11. Ecology and Nature Conservation

11.1 Introduction

11.1.1 This chapter describes and evaluates the ecological impacts of the Scheme. Direct effects on ecological resources resulting from activities that are an integral part of the project will be considered in this ecological assessment. In addition, the indirect, secondary and cumulative effects are examined. The duration of the effect (e.g. permanent or temporary and short, medium or long-term), and sensitivity of receptor are taken into account. The legislative requirements associated with the presence of particular features are also described, as are recommendations for mitigation measures to minimise adverse impacts.

11.2 Methodology

Policy and Guidance

11.2.1 There is no single agreed method for ecological impact assessment, although certain general principles and approaches appear to be widely accepted. The method used for this study provides a systematic and transparent assessment of the significance of impacts upon ecological features.

11.2.2 It is based upon current best practice outlined in legislation and planning policy and with cognisance of environmental legislation relevant to Northern Ireland, including Roads (Environmental Impact Assessment) Regulations (Northern Ireland) 1999, The Planning Service, Development Control Advice Note 10 (DCAN10) Environmental Impact Assessment (revised) (DoE 1999) and PPS 2, Planning and Nature Conservation, June 1997. The Assessment was undertaken in accordance with the requirements of the Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment (Highways Agency; June 1993 and subsequent amendments) and relevant supplementary guidance. Guidance for environmental mitigation is provided in DMRB Volume 10: Environmental Design and Management (Highways Agency; February 2001).

11.2.3 In addition "*Guidelines for Ecological Impact Assessment in the United Kingdom*" (henceforth referred to as "*the IEEM Guidelines"*) developed by a working group of the Institute of Ecology and Environmental Management (IEEM) (IEEM, 2006), have been used to inform the assessment process.

11.2.4 The following legislative framework was also referred to:

- EC Habitats Directive Council Directive No. 92/43/EEC (Annex I, II, IV);
- EC Birds Directive Council Directive No. 79/409/EC (Annex I, II);
- The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995;
- Bonn Convention;
- Berne Convention;

- The Wildlife (Northern Ireland) Order 1985 as amended by The Wildlife (Amendment) (Northern Ireland) Order 1995;
- UK Biodiversity Action Plans;
- Northern Ireland Biodiversity Action Plan; and
- Newtownabbey Biodiversity Action Plan.

11.2.5 The assessment process requires the identification of key ecological features (resources) in an area and determination of their value, identification of the sources of impact and the sensitivity of receptors to these, determination of the nature, scale and duration of any effects (both direct and indirect) of the proposal upon sensitive receptors, identification of potential mitigation measures to reduce any adverse effects; and finally an assessment of the significance of any residual effects. Requirements for consents and licences, in relation to designated sites and protected species are also considered as part of this process.

11.2.6 An Environmental Statement (ES) is only required to report significant effects. A significant effect may be broadly defined as one that should be brought to the attention of those involved in the decision-making process. Guidance on how to determine the significance of an effect has been mainly of a generic nature (e.g. DoE Circular 2/99) and practitioners have been obliged to develop definitions for specific topics and projects. It is broadly accepted, however, in terms of ecological issues, significance is defined in terms of the magnitude (scale) of the effect, and the value (importance) of the ecological feature or receptor experiencing that effect. Specifically, as advised within the IEEM Guidelines (IEEM, 2006), significance is considered in relation to how the impact will affect the conservation status and integrity of the feature/ecological processes, where integrity is understood as:

> "the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified".

Field Survey

11.2.7 The scope of the fieldwork was informed by research, consultations with statutory and non-statutory consultees (see below), an initial site walkover at the start of the project, and the timing and timescale of the study. An initial scoping consultation was carried out with the Environment & Heritage Service (EHS), to determine the scope of the ecological survey requirements and to highlight the pertinent issues to this Scheme.

11.2.8 The extent or area to be covered by the ecological assessment generally depends on the ecological context and type of development being considered. In this case, the fieldwork has been limited to those areas within a buffer zone of approximately 500m of the Scheme and the existing alignment. Generally, this has not included marine areas beyond the shoreline, and did not include entry to private gardens or residences.

11.2.9 The following ecological surveys were deemed appropriate for the proposed development:

- A Phase 1 habitat survey with target notes (NCC, 1990);
- Otter surveys of all watercourses within 500m of the proposed route;
- Badger survey of all suitable habitat within the survey area;

- Bat surveys, to include roost suitability assessment and emergence surveys;
- Two breeding bird survey visits between June and July;
- Wintering birds associated with Belfast Lough habitats based on The Wetland Bird Survey (WeBS) core count and low tide count data, based on existing data.

11.2.10 The scoping and consultation exercise did not suggest any other protected species such as red squirrel or significant populations of invertebrates, amphibians, reptiles or vascular plants in the proposed development area. No marine or fisheries surveys were undertaken. Consequently these groups are not considered further within the ES.

11.2.11 A schedule of the ecological surveys that were carried out is listed in Table 11.1.

Table 11.1: Schedule of Ecological Surveys

Survey	Timing
Phase 1 habitat	7-9th August 2006
Otter	7-9th August 2006
Badger	7-9th August 2006
Bat - Emergence Survey	7th and 8th August 2006
Breeding Bird	14th June 2006 & 19th July 2006
Wintering Bird	Existing WeBS data provided by BTO: Low tide data 2005-2005 Core count data 00/01-04/05

Survey Methodologies

Phase 1 Habitat Survey

11.2.12 A Phase 1 survey provides a rapid assessment of habitat presence and quality. Whilst it is focussed upon categorisation of parcels of land based on their vegetation, the potential value of areas to fauna is also considered. Blocks of land are assigned to recognised broad-habitat categories (e.g. semi-improved grassland, running water), and marked on a map using either standard alphanumeric codes or standard mapping colour codes. Target notes are used to provide additional descriptions of features of particular note (e.g. key and characteristic species, presence of notable species). The purposes of the Phase 1 surveys undertaken for this study were to identify the type, quality and extent of habitats present within an area, and to identify any habitats or features that might require more detailed field investigations. Phase 1 survey is not to be regarded as a definitive representation of the conservation value or interest of any area of land. In addition, it must be noted that plant lists produced from one field survey do not record all species that may occur on a site in the course of a year, or over time.

11.2.13 A Phase 1 habitat survey was conducted over three days in August 2006, by experienced ecological staff of Scott Wilson, using the standard Nature Conservancy Council (NCC) methodology (NCC, 1990). This survey date is considered within the suitable season to carry out botanical surveys. The survey area was approximately 500m in all directions from the limits of the Scheme. The built-up residential nature of some of the land within the Scheme boundary meant there were some constraints in relation to access to private residences and their associated curtileges.

Otter

11.2.14 An otter survey was undertaken at the same time as the Phase 1 habitat survey, between 7th and 9th August 2006, by experienced ecological staff of Scott Wilson, to determine whether otter shelters or otter habitat were likely to be affected by the Scheme, particularly by the new crossings of watercourses. As agreed with EHS, the watercourses were searched and surveyed up to 500m either side of the existing road crossing. Otters were deemed to be likely to use the Belfast Lough shoreline for foraging based on informal consultations with EHS and professional judgement.

11.2.15 The surveys involved searching for the range of otter signs (SNH, 1997), listed below:

- Spraints;
- Food remains;
- Rolling places;
- Slides down river banks;
- Footprints or paths; and
- Shelters (either holts or couches).

11.2.16 Notes were also taken of riparian habitat type, suitability and quality. Although sprainting levels may drop in the summer months (Chanin, 2003), the surveys were undertaken during favourable weather conditions. Water levels were low in all of the watercourses, and had been low for some time, meaning that recent signs of activity would not have been washed away by spate flows.

Badger

11.2.17 A badger survey was undertaken at the same time as the Phase 1 habitat survey, between 7th and 9th August 2006, by experienced ecological staff of Scott Wilson. The aim was to search for setts and activity in the locale of the Scheme layout, particularly in areas of agricultural land and woodland.

11.2.18 According to the standard survey methodology (Harris, Cresswell & Jefferies, 1989) setts are assessed for level of use and the number of entrance holes, and thus classified into four types: main, annexe, subsidiary and outlying. These are defined below.

- Main sett: These are large, well-established setts, normally in continuous use. Each group will use only one main sett and it will form the most likely location for the raising of cubs;
- Annexe sett: These setts are usually found in close association with the main sett, and will often be linked to it by a well-worn path. Where a second litter of cubs is born they will be raised in the annexe sett;

- Subsidiary sett: Subsidiary setts will usually have five or less holes, although not all of these will be in continuous use;

- Outlying sett: These setts are used on an occasional basis and will usually consist of only one to three holes. Spoil heaps will generally be smaller than those found associated with the other sett types, indicating a smaller underground structure.

11.2.19 The entrance holes to setts can provide an indication as to the level of use of the sett. Entrance holes can be classified as follows:

- Well used: These holes are in regular use and are therefore free of debris. They may have been recently excavated.

- Partially used: Debris, including leaves, twigs and other vegetation clutter the entrance to these holes, indicating they are not in regular use. The holes can be used after a minimum of clearance.

- Disused: A considerable amount of clearance is needed before these holes can be used. The holes may become so blocked that only a depression in the ground is visible where the hole used to be.

11.2.20 The method followed the accepted standard approach of walking across the survey area searching for signs of badger, including their setts. Field signs are characteristic and sometimes quite obvious and include tufts of hair caught on barbed wire fences, conspicuous badger paths, footprints, small excavated pits or latrines in which droppings are deposited, scratch marks on trees, and snuffle holes, which are small scrapes where badgers have searched for insects and plant tubers (SNH, 2001). The habitat surrounding the sett, soil type, and signs of human activity are also noted. The results of the badger survey were recorded on standard survey sheets.

Bats

11.2.21 On 7th and 8th August, two experienced and qualified ecologists from Scott Wilson carried out a bat survey along the Scheme route, paying particular attention to buildings and trees likely to be directly affected as a result of the Scheme. The buildings proposed for demolition were 6+8, 12-26 (even nos.) 34, 112 Shore Road and the Spar shop. The aims of the survey were to identify any evidence of bats in the study area, to assess the impact of a change in use of the study area and to suggest mitigation measures if appropriate.

11.2.22 The survey was restricted to external searches of buildings and trees for roost suitability as there was no access to private property/gardens for the purposes of this survey. Therefore, a roost inspection licence from EHS was not required. Many of the potentially suitable trees were located within private gardens, and private residences located some distance from Shore Road.

11.2.23 During daylight hours trees and buildings were surveyed from the ground for entrance holes to potential roosts. For buildings, an external inspection of the structure was carried out. Potential roost sites in trees include obvious features such as cavities, frost cracks and trunk and branch splits, rot holes where branches have been removed and hollow sections of trunk, branches and roots. Bats can also roost in less obvious places such as under ivy, under loose bark, woodpecker holes and in bat or bird boxes. Given the diverse number and size of tree features in which roosts can occur, in practice it can be very difficult to say categorically whether a tree contains a bat roost or not. In addition, many of these features are not easily detectable from the ground, therefore binoculars were used to ascertain greater detail. It should also be

noted that it was a sub-optimal time of year in which to be carrying out tree surveys for bats, as the dense tree canopy can mask all but the most obvious of roost sites.

11.2.24 External signs that bats are using a tree or a building as a roost site include:

- Suitable entry points in buildings/trees etc;
- Bat droppings: black droppings, 5-10mm long that crumble to a fine dust when crushed and may be located on the ground or stuck to walls;
- Staining: Secretions from bat fur can cause oily brown stains in the vicinity of roost entrances;
- Urine stains below the entrance to the roost;
- Audible squeaking from within the roost site;
- Large roost sites may produce an odour; and
- Flies around the entrance attracted by the smell of guano.

11.2.25 Bat emergence and activity surveys were carried out by trained ecologists using specialist bat equipment on the evenings of 7th and 8th August 2006. A heterodyne BatBox III and a BatBox Duet bat detectors were utilised to undertake the bat emergence and activity surveys. The first time of emergence varies between bat species and the visits were timed in order to cover emergence of all species and first return to roost site, i.e. 30mins before dusk and up to 2 hours after dusk.

Breeding Birds

11.2.26 The standard Breeding Bird Survey methodology (Gilbert *et al* 1998) was modified for the Scheme. Two visits were undertaken on 14th June and 19th July 2006. The surveys (due to access constraints) were carried out later than is ideal. However, the first visit was undertaken well within the breeding season and the later visit was undertaken to survey for late breeding birds, birds producing a second clutch or newly fledged young.

11.2.27 The majority of the on-line widening Scheme study area is within a residential area, where most suitable breeding bird habitat is within gardens, amenity areas and built-up areas. The off-line section runs through agricultural grassland, trees and hedgerow habitats. The purpose of the survey was to determine the assemblage of breeding bird species using these areas of land, which may be directly and/or indirectly affected by the Scheme. Accordingly, birds seen or heard within 100m of the Scheme boundary were recorded.

11.2.28 Surveys were conducted between 0630 and 0900 hours. The survey transect followed the centre of the route of the proposed alignment. Streams and dense woodland areas were investigated closely. The surveyor paused at regular intervals to scan and listen for calling and singing birds. Access to private dwelling houses and gardens was not possible; the survey was therefore conducted from public walkways. All birds to the rear of private gardens were fully surveyed however from the adjoining farmland, ensuring that all species utilising habitat within the route footprint were likely to be included.

11.2.29 When individuals or pairs of birds were encountered, the fieldworker determined whether the bird(s) were different from any previously encountered. This involved careful attention to the whereabouts and movements of birds, together with birds' sex and plumage characteristics. To minimise the risk of double counting, behaviour and

location of birds were carefully observed so that previously encountered birds were not recorded twice. Surveys were not conducted in winds greater than Beaufort Force 5, in persistent rain or when visibility was poor.

11.2.30 The location and activities of all bird species from both visits were recorded on 1:10,000 maps using standard British Trust for Ornithology (BTO) codes (Marchant, 1983). Subsequent map analysis was carried out to produce an index of the species present, the estimated number of breeding territories for each species and the estimated breeding density of each species within the study area. Where birds were recorded in the same location on the first and second visits, the location of birds recorded was taken as equidistant from both mapped observations. Numbers of breeding birds were those recorded as showing the following breeding bird behaviour:

- Displaying or singing;
- Territorial dispute;
- Occupied nests;
- Repeated alarm calling or distraction displays;
- Adult(s) carrying food;
- Adults carrying nest material; and
- Newly fledged young with adult(s).

11.2.31 Other records were considered to be of non-breeding birds, failed breeders or birds loafing, feeding or on passage to other areas.

11.2.32 Because the survey visits were carried out later than is ideal, it is likely that some of the birds recorded on the second visit may have represented breeding birds, although these may not have been displaying breeding activity. This may have resulted in low counts of breeding bird numbers for the second visit. Therefore the data gathered during the surveys is useful in providing an index of the species recorded within the survey area, but the breeding territories and breeding density should be treated as a conservative estimate.

Wintering Birds

11.2.33 Existing data were supplied by the Wetland Bird Survey (WeBS), a joint Scheme of the British Trust for Ornithology, The Wildfowl & Wetlands Trust, Royal Society for the Protection of Birds and Joint Nature Conservation Committee (the last on behalf of the Countryside Council for Wales, the Environment & Heritage Service, English Nature and Scottish Natural Heritage). The Wetland Bird Survey is divided into two national Schemes, which aim to monitor non-breeding water bird populations.

11.2.34 WeBS Core Counts on estuaries are based on high tide roost counts. These are undertaken by volunteers once a month from September through to March on an annual basis. The WeBS Low Tide Counts Scheme monitors, assesses and regularly updates information on the relative importance of intertidal feeding areas of UK estuaries for wintering waterfowl and thus complements the information gathered by WeBS Core Counts. WeBS Low Tide Counts provide useful information on site usage by waterfowl populations and help to inform impact assessment in relation to human activities, which may affect the extent or value of intertidal habitats (http://www.bto.org/survey/webs/webs-ltc.htm). WeBS Low Tide counts are undertaken by EHS and there is a minimum of 3 counts per winter.

Assessment Methodology

11.2.35 To determine the significance of any effects of the proposed development, it is necessary to define a robust assessment methodology. The method used is based upon various different protocols for the assessment of significance. The criteria draw on the IEEM guidelines (IEEM, 2006) and also incorporate good practice from other published documents e.g. DMRB Volume 11. The assessment process is summarised in a four step process below:

- The value of nature conservation resources present are identified;
- The source and magnitude of the various impacts that act upon these nature conservation resources are determined (independently of the evaluation of the resource);
- The significance of the effects of the development is determined using a standard matrix linking the previous two variables but amended where necessary (see next section), firstly without mitigation and secondly with mitigation; and
- Residual impacts are then discussed and summarised.

11.2.36 The IEEM guidelines suggest that best practice is to move away from the use of rigidly defined standard matrices. Therefore, while a matrix-based approach has been adopted, ecological experience and professional judgement are an integral part of the assessment process.

Resource Value

11.2.37 An ecological resource is defined as a site/area of nature conservation value. Each site/area may have more than one feature of value that it supports (for example different habitats or populations of species). The IEEM guidance assesses value in terms of the benefits that these features provide to people or society in general, and includes elements such as their contribution to biodiversity as well as social and economic aspects. This chapter only deals with biodiversity elements and if there are any additional social/economic elements, reference is made to relevant section within other chapters. The values of features are described within a geographical frame of reference (e.g. the feature is of importance at a European level). The IEEM guidance recognises up to 8 different geographical scales, but only 6 have been considered relevant in this context. To attain each level of value/importance, an ecological resource or one of the features should meet the criteria set out in Table 11.2 below. These criteria are based upon criteria identified in the IEEM guidance, the DMRB, Guidance on the Methodology for Multi Modal Studies (GOMMMS), previous Environmental Statements produced by Scott Wilson and include the following features:

- Population trends;
- Sustainability of resource;
- Representativeness;
- Potential for substitution/re-creation;
- Position in the ecological unit;
- Biodiversity; or

- Intrinsic value to stakeholders.

11.2.38 To attain each level of value / sensitivity, an ecological feature must meet the criteria in at least one of the areas set out in Table 11.2, although in some cases, professional judgement may be required to increase or decrease the allocation of specific value as outlined in the table. Where a site/feature meets more than one criterion it is assigned the highest value.

11.2.39 Legal protection is not necessarily a good indicator of the nature conservation value of an ecological receptor, and is treated as a separate aspect. Thus, badgers are protected by national legislation for reasons of animal welfare, but if they are widespread and common in an area they may be of only local or regional conservation importance. Similarly, although bats and their roosts are protected by international legislation, an individual of a common species of bat is not values as being important to nature conservation at an international level. Likewise, certain habitats may be important within a regional context, and may have been identified for priority action within the Local Biodiversity Action Plan (LBAP) if this has been prepared for an area, but are not considered to be of national conservation importance. However, the evaluation should be based upon the amount and quality of that habitat type present on the site itself, rather than its presence *per se*. This ensures that small areas of poor-quality habitat are not over-valued.

11.2.40 Areas considered by Environment & Heritage Service to be of national importance for nature conservation are designated as Areas of Special Scientific Interest (ASSI). There are also a range of international designations including Biosphere Reserves, Ramsar sites, Special Areas of Conservation (SAC) and Special Protection Areas (SPA). Wildlife areas of importance at the local level can be designated as non-statutory Sites of Local Nature Conservation Interest (SLNCI) or similar, and/or as Local Nature Reserves (LNR).

Table 11.2: Resource Value (based on IEEM, 2006) (continued over)

Nature Conservation Value	Examples of Selection Criteria
International	<u>European Community and Wider Area</u> A site designated, or identified for designation at the international level e.g. World Heritage Sites, Special Protection Area (SPA), Special Area for Conservation (SAC), and / or Ramsar site. Proposed sites are also given the same consideration as designated sites; A sustainable area of any habitat listed in Annex I of the Habitats Directive or smaller areas of such habitat that are essential to maintain the viability of a larger whole; Any regularly occurring population of an internationally important species e.g. UK Red Data Book species, which is listed as occurring in 15 or fewer 10 km squares in the UK, and that is identified as of unfavourable conservation status in Europe or global conservation concern in the UK BAP.

Nature Conservation Value	Examples of Selection Criteria
UK	United Kingdom of Britain and Northern Ireland A site protected by national designations e.g. Area of Special Scientific Interest (ASSI), National Nature Reserve, or Marine Nature Reserve or a site considered worthy or this designation; A sustainable area of any priority habitat identified in the UK BAP, or smaller areas of such habitat that are essential to maintain the viability of a larger whole; A feature identified as of critical importance in the UK BAP; Any regularly occurring population of an important species in the UK that is threatened or rare in that region of the UK, and for which the LBAP identifies the need to protect all remaining sites.
Northern Ireland	Sustainable population of a nationally important species (species listed on Schedules 1, 5 and 8 to The Wildlife (Northern Ireland) Order 1985, as amended by The Wildlife (Amendment) (Northern Ireland Order 1995), which is threatened or rare; Sustainable areas of key habitat, identified in the NI BAP or smaller areas of such habitat that are essential to maintain the viability of a larger area; Some non-statutory designated sites e.g. certain categories of Ancient Woodland; Sustainable populations of NI BAP (Priority) species; Any regularly occurring, locally important population of a species listed in a Regional Red Data Book or LBAP on account of its regional rarity or localisation.
Local Authority Area	Carrickfergus/ Newtownabbey Local Authority Areas Areas of internationally or nationally important habitats that are degraded but are considered readily restored; Viable areas of key habitat identified in the Newtownabbey LBAP, or smaller areas of such habitat that are considered essential to maintain the viability; Some non-statutory designated sites (Ancient Woodland, TPO's); Sustainable populations of Newtownabbey BAP (Priority) species; A site designated as a Wildlife Site or Site of Nature Conservation Interest (SLNCI) protected through Local Authority policy; A regularly occurring, locally significant number of a nationally important species.
Local	The site and the vicinity including habitats and species linked to those on site A good example of a common or widespread habitat/species in the local area; Areas of internationally or nationally important habitats that are degraded and have little or no potential for restoration and of low value to species of nature conservation interest.
Site	Area within the A2 zone of influence, i.e. 500m buffer zone Common and widespread habitat/species; Areas of heavily managed or modified vegetation of low intrinsic interest and low value to species of nature conservation interest that do not appreciably enrich the site or locally e.g. improved grassland, arable crops.

Magnitude of Impact

11.2.41 A number of factors may influence the magnitude of an effect or impact, listed below:

- Magnitude: "size" or "amount" of impact, determined on a quantitative basis where possible, e.g. the numbers of a species that are influenced;
- Extent: The area over which the impact occurs;
- Duration: The time over which the impact is expected to last prior to recovery or replacement of the resource or feature;
- Reversibility: whether recovery is possible within a reasonable timescale; and
- Timing and Frequency: Whether impacts coincide with critical life changes or seasons (e.g. breeding bird season) and how frequent the impacts are likely to be.

11.2.42 Impacts in combination may have a cumulative effect that is greater than when the same changes act in isolation. Cumulative impacts may entail the assessment of all the effects of the Scheme upon a feature (e.g. impacts at the construction and operation stage), or the combined impacts of a number of Schemes that will affect the same area.

11.2.43 Poor knowledge about the response of different features to particular pressures means that the prediction of the scale of impacts can be difficult. Where possible, effects are quantified, and then assigned to a magnitude category based on the criteria set out in Table 11.3. Impacts are described as 'High', 'Medium', 'Low' or 'Negligible'. Professional judgement is used to assign the effects to one of these four classes of magnitude. In addition impacts may be positive or negative in nature.

Table 11.3: Magnitude of Impact (IEEM, 2006)

Magnitude	Potential Impact
High	Landtake of a habitat or feature, if it occurs, may be greater than 20% of the total area of that habitat or feature. Where impacts are indirect, disruption of ecosystem functioning occurs, with loss of species and loss of diversity. Changes may be long-lasting or permanent, particularly if loss or major alteration of wildlife habitat occurs. Recovery, if possible, is likely to take more than three years.
Medium	Landtake of a habitat or feature, if it occurs is 5-20% of the area. Where impacts are indirect, qualitative change of the habitat or feature occurs. The abundance of some of the more sensitive species may be reduced. Changes in habitat may be longer lasting. Impact is reversible, or nearly so, although recovery of impacts other than landtake may take up to three years following cessation of impact.
Low	Landtake of a habitat or feature, if it occurs, affects less than 5% of the area. Where indirect impacts occur, some changes in species abundance may occur, but the impact is reversible. Full recovery is likely in the short term, probably within a year, following the cessation of impact.
Negligible	With ecological receptors it is often not possible to state categorically that there will be no impact, but this category is used when the chance of any impact is very low and if it occurs it is well below the level of detection.

Significance Criteria

11.2.44 Effects are evaluated as being 'Highly significant', 'Significant', or 'Non-significant' according to Table 11.4 below, and can be either positive or negative. If the significance is assessed as either 'Highly significant' or 'significant' then this must be brought to the attention of the planning authority.

11.2.45 There are certain limitations in using this rigid matrix approach. For example, where the magnitude of impact is *high* but the receptor is of *local* value, it can only be assessed as *significant* or *non-significant*, however professional judgement might be used to increase the significance level to *highly significant.* Therefore, this significance matrix is broadly used as a guide for determination of significance, but professional judgement is ultimately used to determine whether an effect is significant. This professional judgement-based approach is advocated within the IEEM guidelines.

Table 11.4: Impact Significance Table

Magnitude	Nature Conservation Value					
	International	UK	Northern Ireland	Local Authority Area	Local	Site
High	HS	HS	S	S	S/NS	NS
Medium	HS	HS/S	S	S/NS	S/NS	NS
Low	S	S	S/NS	NS	NS	NS
Negligible	S/NS	NS	NS	NS	NS	NS

HS = highly significant, S = significant and NS = not significant

Confidence Level

11.2.46 It is valuable to attribute a level of confidence to the accuracy of a prediction. Four levels have been identified for the purposes of this study, as outlined in IEEM Guidelines (2006):

- Certain/near-Certain: probability estimated at 95% chance or higher;
- Probable: probability estimated above 50% but below 95%;
- Unlikely: probability estimated at less than 5%; and
- Extremely unlikely: probability estimated at less than 5%.

11.2.47 Certain/near-Certain confidence is assigned where the anticipated impact is very likely to occur, based on reliable information (e.g. formal surveys undertaken to a standard methodology) or previous experience. Unlikely level of confidence is assigned where the predicted impact and its level are best estimates, generally derived from first principles of ecological theory and the experience of the assessor. This category has also been used where there is limited information about species occurrence. The reason for including a confidence category of "extremely unlikely" is that though some effects may be very improbable, they would have very serious implications should they occur.

11.2.48 Unless otherwise stated, all impacts are given at a certain/near-certain confidence level.

Sources of Biological Information

11.2.49 Appropriate statutory and non-statutory organisations were consulted to obtain information regarding the location of any statutory and non-statutory designated sites and any existing records of notable species or habitats within the study area. The organisations consulted are listed in Table 11.5.

Table 11.5: Sources of Biological Information

Organisation	Date	Data Received
Environment & Heritage Service	Sept 2006	Otter road kill record within the study area.
British Trust for Ornithology	Dec 2005 and Sept 2006	WeBS core count data: Tabulated five-year synopsis 00/01-04/05 WeBS low tide count data 04/05
The Centre for Environmental Data and Recording, Ulster Museum (CeDAR)	August 2006	Records of Priority and/or Species of Conservation Concern within the study area.
Northern Ireland Bat Group	August 2006	Bat records within the study area.

Consultations

11.2.50 Described below are the scoping, consultation and desk-study elements that relate to ecological issues within this chapter.

11.2.51 The scoping process is based on information about the development Scheme and the area that it will affect. It should help to develop an understanding of the ecological context based on the baseline information derived from existing ecological information, data gathering, and literature searches (IEEM, 2006). The scoping should also identify those factors that are required to be assessed in more detail. Full details of the determination and scoping processes are found in Chapter 1.

11.2.52 The statutory organisations listed below were contacted when Scott Wilson prepared the Scoping Report for the Scheme in July 2006:

- Council for Nature Conservation & the Countryside - Department of Environment;
- Department of Agriculture and Rural Development (DARD) - Fisheries Division;
- Department of Agriculture and Rural Development (DARD) - Rivers Agency;
- Environment & Heritage Service (EHS); and
- Fisheries Conservancy Board.

11.2.53 The following non-statutory consultees were also contacted at this stage.

- The Centre for Environmental Data and Recording, Ulster Museum (CeDAR);
- Northern Ireland Bat Group;
- Royal Society for Protection of Birds;
- The Woodland Trust;
- Ulster Angling Federation; and
- Ulster Wildlife Trust.

11.2.54 The purpose of all consultations was to:

- Identify any relevant information that they held, including the presence of protected species or sites e.g. Local Nature Reserves (LNRs) or otter holts;
- Identify any concerns that the organisations may have about the potential development; and
- Identify any issues that the organisations will like to see covered by the ES.

11.2.55 A summary of the key consultation responses received during the various consultation stages relating to ecological issues is provided overleaf in Table 11.6. A full account of all consultation responses is provided within Chapter 7 – Scoping.

Table 11.6: Summary of Key Ecological Consultation Responses

Consultee	Summary of Response
Statutory Consultee	
Council for Nature Conservation & the Countryside - Department of Environment	They presume that the dualling option along the protected area of Belfast Lough is no longer an option.
Department of Agriculture and Rural Development (DARD) - Fisheries Division	Noted that the potential run off from the construction and operation phases of the Scheme should be considered in relation to aquaculture and wild shellfish in Belfast Lough
Department of Agriculture and Rural Development (DARD) - Rivers Agency	Noted that any previously unidentified watercourse found during construction should be identified to the Agency, and that the written consent of the Agency is required for any interference with a watercourse e.g. culverts, diversions, discharge, etc.
Environment & Heritage Service (EHS)	Claire Hyland (Higher Scientific Officer): Letter dated 26/09/05: EHS does hold some site-specific information, however, advised to carry out search for information on the recommended websites. Enc: citation documents relating to the Outer Belfast Lough Area of Special Scientific Interest, Belfast Lough Special Protection Area, a Natura 2000 site, and Belfast Lough Ramsar. Stated that the proposed development must not impact these designated sites. EHS must be provided with specific information for an assessment to be made on the predicted impacts of the proposal on the Natura 2000 site for the Belfast Lough SPA. Email 28th April 2006, Ian Enlander (EHS): Only commented on breeding bird issues. Stated that Paul Byrne (EHS) be contacted with regard to need for Appropriate Assessment in relation to SPA features. Suggested SW request BTO WEBS information on high tide core counts, and low tide counts. Suggested Breeding Bird Survey in place of Common Birds Census. Also stated a similar assessment using a single visit be made to determine usage by wintering birds. Stated that EHS would wish the survey data be used to assess the impact upon breeding and wintering bird populations, particularly Northern Ireland Species of Conservation Concern and use the information to inform mitigation measures.
Fisheries Conservancy Board	Mrs. K A Simpson, Chief Executive: There are several minor waterways flowing under the A2 to Belfast Lough. Although none of those in the area outlined for improvement have any fishery interest, they do contain invertebrates and other aquatic life upstream of the A2. The Board would not foresee any problems with a proposed improvement Scheme as the A2 runs parallel to Belfast Lough.
Non-statutory Consultee	
The Centre for Environmental Data and Recording (CeDAR)	Provided species records.
The National Trust	The Trust has no comment or objection to the proposed development as the site is not within proximity to any of the Trust's properties or landholdings in the area.

Consultee	Summary of Response
Royal Society for Protection of Birds	RSPB agree that EHS should confirm that an Appropriate Assessment is not required for potential effects on Belfast Lough SPA. Jointure Bay SLNCI should be thoroughly surveyed as part of the EIA as should the remainder of the route. Local people have also alerted us to the number of mature gardens hosting wildlife and a rookery along the route. RSPB support the proposed surveys, but recommend three visits to assess bird use of the site over the breeding season. One of the BBS visits should be in early May to account for early breeding birds. RSPB encourage proposals to mitigate the effect of the development, such as wildlife passes or bridges, including those for otters. Other examples include a comprehensive landscaping plan, SUDS and using bird or bat boxes on trees or bridge structures. Advice is available in publications such as the Welsh Assembly Government Trunk Road Biodiversity Action Plan. The RSPB would also seek to ensure that existing features of wildlife interest are retained where possible, and replaced where loss is unavoidable. This might include, for example, enhancing or replanting hedgerows in the vicinity of the road to replace those lost as a result of construction. The draft Belfast Metropolitan Area Plan allocates proposed green corridors in this area, so every effort should be made to encourage habitat management, cycle and pedestrian access in these areas and along the proposed route. As mentioned in our previous response, there may be opportunities to extend the cycle path with fences and viewpoints if necessary to protect roosting/feeding birds from disturbance, as alongside the stretch of motorway. Naturally the timing of the works should be set to avoid disturbance to breeding birds, or birds using the adjacent SPA on Belfast Lough.
The Woodland Trust	There are two areas of woodland at the eastern end of the study area (near Seapark House), which are on the Ancient Woodland Inventory. The Trust seeks the buffering of such fragments of ancient woodland in order to protect them, and hope that the road development will not impact. Throughout the development, the Trust asks that the contractors follow the guidelines in the Planning Service publication, Trees and Development – A Guide to Best Practice, in order to protect all mature trees.
Ulster Angling Federation	Noted that small streams may play an important role in salmon reproduction and that culverts should be designed in accordance with the recommendations in “River Crossings and Migratory Fish Design Guidance” published by the Scottish Executive
Ulster Wildlife Trust	The Ulster Wildlife Trust do not hold any specific flora and fauna information for the area in question. However, they would like to highlight that the road may potentially create a barrier to wildlife that may prevent free passage of wildlife inland. Mammals in particular may be vulnerable, especially badgers and the Silver Stream may already act as a route for otters to travel inland from the lough shore. The creation of otter-friendly culverts and badger underpasses along the route would be desirable. An overall design that minimises the land take would reduce the barrier effect for birds. Every effort must be made to preserve the line of significant hedgerows that would be cut by the road. There have been successful wildlife bridges created elsewhere that ensures continuity of habitat over a new roadway.

11.3 Baseline Conditions

11.3.1 The baseline information refers to the conditions that are likely to be present at the time the Scheme is implemented. The baseline is broadly based on the conditions at the time of survey but due to the dynamic nature of ecological processes, also takes into consideration any changes likely to occur before works begin e.g. scrub development etc. The works are scheduled for 2008-2009 and anticipated to take 18 months to complete.

Statutory Designated Sites

11.3.2 The nearest statutory designated site for nature conservation is Belfast Lough, designated as a Ramsar site, Special Protection Area (SPA) and Area of Special Scientific Interest (ASSI) (See Figure 11.1). The site is of international importance for nature conservation. SPAs[1] are classified under the Birds Directive, and are selected for their importance as areas for breeding, overwintering and migrating birds. Belfast Lough Open Water SPA is a separate designation to Belfast Lough.

11.3.3 Belfast Lough is of international and national importance for the numbers and species of wintering wildfowl it regularly supports. The Loughs position on the western fringes of Europe have made it of prime importance for the huge flocks of ducks, waders and geese which come south from Arctic Canada and Greenland and other northern areas to the Belfast Lough estuarine habitats.

11.3.4 Belfast Lough SPA is selected on the basis of regularly supporting internationally important numbers of wintering redshank (*Tringa totanus*). The site also regularly supports nationally important numbers of shelduck (*Tadorna tadoma*), oystercatcher (*Haematopus ostralegus*), purple sandpiper (*Calidris maritima*), dunlin (*Calidris alpina*), black-tailed godwit (*Limosa limosa*), bar-tailed godwit (*Limosa lapponica)*, curlew (*Numenius arquata*) and turnstone (*Arenaria interpres*). The site is composed of estuarine, intertidal rock, intertidal sediment (including sandflat/mudflat) and lagoon habitats.

11.3.5 Belfast Lough Open Water qualified recently as an SPA due to it supporting internationally important numbers of great crested grebe (*Podiceps cristatus*). In addition, the site supports nationally important numbers of cormorant (*Phalacrocorax carbo*), shelduck, scaup (*Aythya marila*), eider (*Somateria mollissima*), goldeneye (*Bucephala clangula*) and red-breasted merganser (*Mergus serrator*). The site includes areas of inter-tidal foreshore, comprising of mudflats and lagoons, and land, which form important feeding and roosting sites for significant numbers of wintering waders and wildfowl. Semi-natural vegetation is confined to a narrow shoreline strip that is fragmented, particularly along the inner reaches of the lough. Shores with harder rocks support vegetation typical of maritime cliff ledges, giving way to maritime grassland.

11.3.6 Belfast Lough Ramsar[2] site is designated in respect of common redshank, occurring at levels of international importance. Ramsar sites are designated as wetlands of

[1] SPA's are designated under the EC Directive (79/409/EEC) on the Conservation of Wild Birds and thus have a European level of protection.

[2] Ramsar sites are wetlands of international importance designated under the Ramsar Convention (1971). The Convention, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

international importance under the Ramsar Convention and are usually underpinned as ASSI's[3].

11.3.7 The Inner Belfast Lough ASSI encompasses the southern part of Belfast Lough and is designated primarily because of the assemblages of wintering waders and wildfowl. The Outer Belfast Lough ASSI supports important numbers of great crested grebe and nationally important wintering populations of oystercatcher, ringed plover (*Charadrius hiaticula*), redshank and turnstone. Birds from Inner Belfast Lough ASSI regularly use Outer Belfast Lough for feeding, and the populations of the two areas are closely linked.

11.3.8 Consultations were carried out with the Department for Regional Development, Roads Service as the competent authority to confirm whether an assessment of Article 6 of the Habitats Directive[4] Council Directive No. 92/43/EEC was required to examine the ecological impacts upon the Belfast Lough and Outer Belfast Loch SPAs. Such an assessment was not deemed necessary for the Scheme in question.

Non-Statutory designated sites

11.3.9 At the eastern end of the study area, is Jointure Bay Stream Site of Local Nature Conservation Importance (SLNCI), which is a non-statutory designated site protected under local planning policy. This is a small watercourse with a number of natural features, with both planted and semi-natural woodland either side. Is protected within the Belfast Metropolitan Area Structure Plan Policy Env2 as Wet Grassland, and is described as a small stream flowing through unimproved wet grassland and improved grassland with some scrub and woodland and is classified primarily in respect of the wet grassland area to the northwest of Shore Road.

11.3.10 Jointure Bay stream is culverted underneath the A2, but provides suitable passage for otters (*Lutra lutra*) moving to or from the shores of Belfast Lough. Some mature and ivy-covered trees along the SLNCI and immediately adjacent to the A2 may have the potential to provide suitable roosts for bats, and the watercourse and surrounding field boundary habitats would provide suitable foraging habitat. Tree species in the area immediately adjacent to the A2 include sycamore (*Acer pseudoplatanus*), holly (*Ilex aquifolium*) and elder (*Sambucus nigra*).

11.3.11 Two areas of woodland near Seapark House towards the eastern end of the Scheme are included within the Ancient Woodland Inventory and are identified as long-established woodland (Figure 11.1). This category refers to woodland that appears on First Edition OS maps dating from 1830 (The Woodland Trust). A further area of long-established woodland to the north of the SLNCI is also identified within a map provided by The Woodland Trust, however, this woodland has since been felled and current land use is improved grassland.

11.3.12 Where UK Biodiversity Action Plan (BAP), Northern Ireland BAP or Newtownabbey Biodiversity Action Plan (LBAP) species and habitats are present within the study boundary, they are identified and valued in Table 11.11 - *Value of Ecological Resources*.

[3] The Environment (Northern Ireland) Order 2002 provides the Department of Environment for Northern Ireland with the power to declare areas of land as Areas of Special Scientific Interest (ASSI) where the land is of special interest by reason of its flora, fauna, geological, physiographical or other features and needs to be protected.

[4] An Assessment of Article 6 of the Habitats Directive Council Directive No. 92/43/EEC is the determination of the effect of a project, upon the notified interest features of a Natura 2000 site e.g. an SPA or Special Area of Conservation (SAC). This assessment is required when it is predicted that a project, unrelated to the conservation value of a site, is likely to have a significant effect upon the integrity of the feature for which the site has been designated.

Habitats

11.3.13 The habitats surveyed within the study area include intensively managed gardens and lawn areas, built–up areas and hard standing, amenity grassland, improved grassland, marshy grassland, semi-improved grassland, broad-leaved plantation, broad-leaved semi-natural woodland, mixed plantation, coniferous plantation, dense and scattered scrub, open standing water, tall herbs, tall ruderal, individual trees, running water and hedgerows. Phase 1 habitat survey target notes can be found in Appendix C. The habitats within the Phase 1 survey area shown on Figure 11.2.

11.3.14 The survey area is broadly divided into built-up areas associated with residential, business and community uses at the western end of the Scheme and agricultural land at the eastern end of the Scheme. Private houses and gardens in the survey area were not directly surveyed, and the survey presents the species and habitats observed from public access routes. In some instances, aerial photography imagery was used to ground truth results from inaccessible areas.

11.3.15 Many of the larger gardens contained large amenity lawn areas, mature trees and shrubbery, hardstanding and sheds, and where these were visible from public access routes, they have been included in the Phase 1 map and target notes. The majority of the gardens in the Scheme area contain exotic garden plants, small lawns and tarmac driveways, which were not considered to be of ecological value and were therefore not mapped. Therefore, only gardens with significant amounts of amenity lawn grassland, mature trees and other habitats have been mapped on the Phase 1 habitat map, with all other areas being left blank. Roads and tracks are also not included, as these are shown accurately on the base maps. Fencelines have not been included in the Phase 1 habitat map, Figure 11.2. New buildings and other features, not included in the original base maps have been drawn in.

11.3.16 **Built-up areas along Shore Road: Buildings (J3.6)/amenity grassland (J1.2)/scattered trees (A3)**, typical of residential housing/business/community uses, dominate the semi-natural habitats along Shore Road. Most gardens have areas of lawn or amenity grassland with frequent areas of scattered planted trees or scrub within the property. The scattered scrub includes ornamental species, ivy (*Hedera helix*), privet hedges (*Ligustrum ovalifolium*), hawthorn (*Crateagus monogyna*), beech (*Fagus sylvatica*), rhododendron (*Rhododendron ponticum*), dog rose (*Rosa canina*), bramble (*Rubus fruticosus*), exotic conifers, sycamore (*Acer pseudoplatanus*), Scots pine (*Pinus sylvestris*) and ash (*Fraxinus excelsior*). Some of the mature and ivy-covered trees along the road have the potential to provide suitable roost sites for bats, as do the roof spaces within properties along the road, particularly the older properties. The scattered trees and scrub within the gardens have the potential to provide breeding bird habitat between mid-March and mid-August. The habitats found along Shore Road are of negligible importance only, with the exception of the mature trees and scrub areas which are likely to be of local importance for the birds and other protected species (e.g. bats) that possibly inhabit them.

11.3.17 **Open water and strandline vegetation (H5**) associated with Belfast Lough dominates the southern side of the Shore Road boundary area. Surveys were not carried out below the high tide mark.

11.3.18 **Amenity grassland (J1.2) with scattered trees (A3)**: Within this category we class urban open spaces within Greenisland, and do not include lawn areas within private gardens. These areas are classed as being of negligible ecological value. They are generally areas of amenity grassland associated with school playing fields or large lawn areas fronting housing estates, with few scattered trees such as Poplar (*Populus sp*) and sycamore.

11.3.19 **Grassland: improved grassland (B4), marshy grassland (B5), semi-improved neutral grassland (B2.2), poor semi improved grassland (B6):** The area to the

north of the eastern end of Shore Road is dominated by improved grassland grazing pasture, grazed by cattle and sheep, separated from each other by species-poor but mature hedgerows. While these grassland areas provide suitable foraging habitat for badgers (*Meles meles*), and the wooded and hedgerow areas would provide suitable cover for setts, no badger signs were located within 500m of the improvement Scheme.

11.3.20 **Hedgerows: intact species poor (J2.1.1), defunct species poor (J2.2.2) and species poor with trees (J2.3.2).** Hedgerows were broadly assessed against criteria set out in The Hedgerows Regulations 1997: a guide to the law and good practice (Defra, 2001). Although the regulations apply to England and Wales only, they nonetheless provide a useful definition of "important hedgerows". It was determined that hedgerows within the Scheme boundary do not meet the requirements for "important hedgerows", and have therefore been categorised as species poor. Nevertheless they provide good quality habitat for a range of fauna. Hedgerows in the built up area to the west of the Scheme include exotic species and are well pruned and maintained for amenity purposes, but nevertheless provide suitable nesting habitat for birds. In the agricultural area, the majority of grassland fields are bounded by intact species poor hedgerows, dominated by hawthorn with lesser amounts of gorse (*Ulex europaeus*), ivy, bramble and dog rose and some are interspersed with low density mature trees such as ash, and willow (*Salix* spp.). The majority of these trees have been deemed to be unsuitable for roosting bats, however, one particular mature willow tree of note is described in Target Note 52. The hedgerows are generally intact, though some have small gaps and a few are defunct.

11.3.21 **Running Water: (G2).** The water features associated with the A2 are described in detail in Chapter 12, where 15 water resource features were identified within 250m of the Scheme. Five of these features were evident from during the Phase 1 site walkover, and remainder were either not visible or culverted underground. Chapter 10 – Water Resources provides a full assessment of each watercourse, while this chapter refers to those surveyed during ecological walkover surveys.

11.3.22 There are five small watercourses crossed by the A2 along Shore Road, visible from the Phase 1 walkover. These have been heavily canalised and in some cases concreted and culverted underneath the road and houses. The majority do not provide suitable habitat for otter. These are described below from west to east:

- An unnamed watercourse (Target Note 34) c. 1-1.5m wide, runs along the western fringes of the University and discharges into Belfast Lough via a culvert underneath the Shore Road, then through an amenity grassland area. This comprises a double piped culvert, each pipe 1.3m in diameter, wide enough for otter passage, though no otter signs were seen.

- Silverstream (Target Note 33) runs down the east boundary of the University of Ulster through Belfast High School land and under the Shore Road in a culvert, c.1.7m wide, adjacent to Silver Stream Banks estate before discharging into Belfast Lough. The stream was observed to contain small fish and an eel, but no otter signs were found. The burn at this point passes under Shore Road via an old low stone culvert composed of stonework with supporting/infilling concrete, with no bat roost potential.

- An unnamed watercourse (Target Note 24) with mostly concrete sides flows through gardens either side of Shore Road. Access was not possible within private gardens, however no signs of otters were seen from the road.

- An unnamed watercourse (Target Note 45) runs through agricultural grassland and adjacent to a private garden, for the most part beneath a dense hawthorn-dominated hedgerow. The watercourse is culverted for a 20m

section north of the private garden, and also to the south of the private garden. It could not be located to the south of the A2. It may be suitable for otter, but animals would be required to travel some distance over ground, and cross the A2 to reach the Belfast Lough shoreline.

- Jointure Bay Stream SLNCI (Target Note 54-56) at the eastern end of the study area is a small watercourse with a number of natural features, with both planted and semi-natural broadleaved woodland either side. Earthen banks dominate for the most of its length, and the watercourse is canalised in parts with bank and streambed reinforcements. It does however maintain naturalness throughout the majority of its length. Rubbish tipping is evident, with debris gathering and forming debris dams regularly within the steam channel. Suitable for otter passage, and watercourse likely to contain small fish/eels but no signs of otter evident.

- There are several other watercourses and dry land drains within the study area, but they do not cross the Shore Road and should not be directly affected by the Scheme.

11.3.23 The remaining habitats are present to a small degree throughout the study area, including **tall ruderal** (C3.1) associated with built up areas.

Invasive Species

11.3.24 An **invasive species**, Japanese knotweed (*Fallopia japonica*), was observed growing at two locations within the study area. Target Note 3 shows where Japanese knotweed is occasionally distributed within mature broadleaf plantation at the southern part of the Scheme. At the northern end of the Scheme a small stand of Japanese knotweed measuring c.3mx3m was observed on the roadside embankment (Target Note 61).

11.3.25 Under The Wildlife (Northern Ireland) Order 1985 as amended by The Wildlife (Amendment) (Northern Ireland) Order 1995 it is an offence 'to plant or otherwise encourage' the growth of Japanese Knotweed. This could include cutting the plant or roots and disturbing surrounding soil if not correctly managed.

Otter

11.3.26 Each watercourse was checked for suitability for otters and evidence of their presence. Where the watercourses cross beneath the A2, and other culverts, an appraisal was made as to whether the route would be accessible to otter travelling to and from the Belfast Lough shoreline.

- The unnamed watercourse in Target Note 34 discharges into Belfast Lough via a double piped culvert, measuring 1.3m in diameter. This culvert is wide enough for otter passage, though no otter signs were seen. Much of this watercourse runs through residential areas, and runs through culverts along its length. It is deemed to be of low suitability to otters and no signs were evident.

- Silverstream runs through a culverted area through the University of Ulster and resurfaces by Belfast High School. The stream was observed to contain small fish and an eel, both of which would constitute a food supply for otters. The watercourse passes beneath Shore Road via an old low stone culvert, measuring 1.7m in diameter, which otters could pass through en route to Belfast Lough. However, no signs of otter were observed along the watercourse, but it should be noted that the watercourse was inaccessible in parts.

- The unnamed watercourse at Target Note 24 is mostly composed of artificial concrete sides and flows through gardens either side of Shore Road. Access was not possible within private gardens, however no signs of otters were seen from the road and it is deemed to be of low suitability for otters.

- The unnamed watercourse at Target Note 45 runs through agricultural grassland and adjacent to a private garden, for the most part beneath a dense hawthorn-dominated hedgerow. The watercourse is culverted for a 20m section north of the private garden, and also to the east of the private garden. It could not be located above ground to the south of the A2. It may be suitable for otter, but animals would be required to travel some distance over ground to reach the Belfast Lough shoreline.

- Jointure Bay Stream SLNCI is a small watercourse with a number of natural features. The watercourse is canalised in parts with bank and streambed re-enforcements, but is suitable for otter passage and highly likely to contain fish. The culvert Shore Road is suitable for otter passage, however no signs of otter were evident along the survey area.

11.3.27 The remaining watercourses and land drains within the study area were checked for presence of otter, but no signs were evident.

11.3.28 Communication with EHS (Ian Enlander, *pers. comm.*) noted a recent otter road kill east of Greenisland/Station Road Junction on 8th September 2006. This indicates that otters may be using the unnamed watercourse at Target Note 45, probably for access to and from the Belfast Lough and possibly along further watercourses throughout the survey area.

Badger

11.3.29 No signs of badger activity, including setts, were observed during the survey of August 2006, or during any of the other site visits undertaken by the Scheme ecologists. There is suitable foraging habitat in the agricultural grassland areas, and suitable cover for setts within dense hedgerows and woodland areas. One important caveat is that at the time of survey, there was no access to woodland near Seapark. There is suitable cover for badgers within this area, but it is highly unlikely they are present, as badgers would be anticipated to cross to the agricultural areas to the north of Shore Road for foraging and signs would be likely to be evident, along with badger road deaths.

11.3.30 Consultations with CeDAR and EHS did not return any records of badgers within the Scheme boundary. However, there is an abundance of foraging habitat and suitable habitat for setts within the survey area. Although unlikely, there is a possibility that badgers may move into the Scheme boundary and be affected by the Scheme.

Bats

11.3.31 Number 6 and 8 Shore Road is a derelict 2-storey semi-detached building, with windows boarded up and is assessed as being of high suitability for bats. No signs of bat use, such as droppings or urine stains were evident, though the eastern barge board of 6 Shore Road contained a long crack, which would provide a suitable access point for bats.

11.3.32 Numbers 12-26 Shore Road bungalows are c.50yrs old, with medium suitability for bats, though no external signs were evident.

11.3.33 Number 34 Shore Road is an old two-storey building with an extension to the rear. It was deemed to be of high suitability for roosting bats, however direct access was not possible for closer inspection.

11.3.34 Number 112 Shore Road is a recently constructed 2-storey house with very low suitability for roosting bats, though bats have been known to roost within new buildings.

11.3.35 The Spar shop is a relatively new building with some suitable crevices for roosting bats, but no signs of bats were evident from external searches and it was assessed as being of low suitability.

11.3.36 Trees and other structures within the Scheme footprint were assessed for bat roost potential, and trees with roost potential are shown on Figure 11.4.

11.3.37 Dusk emergence surveys were undertaken on 7th August (Sunset 21.13 hrs BST) and 8th August (Sunset 21.11 hrs BST). Emergence surveys were concentrated in the vicinity of buildings for proposed demolition. Because of time limitations, it was not possible to conduct emergence checks in the vicinity of each tree that was assessed as having bat roost potential.

11.3.38 On the first survey night one surveyor was stationed at 6-8 Shore Road and they also walked periodically between 12-26 Shore Road. The second surveyor was stationed at 34 Shore Road. On the second survey night one surveyor was stationed at the Spar Shop and 112 Shore Road and the second surveyor concentrated on mature trees along the Jointure Bay Stream SLNCI.

11.3.39 The weather conditions on both nights were suitable for bat foraging with considerable numbers of insects on the wing. Although temperatures dropped after sunset, with an associated decline in insect activity, overhead conditions were dry and bright. On the second survey night the wind force reached Force 4-5 at 21:15, which did cause some interference with Bat Detector sound quality, however as bats were being detected even in these weather conditions, we can assume it did not significantly interfere with their activity.

11.3.40 Bat activity on the site was limited to three species, common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus)* and Leisler's bat (*Nyctalus leisleri*). A Daubenton's bat (*Myotis daubentonii*) was possibly recorded near 6 Shore Road. These results are presented in Table 11.7 and Figure 11.3.

Table 11.7: Bat Emergence Survey Results (continued over)

Location	Species	Hours BST	Comments
7th August 2006			
6-8 Shore Road	Leisler's	21.58/22.04/22.15	Recorded flying overhead.
	Daubenton's (possible)	22.15	Brief snippet of call, similar to strident "machine gun" notes of Daubenton's, but not heard for long enough to be certain.
12-24 Shore Road	Common pipistrelle	22.30	Recorded flying overhead 24 Shore Road.
	Leisler's	21.45 & 21.50	Bat seen hunting over 20/22 Shore Road and woodland to the north, feeding buzzes recorded.
34 Shore Road	Leisler's	21.55 & 22.00	Flying above hedgerow at 34 Shore Road.
	Common pipistrelle	22.30-23.00	Recorded 6 times within a half hour period with feed buzzes also recorded.

Location	Species	Hours BST	Comments
8th August 2006			
SLNCI	Leisler's	21.35	2 bats recorded circling over the improved grassland field to the west the SLNCI field, originating from a north-westerly direction over the SLNCI woodland.
	Leisler's	21.40	Concentrated period of Leisler's activity with 4 bats circling over the improved grassland field to the west of the SLNCI. One bat flew in a westerly direction over agricultural grassland and hedgerows while another bat flew out of sight and bat detector range over White Lodge Court.
112 Shore Road and Spar Shop	Soprano pipistrelle	21.55	Recorded with feeding buzzes on several occasions in front of Spar shop.
	Common pipistrelle	21.40 & 21.47	Recorded flying over woodland to east of Spar shop.
	Leisler's	21.32	Recorded near woodland opposite Station Road junction.

11.3.41 Bats were recorded flying over and feeding within the Scheme boundary, but no roosts were located. It is unlikely that any of the houses in line for demolition contain bat roosts, but this cannot be ruled out as there are certain limitations in the use of bat detectors for emergence counts, and the only fully reliable method of bat roost detection is through direct access to roof spaces. It is likely that bat roosts may exist within the disused buildings within White Lodge Court, though there are no proposals for their demolition. It is also evident, as a result of this survey, that at least three species of bat regularly use the area for foraging.

11.3.42 Common pipistrelles and soprano pipistrelles can be expected to set up summer roosts in new or old buildings, bridges and trees. In terms of foraging, the common pipistrelle will forage in most habitats, including built-up areas, but avoids very open habitats. The soprano pipistrelle may forage in similar habitats to the common pipistrelle, but favours lakes and rivers. Leisler's bats prefer open habitats, rivers, lakes including urban parks, and roosts mainly in buildings but also trees and boxes. The Daubenton's record is only tentative, and this species forms summer roosts near water, trees, bridges and rarely in houses. Their preferred foraging habitat is over water. There is an abundance of suitable roosting and foraging habitat for these bat species within the Scheme boundary.

Breeding Birds

11.3.43 This section details the results for the Breeding Bird Survey (BBS) undertaken, and includes incidental bird sightings. The bird species recorded are presented in tabular format, including estimates of the number of breeding pairs and the breeding density. The conservation status of each species is also included, e.g. birds listed on Annex I of the EC Birds Directive (79/409/EEC)[5], birds listed on Schedule 1[6] to The Wildlife

[5] The Directive aims to deliver protection, management and control of all species of wild birds where they occur naturally. Member states are required to take steps to maintain populations at levels at which they are sustainable both ecologically and scientifically. For particular species a member state must designate Special Protection Areas (SPAs) of

(Northern Ireland) Order 1985 as amended by The Wildlife (Amendment) (Northern Ireland) Order 1995, Red-listed, Amber Listed and Green-listed Birds of Conservation Concern[7] (Gregory *et al*, 2002), and Northern Ireland Priority Species and Species of Conservation Concern[8] (SoCC).

11.3.44 The Birds of Conservation Concern list of red, amber and green listed species is frequently used to determine the conservation status for birds in the UK, and to indicate the conservation priority for each species. Red list species are those that are globally threatened, whose population or range has declined rapidly in recent years (i.e. by more than 50% in 25 years), or which have declined historically and not recovered. Amber list species are those whose population or range has declined moderately in recent years (by more than 25% but less than 50% in 25 years), those whose population has declined historically but recovered recently, rare breeders (fewer than 300 pairs), those with internationally important populations in the UK, those with localised populations, and those with an unfavourable conservation status in Europe. Species that do not meet any of the above criteria are green-listed. The listing process provides a guide to the conservation priority status of the species, with red list species being of highest conservation priority. However the IEEM guidelines suggest that inclusion of birds on list of species of conservation concern may not in itself be a sufficient criterion for assigning a level of value to the species concerned, and as such professional judgement will be utilised.

11.3.45 Table 11.8 summarises the bird species recorded within the study area during the surveys and the estimated number of breeding pairs for each species that was considered to be breeding within 100m of the Scheme. The table also gives the current conservation status. The locations of birds observed and their activity codes during the two visits are illustrated in Figure 11.4.

Table 11.8: Bird species, including conservation status recorded during Breeding Bird Surveys 2006 (continued over).

Species (BTO Code)	Number of individuals recorded	Estimated number of breeding pairs	Conservation status
Barn swallow *Hirundo rustica* (SL)	15	0	Amber List, NI SoCC
Blackbird *Turdus merula* (B)	9	2	Green List
Blue tit *Parus caeruleus* (BT)	7	0	Green List
Chaffinch *Fringilla coelebs* (CH)	5	3	Green List
Coal tit *Parus ater* (CT)	1	0	Green List
Dunnock *Prunella modularis* (D)	2	2	Amber List, NI SoCC

suitable habitat. An Annex 1 species is listed for reason of danger of extinction, vulnerability to specific habitat changes, rarity either by population size or restricted local distribution, or other specific habitat requirements.

[6] Schedule 1 birds are priority species on which special penalties apply to infringement of the act either against the bird, its nest or eggs. Generally under the Order all wild birds, their nests and eggs are protected.

[7] The JNCC publish a list of Birds of Conservation Concern (JNCC, 2002). Red-listed species are generally those whose breeding population or range is declining or that are globally threatened. Amber-listed species are those whose breeding or non-breeding populations are in moderate decline, they are internationally important and localised breeding or non-breeding species, or they hold an unfavourable conservation status in Europe.

[8] Northern Ireland Priority Species and SOCC have been selected by EHS and partners as being of value in the local context of Northern Ireland, and best reflect current trends in the populations of valued species.

Species (BTO Code)	Number of individuals recorded	Estimated number of breeding pairs	Conservation status
Feral pigeon *Columba livia (domest.)* (FP)	3	0	Not listed
Goldfinch *Carduelis carduelis* (GO)	2	0	Green List
Greenfinch *Carduelis chloris* (GR)	9	2	Green List
Hooded crow *Corvus corone cornix* (HC)	1	0	Green List
House sparrow *Passer domesticus* (HS)	5	2	Red List, NI Priority, NI SoCC
Jackdaw *Corvus monedula* (JD)	16	0	Green List
Magpie *Pica pica* (MG)	23	3	Green List
Mistle Thrush *Turdus viscivorus*	1	1	Amber List
Robin *Erithacus rubecula* (R)	2	0	Green List
Rook *Corvus frugilegus* (RO)	39	Rookery at Seapark	Green List
Starling *Sturnus vulgaris* (ST)	21	0	Red List, NI Priority, NI SoCC
Swift *Apus apus* (SW)	10+		Green List
Woodpigeon *Columba palumbus* (WP)	14	0	Green List
Wren *Troglodytes troglodytes* (WR)	8	7	Green List
Additional species seen flying over/using the study area outside BBS	**Number of Sightings**		
Raven *Corvus corax*	1 (individual)		Green List
Peregrine falcon *Falco peregrinus*	1 (pair)		Amber List, Schedule 1 to the Wildlife (Northern Ireland) Order 1985 as amended by The Wildlife (Amendment) Northern Ireland) Order 1995 NI SoCC.

11.3.46 A total of 20 species were recorded during the Breeding Bird Survey (BBS). Of these, nine species were considered to be breeding (see Table 11.8). This BBS survey is not suitable to determine breeding estimates for swift (*Apus apus),* since they spend most of their time on the wing and do not display any perching or territorial behaviour, but all birds encountered were considered to be foraging or on passage to another area. The remaining individuals were considered to be failed breeders, or birds loafing, foraging or passing through the site. However, some, or all of these individuals may represent breeding species. These may have been missed during the first survey and may not have been displaying breeding behaviour during the second visit due to the late timing of the visit. Therefore the results should be interpreted as a conservative estimate of

the number of breeding species, breeding pairs and breeding densities of birds present within the study area.

11.3.47 The BBS and incidental sightings provide a useful species index of the bird assemblage present within the study area. The bird assemblage is largely typical of urban built-up areas including common woodland and agricultural species. The most common breeding species were wren and chaffinch. A rookery with c. 30 nests was located within Seapark woodland.

11.3.48 Table 11.8 also shows notable species peregrine falcon (*Falco peregrinus*) and raven (*Corvus corax*) that were seen flying over the off-line section of the Scheme. There are no suitable breeding habitats (rocky outcrops, cliff edges, quarries, etc) present within the Scheme study area for either of these species, and therefore these species are not considered further within the ES.

Wintering Birds

11.3.49 The Wetland Bird Survey is divided into two national schemes, which aim to monitor non-breeding waterbird populations. Core Counts are the coordinated monthly counts of waterbirds (wildfowl and waders) on around 2,500 inland and coastal wetlands, whilst Low Tide Counts aim to record periodically bird distributions on the major estuaries in the UK.

11.3.50 Core Count Data from Kilroot to Whiteabbey is provided within Appendix D and summarised in Table 11.9. A total of 48 wildfowl and wader species have been recorded along this section of the Belfast Lough between the years 2000/01 to 2004/05 (BTO, 2006). Several of these species recorded are internationally or nationally protected species and may also be a UK or Northern Ireland Action plan Species, or on Amber or Red Lists and these species are considered to be the wildfowl and wader species of interest and importance for the site. The data for the site includes Annex I red-throated diver, Slavonian grebe, bar-tailed godwit, sandwich tern and common tern, and Schedule 1 species such as common scoter, goosander, grey heron, dunlin, black-tailed godwit, sandwich tern and common tern.

Table 11.9*:* Five-year summary for Belfast Lough - Kilroot to Whiteabbey showing Autumn and Winter 5yr peak data and conservation status, based on Core Count Data 99/00 – 04/05 (continued over).

Species	Autumn 5yr mean of peaks	Winter 5yr mean of peaks	Conservation Status
Mute swan *Cygnus olor*	1	2	Amber
Whooper swan *Cygnus cygnus*	0	1	Amber
Light-bellied brent goose (East Canadian high Arctic population) *Branta bernicla*	13	33	Amber
Shelduck *Tadorna tadorna*	1	4	Amber
Wigeon *Anas penelope*	1	3	Amber
Teal *Anas crecca*	1	2	Amber
Mallard *Anas platyrhynchos*	10	10	
Feral/hybrid mallard type *Anas* sp.	0	0	
Pintail *Anas acuta*	0	0	Amber

Species	Autumn 5yr mean of peaks	Winter 5yr mean of peaks	Conservation Status
Scaup *Aythya marila*	2	422	Amber
Eider *Somateria mollissima*	1015	1037	Amber
King eider *Somateria spectabilis*	0	0	
Long-tailed duck *Clangula hyemalis*	0	26	Amber
Common scoter *Melanitta nigra*	0	33	Schedule 1, UK BAP, NI BAP, Red
Velvet scoter *Melanitta fusca*	1	1	Amber
Goldeneye *Bucephala clangula*	1	57	Amber
Red-breasted merganser *Mergus serrator*	45	55	
Goosander *Mergus merganser*	0	0	Schedule 1
Red-throated Diver *Gavia stellata*	4	11	Annex I, Amber
Great northern diver *Gavia immer*	1	1	Amber
Great crested grebe *Podiceps cristatus*	972	1017	
Slavonian grebe *Podiceps auritus*	0	0	Annex I, Amber
Cormorant *Phalacrocorax carbo*	138	146	Amber
Shag *Phalacrocorax aristotelis*	16	39	Amber
Grey heron *Ardea cinerea*	3	4	Schedule 1
Oystercatcher *Haematopus ostralegus*	685	1234	Amber
Ringed plover *Charadrius hiaticula*	100	84	Amber
Lapwing *Vanellus vanellus*	5	70	NI BAP, Amber
Knot *Calidris canuta*	0	0	Amber
Purple sandpiper *Calidris maritima*	0	5	Amber
Dunlin *Calidris alpina*	5	130	Schedule 1, Amber
Snipe *Gallinago gallinago*	0	0	Amber
Black-tailed godwit *Limosa limosa*	2	34	Schedule 1, NI BAP, Red
Bar-tailed godwit *Limosa lapponica*	10	26	Annex I, Amber
Curlew *Numenius arquata*	178	207	NI BAP, Amber
Redshank *Tringa totanus*	228	263	NI BAP, Amber

Species	Autumn 5yr mean of peaks	Winter 5yr mean of peaks	Conservation Status
Turnstone *Arenaria interpres*	173	171	Amber
Little gull *Larus minutus*	0	0	
Black-headed gull *Larus ridibundus*	338	614	Amber
Ring-billed gull *Larus delawarensis*	0	1	
Common gull *Larus canus*	138	286	Amber
Lesser black-backed gull *Larus fuscus*	1	9	Amber
Herring gull *Larus argentatus*	167	915	NI BAP, Amber
Glaucous gull *Larus hyperboreus*	0	1	
Great black-backed gull *Larus marinus*	13	29	
Kittiwake *Rissa tridactyla*	1	2	Amber
Sandwich tern *Sterna sandvicensis*	135	0	Annex I, Schedule 1, Amber
Common tern *Sterna hirundo*	3	0	Annex I, Schedule 1

11.3.51 Low Tide Count Data for the Belfast Lough is provided within Appendix D and summarised in Table 11.10, which also indicates preferred habitat and conservation status. A total of 23 wildfowl and wader species have been identified using the estuarine habitats of the Belfast Lough during low tide counts. This includes the Annex I bar-tailed godwit and Schedule 1 grey heron, common scoter and black-tailed godwit.

Table 11.10: Mean count and density for each species for the whole site based on WeBS Low Tide Count data for the winter 2004/2005 for Belfast Lough (continued over). (Densities in birds per hectare. Data for gulls and terns not presented, since counting optional and thus statistics unreliable. Note these values take into account monthly variation in coverage).

Species	Preferred habitat	Total area of preferred habitat	Mean site count	Mean site density	Conservation Status
Great crested grebe *Podiceps cristatus*	Sub-tidal	277	42	0.15	
Cormorant *Phalacrocorax carbo*	Sub-tidal	277	87	0.31	Amber
Shag *Phalacrocorax aristotelis*	Sub-tidal	277	1	0.00	Amber
Grey heron *Ardea cinerea*	Intertidal & non-tidal	54	0	0.00	Schedule 1
Mute swan *Cygnus olor*	Sub-tidal	277	1	0.00	Amber
Light-bellied brent goose *Branta bernicla*	All habitats	331	8	0.02	NI BAP
Wigeon *Anas penelope*	All habitats	331	2	0.01	Amber
Mallard *Anas platyrhynchos*	All habitats	331	4	0.01	
Scaup *Aythya marila*	Sub-tidal	277	581	2.10	Amber
Eider *Somateria mollissima*	Sub-tidal	277	483	1.74	Amber
Long-tailed duck *Clangula hyemalis*	Sub-tidal	277	7	0.03	Amber
Common scoter *Melanitta nigra*	Sub-tidal	277	9	0.03	Schedule 1, UK BAP, NI BAP, Red
Goldeneye *Bucephala clangula*	Sub-tidal	277	28	0.10	Amber
Red-breasted merganser *Mergus serrator*	Sub-tidal	277	20	0.07	
Oystercatcher *Haematopus ostralegus*	Intertidal	54	433	8.02	Amber
Ringed plover *Charadrius hiaticula*	Intertidal	54	2	0.04	Amber
Lapwing *Vanellus vanellus*	Intertidal & non-tidal	54	92	1.70	NI BAP, Amber

Species	Preferred habitat	Total area of preferred habitat	Mean site count	Mean site density	Conservation Status
Black-tailed godwit *Limosa limosa*	Intertidal & non-tidal	54	5	0.09	Schedule 1, NI BAP, Red
Bar-tailed godwit *Limosa lapponica*	Intertidal	54	20	0.37	Annex I, Amber
Curlew *Numenius arquata*	Intertidal & non-tidal	54	189	3.50	NI BAP, Amber
Redshank *Tringa totanus*	Intertidal & non-tidal	54	75	1.39	NI BAP, Amber
Turnstone *Arenaria interpres*	Intertidal	54	28	0.52	Amber
Black guillemot *Cepphus grylle*	Sub-tidal	277	0	0.00	Amber

11.3.52 Belfast Lough is of international importance for nature conservation and is selected on the basis of regularly supporting internationally important numbers of wintering redshank. It is also designated as a Ramsar site in respect of redshank occurring at levels of international importance. The site also regularly supports nationally important numbers of shelduck, oystercatcher, purple sandpiper, dunlin, black-tailed godwit, bar-tailed godwit, curlew and turnstone.

11.3.53 Belfast Lough Open Water qualified recently as an SPA due to it supporting internationally important numbers of great crested grebe. In addition, the site supports nationally important numbers of cormorant, shelduck, scaup, eider, goldeneye and red-breasted merganser.

Value of Ecological Resources

11.3.54 This section evaluates the nature conservation interest of the study area for its habitats and the species it supports in terms of relative importance in geographical context through the framework shown in Assessment Methodology section, based on relevant legislation and guidance. This evaluation is shown in Table 11.11.

Table 11.11 – Value of Ecological Resources (continued over)

Ecological Receptor (habitat/species)	Status
Belfast Lough SPA/Ramsar, Belfast Lough Open Water SPA, Inner Belfast Lough ASSI, Outer Belfast Lough ASSI	Belfast Lough is designated as a Ramsar site and SPA (underpinned as an ASSI). It qualifies as an SPA due to it supporting internationally important numbers of wintering redshank. The site also regularly supports nationally important numbers of shelduck, oystercatcher, purple sandpiper, dunlin, black-tailed godwit, bar-tailed godwit, curlew and turnstone. Belfast Lough Open Water qualifies as an SPA due to it supporting internationally important numbers of great crested grebe and supports nationally important numbers of cormorant, shelduck, scaup, eider, goldeneye and red-breasted merganser. Belfast Lough Ramsar site is designated in respect of common redshank

Ecological Receptor (habitat/species)	Status
	occurring at levels of international importance. These sites are also underpinned as ASSI's. Coastal habitats are part of the Newtownabbey LBAP and their various component habitats through the UK BAP. While the ASSI's are of National value for nature conservation, they are integral to the SPA/Ramsar designations and therefore the site is assessed as being of **International** value for nature conservation.
Jointure Bay Stream SLNCI	Jointure Bay Stream SLNCI, protected through the Local Authority, has a number of natural features, including semi-natural broadleaved woodland, providing foraging habitat for bats. Of the several watercourses in the study area, it is the most likely to contain otter habitat. River and streams are part of the Newtownabbey LBAP, and as Broad Habitats in the UK BAP. Woodland is part of the Newtownabbey LBAP, and broadleaved, mixed and yew woodland is a Broad habitat category on the UK BAP. Jointure Bay Stream SLNCI is assessed to be of **Local Authority Area** value for nature conservation.
Habitats - Ancient Woodland	The Woodland Trust classifies the woodland within Seapark as being long established. The majority of the remaining woodland within the route corridor is of plantation origin. Woodland is part of the Newtownabbey LBAP, and broadleaved, mixed and yew woodland is a Broad habitat category on the UK BAP. The long-established woodland has been assessed as of **Local Authority Area** value for nature conservation.
Habitats - on-line section	This section includes residential houses and gardens, amenity grassland, semi-improved grassland, scattered scrub, hedgerows and trees. These habitats are of limited ecological value, and are widely distributed in the wider area. The mature trees may be of potential for roosting bats. Scrub and trees will be of value to breeding birds. Urban and managed habitats are part of the Newtownabbey LBAP and urban areas and built-up areas and gardens are Broad Habitats within the UK BAP. These habitats are of limited value and are widely distributed in the wider area, and have been assessed as of **Local** value for nature conservation.
Habitats - off-line section	This includes improved, semi-improved, poor semi improved, marshy grassland, scattered scrub, hedgerows and planted trees, broadleaved woodland (semi-natural and plantation). The mature trees may be of potential for roosting bats. Scrub and trees will be of value to breeding birds. Agricultural habitats are part of the Newtownabbey LBAP and improved grassland is a Broad Habitat in the UK BAP. Woodland is part of the Newtownabbey LBAP, and broadleaved, mixed and yew woodland is a Broad habitat category on the UK BAP. These habitats are of limited value and are widely distributed in the wider area, and have been assessed as of **Local** value for nature conservation.
Habitats - running water	The majority of the running water habitats are generally highly modified, culverted, though they are associated with semi-natural vegetation such as trees and hedgerows, and provide habitat for breeding birds and foraging habitat for bats.

Ecological Receptor (habitat/species)	Status
	River and streams are part of the Newtownabbey LBAP, and as Broad Habitats in the UK BAP. These habitats are widely distributed in the wider area, and therefore have been assessed as of **Local** value for nature conservation.
Otters	Otters are known to be using the watercourses within the study area to travel between the Belfast Lough and surrounding areas. While otters underwent a dramatic decline throughout much of the UK during the 1950's and 1960's, in Northern Ireland, otters fared better. Recent declines of otter in Northern Ireland have been reported. The otter is a priority species on the UK BAP and the NI BAP. Otters have been assessed as of **Northern Ireland** value for nature conservation.
Badgers	There are no badger records within the area, but there is suitable habitat for foraging and there is suitable cover for setts, and while no evidence of potential source populations is evident, the possibility that badger may move into the area cannot be ruled out. Badgers have been assessed as of **Northern Ireland** importance.
Bats	There are 10 known species of bat in Ireland. The two species of pipistrelle and the Leisler's bat are common throughout Ireland. The possible Daubenton's record is omitted for the purposes of resource evaluation. The site is considered likely to contain active roosts, and provided foraging habitat for at least 3 species of bat. The common pipistrelle is a priority species on the UK BAP and all bats are NI BAP priority species. Bats are assessed to be of **Northern Ireland** value for nature conservation.
Breeding Birds	There are a number of bird species breeding, or likely to be breeding, within the scrub, trees and buildings within the Scheme study area. Two of these species (starling and house sparrow) are Red List, Northern Ireland Priority Species and Northern Ireland Species of Conservation Concern. The remaining species are all Amber listed and Northern Ireland Priority Species, Amber List or Green List species. The numbers of all birds recorded was relatively low and all of these species are abundant and widespread in the local and wider area. There is also an abundant quantity of similar breeding habitat in the wider area. All of the breeding bird species within the study area are assessed to be of **Local** value for nature conservation.
Wintering Bird Assemblage - WEBS	Belfast Lough qualifies as an SPA due to supporting internationally important numbers of wintering redshank. The site also regularly supports nationally important numbers of shelduck, oystercatcher, purple sandpiper, dunlin, black-tailed godwit, bar-tailed godwit, curlew and turnstone. Belfast Lough Open Water qualifies as an SPA due to it supporting internationally important numbers of great crested grebe and supports nationally important numbers of cormorant, shelduck, scaup, eider, goldeneye and red-breasted merganser. Belfast Lough Ramsar site is designated in respect of common redshank occurring at levels of international importance. The light bellied brent goose, redshank and lapwing are priority species in the NI BAP. This assemblage of wintering birds is integral in the classification of the

Ecological Receptor (habitat/species)	Status
	statutory designations and is assessed to be of **International** value for nature conservation.

Predicted Trends in the Absence of Development

11.3.55 The construction period is scheduled for 18 months between 2008 and 2009. Therefore it is anticipated that the habitats baseline as described will remain relatively unchanged at the time of construction. It is likely that the section of the Scheme proposed for on-line widening will remain unchanged in the absence of development and the off-line section will remain predominantly agricultural grazing pasture.

11.3.56 However the faunal assemblage may change, as badgers may colonise the agricultural land to the west of the road, though there is no known a resident population close by which would act as the source population for colonisation (EHS, *pers. comm.*). Bats may have more trees available as roost sites as trees mature and develop more cracks and splits, or may colonise trees or structures by the time of construction. Otters may start to increase use of the watercourses within the site as foraging habitat to and from the Belfast Lough shoreline.

Limitations

11.3.57 For access reasons, private residences and gardens areas were not surveyed. Starting the breeding bird surveys earlier in the season may have provided additional information on the use of habitats by breeding species and given a more accurate number of the numbers of breeding individual birds. Not all watercourse stretches were accessible due to dense scrub coverage, so otter evidence along these stretches, if present, may have been missed.

11.4 Predicted Impacts

Introduction

11.4.1 The Scheme proposals were outlined in Chapter 5 – The Scheme . These activities might have a range of effects (both positive and negative) upon ecological features at either the construction or operation phases. A distinction is often made between direct and indirect impacts. Direct impacts occur where the changes to an ecological feature are directly attributable to an action associated with the Scheme, such as the loss of woodland for the construction of new buildings. Indirect impacts usually arise as a 'knock-on' effect of a Scheme, and would include aspects such as disturbance of otter activity as a result of a change in human use of the site.

11.4.2 Direct and indirect effects can be further sub-divided into temporary or permanent impacts. Permanent impacts include loss of land to the Scheme. Temporary impacts arise during the construction phase (e.g. temporary use of land for storage of materials), and whilst short in duration may potentially have longer-lasting effects. For example, temporary loss of habitats of high nature conservation value can be as of great a magnitude as the permanent land take of lower value habitats due to the timescales over which recovery occurs (e.g. the time taken to re-establish woodland). Effects may be cumulative, if, for example, the construction of the surface water treatment works and any adjacent developments were to both cause disturbances to the same ecological receptor. All impacts are also be assigned a confidence level, as defined within the IEEM Guidelines (e.g. certain, likely, probably, unlikely).

11.4.3 As outlined in section 11.2 of this chapter, the significance matrix shown in Table 11.4 is broadly used as a guide for determination of significance, but professional judgement is ultimately used to determine level of significance. Unless otherwise stated it can be assumed that the significance level is based on the matrix approach, and any deviations will be justified within the text.

11.4.4 In the following sections, impacts are divided into construction and operation stages, and the following sections are based on the assessment of the magnitude and significance of impacts *before* mitigation. Mitigation and monitoring methods are fully discussed in Section 11.5. A summary table at the end of the present Section 11.4 summarises the impacts upon ecological features as a result of operation and construction *before* mitigation. Significance of impacts *with* mitigation in place, are summarised in a summary and conclusions section in Table 11.16 at the end of this Chapter.

Effects of Site Construction

11.4.5 Effects related to site preparation and construction include site clearance, demolition of houses, break-up of areas of hardstanding, tree felling, and clearance of other semi-natural habitats. A range of impacts, with potential adverse ecological effects, are associated with demolition and construction works. These are listed in Table 11.12.

Table 11.12: Construction Impact Summary Table

Construction Impacts	Nature of Impact
Landtake	Habitat loss – a direct impact. The severity of this effect is directly related to the relative amount of habitat lost, the conservation value of that habitat, whether it is a temporary or permanent loss, and whether the habitat can be restored or recreated. This Scheme will involve use of areas of terrestrial habitats, and both permanent and temporary effects can be anticipated.
Noise & Vibration	Noise associated with construction, especially piling, acting on sensitive species (e.g. sensitive waterfowl, breeding birds). The impacts will be seasonally dependent. Vibration associated with construction could cause an indirect temporary impact upon sensitive species.
Visual disturbance	Some birds are sensitive to visual disturbance (in construction usually in combination with noise disturbance). The impacts will be seasonally dependent. This would be a temporary indirect impact.
Water quality impacts	Pollution of watercourses -an indirect effect. There are several potential sources of pollution: run-off of materials from stockpiles, accidental spillage, disturbance of previously confined contaminants, pollution such as oils from site machines or chemicals from processes used in demolition or construction (e.g. solvents, paints). Whilst the source of effects is temporary, the result of those effects may be either temporary or permanent.
Dust	Dust deposition adjacent to work sites leading to damage to vegetation, along with air quality and water quality impacts (see above). This would be either a temporary or permanent direct impact.
Lighting	Construction lighting could provoke behavioural changes in sensitive species. The impacts will be seasonally dependent. This would be a temporary indirect impact.
Spread of alien, invasive species	Construction traffic could lead to fragments of Japanese knotweed being spread around the Scheme Study Area and beyond leading to the establishment of new colonies of this alien species. This would be a

Construction Impacts	Nature of Impact
	permanent direct impact.

Effects of Operation

11.4.6 The potential adverse ecological effects impacts involved with the operation of the new road Scheme are outlined in Table 11.13.

Table 11.13: Operation Impacts Summary Table

Operation Impacts	Nature of Impact
Noise	Noise due to traffic acting on sensitive species (e.g. sensitive waterfowl, badgers, otters).
Visual disturbance	Visual disturbance due to human activity acting on sensitive species (e.g. sensitive waterfowl).
Water quality impacts	Due to contaminated run-off.
Air quality impacts	Due to increased traffic movements along Shore Road.
Lighting	Road signage and lighting could disturb sensitive species, particularly where new lighting will be required along the off-line section.
Landscaping	Due to introduction of new vegetation types and species.
Spread of alien, invasive species	Future Scheme maintenance works could lead to fragments of Japanese knotweed being spread around the Scheme Study Area and beyond leading to the establishment of new colonies of this alien species. This would be a permanent direct impact.
Road mortality	Increased risk of road mortality to badger, otter and birds due to faster moving traffic and increase in lane numbers resulting in a wider carriageway to cross.

Evaluation of Impacts on Ecological Features

Statutory designated sites

11.4.7 There may be some pollution and water quality related impacts upon watercourses and downstream impacts upon the Belfast Lough. The water quality issues are discussed in more detail in Chapter 12.

11.4.8 Potential for downstream pollution depends on flow rates of the main watercourses on site and current hydrological conditions. There is no hydrological data for any of the watercourses crossed by the Scheme but flow assessments were made for the four main watercourses (Target Notes 33 (Silver Stream), 34, 45 and 54-56 (Jointure Bay Stream SLNCI), using accepted methodologies from the Institute of Hydrology's Low Flow Studies Reports. This hydrological data is presented below, as detailed within Chapter 12, including an assessment of risk of pollution assessment (as detailed in DMRB Volume 11, Section 3, Part 10, HA 216/06).

- Target Note 33 (Silver Stream): catchment area in the order of 1.3km^2, likely to produce an average daily flow in the region of 0.03m^3/s of medium sensitivity with low risk of pollution.
- Target Note 34: catchment area in the order of 1.3km^2, likely to produce an average daily flow in the region of 0.03m^3/s of medium sensitivity with low risk of pollution.
- Target Note 45: catchment area in the order of 0.7km^2, which is likely to produce an average daily flow in the region of 0.015m^3/s, of medium sensitivity with low risk of pollution.
- Target Note 54-56 (Jointure Bay Stream SLNCI): catchment area in the order of 1km^2, which is likely to produce an average daily flow in the region of 0.02m^3/s, of medium sensitivity with high risk of pollution. Further, this discharges to the Belfast Lough within 120m of the road.

Construction

11.4.9 There will be no direct landtake or reduction in habitat area for the Ramsar site, SPAs or ASSIs as a result of the Scheme and no habitat or species fragmentation within these sites is expected to occur during construction.

11.4.10 Based on the above information, construction activities and in particular alteration of culverts may have the potential to cause pollution due to accidental spillages, which is assessed as **medium impact magnitude and be highly significant and unlikely to occur. However if spillages did occur the negative impacts would be probable.** Impacts upon the avian qualifying features of the Belfast Lough are further discussed within the wintering birds section.

11.4.11 This assessment is in the absence of mitigation, and there were discussions with EHS and the design team to mitigate against potential impacts during construction in order to remove the need for an assessment of Article 6 of the Habitats Directive Council Directive No. 92/43/EEC.

Operation

11.4.12 It is not anticipated that there will be any appreciable increase in noise, visual or lighting disturbance as a result of the operation of this Scheme. Possible impacts include air quality and water quality impacts. The proposal should not have the effect of moving traffic appreciably closer to the Belfast Lough than it is currently. The

distance of separation and limited changes in air quality pollutants will prevent any increased indirect or direct pollution impacts upon the notified features of SPA/Ramsar sites and ASSI. This is further discussed within the Air Quality chapter.

11.4.13 Water quality impacts are possible. There is potential for an increased level of pollutants reaching Belfast Lough as a result of untreated contaminated road-runoff, though SUDS will be incorporated as part of the Scheme, particularly along the on-line section (discussed further below). The magnitude of water quality impacts in the **absence** of SUDS systems is **medium and may be highly significant and likely to occur.**

11.4.14 As above, this assessment is in the absence of mitigation, and there were discussions with EHS and the design team to mitigate against potential impacts, though SUDS principles and to remove the need for an assessment of Article 6 of the Habitats Directive Council Directive No. 92/43/EEC.

Non-statutory designated sites

Construction

11.4.15 No direct landtake or reduction in habitat area is expected for the areas of long-established woodland within Seapark.

11.4.16 Jointure Bay Stream SLNCI will be subject to direct and permanent construction impacts. A bridging structure will be employed to carry the offline section over the SLNCI before re-joining with the on-line section of the existing Shore Road. This will involve the felling of semi-natural trees and clearance of scrub associated with the SLNCI estimated as 740m^2. **The loss of habitat is assessed as being direct and permanent, and the magnitude is assessed as being medium and non-significant but certain to occur.**

11.4.17 However the watercourse associated with Jointure Bay Stream SLNCI may be indirectly and permanently affected by the Scheme. There is a risk of pollution to the SLNCI during construction, which may directly feed downstream to the Belfast Lough. This watercourse water quality is not expected to be high (see Chapter 10), but the stream does not show signs of gross pollution, so it has been assigned a “fairly good” classification level. It is not anticipated that the proposals will cause a major shift in the aquatic ecosystem associated with the SLNCI. **The magnitude is assessed as medium and non-significant and likely to occur.** However these impacts are also discussed separately within the Water Resources chapter.

Operation

11.4.18 The areas of long-established woodland will not be directly or indirectly impacted at any stage during the operational phase of the Scheme . It is not expected that the new alignment will result in a significant change to airborne pollutants. This issue is examined in more detail within the Air Quality chapter.

11.4.19 Jointure Bay Stream SLNCI is not anticipated to be subject to operation effects on habitats, though some shading due to the bridging structure may cause adjacent plants to die-back. Water quality within Jointure Bay Stream SLNCI may be impacted during the operational phase, depending upon the exact road drainage arrangements, which are subject to detailed design. At present it is anticipated that SUDS systems will be implemented between the offline section and the existing A2 carriageway (further discussed in the mitigation section). However, in the absence of SUDS, the magnitude of water quality impacts is **medium and may be significant and likely to occur.**

Habitats

Construction

11.4.20 There will be areas of direct habitat loss to allow construction of the proposed re-alignment of the A2. In most areas this will be limited to the habitats immediately adjacent to the existing alignment, where on-line widening is occurring, and the estimated area is 19440 m^2. However the off-line section will involve land-take through primarily agricultural grassland areas, with an estimated 71000m^2 of these habitats being lost. The habitats affected will include intensively managed gardens and lawn areas, built-up areas and hard standing, amenity grassland, improved grassland, marshy grassland, semi-improved grassland, broad-leaved plantation, broad-leaved woodland, mixed plantation, coniferous plantation, scrub, open standing water, tall herbs, tall ruderal, individual trees, running water and hedgerows, all of which have been assigned of local value to nature conservation. These existing areas of habitat are limited in their size and ecological quality or value, and are widely distributed within the wider area. **The loss of habitat is assessed as being direct and permanent, and the magnitude is assessed as being medium and non-significant and certain to occur.**

11.4.21 There is the potential for impacts upon the water quality within the watercourses along the alignment. These are also considered separately within the Water Resources chapter. As outlined, potential for pollution of watercourses depends on flow rates of the main watercourses on site and current hydrological conditions etc. Within the water resources chapter, all watercourses were deemed to incur a low risk of pollution, apart from Jointure Bay Stream SLNCI which is deemed to have a high risk, based on estimates. Further, the watercourses flow directly to the Belfast Lough, and any negative impacts would only occur through a short section of the relative length. Therefore impacts upon watercourses are deemed to be of **low magnitude, non-significant and unlikely to occur.** Downstream impacts upon Belfast Lough are considered within the statutory designated sites section.

Operation

11.4.22 Initially during the construction phase there will be some loss of semi-natural habitats along the on-line and off-line sections of the Scheme. However, over time the landscape planting proposed in Chapter 12 – Landscape and Visual Effects should partially compensate for the loss of some of the semi-natural habitats removed during construction. The loss of these habitats is therefore a direct but temporary loss, and during the operational phase the impact will reduce over time until the new planting becomes established. **These impacts have been assessed as low (in the long-term) and non-significant and certain to occur.**

Invasive Species

Construction

11.4.23 An invasive species, Japanese knotweed was observed growing at two locations within the study area. Stem and root fragments can be easily spread inadvertently on construction sites through site traffic and can then establish new dense stands which displace native plant species. The rhizome system can extend 7m from the parent plant and can be present up to 3m deep in the soil. The roots can cause structural damage to buildings and other infrastructure. There is the added danger of Japanese knotweed being spread to the foreshore. **The spread of Japanese knotweed is assessed as being direct and permanent, and the magnitude is assessed as being high and significant and likely to occur, if works are carried out in the vicinity of identified invasive species stands.**

Operation

11.4.24 An invasive species, Japanese knotweed was observed growing at two locations within the study area. Stem and root fragments can be easily spread inadvertently on construction sites through site traffic and can then establish new dense stands which displace native plant species. If the existing populations of Japanese knotweed are not eradicated during the construction phase then there is a risk that it will be spread during future Scheme maintenance works. **If the Japanese knotweed populations are not eradicated during construction then its spread is assessed as being direct and permanent, and the magnitude is assessed as being medium and significant and likely to occur.**

Otter

Construction

11.4.25 As noted in the baseline section, there has been a recent otter road-kill adjacent to Station Road Junction. This indicates that otters are present in the wider area, and do cross the A2 *en route* between Belfast Lough and the wider area. It is possible that noise, vibration and lighting from construction activity could cause disturbance in the surrounding area, potentially impacting on otters. However, all such impacts will be temporary in nature and are not likely to be significantly greater than existing baseline levels resulting from the existing A2. Also, otters are mainly nocturnal though may also be considered crepuscular in some habitats, and will be moving along the riverbank during the hours of darkness when construction activity will have ceased.

11.4.26 If otters do use some of the smaller watercourses along the A2 during the construction period, and move towards construction activity areas, there is a slightly increased risk of road-kill incidents due to the number of construction vehicles in the area. The magnitude of impact upon otters is assessed as **low and non-significant and unlikely to occur, though will have serious implications should they occur.**

Operation

11.4.27 It would appear that otters only cross the A2 carriageway infrequently using the watercourses along the Shore Road. If otters attempt to cross the widened on-line and off-line sections, there is potential for an increase in otter road-kill mortality due to faster moving vehicles and an increased number of lanes of traffic to cross. Permanent lighting associated with the offline section would potentially impact upon otter holts/couches if they are present. **The magnitude of impact upon otters has been assessed as low and non-significant and unlikely to occur.**

Badgers

Construction

11.4.28 There are currently no badger setts within the Scheme boundary, but although unlikely, it is possible that a new sett (s) could be established prior to commencement of works. Work that disturbs a badger sett is illegal without a licence from EHS. Even if works do not directly impact upon a badger sett, there is potential for badgers to be affected during the construction period. **The magnitude of impact has been assessed as low and non-significant and extremely unlikely to occur, though will have serious implications should they occur.**

Operation

11.4.29 No signs of badger setts or other signs of activity have been observed during the baseline survey work, and there are no records that badgers are present in the immediate area. **The impacts upon badgers during the operational period are**

therefore assessed as negligible and non-significant and extremely unlikely to occur.

Bats

Construction

11.4.30 Potential roosting habitat in the form of buildings/mature trees will be demolished/felled during the construction period. While no bat roosts were located within the Scheme Study Area, this cannot be ruled out. There could be a permanent and direct impact upon bats. **The magnitude of impact has been assessed as medium and significant and unlikely to occur in relation to buildings and extremely unlikely to occur in relation to mature trees. However there will be serious implications should they occur.**

11.4.31 Foraging habitat will be removed during the construction period, particularly along hedgerow and mature trees lines in the off-line section. This will lead to limited loss of foraging areas during the first few years of operation, until the landscape planting of the Scheme has matured. Loss of foraging habitat will be a temporary and indirect impact upon bats. **The magnitude of impact has been assessed as negligible and non-significant, though likely occur.**

Operation

11.4.32 Poor quality foraging habitat will be removed during the construction period, and this will lead to limited loss of foraging areas during the first few years of operation, until the landscape planting of the Scheme has matured. This will be a temporary and indirect impact upon bats, and will not cause problems due to the extent of better foraging along adjacent areas. **The magnitude of impact has been assessed as negligible and non-significant and likely to occur.**

Birds

11.4.33 The impact of the Scheme on the ornithological receptors has been divided into two main categories; impacts on breeding birds and impacts on wintering waders and wildfowl assemblages associated with Belfast Lough.

11.4.34 The Scheme is likely to impact indirectly upon different bird species in different ways during the construction and operational phases, depending upon the ecological needs of the various species, and sensitivity to disturbance. The development is likely to have some of the following effects on wintering bird species:

- Disturbance or loss of habitat for breeding birds;
- Disturbance due to noise and human activity;
- Potential interruption of bird flyway; and/or
- Birds-strike risk, collision with unloading cranes, or other tall construction plant, particularly in relation to overbridge construction over Jointure Stream Bay SLNCI.

11.4.35 While loss of habitat is relatively straightforward to calculate, disturbance can be difficult to quantify, due to the number of factors involved, such as level of noise, its type, regularity, and whether it is associated with any other stimuli such as human presence and the ecological requirement of the species. In general birds respond to disturbance in a number of ways, depending on intensity, frequency and duration (Hill *et al*, 1997). This may range from complete habituation to the abandonment of an area. In general, passive low-level continuous disturbance (as may be caused during

operation) results in habituation, whereas active high-level infrequent disturbance (associated with construction) may displace birds for short periods of time, though the site retains most of its attraction (Hockin *et al* 1992).

11.4.36 The impact of the Scheme on the ornithological receptors has been divided into two main categories; impacts on breeding birds and impacts on wintering waders and wildfowl assemblages associated with Belfast Lough.

Breeding Birds

Construction

11.4.37 Two red-listed species (house sparrow and starling) and two species of birds listed on the amber list of Birds of Conservation Concern are likely to be breeding within the gardens, trees/scrub or buildings along the Scheme. At least another six species on the green list are likely to breed within the Scheme study area. There will be some direct impacts on breeding bird populations during the construction phase due to disturbance of birds through increased noise levels and vehicle movements and depending on the timing of works, potential direct loss of active nests and breeding birds. However, the potential number of birds disturbed will be relatively low in terms of the wider populations of any affected species. Any impacts due to disturbance will be temporary and of **medium magnitude and non-significant and likely to occur.**

11.4.38 There will be some direct impacts on breeding bird populations during the construction phase due to the loss of potential breeding habitat. There is an abundance of suitable breeding and foraging habitat for all of these species within the wider area. In addition, landscape planting (proposed in Chapter 12 – Landscape and Visual Effects) will help to compensate for any minor loss of these habitats. Without the planting, any **impacts will be direct, permanent and of medium magnitude and non-significant and likely to occur.**

Operation

11.4.39 Disturbance during the operational phase is not likely, as it will not differ considerably from the current situation, as the A2 carriageway is currently busy and noise levels are deemed to remain relatively similar. In addition, increased lighting levels along construction areas have the potential to disturb birds. However, given the baseline level of illumination in the Shore Road area, it is not deemed to be a potential impact during this Scheme. However, any increase in disturbance caused by operational noise/lighting will be of **negligible magnitude and non-significant and unlikely to occur.**

Wintering Birds

Construction

11.4.40 The main impact on wintering birds may be due to disturbance, the extent of which depends upon the timing of the works. Bird disturbance will come either from noise, probably loud unavoidable bangs, i.e. active high-level infrequent disturbance, as a consequence of the construction of large structures such as the bridge spanning Jointure Bay Stream SLNCI or impact piling. However, the residential area between the Belfast Lough and the A2 effectively screens the wildfowl and waders from such disturbance. Therefore any **impacts due to disturbance would be indirect, temporary, of negligible magnitude and non-significant and be unlikely to occur.** This assessment assumes that no works/construction compounds will be placed on or directly adjacent to the Belfast Lough.

11.4.41 Increased lighting levels along construction areas have the potential to disturb birds. However, given the baseline level of illumination in the Shore Road area, it is not deemed to be a potential impact during this Scheme.

11.4.42 Bird collisions with high-level plant machinery, is a possibility, particularly if cranes are required for major infrastructure works such as the bridge spanning the SLNCI site. Most at risk are large less manoeuvrable species such as swans and geese, but there are no regular numbers of these species using the Belfast Lough. Therefore any **impacts due to bird collisions would be of negligible magnitude and non-significant and be extremely unlikely to occur.**

Operation

11.4.43 Disturbance during the operational phase is not likely, as it will not differ from the current situation, as the A2 carriageway is currently busy and noise levels are deemed to remain similar. In addition, increased lighting levels along construction areas have the potential to disturb birds. However, given the baseline level of illumination in the Shore Road area, it is not deemed to be a potential impact during this Scheme.

11.4.44 Bird collisions with high-level bridge structures is a possibility, such as the bridge spanning the SLNCI site. Most at risk are large less manoeuvrable species such as swans and geese, but there are no regular numbers of these species using the Belfast Lough. Therefore any **impacts due to bird collisions would be of negligible magnitude and non-significant and be extremely unlikely to occur.**

Significance of Environmental Effect

11.4.45 A summary of the potential sources of impact is set out in Table 11.14. These have been divided into two categories, those impacts occurring during construction, and those occurring during operation of the Scheme . The significance of the identified impacts is also set out in the table. This is based on the criteria highlighted in Tables 11.1-11.3. **The stated significance of impact is in the absence of mitigation measures.**

Table 11.14 – Significance of Environmental Effects (continued over)

Feature	Value of Receptor	Potential Impact / Effect	Impact Magnitude	Significance of Impact (without mitigation)	Confidence Level in Predictions
Belfast Lough SPA/Ramsar/ASSI	International	Construction: possible pollution incidents through accidental spillages etc	Medium	HS	Likely
		Operation: possible pollution through road runoff etc	Medium	HS	Likely
Non-statutory sites (Ancient Woodland /SLNCI)	Local Authority Level	Construction: direct permanent loss to SLNCI riparian woodland/scrub	Medium	NS	Certain
		Construction: possible pollution incidents through accidental spillages etc	Medium	NS	Likely
		Operation: possible pollution	Medium	HS	Likely
Habitats	Local	Construction: direct permanent habitat loss through on-line (built-up) and offline (agricultural) sections	Medium	NS	Certain
		Operation: temporary loss of habitats before landscaping develops	Low	NS	Certain
Invasive Species	Local	Construction: spread of Japanese knotweed	High	S	Likely

Feature	Value of Receptor	Potential Impact / Effect	Impact Magnitude	Significance of Impact (without mitigation)	Confidence Level in Predictions
		Operation: spread of Japanese knotweed	Medium	S	Likely
Otters	Northern Ireland	Construction: disturbance of otters, increase in road-kill risk due to construction vehicles	Low	NS	Unlikely
		Operation: increase in road kill incidents	Low	NS	Unlikely
Badgers	Northern Ireland	Construction: road kill incidents, destruction sett, disturbance	Negligible	NS	Extremely Unlikely
		Operation: road kill incidents, disturbance	Negligible	NS	Extremely Unlikely
Bats	Northern Ireland	Construction: potential destruction of roosts in buildings/trees	Medium	S	Unlikely/Extremely unlikely
		Construction: loss of habitat	Negligible	NS	Likely
		Operation: temporary loss of habitats, reduction in number of potential roost sites	Negligible	NS	Likely
Breeding Birds	Local	Construction: Disturbance to breeding birds (depending on season), potential loss active nests (depending on season)	Medium	NS	Likely

Feature	Value of Receptor	Potential Impact / Effect	Impact Magnitude	Significance of Impact (without mitigation)	Confidence Level in Predictions
		Construction: Loss of breeding habitat	Medium	NS	Likely
		Operation: Increased noise/light disturbance	Negligible	NS	Unlikely
Wintering Birds	International	Construction: Disturbance to wintering birds	Negligible	NS	Unlikely
		Construction: Bird collisions with high level machinery	Negligible	NS	Extremely unlikely
		Operation: Bird collisions	Negligible	NS	Extremely unlikely

11.5 Mitigation & Monitoring

Introduction

11.5.1 This section provides a summary of the principles of mitigation considered during the preparation of proposals, and the legislative and policy requirements associated with the ecological features of the site. It also highlights mitigation measures necessary to reduce any adverse effects upon ecological receptors, identified in the previous sections.

Principles of Mitigation

11.5.2 Traditionally mitigation has involved damage limitation or neutralisation of impacts and the principles of mitigation applied here, in order of priority are as follows:

- Avoid any negative impact on the target habitat or species;
- Minimise impacts by input into the Scheme design.

11.5.3 If this is not possible, then:

- Minimise the scale and magnitude of the impact, and then;
- Compensate for the impact through provision of alternatives.

11.5.4 However, there is a growing opinion that new developments should delivery “net ecological gain”, therefore methods to increase the biodiversity value above the baseline should be included with the design process, over and above the principles outlined above (IEEM, 2006). Where possible mitigation principles have been included

and discussed at the design stage, such as the application of Sustainable Urban Drainage System principles.

Legislative and Policy Requirements

Introduction

11.5.5 In addition to the general legal requirements that planners must consider in regard to potential environmental impacts of proposed activities or developments, certain habitats and species are afforded specific protection under European and national legislation. Several European Directives and conventions have been implemented using national legislation. Protected species in Northern Ireland are covered by Schedule 5 to the Wildlife (Northern Ireland) Order 1985 as amended by the Wildlife (Amendment) (Northern Ireland) Order 1995, which makes it an offence to intentionally kill, injure, or take the animal, or to damage, destroy or obstruct access to its resting place, and Schedule 6 which covers animals (other than birds) that may not be killed or taken by specific methods. The Wildlife Order is the national legislation by which Northern Ireland implements the Berne Convention (The Convention on the Conservation of European Wildlife and Natural Habitats). Most protected species in Northern Ireland are also protected by Schedule 2 to the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (CNH) which is the legislation by which Northern Ireland implements the European Habitats and Birds Directives.

11.5.6 The legislative requirements associated with these protected habitats and species, and the implications of these for development are considered below.

Statutory Designated Sites

11.5.7 Special Protection Areas (SPAs) are strictly protected sites classified in accordance with Article 4 of the EC Directive on the conservation of wild birds, also known as the Birds Directive Council Directive No. 79/409/EC, which came into force in April 1979. They are classified for rare and vulnerable birds, listed in Annex I to the Birds Directive, and for regularly occurring migratory species.

11.5.8 Ramsar sites are wetlands of international importance designated under the Ramsar Convention. Sites proposed for selection are advised by the relevant statutory nature conservation agencies, co-ordinated through JNCC. The initial emphasis in relation to site selection was on selecting sites of importance to waterbirds within the UK, and consequently many Ramsar sites are also SPAs classified under the Birds Directive.

11.5.9 ASSIs encompass a national suite of sites providing statutory protection for the best examples of Northern Ireland's flora, fauna, or geological or physiographical features. In Northern Ireland the statutory nature conservation body, EHS, are responsible for identifying and protecting these sites. A large majority of ASSIs are owned by private landowners, and are given certain protection against potentially damaging operations, which must be authorised by EHS prior to taking place. An ASSI also has a certain amount of planning protection, which varies depending upon specific proposals, though no implications are expected for this Scheme.

11.5.10 Coastal habitats are part of the Newtownabbey LBAP and their various component habitats through the UK BAP.

Non-statutory Designated Sites

11.5.11 While ancient woodland is widely recognised as being of ecological value, the vast majority is afforded no legal protection in Northern Ireland. Some ancient woodland has been afforded specific protection through the ASSI designation, while Tree Preservation Orders (TPO) operated by local authorities combine to protect other trees

and areas of woodland (www.woodland-trust.org.uk). However, the presence of long-established woodland on a site will be taken into consideration by EHS.

11.5.12 SLNCIs are protected within the Belfast Metropolitan Area Structure Plan Policy Env2, where planning permission will not be granted for development that would be liable to have an adverse effect on the nature conservation interests of these sites, which are designated for their flora, fauna, or earth science interests.

11.5.13 River and streams are part of the Newtownabbey LBAP, and as Broad Habitats in the UK BAP. Woodland is part of the Newtownabbey LBAP, and broadleaved, mixed and yew woodland is a Broad habitat category on the UK BAP.

Habitats

11.5.14 The habitats present within the study boundary are not subject to specific legal protection. Urban and managed habitats are part of the Newtownabbey LBAP and urban areas and built-up areas and gardens are Broad Habitats within the UK BAP. Agricultural habitats are part of the Newtownabbey LBAP and improved grassland is a Broad Habitat in the UK BAP. Woodland is part of the Newtownabbey LBAP, and broadleaved, mixed and yew woodland is a Broad habitat category on the UK BAP. River and streams are part of the Newtownabbey LBAP, and as Broad Habitats in the UK BAP.

Invasive Species

11.5.15 Japanese knotweed was observed growing at two locations within the study area. Under The Wildlife (Northern Ireland) Order 1985 as amended by The Wildlife (Amendment) (Northern Ireland) Order 1995 it is an offence 'to plant or otherwise encourage' the growth of Japanese Knotweed. This could include cutting the plant or roots and disturbing surrounding soil if not correctly managed.

Otter

11.5.16 Otters are fully protected by The Wildlife (Northern Ireland) Order 1985 as amended by The Wildlife (Amendment) (Northern Ireland) Order 1995 and The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995.. Licences must be obtained from EHS for any activities that involve the killing, injuring, taking or disturbance of otters. Holts are protected as well as couches.

11.5.17 There are provisions in the legislation to allow actions to take place under licence that would otherwise contravene the above law. The implications for the proposed development are that any couches or holts found within the site, must not be disturbed either during development works or during the operation of the proposed road Scheme.

11.5.18 The otter is a priority species on the UK BAP and the NI BAP.

Badgers

11.5.19 Badgers are protected under Schedule 5 ("animals which are protected at all times") to The Wildlife (Northern Ireland) Order 1985 as amended by the Wildlife (Amendment) (Northern Ireland) Order 1995 which makes it an offence to intentionally kill, injure, take, possess, or trade in badgers, and prohibits interference with places used by badgers for shelter or protection (including their setts), or intentionally disturbing badgers occupying such places, without a licence from EHS.

Bats

11.5.20 In Northern Ireland bats are protected under Schedule 5 ("animals which are protected at all times") to The Wildlife (Northern Ireland) Order 1985, as amended by The Wildlife

(Amendment) (Northern Ireland) Order 1995, The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995, The Convention on the conservation of European wildlife and natural habitats (Berne Convention 1982) and The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979). The common pipistrelle is a priority species on the UK BAP and all bats are NI BAP priority species.

Birds

11.5.21 All wild bird species are protected from killing, injury and taking under the Wildlife (Northern Ireland) Order 1985 as amended by The Wildlife (Amendment) (Northern Ireland) Order1995 . In addition this legislation makes it an offence to take, damage or destroy a nest while in use or being built, and to take or destroy the eggs of any nesting bird. In addition, certain species are listed on Schedule 1 to the Order. This makes it an additional offence to intentionally or recklessly disturb the adults while they are in and around their nest or intentionally or recklessly disturb their dependent young. Several bird species protected by the Wildlife Order (as amended) are also covered by Annex I of the EC Birds Directive (1979) Council Directive No. 79/409/EC, affording them European protection. The light bellied brent goose, redshank and lapwing are priority species in the NI BAP.

Mitigation

11.5.22 The following mitigation measures have been identified for the habitats and species likely to be affected by the proposals, but these may require further refinement, which should follow discussions between EHS and the developers before construction commences. It should be noted that some mitigation measures are relevant to the construction phase only, and others to the operation phase only. These are separated within each of the sections.

11.5.23 Early consultation between interested parties is desirable to ensure that practical and effective mitigation is incorporated as early in the project as possible. Mitigation that has already been built into the design includes incorporation of SUDS and other drainage aspects and the provision of a bridge over the Jointure Bay SLNCI to reduce any direct impacts upon the non-statutory designated site.

11.5.24 In the following sections, the extent of mitigation will be assessed as follows:

- Fully - impact fully mitigated, no residual effects predicted;
- Substantially - impact substantially mitigated, some residual effects possible; or
- Partially - impact partially mitigated, some residual effects predicted;

11.5.25 The general mitigation measures identified below should be included within the final design and the employers requirements for the construction phase of the Scheme:

General measures

- An ecologist acting as an “Ecological Clerk of Works” will be retained during construction work to deal with any protected species or other ecological issues that may arise. They will liase with relevant specialists, undertake pre-construction checks, and liase with EHS to provide and supervise mitigation as necessary;
- All site workers will be briefed on the ecological sensitivities of the site, through “Toolbox Talks” and will be provided with clear information about

protected species and restricted areas. Toolbox talks provide a convenient and effective method of communicating and reinforcing the safety and environment messages throughout the workforce on a regular basis;

- Haul roads will be clearly defined and marked. Vehicles will be restricted to the marked routes to avoid incursion into sensitive surrounding habitats, especially within coastal areas and to prevent unauthorised access to the Belfast Lough shore.

- All relevant guidelines for working near water should be followed, including PPG5 "Works in, near or liable to affect watercourses", in accordance with Joint Environment Agency Regulations (Environment & Heritage Service, Scottish Environmental Protection Agency and the Environment Agency) ;

- All potentially polluting liquids and solids associated with vehicles, equipment and machinery need to be identified to site staff so that spillages and washwaters can be prevented from entering watercourses;

- Timing of works will be planned to avoid disturbance to terrestrial breeding bird seasons, i.e. outside mid March – mid August inclusive; and

- At present there is no intention for works on or adjacent to the Belfast Lough shore. Any change to these plans will need to be fully agreed with EHS. If there is the intention for works on, or adjacent to the Lough shore, there may be a need to ensure that timing of works avoids major disturbance to feeding/roosting wildfowl and waders, in consultation with EHS, to avoid the over-wintering peak time of October to March inclusive.

11.5.26 The specific mitigation measure will need to be employed in relation to the following habitats and species of interest.

Statutory Designated Sites

Construction

11.5.27 There are a number of mitigation measures that should be enforced to protect Belfast Lough and its associated features during construction, some of which have been outlined above. This is mainly relating to watercourses, which feed directly into the Belfast Lough, and therefore can potentially carry pollutants with them. While the details of design in relation to construction in the vicinity of watercourses and the Lough have not yet been completely finalised, and are subject to clarification during detailed design, as a minimum the following mitigation measures must be adhered to, which may be compiled within Construction Method Statements and/or Construction Environmental Management Plans:

- An 'ecological clerk of works' will be retained throughout the construction period, and consulted on all issues that have the potential to cause impacts upon the Belfast Lough SPA/Ramsar/ASSI and notified features of interest.

- Guidance published by the Joint Environment Agency should be applied to the Scheme e.g. Pollution Prevention Guideline (PPG) 5, "*Works in, near or liable to affect watercourses*", PPG 6, "*Working at Construction and Demolition Sites*", and PPG 2 "*Above Ground Oil Storage Tanks*".

- Working areas will be clearly defined, that prevent access to the river channel and riverbank vegetation;

- Litter management Schemes will be implemented, to prevent loss of material into the watercourses and downstream to Belfast Lough;

- Stockpiles of earth will not be kept near stream channels. Where possible earth stockpiles should be covered to prevent run-off of sediment-laden water into watercourses;

- On-site storage of chemical, fuel or construction materials shall be limited to those needed for immediate construction. All surplus materials will be removed from the works site as soon as their immediate purpose has been concluded;

- Any fuel or chemical stores will be secure from vandalism and appropriately bunded to at least 110% capacity. These stores should be kept at a safe distance (refer to relevant guidance at time of construction) away from Belfast Lough and watercourses;

- All potentially polluting liquids and solids associated with vehicles, equipment and machinery need to be identified to site staff so that spillages and washwaters can be prevented from entering watercourses;

- Pollution contingency plans will be developed and approved with the relevant agency. These should include designated members of staff to deal with emergencies if they arise;

- The contractor shall not wash tools and equipment in any watercourse. Washwater shall not be discharged into any watercourse or into road drains or disposed of in any way that could result in a discharge to controlled water;

- Mobile bunding or material for bund construction will be available should an emergency barrier need to be constructed to prevent material leakage from a works site into a watercourse; and

- Quantities of absorbent substrate will be available to soak up spillages or leaks;

11.5.28 Chapter 10 – Water Resources also includes additional mitigation measures to safeguard watercourses and Belfast Lough.

Operation

11.5.29 It is assumed that the authorities would require that Sustainable Urban Drainage System (SUDS) principles are applied to all new stretches of road, and where possible to the existing road where this is being widened, in accordance with the technical guidance set out in CIRIA Report C521 “Sustainable Urban Drainage Systems (SUDS) – a design manual for Scotland and Northern Ireland”.

11.5.30 At the time of assessment, outline mitigation measures in relation to road drainage and outfalls and culverts have been agreed in principal and will include two different forms of road drainage in the online and offline sections.

11.5.31 On-line sections will be drained ultimately through carrier drains, which will provide some attenuation of the flows in advance of the outfalls, and some settlement of grit and other deposits will be achieved within the gullies. Before each outfall will be a bypass type fuel/oil interceptor providing primary treatment for the flows in advance of discharge to a watercourse.

11.5.32 Off-line sections will not drain directly into watercourses, but will be channelled to a settlement/attenuation pond (s) adjacent to the offline section, currently proposed to be in the vicinity of Jointure Bay Stream SLNCI, location and design to be finalised during detailed design stages.

11.5.33 Chapter 10 – Water Quality and Drainage also includes additional mitigation measures to safeguard watercourses and Belfast Lough.

Non-statutory designated sites

Construction

11.5.34 All site staff should be made aware of the location of the areas of long-established woodland identified by The Woodland Trust by the Scheme ecologist or Ecological Clerk of Works, and notified about the ecological features of interest and their importance. Briefing must seek to ensure that there will not be any incursion into these woodland sites at any stage during construction or for site compounds. Fencing and signage may require to be erected to prevent access by site staff.

11.5.35 Jointure Bay Stream SLNCI will be directly impacted by the construction works, but habitat loss should be minimised and Joint Agency Pollution Prevention Guidelines should be implemented to reduce impacts upon the watercourse. There should not be any unnecessary incursion into the SLNCI woodland, therefore fencing and signage may be required to prevent unnecessary access by site staff. Planning permission may not be permitted if there will be adverse impacts on the nature conservation interest of a SLNCI.

Operation

11.5.36 Operation impacts upon the ancient woodland are not anticipated. Operation impacts upon the SLNCI will be avoided through SUDS systems along the off-line section as outlined above.

Habitats

11.5.37 The storage and construction compounds must be located within areas agreed with the Scheme ecologist or Ecological Clerk of Works and clearly marked and fenced if necessary, to avoid incursion into ecologically sensitive habitats and be secured to avoid malicious damage. Contractors will implement Joint Environment Agency Regulations PPG2, PPG5, and PPG6 during the construction period, to safeguard the aquatic ecology interest of the watercourses. Landscape planting will be undertaken along the length of the Scheme, and further details of this are detailed in Chapter 12 – Landscape and Visual Effects. The trees, scrub and any grassland mixes specified will be native species and have local provenance, in accordance with best practice.

Invasive Species

Construction

11.5.38 A management plan for the removal/eradication of Japanese knotweed at the site should be produced, where works are scheduled to be carried out in the vicinity of Target Note 3 and Target Note 61 as shown on Figure 11.2. The management plan should include methods to control Japanese knotweed including application of herbicide, cutting, digging and pulling. It is not possible to eradicate an established stand of Japanese Knotweed with a single herbicide application and repeated control measures are required over more than one growing season. Chemical control usually takes a minimum of 3 years to totally eradicate Japanese Knotweed from a site. Given the small amount of Japanese knotweed present on the site a combined treatment of digging and spraying is likely to be the most effective method of control[9].

[9] Environment Agency. Code of Practice for the Management and Destruction of Japanese Knotweed.

11.5.39 Most of the rhizomes of Japanese knotweed exist in the upper layers of topsoil. Excavation of Japanese Knotweed is recommended to be at least 3m deep and to 7m from the parent plants. On completion, the site manager should check the periphery of the excavation for remaining rhizome to ensure that the excavation is of a sufficient size to remove all of the infective plant material. Excavated material should be removed to a licensed landfill or buried on site (see below for further details on disposal of plant material). Digging can be carried out during the winter and re-growth treated during spring and summer. It must be ensured that all plant and equipment used on site is free of Japanese knotweed material before leaving the site to prevent the spread of the plant. The use of excavators with caterpillar tracks should be avoided.

Operation

11.5.40 As long as the construction phase mitigation measures are fully implemented, there should be no operational mitigation required.

Otter

11.5.41 Based on baseline surveys for this assessment, otters are evident within the study area, but current level of usage is very low. The otter specialist or Ecological Clerk of Works will undertake a pre-construction check of the watercourses to determine level of otter use prior to construction, and whether holts or couch areas are in use. Such pre-construction checks should be undertaken in the month before construction activity will affect the areas in question. A licence may be required to undertake these works, depending on the outcome of the pre-construction checks.

11.5.42 The otter specialist or Ecological Clerk of Works will ensure that otter underpasses and fencing designs (if required) are implemented appropriately. This would ensure that the contractors implement the mitigation measures as intended, and would help to ensure that legislative requirements are met, and that impacts upon otters are minimised.

Construction

11.5.43 Site compounds where lighting is to be used should be located well away from any of the watercourses, so that the lighting does not disturb otter activity during the hours of darkness. Precautions will also be necessary to prevent otters from gaining access to the site compounds, and this can be achieved by the use of appropriate fencing, if deemed appropriate by the Ecological Clerk of Works or otter specialist based on results of the pre-construction checks.

Operation

11.5.44 The key requirement is that otter passage through the existing and new-build culverts is maintained. Where the road is being widened over existing culverts, it is intended that these will be lengthened upstream and downstream assuming that the existing culverts are structurally sound. The size and form of the original culvert will be maintained, thereby maintaining suitability for otter passage.

11.5.45 Where the new road alignment deviates from the existing alignment, new culverts will be provided to cross watercourses and field drains. The format of new culverts is likely to be pipe culverts with masonry or concrete headwalls and splay wing walls upstream and downstream. The sizing of the culverts will be completed based on a hydrological assessment of the catchment. Sympathetic culvert design should allow access for otters. This may involve placement of ledges or dry otter underpasses to allow otter passage even through high flow conditions.

11.5.46 The culvert invert will be below the bed level of the existing watercourse to allow some level of re-establishment of the natural bed conditions. The length of the culverts will typically be equivalent to the width of the new road construction (i.e. pavement width and embankment width) as most watercourses flow perpendicular to the proposed road alignment. It is understood that the crossing at the Jointure Bay Stream SLNCI will be made without encroaching into the channel of the watercourse, and this could be done with some form of bridging structure.

11.5.47 Any mitigation that has been incorporated into the design should be fully operational before the road is opened to traffic wherever possible. Unless such mitigation measures are incorporated into the Scheme design then this has implications for the assessment of impacts upon otters within the ES, and it is also likely that EHSEHS would object to the Scheme. The specific details of the otter underpasses and fencing, and licensing requirements should all be agreed with EHS before construction activity commences. Due to the low potential for disturbance of otters, including disturbance of possible shelter sites and disruption to their movement along watercourses, it is not expected that a licence will be required from EHS, but this cannot be ruled out at the present time, and should be reviewed based upon otter evidence at the time of the pre-construction surveys.

Badgers

11.5.48 A pre-construction badger survey is not required, and there are no specific badger related mitigation proposed for this development.

Bats

11.5.49 It is a legal requirement to consult EHS before any work is carried out that might affect bats or their roosts. This might include building, alteration or maintenance work, demolition, reproofing, remedial timber treatment as well as the felling of mature trees acting as bat roosts. Provisions are made within the legislation to allow works to take place under licence that would otherwise contravene legislation.

11.5.50 A bat specialist or Ecological Clerk of Works will be employed at the time of implementing the mitigation measures during the construction period. Specifically they would ensure that the contractors implement the mitigation measures as intended, and would help to ensure that legislative requirements are met, and that impacts upon bats are minimised.

Construction

11.5.51 Although no bat roosts were located during the emergence surveys of August 2006, it is required that a licensed bat specialist carry out further inspection work on all houses immediately prior to demolition. Should bat roosts be found within buildings planned for demolition, discussions will need to be carried out with EHS before demolition can commence.

11.5.52 Workmen should be made aware of the possibility of finding bats. If they do so, they should contact EHS/Ecological Clerk of Works immediately, who will advise a licensed bat worker to come and remove the bats. The work to disturb or attempt to move bats may be legitimately undertaken under the terms of a licence issued by EHS. This should be arranged before the construction work commences.

11.5.53 As many mature deciduous trees as possible should be retained, particularly along Jointure Bay Stream SLNCI where they may provide bat roost sites. Continuous strips of woodland should be maintained, or planted where they are currently absent, in order to provide corridors for bats to access their foraging sites. If any mature trees are to be felled, this should be done stepwise, checking for the presence of bats as each limb is removed, under the constant supervision of an Ecological Clerk of Works.

Operation

11.5.54 Landscape planting should ensure continuity of habitats, through use of native tree and plant species of local provenance. This will ensure that while foraging habitat may be lost/severed in the short time, long-term impacts are minimised.

Breeding Birds

Construction

11.5.55 Any tree or scrub removal, at any of the possible development areas, must be undertaken outwith the breeding bird season, which is regarded as being between mid-March and August. This will avoid damage or destruction to any active nesting sites and disturbance to any breeding birds. If vegetation clearance cannot be undertaken outside of the breeding bird season, then all trees and vegetation must be checked for breeding birds by an Ecological Clerk of Works before the clearance commences, and trees with active nests will be left until breeding has finished.

Operation

11.5.56 Landscape planting will be undertaken around the Scheme to off-set the loss of potential breeding habitat and further details of this are detailed in the Landscape chapter. The trees, scrub and any grassland mixes specified will be native species and have local provenance, in accordance with best practice.

Wintering Birds

11.5.57 Given the low potential for disturbance impacts upon wintering birds on the Belfast Lough, no specific mitigation will be put in place. This assessment is based on the assumption that no work or works related compounds will be located on or adjacent to Belfast Lough. Mitigation measures associated with watercourses should serve to minimise/neutralise and potential pollution impacts upon the Lough habitats, in turn ensuring their invertebrate food sources are not affected.

Mitigation and Monitoring Summary

11.5.58 Table 11.15 summarises impacts upon ecological resources and mitigation measures as a result of the Scheme. This table also includes the extent to which impact can be mitigated, monitoring requirements (if any) and means by which mitigation or enhancement will be delivered.

11.5.59 Impacts which cannot be fully mitigated are further discussed in Residual Impacts, section 11.6.

Table 11.15: Mitigation Measures Summary (continued over)

Impact	Mitigation/ Enhancement measure	Extent to which impact mitigated	Monitoring requirements (if any)	Means by which mitigation or enhancement will be delivered
Construction				
Statutory designated sites: Pollution impacts upon Belfast Lough SPA/RAMSAR/ASSI	• An 'ecological clerk of works' will be retained throughout the construction period; • Guidance published by the Joint Environment Agency should be applied to the Scheme; • Working areas will be clearly defined, that prevent access to the river channel and riverbank vegetation; • Litter management Schemes will be implemented; • Stockpiles of earth will not be kept near stream channels. Where possible earth stockpiles should be covered to prevent run-off of sediment-laden water into watercourses; • On-site storage of chemical, fuel or construction materials shall be limited to those needed for immediate construction. All surplus materials will be removed from the works site as soon as their immediate purpose has been concluded; • Any fuel or chemical stores will be secure from vandalism and appropriately bunded to at least 110% capacity. These stores should be kept at a safe distance (refer to relevant guidance at time of construction) away from Belfast Lough and watercourses; • All potentially polluting liquids and solids associated with vehicles, equipment and machinery need to be identified to site staff so that spillages and washwaters can be prevented from entering watercourses; • Pollution contingency plans will be developed and approved with the relevant agency. These should include designated members of staff to deal with emergencies if they arise; • The contractor shall not wash tools and equipment in any watercourse. Washwater shall not be discharged into any watercourse or into road drains or disposed of in any way that could result in a discharge to controlled water; • Mobile bunding or material for bund construction will be available should an emergency barrier need to be constructed to prevent material leakage from a works site into a watercourse; and • Quantities of absorbent substrate will be available to soak up spillages or leaks;	Substantially	Monitoring of success of SUDS in eliminating pollutants	Implementation of The Roads (Northern Ireland) Order 1993
Non-statutory designated sites: possible pollution incidents, loss	• An Ecological Clerk of Works will be retained throughout the construction period; • Minimise habitat loss; • Site staff aware of location of sensitive habitats; and	Substantially	Monitoring of success of SUDS in eliminating	Implementation of The Roads (Northern Ireland)

Impact	Mitigation/ Enhancement measure	Extent to which impact mitigated	Monitoring requirements (if any)	Means by which mitigation or enhancement will be delivered
of habitat	• Fencing and signage of sensitive habitats.		in eliminating pollutants	Order 1993 Method Statements prepared prior to construction.
Habitats: direct permanent habitat loss, pollution of watercourses	• An Ecological Clerk of Works will be retained throughout the construction period; • Storage and construction compounds located in areas agreed with Ecological Clerk of Works; • Observance of Joint Environment Agency Regulations; and • Landscape planting using species of local provenance.	Substantially	Monitoring of success of SUDS in eliminating pollutants	Implementation of The Roads (Northern Ireland) Order 1993 Method Statements prepared prior to construction.
Invasive species: possible spread Japanese knotweed	• An Ecological Clerk of Works will be retained throughout the construction period; • Japanese knotweed Method Statement; • Spraying and digging out Japanese knotweed rhizomes; and • Disposal of plant material in licensed landfill.	Fully	Regular checks (monthly) to ascertain any regrowth	Method Statement prepared prior to construction.
Otters: Disturbance of otters	• An Ecological Clerk of Works will be retained throughout the construction period; • Pre-construction check for shelters and extent of otter usage of site; • Culverts to remain passable to otter during construction phase; and • Site compounds sited away from watercourses.	Substantially	None	Implementation of The Roads (Northern Ireland) Order 1993
Badgers: road kill incidents, destruction sett, disturbance	• An Ecological Clerk of Works will be retained throughout the construction period. • None suggested due to low potential for impacts.	Fully	N/a	N/a
Bats: potential destruction of roosts Loss of habitat	• Inspection of all buildings and suitable tree roost sites prior to demolition or felling; • Workmen advised of possibility of finding bats on site; Felling of mature trees using stepped approach for each limb. • Continuous strips of woodland retained and any gaps replanted with native species of local provenance.	Substantially	None	Implementation of The Roads (Northern Ireland) Order 1993 Method Statements

Impact	Mitigation/ Enhancement measure	Extent to which impact mitigated	Monitoring requirements (if any)	Means by which mitigation or enhancement will be delivered
		Substantially		Statements prepared prior to construction.
Breeding birds: Destruction of nests/ disturbance of breeding birds Loss of potential breeding habitat	• Any necessary removal of scrub/trees to be take place outside of the breeding season (March-August). If not possible, works to be supervised by experienced ornithologist to avoid nest disturbance. • Planting of native tree, scrub and grassland species.	Substantially Substantially	N/a	Implementation of The Roads (Northern Ireland) Order 1993 Implementation of The Roads (Northern Ireland) Order 1993
Wintering Birds: disturbance to wintering birds	• No site compounds or works carried out on or adjacent to the Belfast Lough; • No further specific mitigation put in place due to low potential for impact. No proposals for any works to be carried out in close proximity to Belfast Lough.	Fully	N/a	N/a
Operation				
Statutory designated sites: pollution impacts upon Belfast Lough SPA/RAMSAR/ASSI	• Appropriate pollution prevention controls including SUDS, including a bypass type fuel/oil interceptor providing primary treatment for the flows in advance of discharge to a watercourse.	Substantially	Monitoring of success of SUDS in eliminating pollutants	Implementation of The Roads (Northern Ireland) Order 1993
Non-statutory designated sites: possible pollution	• Appropriate pollution prevention controls including SUDS, including a bypass type fuel/oil interceptor providing primary treatment for the flows in advance of discharge to a watercourse.	Substantially	Monitoring of success of SUDS in eliminating pollutants	Implementation of The Roads (Northern Ireland) Order 1993
Habitats: temporary loss of habitats, pollution of	• Maintenance of landscape planting.	Fully	Routine aftercare schedule	Implementation of The Roads

Impact	Mitigation/ Enhancement measure	Extent to which impact mitigated	Monitoring requirements (if any)	Means by which mitigation or enhancement will be delivered
habitats, pollution of watercourses			schedule Monitoring of success of SUDS in eliminating pollutants	(Northern Ireland) Order 1993
Invasive species: possible spread Japanese knotweed	• Should not be required as long as Japanese knotweed is eradicated during the construction phase.	Substantially	Regular checks (monthly) to ascertain any regrowth	Implementation of The Roads (Northern Ireland) Order 1993
Otters: disturbance of otters and their travel routes	• Fencing positioned to guide animals into underpasses; • Sympathetic culvert and bridge design; and • On-going maintenance of fencing and underpasses.	Fully	N/a	N/a
Badgers: road kill incidents, destruction sett, disturbance	• None, low likelihood of occurrence, does not warrant specific mitigation measures.	Fully	N/a	N/a
Bats: Loss of habitat	• Maintenance of landscape planting.	Substantially	N/a	N/a
Breeding birds: Loss of potential breeding habitat	• Maintenance of landscape planting.	Substantially	N/a	N/a
Wintering Birds: disturbance to wintering birds	• No operational impacts anticipated so no mitigation measures suggested.	N/a	N/a	N/a

11.6 Predicted Residual Impacts

11.6.1 This section describes the residual impacts of the Scheme , assuming that all of the mitigation or enhancement measures described above are fully implemented and there are no changes to Scheme design affecting any of the identified ecological receptors.

Statutory designated sites

Construction

11.6.2 There is the potential for pollution incidents to the watercourses which flow into the Belfast Lough during construction. These risks have all been substantially reduced through the proposed mitigation measures and any residual impacts on watercourses will be of **low magnitude and non-significant if all of these mitigation measures are put in place.**

Operation

11.6.3 There is the potential for pollution to the watercourses draining to the Belfast Lough during operation. These risks have all been substantially reduced through the proposed mitigation measures and any residual impacts on watercourses will be of **low magnitude and non-significant if all of these mitigation measures are put in place.**

Non-statutory designated sites

Construction

11.6.4 There is the potential for direct loss of the SLNCI area and pollution incidents to Jointure Stream Bay SLNCI during construction. These risks have all been substantially reduced through the proposed mitigation measures and any residual impacts on watercourses will be of **low magnitude and non-significant if all of these mitigation measures are put in place.**

Operation

11.6.5 There is the potential for pollution to Jointure Stream Bay SLNCI during operation. These risks have all been substantially reduced through the proposed mitigation measures and any residual impacts on watercourses will be of **low magnitude and non-significant if all of these mitigation measures are put in place.**

Habitats

Construction

11.6.6 There will be some loss and fragmentation of habitat associated with the construction phases. Mitigation measures will minimise the loss and disturbance of this habitat and the long-term magnitude of the residual impact will be **low and non-significant.**

Operation

11.6.7 Habitat loss will be compensated for substantially by the proposed landscape planting and the long-term residual impact will therefore be of **low magnitude and non-significant.**

Invasive species

11.6.8 There is potential for the spread of Japanese knotweed, both during the construction and operation phases. However, providing that the mitigation measures are

implemented at the construction phase, and the species is eradicated from the Scheme area before works begin, then there will be a **long-term and significant positive residual impact.**

Otter

Construction

11.6.9 There is the possibility of disturbance to otters during construction through blockage/amendments to culverts and noise/vibration disturbance. However, mitigation procedures will reduce these impacts substantially, and long-term magnitude of the residual impact will be **low and non-significant.**

Operation

11.6.10 There is the possibility of disturbance to otters during operation, through amendments to culverts, but mitigation procedures will reduce these impacts substantially, and long-term magnitude of the residual impact will be **low and non-significant.**

Badger

Construction

11.6.11 There is the possibility of road kill incidents, sett destruction and disturbance, though highly unlikely. The on-site presence of an Ecological Clerk of Works and the Toolbox talks will fully reduce the potential impacts to **negligible and non-significant.**

Operation

11.6.12 Residual impacts remain **negligible and non-significant and unlikely to occur.**

Bats

Construction

11.6.13 There is a potential for impacts upon bats and/or bat roosts in trees/buildings. The pre-construction check mitigation procedures should substantially compensate for this, by reducing the probability of adverse effects. The overall residual impact will therefore be of **low magnitude and non-significant.**

11.6.14 There will be loss of potential bat roosts and foraging areas where mature trees and buildings are removed. The mitigation measures and proposed planting will partially compensate for this in time by providing foraging corridors and potential alternative roost sites. The overall residual impact will therefore be of **low magnitude and non-significant.**

Operation

11.6.15 The proposed landscape planting will substantially compensate for the loss of bat roosting/foraging habitat over time. The long-term magnitude of the residual impact will therefore be **negligible and non-significant.**

Breeding Birds

Construction

11.6.16 The avoidance of the breeding bird season for vegetation clearance, or carrying out pre-construction checks if work is carried out during the breeding season, will substantially reduce adverse impacts. The long-term magnitude of the residual impact will therefore be **negligible and non-significant and unlikely to occur.**

11.6.17 There will be some loss of habitats, which provide potential breeding and foraging habitat to birds, though the habitat loss will be minimised as part of the design. The residual impacts will remain **medium and non-significant and likely to occur.**

Operation

11.6.18 However, the proposed landscape planting will substantially compensate for the loss of breeding bird habitat over time. The long-term magnitude of the residual impact therefore will be **negligible and non-significant.**

Wintering Birds

Construction

11.6.19 As long as work is not carried out on or adjacent to the Belfast Lough, residual disturbance impacts are **negligible, non significant and unlikely to occur.**

Operation

11.6.20 No residual impacts anticipated during the operation phase.

11.7 Summary and Conclusions

11.7.1 This Chapter described and evaluated the ecological impacts of the Scheme in line with current guidance (IEEM, 2006) and with cognisance of legislative and policy frameworks. The ecological surveys entailed a Phase 1 habitat survey with target notes, otter, bat, badger, breeding bird surveys and an assessment of existing wintering bird data provided by BTO.

11.7.2 The nearest statutory designated sites for nature conservation are Belfast Lough, designated as a Ramsar site, Special Protection Area (SPA) and Area of Special Scientific Interest (ASSI), and Belfast Open Water SPA primarily designated for the wintering wildfowl interest. Consultations were carried out with the Department for Regional Development, Roads Service as the competent authority to confirm whether an assessment of Article 6 of the Habitats Directive Council Directive No. 92/43/EEC will be required to examine the ecological impacts upon the Belfast Lough and Outer Belfast Loch SPAs (also referred to as an Appropriate Assessment). It was deemed that the assessment of Article 6 would not be required for this scheme. These sites were valued as **International** value for nature conservation. Special Protection Areas (SPAs) are strictly protected sites classified in accordance with Article 4 of the EC Directive on the conservation of wild birds, also known as the Birds Directive Council Directive No. 79/409/EC, which came into force in April 1979. They are classified for rare and vulnerable birds, listed in Annex I to the Birds Directive, and for regularly occurring migratory species.

11.7.3 Jointure Bay Stream Site of Local Nature Conservation Importance (SLNCI) is located at the northern end of the Scheme area. There are two areas of woodland near Seapark House identified as long-established woodland included within the Ancient Woodland Inventory. Some UK Biodiversity Action Plan (BAP), Northern Ireland BAP

or Newtownabbey Biodiversity Action Plan (LBAP) species and habitats are present within the study boundary. These sites were valued as **Local Authority Area** value for nature conservation.

11.7.4 Some ancient woodland has been afforded specific protection through the ASSI designation, while Tree Preservation Orders (TPO) operated by local authorities combine to protect other trees and areas of woodland (www.woodland-trust.org.uk). However, the presence of long-established woodland on a site will be taken into consideration by EHS. SLNCIs are protected within the Belfast Metropolitan Area Structure Plan Policy Env2, where planning permission will not be granted for development that would be liable to have an adverse effect on the nature conservation interests of these sites, which are designated for their flora, fauna, or earth science interests.

11.7.5 The remaining habitats include intensively managed gardens and lawn areas, built-up areas and hard standing, amenity grassland, improved grassland, marshy grassland, semi-improved grassland, broad-leaved plantation, broad-leaved semi-natural woodland, mixed plantation, coniferous plantation, dense and scattered scrub, open standing water, tall herbs, tall ruderal, individual trees, running water and hedgerows. These sites were valued as **Local** value for nature conservation. The habitats present within the study boundary are not subject to specific legal protection.

11.7.6 An invasive species, Japanese knotweed (*Fallopia japonica*), was observed growing at two locations within the study area at the southern and northern ends of the Scheme area. Under The Wildlife (Northern Ireland) Order 1985 as amended by The Wildlife (Amendment) (Northern Ireland) Order 1995 it is an offence 'to plant or otherwise encourage' the growth of Japanese Knotweed. This could include cutting the plant or roots and disturbing surrounding soil if not correctly managed.

11.7.7 Otter surveys were carried out and while no evidence was found on site, and watercourses show low suitability for otters. In addition a road-kill record was provided (Ian Enlander, EHS, *pers. comm.*) east of Greenisland/Station Road Junction on 8th September 2006. Otters are valued as **Northern Ireland** level value for nature conservation. Otters are fully protected by Schedule 5 to The Wildlife (Northern Ireland) Order 1985 as amended by The Wildlife (Amendment) (Northern Ireland) 1995 and The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995. Licences must be obtained from EHS for any activities that involve the killing, injuring, taking or disturbance of otters. Holts are protected as well as couches.

11.7.8 No signs of badger activity, including setts, were observed during the surveys. Badgers are valued as **Northern Ireland** level value for nature conservation. Badgers are protected under Schedule 5 ("animals which are protected at all times") to the Wildlife (Northern Ireland) Order 1985 as amended by The Wildlife (Amendment) (Northern Ireland) Order 1995 which makes it an offence to intentionally kill, injure, take, possess, or trade in badgers, and prohibits interference with places used by badgers for shelter or protection (including their setts), or intentionally disturbing badgers occupying such places, without a licence from EHS.

11.7.9 No bat roosts were located, though 6-8 and 34 Shore Road, were deemed to be of high suitability for roosting bats, however direct access was not possible for closer inspection. Dusk emergence surveys were undertaken on 7th August 2006 and bat activity on the site was limited to three species, common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus)* and Leisler's bat (*Nyctalus leisleri*). A Daubenton's bat (*Myotis daubentonii*) was possibly recorded near 6 Shore Road. Bats are valued as **Northern Ireland** level value for nature conservation. In Northern Ireland bats are protected under Schedule 5 ("animals which are protected at all times") to the Wildlife (Northern Ireland) Order 1985, as amended by The Wildlife (Amendment) (Northern Ireland) Order 1995, The Conservation (Natural Habitats, etc.)

Regulations (Northern Ireland) 1995, The Convention on the conservation of European wildlife and natural habitats (Berne Convention 1982) and The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979). The common pipistrelle is a priority species on the UK BAP and all bats are NI BAP priority species.

11.7.10 A total of 20 species were recorded during the Breeding Bird Survey (BBS). Of these, nine species were considered to be breeding. The bird assemblage is largely typical of urban built-up areas including common woodland and agricultural species. The most common breeding species were wren and chaffinch. A rookery with c. 30 nests was located within Seapark woodland. Breeding birds are valued as **Local** level value for nature conservation.

11.7.11 Core Count Data from Kilroot recorded a total of 48 wildfowl and wader species have along this section of the Belfast Lough between the years 2000/01 to 2004/05 (BTO, 2006). The data for the site includes Annex I red-throated diver, Slavonian grebe, bar-tailed godwit, sandwich tern (also Schedule 1) and common tern, and Schedule 1 species such as common scoter, goosander, grey heron, dunlin, black-tailed godwit and common tern. Low Tide Count Data for the Belfast Lough indicates preferred habitat and conservation status. A total of 23 wildfowl and wader species have been identified using the estuarine habitats of the Belfast Lough during low tide counts. This includes the Annex I bar-tailed godwit and Schedule 1 grey heron, common scoter and black-tailed godwit. Wintering Birds are valued as **International** level value for nature conservation.

11.7.12 All wild bird species are protected from killing, injury and taking under the Wildlife (Northern Ireland) Order 1985 as amended by The Wildlife (Amendment) (Northern Ireland) Order 1995 . In addition this legislation makes it an offence to take, damage or destroy a nest while in use or being built, and to take or destroy the eggs of any nesting bird. In addition, certain species are listed on Schedule 1 to the Order. This makes it an additional offence to intentionally or recklessly disturb the adults while they are in and around their nest or intentionally or recklessly disturb their dependent young. Several bird species protected by the Wildlife Order (as amended) are also covered by Annex I of the EC Birds Directive (1979) Council Directive No. 79/409/EC, affording them European protection. The light bellied brent goose, redshank and lapwing are priority species in the NI BAP.

11.7.13 Predicted impacts were divided into construction and operational impacts. The main impacts were assessed as:

- Statutory designated sites: pollution and water quality related impacts upon watercourses and downstream impacts upon the Belfast Lough during operation and construction;
- Non-statutory designated sites: permanent loss of some mature trees and scrub habitat associated with Jointure Bay Stream SLNCI, risk of pollution to the SLNCI during construction and operation, which may directly feed downstream to the Belfast Lough;
- Habitats: direct habitat loss, particularly along the off-line section, and potential impacts upon the water quality within the watercourses along the alignment;
- Invasive Species: spread of Japanese knotweed during construction, and if not eradicated successfully at this stage, possible spread during operation phases;

- Otter: disturbance of otters and increase in road kill incidents during construction/operation;
- Bats: potential for destruction of roosts, removal of suitable roosting habitat, potential fragmentation of habitats and loss of foraging habitat;
- Breeding birds: loss of breeding bird habitat, depending on timescales, potential destruction/disturbance breeding birds;
- Wintering birds: disturbance impacts during construction and operation depending on the timing of the works, bird collisions with high-level plant machinery, bridges.

11.7.14 Mitigation and monitoring methods are stipulated, based on legislation and policy requirements and best practice. A further stage of assessment was undertaken to determine if there were any significant residual impacts, assuming that all of the mitigation and enhancement measures are implemented. No significant negative impacts are anticipated on any of the ecological receptors discussed in this chapter, providing all of the mitigation and enhancement measures recommended are implemented. Further, it is anticipated that the mitigation/enhancement measures outlined in relation to Japanese knotweed will have a significant positive impact. This will be achieved by successfully eradicating and removing the invasive species from the site, as outlined in the mitigation measures.

11.7.15 A summary of the impact significance with mitigation and concluding comments is provided within Table 11.16.

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Table 11.16: Summary and Conclusions (continued over)

Impact	Type of Impact	Probability of Impact	Nature	Resource Value	Mitigation Extent	Significance (with mitigation)	Comments/Rationale
Construction							
Statutory designated sites: Pollution impacts upon Belfast Lough SPA/RAMSAR/ASSI	-ve	Likely	ST	International	Substantial	NS	The extensive mitigation measures will substantially reduce the risk of any pollutants entering watercourses thereby protecting the integrity of the site.
Non-statutory designated sites:, loss of part of SLNCI Possible pollution incidents	-ve -ve	Certain Likely	LT ST	Local Authority Area	Partial	NS	The extensive mitigation measures will substantially reduce the risk of any pollutants entering watercourses thereby protecting the integrity of the site.
Habitats: direct permanent habitat loss, pollution of watercourses	-ve	Certain/Likely	LT	Local	Substantial	NS	The habitats that will be lost are all of Local value and widespread in the surrounding area. In addition, the proposed planting of native species will off-set any loss of these habitats.
Invasive species: possible spread Japanese knotweed	+ve	Likely	LT	Local	Full	S	Eradication of this species through the mitigation proposals will have a positive significant impact by preventing further spreading of the species in the immediate area.
Otters: road kill incidents, disturbance of otters	-ve	Unlikely	ST	Northern Ireland	Substantial	NS	The mitigation measures will allow free otter movements along watercourses and under the Scheme , significantly reducing any potential impacts.

Impact	Type of Impact	Probability of Impact	Nature	Resource Value	Mitigation Extent	Significance (with mitigation)	Comments/Rationale
Badgers: road kill incidents, destruction sett, disturbance	-ve	Unlikely	ST	Northern Ireland	N/a	NS	No impacts are anticipated
Bats: potential destruction of roosts in buildings/trees Loss of habitat	-ve	Unlikely/Extremely unlikely	ST	Northern Ireland	Partial	NS	Replanting of native species will partially off-set the loss of foraging and roost sites, by providing foraging corridors and alternate roost sites when trees are mature.
Breeding birds: Destruction of nests/ disturbance of breeding birds	-ve	Likely	LT	Local	Substantial	NS	Landscape planting of native species will off-set loss of potential breeding bird habitat.
Loss of potential breeding habitat	-ve	Likely	ST	Local	Substantial	NS	Timing of works will significantly reduce any potential disturbance to breeding birds.
Wintering Birds: disturbance to wintering birds, collisions with high level machinery	-ve	Unlikely	LT	International	Substantial	NS	Avoidance of works close to Belfast Lough Shore and timing of works will also significantly reduce any potential disturbance to wintering birds.
Operation							
Statutory designated sites: pollution impacts upon Belfast Lough SPA/RAMSAR/ASSI	-ve	Likely	LT	International	Substantial	NS	The extensive mitigation measures will substantially reduce the risk of any pollutants entering watercourses thereby protecting the integrity of the site.
Non-statutory designated sites: possible pollution	-ve	Likely	LT	Local Authority Area	Substantial	NS	The extensive mitigation measures will substantially reduce the risk of any pollutants entering watercourses thereby protecting the integrity of the site.

Impact	Type of Impact	Probability of Impact	Nature	Resource Value	Mitigation Extent	Significance (with mitigation)	Comments/Rationale
Habitats: temporary loss of habitats, pollution of watercourses	-ve	Certain	LT	Local	Full	NS	The habitats lost initially during construction, will be compensated for by the proposed planting of native species, which will mature during the operation phase of the Scheme.
Invasive species: possible spread Japanese knotweed	-ve	Likely	LT	Local	Full	NS	Eradication of this species through the mitigation proposals will have a positive significant impact by preventing further spreading of the species in the immediate area.
Otters: disturbance of otters and their travel routes	-ve	Unlikely	LT	Northern Ireland	Substantial	NS	The mitigation measures will allow free otter movements along watercourses and under the Scheme , significantly reducing any potential impacts.
Badgers: road kill incidents, destruction sett, disturbance	0	Unlikely	LT	Northern Ireland	Full	NS	No impacts are anticipated
Bats: Loss of habitat	-ve	Likely	LT	Northern Ireland	Substantial	NS	Replanting of native species will off-set the loss of foraging habitat during construction, by providing foraging corridors and alternate roost sites when trees are mature during the operational phase.
Breeding birds: Loss of potential breeding habitat, disturbance	-ve	Likely	ST	Local	None	NS	Any increased noise level through traffic will be negligible and therefore will have no significant impact. Landscape planting will provide replacement of breeding bird habitat.
Wintering Birds: disturbance to wintering birds	-ve	Extremely unlikely	LT	International	N/a	NS	No impacts are anticipated