the populations from the Foyle SAC which extends to Newtownstewart are present throughout the entire survey area.

Impacts

- 8.15 Due to their large home ranges, low population density and interaction between individuals across large areas it would not be appropriate to divide the Otter populations throughout the Proposed Scheme into separate groups and value those groups individually.

- 8.16 Otters are considered to be present on all rivers, streams and other watercourses along the Proposed Scheme. Sites that have been identified as either an actual Otter breeding site or assessed as a high, good or moderate quality potential Otter breeding site may be impacted up to 500m from the Proposed Scheme, although impacts at 250m are more likely to be significant. Resting sites up to 200m from the Proposed Scheme may be impacted upon, with those within 50m most likely to suffer significant impacts.
- 8.17 The Proposed Scheme crosses through three high, good or moderate quality potential Otter breeding sites. The remaining sites are located a sufficient distance from the Proposed Scheme to avoid probable impacts. The loss of habitat at each of these three potential Otter breeding sites would be likely to adversely affect the whole integrity of each site and Otters are unlikely to breed there temporarily during construction. No natal dens were found during the survey, but as these are extremely hard to locate the presence cannot be ruled out. Otters are much more selective of natal dens compared to resting sites, so the loss of a natal den could significantly affect the ability of an individual Otter to breed and/or rear young. Adverse impacts on the conservation status of Otter within the Foyle and Blackwater catchments would be unlikely. However, as surveys indicated that they are widespread within this area (as detailed in Volume 3 of the ES). However, significant impacts at a local scale in each location would be probable.
- 8.18 The Proposed Scheme would also result in the permanent loss of two Otter resting sites. These are located at W26, River Derg and W79, Routing Burn. The loss of these resting sites scattered throughout the Proposed Scheme would be unlikely to have a significant impact on the conservation status of Otter either cumulatively or at their individual locations as there are abundant suitable alternative resting sites. However, significant effects within the immediate vicinity are likely.
- 8.19 Significant impacts to specific breeding sites are possible from disturbance. Although no natal dens were found in the surveys their presence cannot be ruled out from all high, good or moderate quality potential breeding sites. The disturbance of an actual breeding site without a licence is an offence. As with the direct loss of potential breeding sites the impact of disturbance on five sites on the conservation status of Otter within the Foyle and Blackwater catchments would be unlikely to be significant as they are widespread within this area (as detailed in Volume 3 of the ES).

- 8.20 Temporary disturbance of Otter resting sites would be unlikely to have a significant impact on the Otter population as other suitable resting sites are widely available. One confirmed Otter holt was found on the Fairy Water, just outside the Proposed Scheme's footprint (approximately 30m away) which would be likely to be subject to disturbance if in use during construction. The disturbance of a confirmed resting site would be significant at a local scale.
- 8.21 The works along the whole route would be likely to cause temporary disturbance populations from construction activities. However, Otters will habituate readily to human activity and noise and road construction would not prevent Otters from using a watercourse for commuting, foraging and resting up. Adverse effects on the conservation status of the population are unlikely although effects may be of significance locally.
- 8.22 The Proposed Scheme may also result in the loss of or degradation of Otter habitat, including the watercourse and the surrounding riparian habitat which may support breeding sites and resting sites. This could affect the breeding potential of a population, the availability of resting places, the level of food resources and the level of cover providing protection. Changes to these factors could affect the conservation status of Otters throughout the route. This would be of significance at a local scale in any one location where such degradation occurs.
- 8.23 The Proposed Scheme could lead to an increase in the numbers of Otters killed or injured as safe routes used by Otters would be lost, unavailable or heavily disturbed, forcing Otters to use more hazardous routes. There is evidence that the number of casualties is correlated with the abundance of Otters (Chanin, 2006). Therefore, there would be a significant risk of Otter casualties occurring on the Proposed Scheme during operation. Casualties can occur for several reasons; Otters are unable to pass beneath the road along the waterway due to the presence of an obstruction, due to a water flow in excess of 0.5ms⁻¹ or they may choose to cross the road even though they can travel underneath. As Otter commuting routes occur along the entire length of the Proposed Scheme road casualties have the potential to affect the conservation status of the Otter populations which would be of significance at an international level.

- 8.24 Where the Proposed Scheme crosses a watercourse, there would be potential that dispersal routes and home ranges of some individuals may be severed. This may prevent an Otter from accessing habitat that provides food resources, breeding sites and resting places, it may also increase competition between Otters. The Proposed Scheme could therefore pose a significant barrier to Otters along its entire length and affect the conservation status of the population within the study area which would be of significance at an international level.
- 8.25 Although loss of and disturbance to potential breeding sites and resting places would not adversely affect the conservation status of otter, they may have significant impacts upon local otter populations and may result in a legal offence where otter are confirmed as present. Therefore the following mitigation would be implemented to avoid impacts where possible and reduce those that remain.

Mitigation

- 8.26 Update surveys would be carried out at all locations suitable to contain resting sites prior to construction. This would inform the need for any EPS licence.
- 8.27 The clearance of wet woodland at Strabane Nature Reserve would be undertaken in accordance with the method statement detailed in Volume 3 of the ES. Any destruction or disturbance of a confirmed breeding site or resting place would be carried out under an EPS licence from NIEA. If granted this would specify a careful method of closure and the creation of an alternative site.
- 8.28 Disturbance of potential breeding sites and resting places is not an offence and therefore doesn't require a licence. Nevertheless, as it is difficult to confirm such features, construction works would adhere to the methods contained in the Mitigation Appendix as detailed in Volume 3 of the ES at locations where such risks occur.
- 8.29 All works near water courses would adhere to best practice guidance and the working practices outlined in the Mitigation Appendix as detailed in Volume 3 of the ES.
- 8.30 All culverts which would be impassable to otter at 1 in 25 year flood events would be fitted with otter ledges or alternative mammal tunnels adjacent to water courses to allow safe otter passage. Fencing suitable to deter otters from entering the

carriageway would be placed in locations of high risk to reduce this possibility. These would adhere to the designs contained in the Mitigation Appendix as detailed in Volume 3 of the ES. The locations of ledges, dry tunnels and accompanying fencing are detailed in Volume 2 of the ES.

- 8.31 The risk of road casualties during operation would be further reduced by monitoring mitigation and road kill. All otter ledges and fencing would be checked as part of routine road maintenance. Any otter road casualty highlighted to RSNi would be investigated to identify any probable causes. If any defects on fencing or ledges are noted these would be remedied to reduce the risk of future road casualties.
- 8.32 Therefore, it is my opinion that the scheme complies with the legislative requirements in relation to Otter.

Bats

Baseline

- 8.33 Bats are European Protected Species and Nathusius' pipistrelles *Pipistrellus nathusii* and soprano pipistrelle *Pipistrellus pygmaeus* are listed as Northern Ireland BAP priority species. Many bats are UK BAP priority species and most are thought to be declining nationally. Desk studies also revealed the presence of a site currently proposed for designation as an ASSI for Leisler's bats *Nyctalus leisleri* 1km west of the Proposed Scheme at Ch. 67400. This site, if designated will be of biodiversity value at a national scale. The desk study also revealed one record of a Pipistrelle sp. bat roost at Bready 50m from the northbound carriageway at Ch. 6600. No other roosts were identified in desk studies within 250m of the Proposed Scheme.
- 8.34 Detailed information relating to the presence and distribution of bats based on the review of desk based data and surveys undertaken during the preliminary planning for the project and targeted surveys undertaken as part of the assessment of the Proposed Scheme is detailed in Volume 3 of the ES.
- 8.35 Field surveys recorded five species of bats commuting and foraging throughout the route. Common pipistrelles *Pipistrellus pipistrellus* and soprano pipistrelles were found in virtually every 1km section of the route, with Leisler's and Myotis sp. bats recorded in a more patchy distribution over approximately 50% of the route. Nathusias' pipistrelles were more rarely recorded in only about 20% of the route.

Owing to their distribution, abundance and conservation status within Northern Ireland the common pipistrelle, soprano pipistrelle, Leisler's and Myotis sp. populations are of biodiversity value at a local scale throughout the route. Due to their conservation status and restricted distribution both within the route and nationally, the Nathusias' pipistrelle populations are of biodiversity value at a district scale. The Leisler's normal range is normally within 25km, Myotis sp. 5km and pipistrelle species normally ranging 1-5km from a roost. These biodiversity valuations therefore apply to individual colonies throughout the Proposed Scheme corridor and it would not be appropriate to provide a cumulative value for each species throughout the 90km. A summary of bat biodiversity value is detailed in Volume 2 of the ES.

8.36 Four roosts were confirmed within 250m of the route:

- a summer roost for common pipistrelle and Leisler's within the land take at Ch.3400;
- a summer roost for Leisler's within the land take at Ch. 19000;
- an unknown size roost for pipistrelles spp. 230m from the north bound carriageway at Ch. 32900; and
- a maternity roost for soprano pipistrelles 50m from the north bound carriageway, at Ch. 34000.

8.37 The summer roosts are of biodiversity value at a local scale with the (potentially) larger, less substitutable maternity and unknown roost of biodiversity value at a district scale.

8.38 It is not thought that any other structures scoped within the Proposed Scheme landtake or directly adjacent to it support important roosts. However, the presence of summer roosts in any structure cannot be ruled out. Woodland blocks containing mature trees throughout the Proposed Scheme corridor may also support roosts. All such features should be considered as potentially supporting roosts which, if found, are likely to be of biodiversity value at a local to district scale.

Impacts

- 8.39 Impacts upon bats would include destruction of roosts, killing or injury of bats within roosts, disturbance of bats using roosts, loss of foraging habitat and fragmentation of commuting routes.
- 8.40 Two confirmed summer roosts would be permanently destroyed which would be of significance at a local scale. These roosts support small numbers of common and soprano pipistrelles and Leisler's bats. It would be unlikely that their loss taken together would affect the conservation status of these species at any larger geographic scales. As they are more than 5km apart it is unlikely that they support the same colony and so it is not appropriate to consider these together. The disturbance of the large roost at Ch. 34000 through increased noise, lighting and temporary fragmentation of commuting routes during construction has the potential to affect the numbers of individuals using it and therefore its conservation status. It would be of significance at a district scale.
- 8.41 It is probable that there would be a loss of summer roosts throughout the Proposed Scheme land take as trees and structures are destroyed. In some cases these would be detected prior to destruction, but in most it would not be possible to detect. It is difficult to state a scale at which this would be significant, but in accordance with the populations recorded during surveys it would be of significance at least at a local scale for Leisler's, Myotis sp., common pipistrelles and soprano pipistrelles and at a district scale for Nathusias' pipistrelles.
- 8.42 Large areas of foraging habitat would be lost throughout the Proposed Scheme corridor. However, these are likely to be fairly small percentages of those available to bat populations which typically range 1.5km – 25km depending upon the species as detailed in Volume 3 of the ES. The loss of foraging habitat within any one home range would be therefore likely to be less than 5% of the total available and therefore would be unlikely to affect the conservation status of the bats throughout the Proposed Scheme corridor. The main operational impacts would be expected to be fragmentation of commuting routes, lighting at junctions and increased risk of vehicle collision.

- 8.43 Lighting disrupts the normal 24-hour pattern of light and dark which would be likely to affect the natural behaviour of bats. Lighting could further sever foraging habitat and adversely impact on roosts. Given the value of the bat populations within the zone of influence of the Proposed Scheme and the small number of lit junctions it would be considered that this could affect the conservation status of bats at most at a local level.
- 8.44 Severance of commuting routes by roads and the associated road-kill of bats is still poorly understood, although some species (Whiskered bat *Myotis mystacinus*) have been recorded flying 0.5-3m above roads over 30-40m gaps caused by road severance of flight paths. Although a quantitative figure cannot be placed on bat mortality caused by the Proposed Scheme it is anticipated that road kill would occur along severed commuting routes, and this may have severe localised impacts on bat populations. Owing to the values of the populations present it would be likely that the significance of unmitigated impact would be at a local to district level.

Mitigation

- 8.45 Update surveys would be carried out at confirmed roosts and all suitable features of moderate or high potential within the construction zone. Trees with a moderate potential to support bat roosts may not require surveys, but would be 'soft felled' as described in the Mitigation Appendix as detailed in Volume 3 of the ES. Artificial roosts would be installed prior to the destruction of the originals. The closure of any roosts would be carried out under an EPS licence from NIEA and may involve restrictions on the timing of works.
- 8.46 Construction works adjacent to the major roost at Ch. 34000 would adhere to the methodology outlined in the Mitigation Appendix as detailed in Volume 3 of the ES. This methodology would aim to prevent fragmentation of flight lines during construction and operation and avoid disturbance of bats using the roost thereby avoiding the need for an EPS licence.
- 8.47 The impact of habitat severance and associated potential increase in road kill would be reduced through the inclusion of over 60 'hop-over' planting zones as detailed in the Mitigation Appendix as detailed in Volume 3 of the ES.

- 8.48 During construction, lighting would be mitigated through the use of low pressure sodium lighting or mercury vapour lighting with UV filters attached, which attracts relatively few insects, and thus fewer bats would be brought into contact with the road corridor. In addition, cowling of the lighting to direct light at an angle of 70 degrees, and optimising the height of light columns would ensure that light spill onto potential or actual roosts and into commuting and foraging habitat would be reduced to below 1 Lux at 10m from the road. Additional artificial roosts would be installed in woodland fragments and around settlement ponds throughout the scheme as detailed in Volume 2 of the ES. These would be aimed at providing an alternative to any tree roosts destroyed in the course of construction and would enhance the value of the route for bats.
- 8.49 Therefore, it is my opinion that the scheme complies with the legislative requirements in relation to bats.

9 Summary of Ecological Issues – Section 1 (Chainage 0-22.8km)

Introduction

- 9.1 The section provides a brief summary of the key ecological issues which have been identified within this document which are relevant to Section 1 of the Proposed Scheme.

Natura 2000 Sites

- 9.2 One SAC is located within the study corridor for Section 1:
- River Foyle & Tributaries SAC.
- 9.3 Three SPA are within the study corridor for Section 1:
- Lough Foyle SPA;
 - Lough Swilly SPA (Republic of Ireland); and
 - Inch Lough and Levels SPA (Republic of Ireland).
- 9.4 More detail of these sites is provided in Sections 3.2 and 3.7 to 3.9 of this document.

ASSI

- 9.5 A single ASSI is located within the study corridor of Section 1, this is McKean's Moss ASSI, a lowland raised bog site. Further detail regarding potential impacts can be found in Section 4 of this document.

BAP Habitats

- 9.6 Within Section 1 the following BAP habitats have been identified as receptors, further detail regarding potential impacts can be found in Section 6:
- Coastal Salt Marsh;

- Coastal and Floodplain Grazing Marsh;
- Mudflats;
- Reedbeds; and
- Hedgerows.

European Protected Species

9.7 Otter are discussed in more detail in Section 8 of this document.

9.8 Bats are discussed in more detail in Section 8 of this document.

10 Summary of Ecological Issues – Section 2 (Chainage 27-57.5km)

Introduction

10.1 The section provides a brief summary of the key ecological issues which have been identified within this document which are relevant to Section 2 of the Proposed Scheme.

Natura 2000 Sites

10.2 Four SAC are located within the study corridor for Section 2:

- River Foyle & Tributaries SAC;
- River Finn SAC (Republic of Ireland);
- Owenkillew River SAC; and
- Tully Bog SAC.

10.3 More detail on these sites is provided in Section 3 of this document

ASSI

10.4 Two ASSI and one proposed ASSI are potentially impacted by the Proposed Scheme:

- River Foyle & Tributaries ASSI (in respect of riparian woodland only);
- Grange Wood ASSI; and
- Baron's Court Estate pASSI.

10.5 More detail on these sites is provided in Section 4 of this document.

Ancient Semi Natural Woodland and Long Established Woodland

10.6 More detail of the Long Established Woodland found at Mulvin Park is given in Section 5 of this document.

BAP Habitats

10.7 BAP habitats associated with Section 2 of the Proposed Scheme are:

- Coastal and Floodplain Grazing Marsh;
- Hedgerows;
- Wet woodland;
- Rush Pasture; and
- Modified bog (falling under other Bog BAPs).

10.8 More detail on BAP habitats is provided in Section 6 of this document.

European Protected Species

10.9 Otter are discussed in more detail in Section 8 of this document.

10.10 Bats are discussed in more detail in Section 8 of this document.

11 Summary of Ecological Issues – Section 3 (Chainage 62-93.6km)

Introduction

11.1 The section provides a brief summary of the ecological issues which have been identified within this document which are relevant to Section 3 of the Proposed Scheme.

ASSI

11.2 One proposed ASSI is potentially impacted by the Proposed Scheme:

- Seskinore Forest pASSI.

11.3 More detail is given in Section 4 of this document.

Ancient Semi Natural Woodland and Long Established Woodland

11.4 Two areas of these woodlands are located within Section 3:

- Routing Burn; and
- Cottage Hill.

11.5 More detail is provided for the above sites in Section 5 of this document.

BAP Habitats

11.6 BAP habitats associated with Section 3 of the Proposed Scheme are:

- Hedgerows;
- Wet woodland;
- Reedbed; and
- Lowland Raised Bog.

11.7 More detail on BAP habitats is provided in Section 6 of this document.

European Protected Species

11.8 Otter are discussed in more detail in Section 8 of this document.

11.9 Bats are discussed in more detail in Section 8 of this document.

12 Conclusion

- 12.1 The surveys undertaken, consultation with interested organisations, impact assessment and reporting have all been, in my opinion, robust and fair.
- 12.2 Impacts identified which may occur within and on the Natura 2000 sites have been discussed within the project team and with the proposed contractors at length, with working practices and scheme design being evolved to ensure that no significant impacts occur.
- 12.3 The scheme as proposed demonstrates a clear commitment on behalf of Road Service Northern Ireland to deliver minimal impact on wildlife, with a high standard of mitigation for identified impacts being used throughout.

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