

SECTION 4

ECOLOGY & NATURE CONSERVATION

4.1 Introduction

4.1.1 This Technical Appendix provides the essential baseline information on ecology and nature conservation of relevance to the proposed An Camas Mòr development. It also provides a full assessment of the predicted effects of the proposed An Camas Mòr development on sensitive ecological receptors (*i.e.* habitats, flora and fauna) to a level of detail commensurate with an Outline Planning Application. It also sets out the proposed suite of mitigation measures that have been carefully considered from an early stage in the development design process.

4.1.2 Particular focus has been given in this assessment to sites, habitats and species that are considered to be of conservation concern at an international and national level. Potentially relevant ecological receptors include statutory designated sites such as Natura sites (*i.e.* Special Areas of Conservation and Special Protection Areas) and Biological Sites of Special Scientific Interest. Within and often outside of formally designated sites, potentially sensitive ecological receptors also include specially protected fauna and flora (*i.e.* European Protected Species and plants, mammals, birds, reptiles, amphibians, fish and invertebrate species protected under UK domestic legislation). Other potentially sensitive ecological receptors include notable flora or fauna (*i.e.* species that are uncommon, have an unfavourable conservation status, that are threatened, rare or scarce in a national or regional context and UK / Local Biodiversity Action Plan priority species).

4.1.3 One of the key overarching aims of the design and assessment process for An Camas Mòr has been, and would continue to be, to avoid significant impacts on important ecological receptors. Impacts have been avoided through the iterative development design process. Where avoidance of impacts has not been possible they have been minimised and proposals to create and enhance habitats of nature conservation interest that would be affected by the development have been proposed. The main objectives of the ecological studies for the EIA of the proposed development were as follows:

- Establishment of the existing ecological baseline;
- Identification of potential impacts;
- Incorporation of mitigation measures to avoid, reduce or offset potential impacts and any opportunities for enhancement measures; and
- Accurate prediction of likely residual impacts.

4.1.4 The total Local Plan area for the proposed An Camas Mòr community is approximately 105 ha and is largely composed of various age classes and types of planted conifer woodland. In recent years an area of former dwarf shrub heath that comprised a large part of the eastern side of the core development area has been planted with young trees and has also been subject to natural seeding and encroachment of young Scots pine and silver birch. Towards the northern and western sides of the site are commercial conifer plantations of varying age-classes. Towards the south and east there is a semi-natural mixed Scots pine and silver birch woodland.

There are also areas of scattered mature Scots pine trees and silver birch, acid grassland and heath scrub. Surrounding the site is also improved pasture, arable fields, commercial conifer plantations and Scots pine and silver birch woodland. There is one pond within the site and a small area of basin mire within a forestry plantation. The site is located on an old river terrace and is elevated from the river floodplain to the west.

4.1.5 The proposed An Camas Mòr community would also require links to the surrounding existing infrastructure including roads and cycle / walk ways. There would also be a requirement for playing fields. These surrounding links and facilities would be outside of the Local Plan area and can be seen in the ILUP drawings (Chapter 5, Volume 1).

4.1.6 The River Spey Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) lies approximately 100 - 400 m to the west of the proposed development area. The River Druie, a tributary of the Spey, runs to the south of the proposed development area and is part of the River Spey SAC. The entire site and surroundings lie within the Cairngorms National Park. There are other designated sites of nature conservation interest adjacent to the site and the most important of these are the Cairngorms SAC and the Cairngorms Special Protection Area (SPA).

4.1.7 All habitats, flora and fauna surveys, reporting and assessment were completed by qualified and experienced professional ecologists. These ecologists were all either employed directly by MBEC (Ecological Consultants) or were commissioned by them as specialist sub-consultants to carry out specific surveying and reporting roles. All survey results have been fully incorporated into this assessment (see also the accompanying Appendices). MBEC ecologists have been involved in the development of these proposals since the start of the feasibility stage and the same people have project managed all of MBEC's inputs and involvement since then.

4.1.8 Any ecological data and survey limitations are reported in the relevant sections within this report. Similarly, any assessment and mitigation limitations or uncertainties are also reported, where they could have an effect on the subsequent consideration of the findings. It is important to note that an Environmental Impact Assessment (EIA) of a development and its consequences for ecology and nature conservation assets is not intended to be, and cannot be a complete inventory of every species present or likely to be present within a site, or an assessment of the implications for every species. Rather, it should be an accurate summary by experienced ecologists of the overall ecological importance of the site, focusing on key indicator habitats and species to arrive at a carefully considered and objective assessment. The development of best practice in ecological assessment promotes the use of such key indicators and these include the habitats present and a range of species, including, for example, all European Protected Species. The aim of this ecological assessment is ultimately to provide decision makers and interested parties with an objective overall assessment; helping to inform the critical professional judgements and explanations which they need for planning and decision making at an Outline Application stage.

Relevant Legislation, Policy and Guidance

4.1.9 This impact assessment has been carried out in compliance with the Environmental Impact Assessment (Scotland) Regulations (1999) and amendments (the EIA Regulations) and following current best practice. Within the assessment, and the associated baseline surveys and consultations, due consideration has also be given to the requirements of the Wildlife and Countryside Act 1981 (as amended), the Nature Conservation (Scotland) Act 2004 and the Conservation (Natural Habitats, &c.) Regulations, 1994 (the Habitats Regulations) (as amended)

and other relevant environmental legislation. In addition, attention has been paid to the four key aims of the Cairngorm National Park, as detailed in the National Parks (Scotland) Act, 2000.

4.1.10 In undertaking this ecological impact assessment due cognisance has also been given to the following relevant national and local level nature conservation policy and guidance:

- National Planning Policy Guideline 14: Nature Conservation;
- PAN 60: Planning for Natural Heritage (Scottish Executive);
- UK and local Biodiversity Action Plans (Priority habitats and species);
- Scottish Biodiversity Strategy;
- Cairngorms Local Biodiversity Action Plan;
- The relevant structure and local plans for the area;
- EIA best practice guidance (e.g. as produced by SNH and IEEM);
- Best practice construction guidance (e.g. relevant SEPA pollution prevention guidelines); and
- Relevant scientific literature.

Relevant Nature Conservation Policy - Development Plans

4.1.11 An Camas Mòr (previously referred to as Cambusmore) is proposed as a new community in The Highland Structure Plan (2001), the Badenoch and Strathspey Local Plan (1997) and the Cairngorms National Park Draft Local Plan (2006). The Highland Council Structure Plan has a number of Natural Environment policies which are relevant to all proposed developments. These are summarised here:

- The Council aims to minimise the impact of developments and preserve the nature conservation resource;
- Sites and species of international importance will have a priority over those of national importance, which will in turn have a priority over sites and species at a local level; and
- The Council will also have a regard to the Local Biodiversity Action plans with respect to development proposals and these will be implemented throughout the Highland Region.

Biodiversity Action Plans

4.1.12 The Cairngorms Local Biodiversity Action Plan (LBAP) includes specific objectives, some of which are relevant to this proposal. All relevant Local and National Biodiversity Action Plan Priority Habitats and Species have been considered within the baseline surveys and the ecological assessment; the potentially relevant ones are listed in Table 4.1. This is not a complete list of BAP priority habitats and species present within the survey area, but a list of

habitats and species that have been identified as key ecological receptors for the purposes of the ecological assessment. The relevant current Local and National BAP objectives associated with the species and habitats listed in Table 4.1 can be found on the relevant BAP web sites.

The Scottish Biodiversity Strategy

4.1.13 The Scottish Biodiversity Strategy, called "Scotland's Biodiversity: It's in Your Hands", was published by the Scottish Government in May 2004. It aims to conserve biodiversity for the health, enjoyment and wellbeing of the people of Scotland. This strategy was developed in partnership with the Scottish Biodiversity Forum, a broad based working partnership of public, private and voluntary organisations.

4.1.14 Borne out of the Scottish Biodiversity Strategy was an inventory of key ecological features and the identification of species of principal importance for the conservation of biodiversity. The results of this process, the Scottish Biodiversity List (2005), are species considered by the Scottish Ministers to be of principal importance for biodiversity conservation. The publication of the Scottish Biodiversity List satisfies the requirements of Section 2(4) of The Nature Conservation (Scotland) Act 2004. As noted above, The Scottish Biodiversity List has also been considered in the completion of this ecological assessment. The key species (and habitats from BAPs) which were viewed as likely to be relevant are listed in Table 4.1 below. It should be noted that only those viewed as potentially relevant at an early stage of the assessment are listed in the Table but all species included in the various lists were considered, where relevant.

4.1.15 The Scottish Biodiversity Strategy objectives associated with the Biodiversity List in Table 4.1 can be found on the relevant web site.

Table 4.1: Local and National Biodiversity Action Plan Priority Habitats and Species and Scottish Biodiversity Strategy Habitats and Species that have been identified as potentially relevant to this assessment.

National and Local Priority Species and Habitats	Cairngorms LBAP	Scottish Biodiversity List	UK BAP
Badger		✓	
Brown hare		✓	✓
Mountain hare		✓	✓
Otter		✓	✓
Pine marten			✓
Red squirrel	✓	✓	✓
Water vole	✓	✓	✓
Wildcat	✓	✓	✓
Pipistrelle spp.		✓	✓
Daubenton's bat		✓	
Natterer's bat		✓	
Brown long-eared bat		✓	
Red deer		✓	
Roe deer		✓	

National and Local Priority Species and Habitats	Cairngorms LBAP	Scottish Biodiversity List	UK BAP
Short-eared owl		✓	
Siskin		✓	
Goldeneye	✓		
Kingfisher		✓	
Hen harrier	✓	✓	
Scottish crossbill	✓	✓	
Black grouse	✓		
Capercaillie	✓	✓	
Redshank	✓		
Lapwing	✓	✓	✓
Northern brown argus	✓	✓	✓
Pearl-bordered fritillary	✓	✓	✓
Northern damselfly	✓	✓	
Pine hoverfly	✓	✓	✓
Narrow-headed wood ant	✓	✓	✓
Kentish glory	✓	✓	
Dark-bordered beauty	✓	✓	✓
Cousin German	✓	✓	✓
Netted mountain moth	✓	✓	✓
Mason bee	✓		
Freshwater pearl mussel	✓	✓	✓
Atlantic salmon	✓	✓	✓
Brown / sea trout			✓
Juniper		✓	✓
Blunt-leaved bristle moss	✓		
Acid grassland	✓		✓
Arable field margins	✓		✓
Rivers and burns	✓		✓
Standing open water (ponds)	✓		✓
Marsh / marshy grassland	✓		
Lowland birch woodland	✓		
Broad-leaved woodland	✓		✓
Wet / riparian woodland	✓		✓
Planted conifer woodland	✓		
Native conifer (pine) woodland	✓		✓

Planning Policy Background and Feasibility Study

4.1.16 A summary of the planning background is provided in Chapter 1, Volume 1. The report, *Cambusmore – A proposed New Community: Background Report Draft 2* (for Comment 21 January 2002 (Revised 23 August 2004)) summarises The Highland Council Structure Plan, National and Local Plan policy and Rothiemurchus Estate support for An Camas Mòr.

4.1.17 A Feasibility Study Report, including a scope of works, was produced in August 2004, which outlined the proposals and assessed the feasibility of the development.

4.2 Methodology

4.2.1 This section describes the methods used to collect, survey and collate baseline information on the various ecological receptors present within the study area. The study area is defined within this section as are the overall methods used to determine the nature conservation value of these receptors and to assess the range of potential impacts arising from the proposed development.

The Study Area

4.2.2 Boundaries at varying distances from the proposed development area (the defined Local Plan area) and route of proposed main site access roads were defined for the purposes of baseline data collation (site survey and desk study) and impact assessment. A wider study area was initially used for the feasibility study to ensure that all surrounding features and species of possible relevance were included (see ‘wider survey area’ boundaries on Figure 4.1). For the purposes of the EIA the study areas have been refined for various different receptors. Generally, for habitat and protected species surveys, a boundary which includes at least a 500m wide buffer (see Figure 4.1) but following natural boundary features (e.g. the River Spey), around the Local Plan area was used. Since survey areas did vary for particular ecological receptors the specific reports for those precise survey areas should be referred to for details. The following defines the extent of the specific survey areas and related terms referred to in this report:

- ‘core development area’ is the local plan area where the main development would occur (e.g. high street, houses, internal roads);
- ‘site access corridors’ refer to the proposed main access routes to the housing development area from Inverdrue and Coylumbridge, including the proposed new road behind Coylumbridge (it should be noted that where necessary further surveying has been undertaken in localised areas south of the B970 and outside of the area shaded as the wider survey area to incorporate the possibility of road junctions impinging outside of this area); and
- ‘playing fields’ refers to the area towards the River Spey which is highlighted in the ILUP for leisure facilities but is within the wider survey area (see Chapter 5, Volume 1).

4.2.3 The above together comprise the ecological study area with the various surrounding buffers used for the purposes of consultation and desk study data requests from various nature conservation organisations (see below). It should be noted that many specific ecological

surveys covered larger areas than just the core development area and access corridors to ensure that adjacent receptors and the surrounding ecological context was fully included in the assessment.

Consultation and Desk Study

4.2.4 The following organisations were consulted for their views and / or relevant baseline data (including ecological views and information) for the study area:

- Badenoch and Strathspey Conservation Group (no detailed response received);
- Botanical Society of the British Isles - vice-county recorder;
- British Trust for Ornithology (BTO);
- Cairngorm National Park Authority;
- Highland Badger Network;
- Highland Bat Group;
- Highland Biological Recording Centre;
- Highland Red Squirrel Group;
- Forestry Commission Scotland;
- Mammal Society;
- National Biodiversity Network Gateway (NBN Gateway);
- Royal Society for the Protection of Birds (RSPB);
- Rothiemurchus Estate and Rangers;
- The Highland Council;
- Scottish Environment Protection Agency (SEPA);
- Scottish Natural Heritage (SNH);
- Scottish Ornithologists Club (SOC) - local recorder;
- Scottish Wildlife Trust (SWT);
- Spey District Salmon Fishery Board; and
- Spey Research Trust.

4.2.5 Summaries of the results of the desk study are provided in the appropriate sections within the ecological baseline descriptions provided in this report. Additional information / comment arising

from the desk study can be found in Appendix 4A. Records relating to species at risk from disturbance / persecution (e.g. badger sett records) are included within a Confidential Annex. The detail of these confidential records will only be made available to SNH and CNPA, however, all necessary assessment has been undertaken and is reported within this report: it is only the precise location details that are omitted.

Field Surveys

4.2.6 A range of field surveys were undertaken to inform the evaluation of the study area. Surveys were focused on key indicator species and habitats likely to be affected by the construction and / or operation of the proposed development. The following field surveys were specifically undertaken (while these were being completed relevant other sightings and signs were also noted and included to inform the wider assessment):

- Extended Phase I Habitat Survey (wider study area, core development area and site access corridor, including localised areas to the south of B970) – initially in 2004 but subsequently updated as necessary into 2008;
- Targeted Phase II / National Vegetation Classification (NVC) Survey (core development area & native woodland to the south) – 2005 and updated / added to in 2006 and 2008;
- River Habitat Survey (riverine corridors of the Rivers Spey and River Druie) 2005 and 2006;
- Protected Mammal Species Surveys (wider survey area and areas of the B970 to the south) 2004 through to 2008;
- Specific Bat Activity Surveys and Habitat Assessment for Bats (wider survey area)– July and August 2008;
- Specific Squirrel Drey Surveys and Habitat Assessment for red squirrels (wider survey area and areas of the B970 to the south)– July and August 2008;
- Update to Badger Surveys undertaken previously as part of the protected species surveys and Badger Habitat Assessment (wider survey area and areas of the B970 to the south) – August 2006, July and August 2008;
- Additional Water Vole Surveying – August 2006;
- Terrestrial Entomological Surveys (core development area plus a 500 m buffer) – August 2006, October 2007 and June – July 2008;
- Aquatic Entomological Surveys (pond in core development area) – August 2006, October 2007 and June – July 2008;
- Freshwater Pearl Mussel Survey (River Druie and River Spey confluence area) – November 2008;
- Breeding moorland birds / wader survey - April to June 2005 (wider and core survey areas) and April to June 2007 (core development area);

- Breeding raptor / owl survey - April to July 2005 (wider and core survey areas) and April to July 2007 (core development area);
- Woodland breeding bird survey (transects and points counts) - May to June 2005 (wider survey area) and May to June 2007 (core development area); and
- Forest grouse survey - March to May 2005 (wider development area) and March to May 2007 (core development area).

4.2.7 Aerial photography taken in 2005 was used to assist with the accurate mapping of Phase 1 habitat types and NVC communities.

4.2.8 As noted above, in addition to the listed surveys, any sightings or other evidence of protected and other notable species were recorded during all ecological surveys. These additional, ad hoc, observations included sightings of mammals, reptiles, invertebrates, amphibians, fungi and plants, and some animal and bird records are listed in Appendix 4B.

Survey Methodologies

Extended Phase I Habitat Surveys

4.2.9 Extended Phase I Habitat surveys were carried out following the standard guidance (JNCC, 1993). The vegetation communities present were identified, described and plotted on appropriately scaled maps of the site. Target Notes, linked to the Phase I Habitat maps, were produced providing greater detail on specific habitats or features and species. A list of plant and animal species recorded during the surveys was also produced. Plant species nomenclature followed Stace (1997) for higher plants and Watson (1981) and Hill (1992) for mosses and liverworts. Species names for all fauna follow the standard nomenclature or relevant leading authorities where recent changes have occurred. Habitats, species and dominant plant community types were described and any rare, notable, protected or BAP species or habitats were also noted where present.

4.2.10 Handheld Global Positioning Systems (GPS) were used to locate features / receptors (as high as $\pm 3\text{m}$ accuracy but typically $\pm 7\text{m}$ accuracy). Where less accurate readings occurred because of very thick cloud or tree canopy cover this was noted during surveys. Notable species (e.g. nationally scarce, BAP higher and lower plants) or other areas / features or boundaries of importance were specifically noted.

4.2.11 The frequency of occurrence / percentage cover of plant species was also noted for important plant communities. Where completed, this utilised the five-point 'DAFOR' scale with the letters equating to **D**ominant, **A**bundant, **F**requent, **O**ccasional and **R**are. Although this is not as detailed as the NVC surveying method (see below), in this context it is a useful method for description. The word "locally" has been used as a prefix to show patchiness. The word "rare" is used in a very local context and does not imply that the species is necessarily rare within the area, region or nationally.

4.2.12 The Phase I Habitat survey method provides a broad characterisation of the type and extent of habitats in the area of study. In this case the Phase 1 habitat reporting and mapping is relatively detailed because it has been the result of several separate surveys. However, Phase 1 habitat

surveying is not intended to provide a definitive list of all plant species present, rather the key indicators and important species. Some species may only be visible or in flower for short periods at certain times of the year. In this case, surveying has been carried out over an extended period and covering different periods of the year and therefore fairly complete species lists have been compiled.

Targeted Phase II / National Vegetation Classification (NVC) Surveys

4.2.13 Targeted Phase II / NVC methodology surveys were also carried out by experienced botanists between 2005 and 2008. The initial time of year for NVC surveys was not optimal, however the habitats present are mostly characterised by persistent woody species and by lower plants, which can be surveyed all year round by an experienced NVC surveyor. In addition, extra surveys were completed in July and August 2008, which is optimal timing for many flowering plants, and the previous survey results and species lists were checked and updated as necessary at that time.

4.2.14 The survey methodology was based on the standard guidance (Rodwell *et al.*, 1998). In order to assist in the identification of upland type vegetation communities, the key provided in Averis *et al.* (2004) was also used during the field surveys. This assisted in describing and classifying the semi-natural flora communities present within the study area and selecting the closest associated NVC community. It is important to note that in reality vegetation communities are often present in mosaics, and transitional habitats are common, which requires careful interpretation. Therefore, exact matches are not always possible.

4.2.15 Each distinct community type was sampled using quadrats. For most communities 2 m x 2 m quadrats were used. These were located in representative areas of discrete plant communities. For woodland communities the canopy layer was assessed over an approximate 50 m x 50 m quadrat area. The number of quadrats in a community type varied according to the occurrence of the community. Generally two quadrats were surveyed in any one location where a community occurred, with further sampling and extensive walkover checking to ensure that all of the most important vegetation communities within the core development area were included. Approximate locations of quadrats are shown in Figure 4.2. For grid references and descriptions of quadrats see Appendix 4C. In addition, mapping was also completed by careful walkover survey by an experienced botanist to allow larger areas to be interpreted with the closest matching dominant NVC community or sub-community type.

4.2.16 Handheld Global Positioning Systems (GPS) was used to locate (normally at least $\pm 7\text{m}$ accuracy) notable species (e.g. nationally scarce, BAP higher and lower plants) or other areas / features mentioned in Target Notes, and to assist with mapping the boundaries between vegetation communities and other features of interest within the site.

4.2.17 All species of plants including bryophytes and lichens occurring within a quadrat were recorded and assigned a cover value using the DOMIN scale (see Table 4.2 below), based on percentage cover of the quadrat area. In some cases where species could not be accurately identified in the field, species groups (e.g. *Cladonia* lichens) were assigned a cover score for the whole group. Samples were taken, where appropriate, for later identification.

Table 4.2: DOMIN Scale (as determined by Rodwell *et al.*, 1998)

Percentage of Cover	DOMIN Scale
91-100	10
76-90	9
51-75	8
34-50	7
26-33	6
11-25	5
4-10	4
< 4 (many individuals)	3
< 4 (several individuals)	2
< 4 (few individuals)	1

4.2.18 Data collected for quadrats were compared and analysed for similarities and differences between quadrats. In many cases communities which appear distinct in the field may fall into the same community type as determined by the NVC system. Grouping quadrats allows a frequency to be determined for each species; the fraction of the number of quadrats of that community in which the species occurs. These frequency and abundance scores were then used to create floristic tables. The frequency of species within the floristic table refers to how often a plant was encountered between the quadrats in each community (see Appendix 4C). This information was then used to assign a community type from the NVC system to each community. Experience and professional judgement was also necessary in the determination of NVC community types.

4.2.19 Within this Technical Annex, in most cases, botanical nomenclature is given as common names only to aid readability. All higher plants are referred to by common name only in text descriptions but where there is the potential for confusion or common names are not normally used scientific names are only or also given. All NVC titles of vegetation communities follow normal latin binomial nomenclature, as detailed in Rodwell *et al.* (1991 onwards). All botanical nomenclature is given in full in Appendix 4C, 4D and 4E.

River Habitat Surveys

4.2.20 A River Habitat Survey (RHS) of the River Druie and River Spey adjacent to the proposed An Camas Mòr development site was carried out in 2005 and 2006. The methodology for the River Habitat Survey followed that detailed in the River Habitat Survey Guidance Manual: 2003 Version (Environment Agency, Scottish Environment Protection Agency and Environment and Heritage Service, 2003). Full details of the methodology are provided in the RHS report (see Appendix 4F).

Protected Mammal Species Surveys

4.2.21 All 1 km² grid squares covering the wider and core survey areas were included in the surveys, and a route was walked that came to within at least 200 m of all ground and to within 20 m of

areas of suitable habitat. The banks of all watercourses within the survey area were walked to search for evidence indicating the presence of otter and water vole, and areas regarded as particularly suitable for other species was subject to thorough survey. Similarly, all areas of the site were assessed for their potential as habitat for protected species during these surveys. Sightings of all species observed during other survey work were also recorded on an *ad hoc* basis. The surveys were completed in 2004, 2005, 2006 and 2008, in dry weather with good visibility, and following a relatively dry period in order to reduce the potential for signs such as prints and droppings to be washed away prior to surveying. Further surveying, following the same methodology, was undertaken in July-August 2008, and updated in November of the same year, to cover proposed changes to the access roads.

4.2.22 These surveys are intended to allow an assessment of habitat suitability, presence / (likelihood of) absence and an estimation of the extent of activity by protected mammal species within the survey area. The surveys were not intended specifically to provide details on the extent of territories, abundance or population structure / productivity, however, given the number and time period involved on this site a good estimation of such details can be gained from the data collected.

4.2.23 The following text provides more detail on the survey approach for particular species that have the potential to be present in the area. Latin names for mammals and birds are normally only given once in the text at the first mention of the species and accepted common names are used subsequently. Dues to the potential for confusion scientific names are used for animal species where it is deemed necessary, particularly for insects.

Otter (*Lutra lutra*)

4.2.24 All watercourses within the survey area were searched carefully for signs of the presence of this species, including banks, exposed boulders and any woody debris present in channels. Evidence of the presence of otter such as spraints, holts, couches, slides, prints and tracks were searched for in order to assess site use by this species. Signs were accurately recorded with GPS and marked onto 1 km grid square maps. Based on the survey findings, an assessment could therefore be made of the current status of otter on the site, such as the likelihood of a breeding population in the study area or the importance of the site for movement between areas.

Water vole (*Arvicola terrestris*)

4.2.25 The water vole survey involved a thorough inspection of all watercourses and associated habitats such as areas of wet grassland, to assess suitability for the species and to record signs of their presence. Signs searched for included burrows (both active and disused), feeding areas (grass clippings and grazed areas of vegetation), latrines, prints, and runways through the vegetation. A search for evidence of the presence of American mink (*Mustela vison*) was also undertaken during the water vole survey, as the presence of this predatory species could reduce the likelihood of water vole occurring on the site. This involved searching along the banks and marginal vegetation of watercourses for signs such as prints and scats. Based on the survey findings a description and assessment was made on the current status of water voles on the site (as well as extant or historical populations), the extent of activity and the habitats and other site features that could be important to the species.

Red squirrel (*Sciurus vulgaris*)

4.2.26 The majority of the core development area is comprised of heath and acid grassland with young establishing trees, which is generally unsuitable habitat for red squirrels. However there are many individual “granny” (old, lone and wide crowned Scots pine) pine trees scattered within the centre of the site in addition to the mature plantation, belts and semi-natural conifer and birch woodlands around the edges that do provide some suitable habitat. All potentially suitable woodlands within the core and wider survey areas were carefully searched for signs of squirrel (e.g. foraged cones, food caches, dreys etc.) as well as visual sightings of red squirrels. Drey locations were noted where these were clearly visible, along with their likelihood of occupation on a standard 1 to 5 scale. However, a more reliable but general measure of habitat suitability was also undertaken for the core development area and surrounding potentially affected habitat areas.

Pine marten (*Martes martes*)

4.2.27 Evidence of pine marten (principally prints, scats and dens) was searched for throughout the core and wider study areas. In particular, mature pine trees were assessed for their suitability as denning sites for the species. The areas of more mature conifer plantation are considered to provide more valuable habitat for pine marten than the younger areas of plantation. In addition, suitable farm outbuildings in the nearby farms (e.g. Dell Farm) may also provide suitable denning sites for the species and evidence of these was also checked.

Wildcat (*Felis sylvestris*)

4.2.28 Evidence of wildcat (principally dens, prints and scats) was searched for throughout the core and wider study areas. In particular, more remote, mature, pine plantations were assessed for their suitability as denning sites for the species. The areas of more mature conifer plantation, to the north and east of the development area rather than in or immediately surrounding the proposed development, are more likely to regularly host wildcat due to their remoteness. In addition, any reported road traffic accidents of wildcat on the B970 were noted.

Bats (*Vespertilionidae*)

4.2.29 Potentially suitable roosting locations and any evidence of bats was recorded on an ad hoc basis since ecological surveys commenced on the site in 2004. In addition, a specific daytime inspection and habitat assessment of the site was carried out in July and August 2008. Appropriate areas were assessed for their relative potential value as foraging and roosting habitat. A classification protocol based on Bat Conservation Trust (BCT) guidelines was followed to delineate roosting potential for mature trees within and adjacent to the development site. Table 2.1 within the full bat report (Appendix 4G) gives the criteria for the tree roost survey. Buildings were inspected for roosting potential following similar criteria as for trees, also based on BCT guidance.

4.2.30 Evening emergence / bat activity surveys were completed in July and August 2008, towards the end of the period when female bats are raising their young (i.e. May – August). Bat activity transect routes were established throughout the core study area and immediate surroundings

and were selected to pass through or along habitat features considered likely to be of value to bats. Bat activity was systematically recorded along four transects with each transect walked twice; once in July 2008, and then repeated in August 2008.

4.2.31 Bat detectors linked to automated sound recording equipment were also placed at various sampling points. A total of four points were selected within the core survey area. Bat activity was recorded from before sunset to after sunrise at each sampling point on 2 occasions in July and August 2008. One night at one sampling point was lost due to equipment failure. Each box contained a heterodyne / frequency division capable bat detector (Petterson D230 model) and recording unit (Marantz Solid State Recorder PMD620). All recordings were subsequently analysed, with the help of sonogram generating computer software, so that bat activity could be ascribed to particular species.

4.2.32 All transects and recording methods followed those described in “Bat Surveys - Good Practice Guidelines” (Bat Conservation Trust, 2007). Full details of the bat survey methodology used are provided in Appendix 4G.

Badger (*Meles meles*)

4.2.33 Based on the findings of initial desk studies and Estate records several active setts were known to be present in the wider study area. Badger surveys were undertaken to confirm sett locations (including all main, annexe, subsidiary and outlier setts) and assess the relative level of recent and current activity, size and territorial range of the social groups (or clans) associated with the main setts. All potentially suitable habitats within the core and wider survey areas were also searched for evidence of badger activity and setts. Survey effort was concentrated in key areas, including but not limited to, the boundaries of grassland / wooded areas and the arable fields and margins around the edges of the core development area. The surveys involved inspections of setts and potential foraging areas for signs of badger activity such as spoil heaps, discarded bedding, tree scratching, tracks, prints, guard hairs, latrines and signs of digging in foraging areas.

Terrestrial and Aquatic Invertebrates

4.2.34 Ad hoc observations of invertebrate species were recorded during ecological surveys from 2004. Walkover invertebrate surveys were also undertaken from 2004 to 2006 focusing on flight activity by adult life stages of Lepidoptera, Odonata and Hymenoptera. Wood ant nests present within the study area were also mapped from 2004 to 2006. Although under EIA good practice it is common to concentrate on the overall value of habitats rather than on every species of insect that could be present, further specialist entomological surveys, commissioned by MBEC, were undertaken during the autumn of 2007 and the spring / summer of 2008. Sampling methods included suction traps, sweep netting, water traps, flight-netting, pitfall traps, light traps, and searching. Full details of the methodologies used for the specialist invertebrate surveys are provided in Appendix 4H.

Freshwater Pearl Mussel (*Margaritifera margaritifera*)

4.2.35 A freshwater pearl mussel survey was carried out during low water in November 2008 by specialist ecologists commissioned by MBEC. The main stem of the River Druie and the River Spey were entered and searched for mussels using the standardised and accepted methodology, starting 500 m below the Rothiemurchus fishery bridge (at c. NH89639 11937) and ending 100 m above the Dell bridge (at c. NH90203 11048), a total distance of approximately 1.2 km. A general assessment was made of the water courses and substrate types to identify specific areas that were most likely to harbour mussels. Once an apparently suitable area was found, the river was entered at the nearest point and a search conducted, concentrated in the most favourable substrate types so as to optimise search efficiency. Due to the importance of protecting freshwater pearl mussel populations from illegal fishing the full detailed methodology and reporting is only included in the Confidential Annex (Freshwater Pearl Mussel Report).

Avifauna Surveys

4.2.36 Field surveys were undertaken to assess the use of all habitats within the core and wider survey areas by breeding and non-breeding birds with a particular focus on species that are potentially sensitive to development (i.e. species of regional, national and / or international conservation concern). All surveys were carried out by experienced ornithologists. The following field surveys were undertaken (following recognised standard methodological guidance). Full details of species lists for the surveys and summary mapping are provided in Appendix 4I:

- Breeding moorland birds / wader survey - April to June 2005 and April to June 2007;
- Breeding raptor / owl survey - April to July 2005 and April to July 2007;
- Woodland breeding bird survey (transects and points counts) - May to June 2005 and May to June 2007; and
- Forest grouse survey - March to May 2005 and March to May 2007.

Other Fauna

4.2.37 Specific surveys were not carried out for non-protected mammal and herptile species as the presence of species or populations of conservation importance were not indicated during desk study, consultation or subsequently through ad hoc observations during other field surveys. Any sightings or signs of other mammals (e.g. spraints, resting-up places etc.) and amphibians or reptiles noted during other surveys were recorded and noted, for overall consideration. No specific fisheries surveys were undertaken for the Rivers Druie and Spey (with the exception of a search for suitable habitats for lampreys within the freshwater pearl mussel survey area). Adequate existing information on the salmonid resource is available for both the Rivers Druie and Spey and this along with the river habitat survey data has been used to inform the baseline determination for the area, including the habitat suitability for eel.

Field Survey and Assessment Constraints

4.2.38 All seasonally dependant surveys were undertaken during an appropriate time of the year and under appropriate conditions. Where initial surveys were undertaken during sub-optimal periods these were subsequently re-checked during optimal periods for those surveys to ensure accuracy and consistency. Poor weather was avoided for all surveys where weather conditions were a consideration. There are considered to be no significant field survey limitations relevant to this assessment and an adequate survey effort has been undertaken to inform the subsequent EIA assessment. As with all ecological surveys there are advantages in repeat surveying over a number of years and this has been done on this site and the surrounding area in combination with updating data sources obtained from elsewhere.

4.2.39 It is important to emphasise that an ecological baseline which adequately informs an assessment for EIA is not intended to be and cannot be a complete inventory of every single species present, rather it is intended to provide the required level of detail to identify and adequately characterise the sensitivity of ecological receptors so that impacts can be assessed. Where there is uncertainty about the nature and magnitude of a potential impact this is accounted for in ecological impact assessment by assuming a realistic 'worst case scenario' and ensuring that mitigation measures outlined in the EIA are fully adopted and integrated into the detailed design process and future construction and operation of the development proposal.

4.2.40 Overall, the scope and type of surveys undertaken are considered to be robust and appropriate to inform the evaluation of the relevant ecological receptors and the assessment of the types of potentially significant impacts that may occur as a result of the proposed development.

Overall Impact Assessment Methodology

4.2.41 The EIA Regulations outline the information to be considered when determining the impacts of development proposals. The Regulations, in combination with expert professional judgement and methodological guidance from governmental agencies (e.g. SNH 'A Handbook on Environmental Impact Assessment', 2005) and professional bodies (e.g. Institute of Ecology and Environmental Management 'Guidelines for Ecological Impact Assessment', 2006), provide a framework within which potential impacts are assessed and their likely levels of significance determined.

4.2.42 The assessment of impacts on ecological receptors is a staged process that can be summarised as follows:

- Stage 1: Collation of adequate baseline data from desk study and appropriate site specific field surveys to inform the assessment of the likely impacts;
- Stage 2: Determination of the nature conservation value of the ecological receptors present within the study area;
- Stage 3: Identification of the potential impacts based on the nature of the construction and operation (where relevant) of the proposed development;
- Stage 4: Determination of the scale / magnitude of the effects, including consideration of their duration and any potential in-combination / cumulative impacts arising from other developments;

- Stage 5: Determination of the significance of the effects based on the interaction between the effect magnitude / duration and the nature conservation value of the ecological receptors affected;
- Stage 6: Identification, incorporation, and assessment of mitigation measures required to address significant adverse effects; and
- Stage 7: Determination of the residual effect significance once the benefits of the prescribed mitigation measures have been assessed.

4.2.43 The EIA process involves the application of specific criteria to evaluate and rank impacts and features. However, because of the complexity of ecological systems and the potential uncertainty of some impacts, indirect effects, and efficacy of some mitigation measures, experienced professional judgement in the valuation of features and in the determination of effect significance is one of the most important elements of the process.

Nature Conservation Evaluation

4.2.44 A key process in the assessment of ecological impacts is the evaluation of the nature conservation importance or sensitivity of ecological receptors likely to be affected by a proposed development. In this evaluation each ecological receptor (including habitats and species) is described in terms of its nature conservation importance as well as its ecological function, and an assessment of the likely sensitivity of the feature / resource is also made. Assigning a nature conservation value to ecological receptors involves the consideration of a range of criteria. For example, there is a long-established and widely adopted method of determining the nature conservation value of a site. This method is known as the 'Ratcliffe Criteria' (Ratcliffe, 1977). The Ratcliffe Criteria provide a standardised and objective way of assessing the value of a site using the following ten attributes: Size; Naturalness; Representativeness; Rarity; Diversity; Position; History; Fragility; Potential value; and Intrinsic appeal (see Appendix 4J for further details). In practice, rarity is often the most important criterion. Therefore, the nature conservation values described in Table 4.3, below, are primarily defined by the rarity within the different geographical units. This geographical distinction is also useful in placing values in the context of nature conservation designations, which tend to be ranked according to geographical importance.

4.2.45 The assessment of the sensitivity to change of an ecological feature, as the result of a development, is derived from experience and the ecological literature. This aspect of the assessment requires an understanding of the likely responses of a particular feature to a given set of processes or construction plans associated with a proposed development.

Table 4.3: Descriptions of Nature Conservation Value Levels

Value	Examples
Very high (International importance)	Habitats or species that form part of the cited interest within an internationally protected site or candidate site (e.g. SAC, cSAC, SPA, pSPA, Ramsar site). A feature (e.g. habitat or population) which is either unique or sufficiently unusual to be considered as being one of the highest quality examples in a international / national context that the site is likely to be designated as an SAC / SPA.
High (National importance)	Habitats or species that form part of the cited interest within a nationally designated site (SSSI, ASSI, NNR, MNR). A feature (e.g. habitat or population) which is either unique or sufficiently unusual to be considered as being one of the highest quality examples in a national / regional context for which the site could potentially be designated as an SSSI.
Medium (Regional importance)	Habitats or species that form part of the cited interest of a Local Nature Reserve, or some local-level designated sites depending on specific site conditions. Viable areas of internationally or nationally important habitats (e.g. Annex I habitats, priority BAP habitats) present in quality and extent at a regional level, or relevant biogeoclimatic zone, of importance. Population of a species which is either unique or sufficiently unusual to be considered as being of nature conservation value at up to a national context (e.g. UK Nationally Scarce). Sites supporting critical habitats for a regularly occurring, regionally significant number of a nationally important species (e.g. priority UK BAP).
Low (Local importance)	High: Sites meeting the criteria for Scottish Council area designation (such as Site of Importance for Nature Conservation (SINC)), Wildlife Sites, which may include amenity and educational criteria in urban areas. Sites containing viable areas of any priority habitat identified in the UK BAP or Scottish Local Authority LBAPs. Sites supporting viable breeding populations of species known to be Scottish Local Authority rarities (e.g. included in the LBAP), and / or supplying critical elements of their habitat requirements. Any regularly occurring, locally significant population of bird species.
	Medium: Features / habitats or species which are not considered to qualify for non-statutory designation but which provide locally important semi-natural habitats (i.e. approx. 10 km radius from the site). Populations of any species conservation importance in the context of the local area (i.e. approx. 10 km radius from the site).

Value	Examples
	Low: Features / habitats or species which are not considered to qualify for non-statutory designation but which provide locally important semi-natural habitats in the context of the immediate surrounding area (e.g. species-rich hedgerows, small ponds). Populations of any species of conservation importance in the context of the immediate surrounding area.
Negligible	Commonplace feature of little or no habitat / historical significance. Loss of such a feature would not be seen as detrimental to the ecology of the area.

*Where species or habitats occur in more than one level the highest value is applicable.

Impact Magnitude

4.2.46 The impacts (both adverse and beneficial) of the construction and operation of the proposal, and any potential cumulative and in-combination impacts associated with the proposal or other proposals for the wider area, are assessed for their potential effect on the ecological receptors. The impact magnitude is determined by the interaction between the scale of the effect in time, area and intensity, and the sensitivity of the feature being impacted. Guideline criteria for different levels of impact magnitude are given in Table 4.4 below.

Table 4.4: Categorisation of Impact Magnitude (includes consideration of impact duration)

Magnitude	Description
Total / Near Total	Would cause the loss of a major proportion or whole feature / population, or cause sufficient damage to a feature to immediately affect its viability.
High	Major impacts on the feature / population, which would have a sufficient effect to alter the nature of the feature in the short-long term and affect its long-term viability.
Medium	Effects that are detectable in short and long-term, but which should not alter the long-term viability of the feature / population.
Low	Minor effects, either of sufficiently small-scale or of short duration to cause no long-term harm to the feature / population.
Negligible	Minimal change on a very small scale: <i>de-minimus</i> .
Neutral	A potential impact that is not expected to affect the feature / population in any way; therefore no effects are predicted.
Duration definitions	Short-term, up to 5 years Medium-term, 6 - 20 years Long-term, 21 - 30 years Permanent, over 31 years.

Significance and Mitigation

4.2.47 Following the determination of nature conservation value and impact magnitude, the significance of the effect is determined by combining the two. Table 4.5, below, illustrates the relationship between impact magnitude and nature conservation value. This table is for guidance only, as in practice the assessment of effect significance involves judgment based on the nature of the potential impacts and detailed understanding of the sensitivity of the ecological features affected.

4.2.48 Only those effects of moderate to major level are considered to be significant (*i.e.* considered to be “likely significant effects” in terms of the EIA Regulations). Although under the EIA Regulations only significant effects require mitigation, lesser effects may also need to be addressed depending on the specific circumstances.

4.2.49 Once effect significance has been determined, then the need for mitigation measures is identified. The proposed mitigation measures are then in turn assessed for their potential beneficial impact following exactly the same methodology as the assessment of potential adverse impacts. Following this, the residual effect significance is determined, once the benefits of the proposed mitigation measures are factored into the assessment.

Table 4.5: Matrix Showing the Relationship between Impact Magnitude and Nature Conservation Value in the Determination of the Significance of Effects

Impact Magnitude	Nature Conservation Value				
	Very high	High	Medium	Low	Negligible
Total / near total	Major	Major	Major	Moderate	Slight
High	Major	Major	Major-Moderate	Moderate	Slight
Medium	Major	Major - Moderate	Moderate	Moderate - Slight	Slight
Low	Moderate - Slight	Moderate - Slight	Moderate - Slight	Slight	Slight
Neutral / Negligible	Neutral / Negligible Impact				

4.2.50 Residual impacts are considered to be significant under the EIA Regulations if they are at a level of moderate or major. In other words, residual impacts of neutral or slight are not considered to be significant. For this impact assessment, the residual impacts have been considered and weighted on a sensible and realistic ‘worst case scenario’ basis, using professional judgement.

4.3 Ecological Baseline Description

4.3.1 This section describes the ecological baseline of the An Camas Mòr Local Plan area and relevant surroundings, including those areas which would be affected by the associated infrastructure. A summary description is given at the start of this section and then ecological receptors are dealt with in turn under appropriate sub-headings. Relevant legislation for each of

the ecological receptors is summarised and presence / overall importance is described. Species and habitats are not specifically noted as being on the Scottish Biodiversity List because the majority of them are listed, however, the UKBAP is specifically mentioned, where relevant. In these descriptions account is taken of ecological changes which will or have occurred through changes in land use management and as a result of natural successional processes. Consideration has also been given to potential ecological changes which due to influences such as climate change in the future. While an attempt to incorporate present and future climate changes has been made it is important to note that this is a developing sphere of knowledge and there is considerable uncertainty at present as to how global temperature increases will affect complex ecosystems at the local level in the future.

Site Description Summary Related to the Proposed Development

- 4.3.2** The proposed development site (*i.e.* the core development area) lies at c. 220 m above sea level and is located in Strathspey on Rothiemurchus Estate. It is in the base of the Spey valley, on an old river terrace, and to the north of the River Druie; a medium sized tributary of the River Spey which drains Glenmore.
- 4.3.3** The Cairngorm, Rothiemurchus and Glenmore area is renowned for its the characteristic and important native woodland, montane, moorland and wetland habitats and the associated bird and animal communities the area supports. Many species are present in the area which are of national and international conservation concern and of restricted range in the UK for a summary of relevant statutory designated sites and cited ecological interest in the vicinity of the proposed development site).
- 4.3.4** The principle habitat types within the proposed core development area are planted conifer woodlands with scattered lone Scots pines and young birch of varying age classes, and semi-natural pine and birch dominated woodland. The centre of the core development area was formerly dry dwarf shrub heath with scattered areas of acid grassland but this area is all now reverting to woodland through intentional planting and natural regeneration. The B970 road to Nethy Bridge bounds the site to the east. A large area of mainly semi-natural mixed forest extends from the south of the site towards the River Druie. Habitats in the wider surrounding area (outside of the core development area) include juniper heath, various age classes of conifer plantation, semi-natural woodland, riverine habitats, riparian woodland and scrub, marshy grassland and enclosed arable and pasture fields. A more detailed description of the habitat types recorded within and surrounding the core development area is provided below. Table 4.6 provides the approximate total areas of each of the Phase I habitat types recorded within the wider survey area and Table 4.7 provides the equivalent habitat areas for the core development area only.
- 4.3.5** A small, relatively recently dug artificial pond is located just off the main access track into the east of the core development site. A small basin mire, is also located within the pole stage conifer plantation towards the southwest corner of the core development site.
- 4.3.6** Loch Pityoulish lies c. 0.5 km to the northeast of the core development area and the Rothiemurchus Fishery (comprising several angling ponds and netted rearing tanks) is located c. 0.5 km to the southwest. The Fishery is a well known haunt for foraging ospreys and grey heron that nest in the surrounding area. As indicated above, the nearest major watercourses are the River Spey, c. 100 - 400 m to the west of the development area, and a main tributary the River Druie, c. 1 km south.

- 4.3.7** The primary land uses within the site and the immediate surroundings are commercial plantation forestry, mixed arable and beef farming, tourism / recreational activity (including eco tourism, quad biking and angling) and commercial fish rearing. The town of Aviemore is located on the opposite, western bank of the River Spey and the settlements of Inverdrue and Coylumbridge are c. 1 km to the south and south east of the core development area. The more open tree planted areas and tracks are used for various recreational purposes including quad bike tours and by the local model airplane club. West, south and east of the core development area are arable and improved grassland fields associated with the adjacent Rothiemurchus farms. Cattle and commercially raised deer are grazed in the improved grassland fields.
- 4.3.8** The corridor which would contain the main access routes (and the utilities) is proposed to enter the core development site from the south off the B970 close to the existing electricity sub station. This corridor would cross a small area of mixed wet woodland then the River Druie and would then cross agricultural fields before rising up on to the old river terrace through native mixed birch and pine woodland into the proposed development. The utilities and cycling and walking path would follow the same route on a separate bridge (but the same foundations) across the River Druie.
- 4.3.9** In addition, a new section of road is proposed to be located northeast of Coylumbridge, from the ski road to Glenmore to join the B970 just north of Coylumbridge. This corridor would pass through mature conifer plantation and mixed semi-natural woodland. There is also an area of land proposed for playing pitches and linked facilities, these would be located on what is currently arable farmland and would require to be linked to the new road network through an area that is mainly planted conifer woodland. There would also be additional walking and cycling paths linked to the development, most of which would be likely to follow existing tracks. It is also likely that the existing B970 road to the east of the core development area would require to be widened. It is currently fringed by semi-natural woodland and conifer plantation, along with more open areas of grassland and heath.

Statutory Designated Sites

- 4.3.10** Figure 4.3 illustrates the closest boundaries of sites with statutory designations for nature conservation in relation to the core proposed development area (see Figure 4.3). The whole area is within the Cairngorms National Park. There are no designated nature conservation sites within the core development area. The River Spey Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) is close to the western boundary of the core development area and the River Druie (part of the Spey SAC designation) would be crossed by the main access road bridge and the pedestrian / cycleway and combined utilities bridge. In addition, the boundary of the Cairngorms SAC, Special Protection Area (SPA) and North Rothiemurchus Site of Special Scientific Interest (SSSI) are immediately adjacent to part of the proposed new road to the east of Coylumbridge. A summary description of the relevant statutory designations is given for each one in turn below. There are other statutory nature conservation designations in the surrounding area but these are not mentioned here because they are all remote from the development and would be completely unaffected.
- 4.3.11** Cairngorms National Park – The development site is within the Cairngorms National Park, which was formed under the National Parks (Scotland) Act 2000, although the park was designated in 2003. The National Park's four key aims are:

- To conserve and enhance the natural and cultural heritage of the area;
 - To promote sustainable use of the natural resources of the area;
 - To promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public; and
 - To promote sustainable economic and social development of the area's communities.
- 4.3.12 River Spey SAC / SSSI** – This designated area is located between 100 and 400 m west of the core development area. The river rises in the high ground of the Monadhliath Mountains, but for most of its length flows through a wide alluvial plain composed mainly of glacial origin mixed sands and gravels. The Spey can be described as an alpine river with high flow levels, often persisting well into spring. The Spey is designated an SAC and SSSI for its populations of otter, Atlantic salmon, sea lamprey and freshwater pearl mussel. The River Druie is designated as part of the SAC.
- 5.3.13 North Rothiemurchus Site of Special Scientific Interest (SSSI)** – This area is located outside of the core development area but at its closest point it is immediately adjacent to the proposed new road at Coylumbridge. It is c. 0.9 km to the east of the core development area. Rothiemurchus Pinewood forms part of one of the largest tracts of semi-natural native pinewood in Britain and the characteristic fauna and flora of the forest area is an important component of the sites biological interest. The notified features of this site include invertebrate, fungi and lichen assemblages and the glacial geology / geomorphology. In addition, the breeding bird assemblages, including capercaillie, crested tit, osprey, and Scottish crossbill are also a notifying feature.
- 4.3.14 Cairngorms SPA** – This designation overlaps the above SSSI. The Cairngorms SPA is a large upland site that is of outstanding importance for its Caledonian pine forest, moorland and montane plateau. The altitudinal gradation over a relatively short distance between these habitats is of exceptional interest and results in the site supporting a unique range of flora and fauna, including a unique assemblage of Annex I and other rare migratory species. Those species include capercaillie, osprey, Scottish crossbill, golden eagle, dotterel, merlin, and peregrine. This area is located outside of the core development area but at its closest point it is immediately adjacent to the proposed new road at Coylumbridge. It is c. 0.9 km to the east of the core development area.
- 4.3.15 Cairngorms SAC** – This designation also overlaps with the SSSI and SPA detailed above. The Cairngorms SAC is primarily designated for a diverse range of habitats including, acid peat-stained lakes and ponds, acidic scree, alpine and boreal heaths, blanket bog, bog woodland, Caledonian forest, dry limestone grassland and scrublands, dry heaths, hard-water lime-depositing springs, juniper heaths, montane acid grasslands and mountain willow scrub. Notifying species include green shield-moss and otter. This area is located outside of the core development area but at its closest point it is immediately adjacent to the proposed new road at Coylumbridge. It is c. 0.9 km to the east of the core development area.
- 4.3.16 Craigellachie SSSI & National Nature Reserve (NNR)** – is located to the west of the River Spey and remote from the development at c. 1 km west of the core development area. Craigellachie is one of the largest birchwoods in Strathspey and is dominated by silver birch. It is also designated for its breeding bird assemblages, particularly peregrine, and moth populations and vascular plant assemblages.

4.3.17 Kinveachy Forest SPA & SSSI – The pinewood of Kinveachy is one of the major tracts of remnant Caledonian Pine Forest in Strathspey. It is located c. 2.5 km north west of the core development area i.e. it is distant from the proposed development area. The range of altitude is from 300 metres to more than 500 metres. The range of forest habitat present is important for several bird species: capercaillie, Scottish crossbill, siskin, crested tit and greater spotted woodpecker. The extensive forest and moorland habitats of the site provide feeding and nesting areas of several rare species of raptor. The SPA qualifying features include an estimated 200 individual Scottish Crossbills, representing about 13 % of the British breeding population, and about 3 % of the British population of Capercaillie, with an estimated 30 - 70 individual birds present.

4.3.18 Cairngorms NNR – This has been in existence as an NNR for over fifty years and encompasses many of the interests outlined above. This NNR is distant from the proposed development area of An Camas Mòr and is not within the geographical coverage of Figure 4.3. Recently, SNH has been reviewing the NNR and may break up the Cairngorms NNR into its component landholdings and extend the overall area of the reserves.

Non-statutory Sites

4.3.19 The geographical area which includes An Camas Mòr (the core development area) and the related surrounding infrastructure has several non-statutory designations which are within and adjacent to it that relate to nature conservation. These are all related to the SNH Ancient Woodland Inventory (AWI, formerly held by the Nature Conservancy Council). There are no local level wildlife sites (e.g. Scottish Wildlife Trust or Local Authority designated sites) or similar other non-statutory designations within or in the surrounding adjacent area. Figure 4.4 indicates the three categories of woodland on the AWI and their locations relative to the core development area. From this Figure, it can be seen that all the existing woodland to the south of the core development area further south to the farmland is classified as “long-established of plantation origin”. The older conifer plantation within the core development area was added to the Inventory recently by SNH. This area of long-established woodland also crosses the B970 and includes the area of the proposed new road at Coylumbridge. The AWI mapping does not fully align with the OS base mapping appearing to be slightly “shifted” to the west and north. The edge of the long-established woodland polygon is approximately the correct shape to align with the edge of the back garden boundaries at Coylumbridge. To the south there is an area of “ancient woodland of semi-natural origin” marked on the AWI, although on the ground, the edge of this area appears to be conifer plantation. The proposed new Coylumbridge road may just impinge into the mapped edge of the ancient woodland of semi-natural origin. However, there is a clear gap here between this boundary and the back garden boundaries and this gap corresponds to the boundary of the Cairngorms SAC, SPA and SSSI. Consequently, it appears likely that the ancient woodland of semi-natural origin would be avoided but be immediately adjacent to the new road edge.

4.3.20 To the north east of the core development area is the Callart Hill conifer plantation which is recorded within the AWI as being long-established of plantation origin (see Figure 4.4). This area is outside of the core development area but adjacent to it and would not be directly affected by the proposals.

4.3.21 Although not strictly a nature conservation non-statutory designation, Woodland Grant Scheme (WGS) areas are of land management relevance to ecology. There are areas of WGS land within the wider study area and particularly within the proposed core development area. The

majority of the recently planted tree areas around the periphery of the site and within the central portion of the heathland area are within the WGS.

Habitats and Flora

4.3.22 The habitat or vegetation types present within the wider survey area and the core development area are illustrated in Figure 4.5. This Figure also shows the accompanying target note numbers, which are cross-referenced in the text as 'TN ...'. All habitat / vegetation survey target notes are provided in Appendix 4D. In addition, the "best-fit" overall NVC communities have been identified and mapped within the core development area for the most important vegetation communities present and these are shown on Figure 4.2. A list of vascular and non-vascular plant species recorded during all habitat / vegetation surveys is provided in Appendix 4E with common and scientific names, where applicable.

4.3.23 Table 4.6 provides the approximate total areas of each of the habitat types recorded within the wider survey area and Table 4.7 provides the equivalent habitat areas for the core development area only.

Table 4.6: Approximate Areas of Each Phase I Habitat Type Within the Wider Survey Area

Habitat Type	Wider Survey Area (ha)	Percentage of Wider Survey Area (%)
Broad-leaved semi-natural woodland	23.38	4.96
Broad-leaved plantation woodland	0.83	0.18
Coniferous semi-natural woodland	36.93	7.84
Coniferous plantation woodland	104.43	22.17
Mixed semi-natural woodland	38.87	8.25
Mixed plantation woodland	2.83	0.60
Dense / continuous scrub (including juniper scrub)	13.52	2.87
Scattered scrub	1.43	0.30
Broad-leaved parkland / scattered trees	0.19	0.04
Coniferous parkland / scattered trees	0.48	0.10
Mixed parkland / scattered trees	1.80	0.38
Unimproved acid grassland	7.21	1.53
Semi-improved acid grassland	43.13	9.16
Improved grassland	36.40	7.73
Marsh / marshy grassland	19.55	4.15
Poor semi-improved grassland	4.55	0.97
Tall ruderal	0.95	0.20
Dry dwarf shrub heath	28.86	6.13
Dry heath / acid grassland mosaic	13.90	2.95
Wet modified bog	0.12	0.03

Oligotrophic lake (pityoulish)	8.13	1.72
Mesotrophic ponds	3.66	0.78
Oligotrophic to mesotrophic river	8.74	1.86
Quarry	0.02	0.004
Arable	63.28	13.44
Amenity grassland	0.87	0.19
Ephemeral / short perennial	4.79	1.02
Other habitat (including gravel sidebars etc.)	2.10	0.45
Total	470.95	100.00

Table 4.7: Approximate Areas of Each Phase I Habitat Type Within the Core Development Survey Area

Habitat Type	Core Survey Area (ha)	Percentage of Core Survey Area (%)
Broad-leaved semi-natural woodland	8.27	7.93
Coniferous semi-natural woodland	6.39	6.13
Coniferous plantation woodland	44.78	42.93
Mixed semi-natural woodland	0.26	0.25
Dense / continuous scrub	1.06	1.02
Scattered scrub	0.90	0.86
Broad-leaved parkland / scattered trees	0.16	0.15
Coniferous parkland / scattered trees	0.46	0.44
Unimproved acid grassland	4.67	4.48
Semi-improved acid grassland	0.43	0.41
Marsh / marshy grassland	0.04	0.04
Poor semi-improved grassland	0.42	0.40
Dry dwarf shrub heath	24.90	23.88
Dry heath / acid grassland mosaic	9.44	9.05
Wet modified bog	0.12	0.12
Mesotrophic ponds	0.17	0.16
Amenity grassland	0.50	0.48
Other habitat (including gravel sidebars etc.)	1.32	1.27
Total	104.29	100

Overall Description of Vegetation Within the Wider Study Area

- 4.3.24** The dominant semi-natural habitats in the area are of the woodland, heathland, grassland and riverine types. The majority of the heathland is in succession to woodland, mainly through natural regeneration but planting is also further encouraging this. Remaining areas that still consist of fairly open heath are dominated by heather, often with fairly abundant bilberry and cowberry. In localised areas *Cladonia* spp. of lichen are also abundant often along with petty whin. Silver birch and Scots pine are the dominant regenerating saplings, even on currently open heathland. This community continues as the field layer in most places where birch has become established. Floristically, this relatively young birchwood has little ground vegetation differences from the open heath, except for the open canopy of birch itself. There is no well-developed understorey in this community, although gorse is occasional and juniper seedlings / young plants are often common and widely spread. Under denser groups of trees the heather is scarcer, leaving grassy areas with spreading mats of cowberry and sprigs of crowberry and Juniper is more common as slightly larger plants.
- 4.3.25** Older Scots pines (very occasional “granny” pines) occur occasionally in the main birchwood areas, but the boundary between birchwood and pinewood is not a clear one due to successional processes. The relative abundance of pine often appears to increase gradually, with birch decreasing. Although in some areas such as significant areas of the larger area of heathland within the core development area, it appears that fairly dense Scots pine forest would be the immediate climax vegetation in time. The field layer remains similar in the Scots pine areas (both in more open plantations and semi-natural areas), although variable. As in the birchwood community, where the canopy is fairly dense the field layer is much grassier, with little heather. Other areas are much more heather dominated.
- 4.3.26** There are also generally smaller areas of heath / acid grassland mosaic, acid grassland, neutral grassland and marshy grassland present most of which can probably be attributed to heavier grazing in the past. There is one area at the north of the core development site where an accidental fire has had this influence fairly recently. Acid and circumneutral grassland is often dominated by common bent (*Agrostis capillaris*).
- 4.3.27** Figure 4.5 illustrates the importance of riverine habitats within the wider study area. Both the River Spey and the River Druie contain important aquatic and riparian habitats. River edge habitats include areas of wet woodland dominated by common alder in places but also contain a wide range of other native trees and planted native and non-native species in a mix of wet and drier woodland types. There are several large mature islands on the River Spey and the River Druie contains dynamic and older channels and braided sections with varied small mosaics of various localised habitat types.
- 4.3.28** The key habitat types are described in more detail below both in terms of Phase I and NVC terminology. Tables 4.6, 4.7 and 4.8 and Figures 4.2 and 4.5 also relate to these detailed descriptions. These descriptions include habitats that occupy a significant area of land within the core development area and / or the immediately surrounding areas that are likely to be affected by the related infrastructure development.

Detailed Habitat Descriptions

- 4.3.29** Table 4.8 gives an approximate comparison between the Phase 1 habitat types and their corresponding NVC communities and sub-communities for each of the key vegetation

communities present within the core development area but this Table is also equally applicable to the wider surrounding study area. It is important to note that there are many young, mosaic and intermediate NVC categories present within the whole of the study area and where these are small in area and / or a very poor match they have been intentionally omitted from Table 4.8 and the dominating categories for the wider area have been used. Such NVC classification, while very useful to ecologists for assessment, is always open to debate and interpretation.

Table 4.8: Summary of Phase I Habitat Types and Best Corresponding NVC Vegetation Communities

Phase I Habitat	Corresponding NVC Classification (with full botanical nomenclature)	Quadrats (see Appendix 4C)
Semi-natural broadleaved woodland	<i>Betula pendula</i> dominated and often colonised <u>H12b</u> <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath, <i>Vaccinium vitis-idaea</i> – <i>Cladonia portentosa</i> sub-community, closely allied to <u>W18b</u> (below) and this provides the best classification.	a, b, c, 1, 2, 3
Semi-natural coniferous woodland	<u>W18b</u> : <i>Pinus sylvestris</i> - <i>Hylocomium splendens</i> woodland, <i>Vaccinium myrtillus</i> - <i>Vaccinium vitis-idaea</i> sub-community.	4, 5, 6
Dry heath	<u>H12b</u> <i>Calluna vulgaris</i> – <i>Vaccinium myrtillus</i> dry heath, <i>V. vitis-idaea</i> – <i>Cladonia portentosa</i> sub-community is the best match but most is closer to the <u>H12</u> <i>Calluna vulgaris</i> – <i>Vaccinium myrtillus</i> dry heath, lichen rich sub-community as described by Averis <i>et al.</i> (2004) and not well represented in the NVC.	16, 17, 20, 21, 22, 23, 24
	<u>H18</u> <i>Vaccinium</i> – <i>Deschampsia</i> heath, <i>Vaccinium vitis-idaea</i> dominated form.	25, 26
Acid grassland / dry heath mosaic	<u>H9b</u> <i>Calluna vulgaris</i> – <i>Deschampsia flexuosa</i> heath, <i>Vaccinium myrtillus</i> – <i>Cladonia</i> spp. sub-community.	9, 10
	<u>U4a</u> <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Galium saxatile</i> grassland, typical sub-community.	11, 12, 15
	<u>U4a</u> <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Galium saxatile</i> grassland, typical sub-community, <i>Vaccinium vitis-idaea</i> – <i>Trifolium repens</i> form.	13, 14
Acid grassland	<u>U4</u> <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Galium saxatile</i> grassland, mesotrophic form.	7, 8
Wet modified bog (basin)	Transitional between <u>M9</u> <i>Carex rostrata</i> swamp and <u>M2b</u> <i>Sphagnum recurvum</i> / <i>fallax</i> bog pool community, <i>Sphagnum fallax</i> sub-community.	18, 19

- 4.3.30** The headings below give a detailed description of the habitat types listed in Tables 4.6, 4.7 and 4.8 and their occurrence within the core and wider study area. It is important to note that while exhaustive surveys of fungi were not undertaken (due to the fact that most are only identifiable for very short periods of time during their lifecycles), they are considered within this assessment as an inherent part of habitats and flora and are assessed as such.

Broad-leaved Semi-natural Woodland

- 4.3.31** There are several areas of broad-leaved semi-natural woodland within the wider survey area, which account for approximately 5% or 23 ha of the wider survey area and 8% or 8 ha of the core development area. These areas are larger if mixed semi-natural woodland is also included, particularly in the wider study area. This habitat falls within a broad habitat type in the UKBAP – broadleaved, mixed and yew woodland.
- 4.3.32** Towards the south of the proposed core development area is an area of silver birch dominated woodland, with occasional Scots pine. It has a fairly open canopy and a ground layer dominated by heather. Broom, juniper, bilberry and cowberry are also frequent. It occurs between the pinewood and the currently more open heath (see Figure 4.5). Three quadrats (Q 4, 5, 6) were located here for vegetation sampling. See Figure 4.2 for all quadrat locations and NVC communities. The habitat here does not directly correspond to an NVC community type. The field layer community is similar to that in the W18 *Pinus sylvestris* - *Hylocomium splendens* woodland and the adjacent H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath, and this community can therefore be described as a heather rich form of W18b *Pinus sylvestris*-*Hylocomium splendens* woodland, *Vaccinium myrtillus* – *Vaccinium vitis-idaea* sub-community where Scots pine is replaced by silver birch.
- 4.3.33** Alternatively, this community can also be described as a form of transitional H12 *Calluna vulgaris*- *Vaccinium myrtillus* heath almost identical to the adjacent H12b *Vaccinium vitis-idaea* – *Cladonia portentosa* sub-community in a state of succession into woodland by colonisation with birch. This is likely to be the natural progression here where grazing and shading of seedlings by sub-shrubs is low enough to allow successful germination of birch. Further natural regeneration of Scots pine is likely to follow in time.
- 4.3.34** The majority of the remainder of the semi-natural broadleaved woodland occurs outwith the core development area in stands along the banks of the River Spey and on the north bank of the River Druie, and is mainly dominated by common alder. There is one area close to the Dell track that is dominated by common alder and cherry woodland. Along the River Spey, the woodland contains abundant silver birch, while the north of the River Druie is characterised by occasional rowan, Scots pine, and beech as well. The ground flora along these riverine woodlands is typical of wet shady woodlands and contains great wood-rush, common valerian, common hogweed, raspberry, common nettle, tufted hair-grass, wood sorrel, broad buckler-fern, common dog-violet, creeping soft-grass, creeping buttercup and many young ash seedlings. Broad-leaved dock, hedge woundwort, herb robert, wood avens and bugle are also common in these areas.
- 4.3.35** There are only very small areas of planted broadleaved woodland within the wider survey area (0.2 %) and due to their small size and relative unimportance in this area these are not described further but generally included within the broad-leaved semi-natural category.

Coniferous Semi-natural Woodland

- 4.3.36** The majority of coniferous semi-natural woodland is towards the south of the wider survey area. The largest area, enclosed mainly by plantation woodland, the B970 to the east, and broad-leaved semi-natural woodland to the northwest, is dominated by Scots pine, with rare silver birch becoming more frequent towards the northwest where it adjoins the broad-leaved woodland. There is some natural regeneration of Scots pine, and the ground layer is dominated by heather

and bilberry, although in a few areas there is little ground layer vegetation due to an accumulation of pine litter. Bryophytes in the area include *Hylocomium splendens*, *Rhytidiadelphus triquetrus* and *Pleurozium schreberi*. The trees often support common lichen assemblages including (but not limited to) *Usnea* spp., *Evernia prunastri* and *Hypogymnia physodes*. This habitat type is a priority one in the UKBAP.

- 4.3.37** Three quadrats (Q a, b, c) were located in the Scots pine woodland just south of the proposed core development area (see Figure 4.2 for the quadrat locations). This is a good example of semi-natural pinewood. The pinewood within the proposed core development, where Q 1, 2 and 3 were located, is a continuation of this woodland, but appears to be slightly more recent. It is likely that this is naturalised plantation or has been formed from colonisation of the adjoining heath. It is likely that a degree of grazing has affected the ground flora and woodland regeneration here in the recent past.
- 4.3.38** This community is best described as W18 *Pinus sylvestris*-*Hylocomium splendens* woodland in the NVC scheme. While the woodland within the proposed core development area differs to some extent from that to the south, both display sufficiently similar characteristics to fall into the same classification. Heather is less dominant in Q2 and 3, with bilberry and cowberry occurring in some abundance. These quadrats correlate most closely overall with the *Vaccinium myrtillus*-*Vaccinium vitis-idaea* sub-community W18b.
- 4.3.39** Bryophytes form an important part of the community, represented in quantity by *Hylocomium splendens* with *Rhytidiadelphus triquetrus* and *Pleurozium schreberi*. Notably lacking in these quadrats are *Rhytidiadelphus loreus*, *Plagiothecium undulatum* and *Ptilium crista-castrensis*, which one would expect to find in this community, although they may occur elsewhere within the habitat. The *Luzula pilosa* sub-community W18c is very similar, but tends to include a number of characteristic herbaceous species including wood sorrel, heath bedstraw and hairy woodrush as regular components.
- 4.3.40** Quadrats a, b, c and 1 are much more strongly dominated by heather, in contrast to the more normal composition of W18b, but this sub-community still best represents the flora occurring here. H12 *Calluna vulgaris*- *Vaccinium myrtillus* heath, which can be clearly heather dominated as here, is ostensibly the same community as W18 *Pinus sylvestris* - *Hylocomium splendens* woodland without the pine.
- 4.3.41** More semi-natural coniferous woodland runs along the northern and southern sides of improved grassland fields near the south of the wider survey area. The northern area is dominated by Scots pine, and trees around the periphery are mature whereas those in the centre are younger at thicket stage; occasional mature larches are also found around the edges. Parts of these areas have been planted with pine and larch in the past but it is fully naturalised now and is counted as semi-natural. The ground vegetation is dry heath dominated by heather and cowberry, with abundant gorse and bell heather, and occasional juniper and wavy hair-grass. The orchid species, creeping lady's-tresses also occurs in this area (on the verge of being a nationally scarce species with 104 10km² occurrences in Britain but locally common in this area). To the south of the fields is mature Scots pine woodland, with a grassy understorey and stands of juniper. The road verge of the B970 in this area contains a common wintergreen colony on the edge of this pine woodland. No NVC quadrats were completed for this area, however, the species list created indicates it is also the W18 *Pinus sylvestris* - *Hylocomium splendens* woodland.
- 4.3.42** Adjacent to the east side of the B970 is a strip of mature Scots pine with occasional larch. This strip of mature trees continues south, running behind the gardens of the nearby houses at

Coylumbridge. The ground layer is dry heath dominated by heather and bilberry, with occasional common cow-wheat, bell heather, bracken, and an extensive mossy understorey.

- 4.3.43** W18 *Pinus sylvestris* - *Hylocomium splendens* woodland is an important habitat for a wide range of plant species and two less common plant species were found to be present within the wider study area but were not found to be present within the core development area. The wider study area contained approximately 8 % or 37 ha of semi-natural coniferous forest and the core development area contained 6 % or 6 ha.

Coniferous Plantation

- 4.3.44** Coniferous plantation accounts for approximately 22 % of the wider study area and 43% of the core development area, the majority of which consists of Scots pine, with occasional naturally regenerated silver birch. It should be noted that although virtually all of the core development area has been planted with trees, it has not all been fully considered as being plantation in Phase 1 habitat mapping terms because some of it is very young and does not yet have canopy closure. Some plantation areas, including the older plantation within the core development area, have been ploughed in the past for planting. The rest of the plantations within the core development area are recently planted and at pre-thicket / thicket stage. The denser older plantations have a grassy and mossy ground vegetation due to shading. The younger plantings still have a tall heather understorey often with petty whin being frequent.

Mixed Semi-natural Woodland

- 4.3.45** To the south of the wider survey area a fairly high proportion of the woodland is mixed semi-natural (8 % or 39 ha). This is predominantly comprised of Scots pine and silver birch, with occasional common alder and other broad-leaved tree species close to the River Druie. Some small areas which are largely natural but have had planted conifers introduced in the past in small blocks are also included in this category because their character is fairly natural, particularly along the River Druie. Along the edges of this woodland type, bordering the River Druie, there are frequent stands of creeping lady's-tresses, with up to 100 spikes recorded in one colony. This woodland type is a broad habitat within the UKBAP with wet woodland being a priority habitat.
- 4.3.46** The ground flora in these areas varies depending on wetness but the following is an example. To the south of the wider survey area between the B970 and the River Druie is a small area dominated by mature Sitka spruce, European larch, and Scots pine reaching up to c. 40 m in height, with an understorey comprising of 3-5 m high broad-leaved trees and shrubs such as beech, pedunculate oak, broom and conifer seedlings. This understorey is mainly found around the edges of the stand, and more centrally the ground layer is moss-dominated with wavy hair-grass throughout. Stands of great wood-rush are abundant, with wood sorrel, cat's-ear, common cow-wheat and bilberry all present. Creeping lady's-tresses are also found quite frequently throughout.
- 4.3.47** To the northeast of the improved grassland just north of The Dell of Rothiemurchus (see Figure 4.5), the mixed semi-natural woodland becomes dominated by silver birch, but with Scots pine still frequent. This has a heath dominated ground flora.
- 4.3.48** There are only very small areas of mixed plantation (mixed broad-leaved and conifer plantings) present at a total of 0.6 % of the wider study area and 0 % of the core study area and this type is

not covered separately in more detail. In subsequent text it is included under the mixed semi-natural woodland habitat type. These have been planted with various species including larch and occasional beech but several have naturalised with a variety of other native tree species since planting.

Dense / Continuous Scrub (including juniper scrub) and Scattered Scrub

- 4.3.49** There are stands of dense / continuous scrub and scattered scrub throughout the site (see Figure 4.5). In total there is approximately 3 % or 15 ha of the wider study area and 2 % or 2 ha of the core development area with scrub vegetation. The majority of this scrub is juniper dominated and to the east of the B970 outside of the core development area. To the far north of the wider study area is a strip of dry heath under the transmission line way-leave with frequent stands of broom and gorse, some dense. Adjacent to the western boundary of the core development area but mainly outside it between the conifer plantation and the arable fields, is a long strip of scrub. The southern section was once dry heath with young birch trees, but has now been invaded by gorse and broom scrub. The northern section has more scattered scrub within the core development area and is more varied including stands of common hawthorn, with a grassy ground layer.
- 4.3.50** There are several stands of continuous juniper scrub in the semi-natural woodland to the south of the core development area. Relatively close to Dell Farm, the juniper scrub grows up to 4 m tall and the area also contains occasional red-berried elder (*Sambucus racemosa*), common elder, and raspberry. Further south into this area of woodland, many of the juniper bushes are mature, have been seen flowering, and grow up to 8 m tall.
- 4.3.51** Scattered scrub, in particular juniper scrub, occurs throughout other habitats: there are areas in the dry heath in the southwest corner of the core development area and the wider study area by the River Spey; in the strips of semi-natural conifer woodland to the north west and south of the wider study area; and to the east of the B970 near Drumchork, and throughout much of the mixed semi-natural woodland within the wider study area.

Parkland / Scattered Trees

- 4.3.52** Areas of parkland and scattered trees of all habitat types (i.e. broad-leaved, coniferous and mixed) occupy relatively small areas of land within the core and wider study areas (see Tables 4.6 and 4.7 for further details).

There are scattered broad-leaved trees within a number of dry heath and dry heath / acid grassland mosaic areas within the wider study area and within the core development area. The vast majority of the scattered broad-leaved trees within the core development area are silver birch, of varying age classes. Rowan and common hawthorn are also present occasionally.

- 4.3.53** The tree-planted dry heath, particularly to the north of the core development area and the large area of recently tree planted dry heath and dry heath / acid grassland mosaic in the centre of the core development area have scattered lone Scots pine, along with young, regenerating Scots pine. There is an area of dry heath in the south west corner of the proposed core development site, and this also contains scattered mature and seedling Scots pine, as well as several large broadleaved trees.

4.3.54 The private gardens around the Dell of Rothiemurchus House contain mixed parkland / scattered mature trees. An area of lawn is surrounded by planted trees within the garden boundary.

Unimproved Acid Grassland

4.3.55 There are several small areas of unimproved acid grassland within the wider survey area and within the proposed core development area. These are concentrated in the northwest close to the River Spey, and within two areas adjacent to the B970 to the north east (see Figure 4.5). The areas close to the River Spey are outside of the core development area in the south; however, at the north western corner of the core development area there is a larger area, most of which is unimproved. Overall, the wider study area contains approximately 1.5 % or 7 ha of unimproved acid grassland and the core development area contains 4 % or 5 ha.

4.3.56 This community is classified, along with the semi-improved acid grassland (see immediately following paragraphs) as a form of U4 *Festuca – Agrostis – Galium* grassland. The dense sward of common bent here is characteristic of U4 grasslands and the bryophyte flora is typical of this community with frequent *Rhytidiadelphus squarrosus* and *Hylocomium splendens*, although factors such as management and soil type have created some atypical floristic characteristics.

Semi-improved Acid Grassland

4.3.57 There are semi-improved acid grassland fields to the east of the B970, to the north and west of Guislich Farm within the wider study area (Figure 4.5). Species on these fields include sweet vernal-grass, wavy hair-grass, ribwort plantain, tormentil and occasional common ragwort. These were probably subject to heavier grazing in the past but there is now some regeneration of Scots pine and small stands of scattered juniper scrub in places.

4.3.58 There is also a small area of semi-improved acid grassland in the north west corner of the proposed core development area (approximately 0.4% or 0.4 ha). This is strongly dominated by common bent with only relatively little sheep's fescue and small amounts of smooth meadow-grass. Other species are not particularly abundant. White clover occurs at moderate levels throughout and creeping buttercup and common ragwort are fairly common. Sheep's sorrel occurs in scattered stands with very occasional heather and mesophytic species including cock's-foot grass, creeping thistle and dandelion.

4.3.59 This U4 grassland is dominated by common bent and sheep's fescue, but heath bedstraw, tormentil and sweet vernal-grass are generally common in this community and were not present in the quadrats surveyed here. The U4b *Holcus lanatus – Trifolium repens* sub-community includes the more mesotrophic forms of *Festuca – Agrostis – Galium* community (i.e. semi-improved), where the mesophytic species here might occur. Yorkshire-fog is normally a constant in this sub-community and although present was not found here during quadrat surveying.

Improved Grassland

4.3.60 Around the Dell of Rothiemurchus / Dell Farm and to the east of the B970 are fields of improved grassland. There is no improved agricultural grassland within the proposed core development area but within the surrounding wider study area there is approximately 8% or 36 ha (see Tables 4.6 and 4.7). These are characterised by a mix of grass species, including Yorkshire-fog, sheep's fescue, and common bent, with the more species rich areas containing occasional common sorrel, pignut, harebell, lady's bedstraw, heath bedstraw, marsh thistle, yarrow and field stitchwort. The fields are formally grazed by Highland cattle, sheep and deer.

Marsh / Marshy Grassland

4.3.61 There are two areas of marshy grassland in the wider survey area; one on the east bank of the River Spey just North of the Rothiemurchus Fishery, and the other, much larger area, immediately south of Loch Pityoulish and extending south along the banks of the Kinchyles Burn (see Figure 4.5). The total area within the whole of the wider survey area is approximately 20 ha or 4 %. Within the proposed core development area there is one very small area that was large enough to be mapped separately (approximately 0.04 % or 0.04 ha) and it is in the base of a small kettle hole directly under TN70 on Figure 4.5). These areas are seasonally wet and sometimes hold water for short periods. They are not particularly species rich but contain a variety of common plant species such as marsh thistle, creeping buttercup and floating sweet-grass.

Poor Semi-improved Grassland

4.3.62 There is a thin strip of cattle grazed poor semi-improved grassland which is partly within the proposed core development area to the north, along the access track. There is also another cattle grazed strip outside of the core development area next to the River Spey (Figure 4.5). In total the wider study area has approximately 1 % or 5 ha of poor semi-improved grassland and the proposed core development area contains 0.4 % or 0.4 ha. This grassland is species-poor consisting of a few common grass species and some common herbaceous plants typical of such agriculturally improved fields.

Dry Dwarf Shrub Heath

4.3.63 There are two main areas currently dominated by dry dwarf shrub heath within the proposed core development area (see Figure 4.5), both of which are currently reverting to woodland mainly due to natural regeneration but also extensive planting on one area. In total there is approximately 24 % or 25 ha of heathland dominated habitat within the proposed core development area and 6% or 29 ha within the wider survey area. The largest area of this habitat is currently in the centre of the proposed core development site. It is dominated by heather and contains frequent to abundant petty whin in some areas, with drier areas containing bell heather and occasional bilberry and slightly wetter areas containing occasional cross-leaved heath and a *Cladonia* sp. carpet in places. In several localised places the *Cladonia* lichen species are currently dominant. There is also scattered older Scots pine and birch in this area and very

abundant natural regeneration of both, since the cessation of grazing on the area. Parts of the northern end (mainly in the separate heath / acid grassland mosaic area – see Figure 4.5) have been subject to an accidental fire approximately seven years ago, however this is now recovered with heather and petty whin on the dry heath areas.

- 4.3.64** Two NVC communities were identified within this area of dry heath (see Figure 4.2 and Table 4.8). These are H12b - *Calluna vulgaris* - *Vaccinium myrtillus* heath, *Vaccinium vitis-idaea* – *Cladonia portentosa* sub-community, with the majority of the heath being composed of H18 - *Vaccinium myrtillus* – *Deschampsia flexuosa* heath.
- 4.3.65** H12b is a common and typical dry heath community often at higher altitudes than this. Cowberry (*Vaccinium vitis-idaea*) is a notably prominent, characteristic species of the harsher climate of the central and northeast Highlands. Unusually bilberry is somewhat scarce in abundance, though widespread across the area. *Hypnum jutlandicum* and *Dicranum scoparium* are also fairly scarce in this community, but this is the best match in NVC terms.
- 4.3.66** Quadrats 20, 21, 22, 23 and 24 (Appendix 4C) have no bilberry, although it does occur occasionally within the community in the area of the samples. *Cladonia* spp. are fairly frequent and in some areas, as in quadrats Q22 and Q23, attain patchy dominance. Species identified as occurring here were *Cladonia arbuscula*, *C. portentosa*, *C. gracilis* and *C. polydactyla*. This community is not accurately represented in the NVC, but Averis *et al.* (2004) refer to a lichen rich sub-community of H12 *Calluna*-*Vaccinium* heath, allied to the *V. vitis-idaea* sub-community, occurring in the Cairngorm foothills, where *Cladonia* species form a significant part of the community composition.
- 4.3.67** H18 - *Vaccinium myrtillus* – *Deschampsia flexuosa* heath gives the closest fit to the largest area of dry heath within the proposed core development area (Figure 4.2), although cowberry is dominant in the place of the notably rarer bilberry. This is typical of burned or grazed patches in H12 *Calluna* – *Vaccinium* heath, where the heather has probably been grazed quite hard in the past. Heather is therefore quite scarce within quadrats located here, but in many ways the community is similar to the neighbouring *Calluna* heath, with *Hylocomium splendens* forming an extensive mat and with scattered, but dense stands of cowberry. The community has a fairly grassy character; wavy hair-grass, sheep's fescue, velvet bent and sweet vernal-grass forming an important component of the flora.
- 4.3.68** In the southwest corner of the proposed core development area, the dry heath is dominated by heather and has a mixed moss flora with heath rush, cowberry, bilberry and some common sedge species. It is being colonised by gorse but there are occasional pine and juniper seedlings. This has also been identified as H12b - *Calluna vulgaris* - *Vaccinium myrtillus* heath, *Vaccinium vitis-idaea* – *Cladonia portentosa* sub-community. In the quadrats bilberry is limited to Q16 and Q17 (Appendix 4C). Q16 had a grassland-like characteristic with sweet vernal-grass, tormentil and *Rhytidadelphus squarrosus* occurring. This south western area lacks the higher cover of lichens found in the heath, surveyed further north on the site, but the community is otherwise similar.
- 4.3.69** Outwith the proposed core development area, the thin strip of dry heath at the north of the wider survey site is also dominated by heather, with frequent cowberry, crowberry and lichen species. Broom, gorse, Scots pine and silver birch are encroaching on the heath, and without further electricity way-leave management will eventually take over the area.
- 4.3.70** Near Coylumbridge is a thin strip of dry heath to the east of the B970. This is probably an old forest ride, but also partly contains a wood-pole electricity line, and is dominated by heather

reaching 75 cm tall. This heather shows little sign of browsing damage and is in very good condition. There are scattered Scots pine seedlings and occasional more mature Scots pines in this area. Creeping ladies tresses is also present in one place where it has encroached from the woodland to the south.

Dry Heath / Acid Grassland Mosaic

- 4.3.71** A mosaic of dry heath and acid grassland occurs in patches within the wider study area occupying approximately 14 ha or 3% of the wider survey area and 9 ha or 9 % of the proposed core development area (Tables 4.6 and 4.7). The dry heath in these areas has much the same character as the dry heath described above. Bilberry in the mosaic is notably scarce or absent, while grasses including wavy hair-grass, sweet vernal-grass, sheep's fescue and common bent are common, even within the heath community. *Hypnum jutlandicum* is the most prominent species in a significant, but not extensive cover of bryophytes.
- 4.3.72** Scattered trees occur over much of the dry heath / acid grassland mosaics, predominantly Scots pine (both mature and seedlings) and silver birch. This is particularly the case within the proposed core development area (Figure 4.5).
- 4.3.73** The dry heath / acid grassland mosaic area towards the north of the proposed core development area has been identified as a combination of H9 - *Calluna vulgaris* – *Deschampsia flexuosa* heath, and U4a - *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland, typical sub-community. The natural factors affecting the community are probably the same as the heath immediately to the south, but there appears to have been a history of slightly heavier grazing and the area has been partly subject to accidental burning and possibly intentional burning in the past. This has created a mosaic of low growing heather and acid grassland communities.
- 4.3.74** The type of heath in this mosaic is usually produced by fairly intensive management, although in this case it is partly by accidental burning. The heather is somewhat patchy with bare soil visible, the height of the shrub canopy varying from being very low to around 50 cm high. The abundance of *Hypnum jutlandicum* in places suggests that this community could be classified as H9a *Hypnum cupressiforme* sub-community. However the presence of cowberry and *Cladonia* spp. indicates a closer affinity to H9b *Vaccinium myrtillus* – *Cladonia* spp. sub-community, although bilberry is distinctly lacking. U4a is a common and extensive kind of pasture land; heath bedstraw and tormentil are typical of this community although tormentil is restricted here in the mosaic situation. The grassland aspect of the dry heath / acid grassland mosaic habitat is generally dominated by common bent and sheep's fescue, although heather is constant at low levels throughout. Much of the vegetation is intermediate between the distinctly grassy and heath communities identified here.
- 4.3.75** Other herbs present in this mosaic include common mouse-ear, common bird's-foot-trefoil and in more mesotrophic areas, as in Q12 (see Appendix 4C), creeping buttercup, common cat's-ear and ribwort plantain. Yorkshire-fog also occurs occasionally in such circumstances, but such mesophytic species are too scarce to classify this community as U4b *Holcus lanatus* – *Trifolium repens* sub-community. Petty whin is also present regularly as a sub-shrub in this community.
- 4.3.76** The dry heath / acid grassland mosaic area to the southwest corner of the proposed core development area has been identified as a combination of H12b - *Calluna vulgaris* – *Vaccinium myrtillus* dry heath, lichen rich sub-community (Averis *et al.*, 2004), and U4a - *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland, *Vaccinium vitis-idaea* – *Trifolium repens* form. Cowberry does occur occasionally in the mosaic, as does the moss *Hylocomium splendens* that

is characteristic of the neighbouring heath community. The H12b dry heath in this mosaic is a continuation of the dry heath area adjacent to it.

- 4.3.77** The species composition of the U4a community differs slightly to the U4a community already discussed, with a notable lack of wavy hair-grass and sweet vernal-grass. Common bent is joined by some velvet bent and sheep's fescue makes up much of the remainder of the sward. White clover is particularly abundant in Q13 and Q14 (see Appendix 4C), with occasional creeping buttercup and yarrow, although other mesophytic species such as Yorkshire-fog and ribwort plantain do not occur as might be expected in the *Holcus lanatus* – *Trifolium repens* sub-community of U4 grassland.
- 4.3.78** This community is therefore best described by the typical sub-community U4a, but it is peculiar in the abundance of cowberry and white clover. This may be the result of the particular grazing and management history of the site, which has eliminated the dry heath community that is present elsewhere and in mosaic and introduced localised nutrient enrichment encouraging acid grassland development in places.

Wet Modified Bog

- 4.3.79** There is one very small modified basin bog (modified by commercial forestry) within the whole study area. It is approximately 0.1 ha in size or 0.1 % of the proposed core development area. This is located within the stand of plantation woodland to the southwest of the site (adjacent to TN 26) and is a pool infilling with *Sphagnum* spp. This is a relatively species poor assemblage of *Sphagna* and bottle sedge. The fringes of the mire support some soft rush, common cottongrass and mosses including *Aulacomnium palustre*, *Polytrichum* spp. and at the outer margin *Hylocomium splendens*. Bogbean and hare's-tail cottongrass are occasional and Scots pine seedlings are starting to establish within the mire. Quadrats 18 and 19 were located just within the marginal vegetation band (see Appendix 4C).
- 4.3.80** The bryophyte community consists primarily of *Sphagnum fallax* but some *S. capillifolium* and *S. papillosum* was present in 2005 and 2006 but not seen in 2008. This is most closely related to M2b *Sphagnum recurvum* / *fallax* bog pool community, *Sphagnum fallax* sub-community, but the correlation is limited. Bottle sedge is the most significant higher plant here, generally limited in occurrence in M2b communities, while the heathy associates such as cranberry (*Vaccinium oxycoccus*), heather, cross-leaved heath are lacking here and cottongrasses are scarce.
- 4.3.81** The location of this stand of mire vegetation may explain its floristic character. The surrounding vegetation would originally have been more open heath / open woodland edge, probably similar to the H12 *Calluna* – *Vaccinium* heath occurring nearby before the ploughing and dense plantation of Scots pine. The basin may have previously been open water with emergent *bottle sedge* as described by M9 *Carex rostrata* swamp, but partial drying, shading and possibly changes to soil chemistry from the plantation has eliminated nearly all the higher plants under the trees and caused the pool to infill with *Sphagnum*, while preventing colonisation by many of the normally characteristic species of M2 *Sphagnum recurvum* / *fallax* bog pool communities.

Waterbodies

- 4.3.82** Partly within the wider survey area but outside of the proposed core development area is Loch Pityoulish (approximately 2 % or 8 ha of the wider survey area). This is a fairly deep and quite

exposed oligotrophic loch which shelves fairly steeply at the southern end of the loch. This loch is fairly remote from the proposed core development area at the northern end of the wider study area.

- 4.3.83** The ponds and small loch at the Rothiemurchus Fishery, the single small pond within the proposed core development area and the Kinchyles Burn can be generally described as mesotrophic in character with good mixed marginal vegetation (see Figure 4.5). The Kinchyles Burn, while outside of the proposed core development area, has been artificially straightened in the past through the agricultural fields and is fairly slow flowing in places. Its margins grade into marsh and marshy grassland on the margins of the fields with common wet liking plant species present. There are also several straight drainage ditches also present in this area draining into Loch Pityoulish which are all surrounded by marsh and marshy grassland habitats. The one pond within the proposed core development area is small at approximately 0.2 ha in size and occupies 02 % of the core development area.
- 4.3.84** While not within the proposed core development area, the wider survey area contains both the River Spey and the River Druie. According to the boundaries used for this wider area these oligotrophic to mesotrophic habitats occupy approximately 2 % of the wider study area or 9 ha. Figure 4.5 shows the location of these two significant rivers. The River Spey contains several mature wooded islands and the River Druie contains several wet side channels and short drainage tributaries. The habitats of the river channels and riparian zones of both rivers are explained further below and in the RHS Report (Appendix 4F).

Quarry

- 4.3.85** There is a small old quarry to the south of the proposed core development area (adjacent to TN 52 on Figure 4.5). This area has largely re-colonised with the surrounding vegetation types and is naturalising.

Arable Fields

- 4.3.86** There are no arable fields within the proposed core development area. However, to the northwest of Dell Farm are arable fields and adjacent to the River Spey, between the River and the plantation woodland. These can be seen in Figure 4.5. It is important to note with more intensive agricultural fields that the precise pattern of arable fields can change between years, depending on the use of grass leys. These fields have minimal common plant weed species present and do not generally have wider uncultivated margins. Within the wider study area approximately 13 % or 63 ha were under arable land use when surveyed (see Table 4.6). The crops were cereals.

Amenity Grassland

- 4.3.87** Within the wider study area there is an area of amenity grass in the garden of The Dell of Rothiemurchus. Within the proposed core development area there are two areas of amenity grassland within the large tree planted and naturally regenerating dry heath area in the centre of the site (see Figure 4.5). The largest of these is a model aeroplane club strip, and the other a picnic area. These are mown to maintain a short sward of common grass species and are

species poor. In total within the wider survey area there is approximately 1 ha or 0.2 % and within the proposed core development area there is 0.5 ha or 0.5 % of amenity grassland (Table 4.6 and 4.7).

Ephemeral / Short Perennial

4.3.88 Within the proposed core development area there is no ephemeral or short perennial habitat present. However, within the wider survey area there are small areas of this habitat, particularly around the Rothiemurchus Fishery and in disturbed areas near Dell Farm. This habitat type contains common plant species typical of recently disturbed ground. In total there is approximately 1 % or 5 ha of this habitat type present within the wider study area in disturbed areas.

Other Habitats

4.3.89 The title of other habitats contains such things as unvegetated gravel sidebars within the River Druie, the bare ground of tracks and quad bike trails / parking area and buildings and their surrounding hard standing (agricultural storage, clamps etc.). These areas are not important for vegetation. Within the wider survey area there is approximately 0.5 % or 2 ha and within the proposed core development area there is approximately 1 ha or 1 % which is counted as other habitat.

Plant Species

4.3.90 Lists of the plant species recorded during specific surveys are given in Appendix 4C and 4E. The plants recorded within the survey area are species that are not considered to be of particular conservation concern (*i.e.* scarce or rare in a regional, national or international context) and are typical of the habitats in which they were found. While there were no scarce or rare British plant species found there were several more notable species recorded during the surveying. Creeping ladies tresses was common within the woodland to the south and south east of the wider study area but not recorded within the proposed core development area. This plant is on the verge of being classified as a nationally scarce species with 104 10km² quadrat occurrences in Britain (Preston, Pearman and Dines, 2002). National scarce is less than 100 10 km² quadrats. However, within the surrounding local area and this 10 km² quadrat it is locally common in suitable woodland and plantation habitat. Common wintergreen was noted in one small stand on the immediate verge of the B970 just north of Coylumbridge and while occurring in 254 10km² quadrats in Britain (Preston, Pearman and Dines, 2002), it is a notable plant because one does not come across it frequently.

4.3.91 Japanese knotweed was found in two stands within the wider survey area but not within the proposed core development site. Under the Wildlife and Countryside Act 1981 it is illegal to plant or otherwise cause this species to grow in the wild. One stand is present at Dell Farm and another is present on the Mill stream next to the Dell Farm track. It is understood that the Estate have put in place measures to eradicate these two stands but this is likely to take a few years.

Description of River Habitats

4.3.92 Rivers are a priority habitat under the UKBAP. A River Habitat Survey (RHS) was completed to systematically identify and describe the characteristics of the River Spey and the River Druie within the wider study area. The River Druie is a dynamic spate river flowing directly from the Cairngorms into the River Spey and the confluence is within the wider study area. At normal summer water levels it is fairly shallow and fast flowing. The River Spey is a major river running to the west of the proposed An Camas Mòr development. It is fairly broad and contains deep pools and long glides. It is fed by numerous tributaries originating in the Cairngorm and Monadhliath Mountains; its source is high in the Monadhliaths. The River Druie runs approximately east to west to the south of the proposed core development area, and joins the River Spey. The RHS included various survey reaches of both of these rivers. The locations of the survey reaches are detailed within the RHS Report (Appendix 4F).

4.3.93 The River Druie, within the wider survey area, is a relatively shallow, fast flowing spate river. The flow is characterised by riffles (where unbroken standing waves are predominant) and white water (dominated by broken standing waves). The bed is fairly level with mostly uniform cobbles as the substrate, hence there are no cascade or falling flow types, although the flow is generally high energy. The channel bed is dynamic, with the formation of side and mid-channel bars, side channels and deeper main channels. Where flow is slower there are significant discrete sand deposits and some pebbles. There is extensive wet woodland along the banks dominated by common alder, and there are many pools and side channels in the woodland areas. The River Druie has been subject to minor modifications, primarily in the form of bank reinforcement. There are two minor bridges, a boulder dam and a significant intake and outtake for the Fishery. The impact of these modifications on the overall structure of the river is fairly low within the wider study area.

4.3.94 Both banks of the Druie are heavily wooded within the wider study area, with only occasional breaks on the banks where housing, gardens and open areas reach to the river bank. This largely continuous woodland is an important habitat feature for a wide range of species. The wet riverine woodland types are also an important habitat particularly associated with the river.

4.3.95 The River Spey, within the wider survey area, is fairly broad and deep, so that although it is fairly fast flowing and of glide characteristics, the surface shows little disturbance beyond ripples except on tight bends where it becomes highly turbulent with upwellings and standing waves forming in a complex flow system. The bed substrate is a mix of largely stable cobbles and occasional stable boulders interspersed with areas of moving cobbles, finer gravel and sandy areas. The presence of a large point bar of cobbles within the wider survey area indicates that such stones are carried by the flow of the river at least on higher spates. The banks are commonly composed of sand and sandy soil which is often actively eroding. The banks are almost continuously lined with trees, although this is restricted to a line of scattered common alders on the eastern river edge for some of the length. This provides an element of in-river habitat features where the banks plunge into deeper water such as submerged roots, leafy and woody debris and shading of the channel as well as a habitat corridor along the bank.

4.3.96 Within the wider study area there has been little modification to the River Spey. The banks have been reinforced over a few short stretches and an old embankment runs along one bank that is likely to have protected water meadows in the past, although it appears to be partially degraded now. These modifications have a low impact on the overall habitat value of the river.

4.3.97 Further detail of the RHS survey results are provided in Appendix 4F.

Fish

- 4.3.98** Within the proposed core development area there is one pond. During surveying for other species no evidence of fish presence was seen (e.g. rising, indirect evidence of otter presence / feeding, etc.). This pond is isolated from other waterbodies but the presence of introduced fish cannot be totally ruled out.
- 4.3.99** Within the wider study area the wild fish resource of the area is well known mainly through long-term angling fish records and observation. The Spey catchment is an important salmon river, of international conservation importance. Different species of fish are protected by a wide range of different legislation related to such things as management, landowners rights and nature conservation. Salmon are included within the Habitats Directive and are a primary reason for the River Spey SAC designation (Annex II). Adult Salmon and sea trout undertake migration journeys through both the River Spey and the River Druie. Adult salmon are present within the River Spey in all months of the year indicating a range of genetic strains. They also breed in suitable redd habitat in both, of which some is available within the wider study area in both rivers. Juvenile migratory salmonids are also present in both rivers. Brown trout adults and juveniles are also present as residents in both and adults may well undertake localised migration for spawning during the late autumn. In recent years there have been farm reared escaped salmon caught in the River Spey catchment and occasional escaped rainbow trout have also been caught. The River Spey is an economically important angling river, particularly for wild salmon but it has also been important in the past for its runs of sea trout, although these have declined in the last twenty years or so.
- 4.3.100** As well as salmonids, lamprey species are present within the River Spey catchment and these are also important from a nature conservation perspective (river and sea lamprey are UKBAP priority species). All three species are included within the Habitats Directive and sea lamprey are part of the River Spey SAC designation. During the freshwater pearl mussel survey and other ecological surveys the riverine margins were searched for suitable ammocoete habitat. No such suitable habitat was found near to the banks of both rivers within the wider study area, although suitable juvenile habitat is present in the River Spey close by. Some suitable adult lamprey breeding habitat is present within the River Spey, within the wider study area.
- 4.3.101** The Rothiemurchus Fisheries is also present within the wider study area. This consists of a commercial trout rearing operation and a separate angling business catering for leisure anglers by utilising several rainbow trout stocked man made ponds, an artificial river section and the surrounding natural angling resources. It is known that salmon kelts, in particular, and lamprey species use the Fisheries stream. It is also stocked with rainbow trout. During surveying adult lampreys and juvenile trout were seen within the Fisheries stream.
- 4.3.102** Within the wider study area to the north Loch Pityoulish also contains wild brown trout, pike and perch. Common eel is also present in suitable waterbodies within the wider study area, although numbers have been declining recently and legislation and policy is currently being enacted to try to protect their populations (UKBAP priority species, a critically endangered species on the IUCN 2008 list and EC policy measures in place to protect European eel stocks).

Protected Fauna of Conservation Concern

- 4.3.103** Due to concerns related to persecution detailed descriptions for some species, specifically badger and freshwater pearl mussel (FWPM), are only available in the separate Confidential Annex. This is a standard approach used in EIA to protect vulnerable species. SNH and CNPA will receive a copy of the Confidential Annex. However, key information on these species is provided in a general, non-locational basis within this Technical Appendix and all relevant detailed information has been used to inform the impact assessment. These ecological receptors are listed in turn below and a summary of their legislative protection and their status within the core and wider study area is given. Species are not specifically noted as being on the Scottish Biodiversity List because the majority of them are listed; however, the UKBAP is specifically mentioned, where relevant.
- 4.3.104** A map of the wider study area showing the locations of non-confidential target notes for protected species (i.e. mammals only but not including badger or invertebrates) and annotated with the key areas of habitat is provided in Figure 4.6. All target notes relating to Figure 4.6 are provided in Appendix 4K some of which are referred to in the following text (e.g. 'TN'). Maps showing the specific results of habitat assessments for bat species and red squirrel, along with those specific target notes are provided in the survey reports provided in Appendix 4G and 4L. These survey report appendices also contain detailed specific description and mapping of activity related to these species.

Freshwater Pearl Mussel

- 4.3.104** The freshwater pearl mussel is a dioecious bivalve which matures between 10-15 years and can live up to 100 years. The species is dependent on the presence of salmonid fish as hosts for its larvae. The British range is to the north and west of a line running from Scarborough in Yorkshire to Beer Head in Devon. It has however, declined and Scotland is now one of the few remaining strongholds for this species in the world. Recruitment rates are not known for many populations, although it is thought that many populations are not reproducing successfully.
- 4.3.105** The precise details of the survey undertaken for freshwater pearl mussel (FWPM) in the River Spey and the River Druie are only given in the Confidential Annex, this includes details of their status in the wider Spey catchment. The FWPM is classed as Vulnerable on the IUCN Red Data List. It is listed on Annexes II and V of the "Habitats Directive" (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) and Appendix III of the Bern Convention and is fully protected in the UK under the Wildlife and Countryside Act 1981, as amended.
- 4.3.106** The survey was undertaken by experienced ecologists (Dr Peter Cosgrove and Jackie Farquhar) who have direct knowledge of the FWPM resource in the area. It is important to note that the Indicative Land Use Plan Dr Cosgrove used was not the final iteration. There is reference to the location of the new road bridge crossing on the River Druie and reference to a possible services trench which is now out of date with the current proposals. However, the survey completed and the results obtained remain relevant to this as the whole of the relevant area for the current proposed development infrastructure was surveyed. No FWPM or empty shells were found within the River Druie (from 100m upstream of Dell Bridge to the confluence) or the eastern bank of the River Spey for 500 m below the Rothiemurchus Fishery bridge (including the confluence with the Druie). It was clear from the survey that the substrate habitats within the whole of the survey area were unsuitable for FWPM. It is known

from previous surveys that important FWPM populations are present within the River Spey in the wider surrounding area (but outside of the wider study area for An Camas Mòr). There are no known historical records of FWPM from the River Druie and this survey confirms this for the lower section of the River Druie.

Bats

4.3.107 Relatively common bat species that are considered to be potentially present in the general area of the proposed development include *Pipistrellus* sp. (i.e. common and soprano pipistrelle), Daubenton's bat (*Myotis daubentonii*) and brown long-eared bat (*Plecotus auritus*). There are approximately two million *Pipistrellus* bats in Britain (Harris *et al.* [eds.] 2008). There are an estimated 150 000 Daubenton's bats in Britain, with 40 000 estimated for Scotland, with c. 1500 in Scotland (Harris *et al.*, 2008). The Scottish population of brown long-eared bats has been estimated at 27 500 (Harris *et al.* [eds.] 2008).

4.3.108 All of Britain's bat species are listed in the Habitats Directive as 'European protected species of animals'. The UK is also a signatory to 'EUROBATS' (the Agreement on the Conservation of Populations of European Bats), established in 1994 under the 1979 Convention on the Conservation of Migratory Species of Wild Animals (the 'Bonn Convention'), which extends the responsibility of signatory countries to the protection of important feeding habitat for bats. The 'Habitat Regulations' (The Conservation (Natural Habitats, &c.) Regulations 1994) implement the Habitats Directive in British law and affords all bat species legal protection. The Habitats Regulations have been recently amended by The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007. The protection that is afforded to bats, and which is normally relevant to development projects, can be summarised as follows. It is an offence to:

- Deliberately or recklessly to capture, injure or kill a bat(s);
- Deliberately or recklessly to disturb a bat(s) while it is occupying a structure or place which it uses for shelter or protection (i.e. a roost site);
- Deliberately or recklessly to disturb a bat(s) while it is rearing or otherwise caring for its young;
- Deliberately or recklessly to obstruct access to a roost site; or
- Deliberately or recklessly to damage or destroy a roost site (irrespective of whether bats are present at the time the damage / destruction occurs).

4.3.110 A licence may be required for development works to legally proceed that could affect bats or a bat roost. Particular species of bats are also recognised within the UKBAP and some species are listed as priority species.

4.3.111 The NBN gateway has historical records of the following bat species within the wider study area: Daubenton's bat, common pipistrelle, soprano pipistrelle and brown long-eared bat. Locations and details of these records can be found in Appendix 4A.

4.3.112 Specific bat surveys were carried out within the wider study area and are fully reported in Appendix 4G. Generally, bat activity across the site was assessed qualitatively to be at a moderate level. Overall, the walked and repeated transect routes were moderately used by bats and almost all bat passes recorded were by Pipistrelle species (i.e. *Pipistrellus pipistrellus*

or *P. pygmaeus*), which are typically the most common bats species recorded in Scotland. There was one record at the Rothiemurchus Fishery which was likely to be a Daubenton's bat.

4.3.113 Activity, recorded using static remote detectors / recorders, was considered to be low to moderate at the locations sampled. Two static boxes recorded sporadic and light to moderate activity and one static recorder had no activity recorded. One static box was abandoned due to equipment failure. Overall the activity recorded with the remote recorders was moderate. See the Figures for the static locations and a summary of the bat activity in Appendix 4G.

4.3.114 The core development site currently provides foraging habitat for bats, although it does not provide optimal roosting habitat compared with the wider surrounding study area. No evidence of any bat tree roosts was found during daytime inspections and nocturnal surveys of the parts of the site where tree felling is proposed. It is likely that the foraging and roosting potential in the area will increase over time because of all the recent tree planting within the core development area, if a reasonable proportion of the planted trees remain longer-term. Woodland edge habitat, in particular, will provide greater foraging opportunities in the future than currently exists.

4.3.115 Further detail on the survey results is provided in the Bat Survey Report (see Appendix 4G).

Otter

4.3.116 Based on data from 1991 to 1994 there are an estimated 7 950 adult otters in Scotland (Harris *et al.* [eds.], 2008), although this is likely to be an underestimate for the present day population. The otter is afforded protection at a European level through its inclusion in Annex II of the Habitats Directive. Otters are also protected in the UK through The Conservation (Natural Habitats, &c.) Regulations 1994 (as recently amended by The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007). It is illegal to intentionally or recklessly kill, take or injure an otter, intentionally or recklessly disturb an otter in its place of shelter and intentionally or recklessly damage, destroy or obstruct access to a place of shelter. A licence may be required for development works to legally proceed that could affect otter. Otter is also a priority species in the UK Biodiversity Action Plan (UKBAP). The objectives of the UKBAP for otters are to: maintain existing otter populations; expand existing otter populations; and, by 2010, restore breeding otters to all catchments and coastal areas where they have been recorded since 1960.

4.3.117 The NBN Gateway has historical records of otter for the area around the proposed development, the nearest being on the River Druie at Coylumbridge on the upstream edge of the wider study area. Full NBN Gateway record search results are provided in Appendix 4A.

4.3.118 Specific surveys for otter within the wider study area were undertaken and additional sightings and evidence were noted while ecologists were on the site completing the full range of other surveys over the past 5 years. Evidence of the presence of otters was found along both the River Spey and the River Druie within the wider study area. No evidence of otter was found within the proposed core development area which is not surprising given the lack of suitable habitat and lack of need for otters to cross the site (for otters to move between the River Spey and Loch Pityoulish the preferred route would be further north outside of the proposed core development area). Figure 4.6 indicates the location of all otter signs recorded and the target notes for these locations are provided in Appendix 4K.

- 4.3.119** Otter prints were found in several locations along the River Spey on both banks. Occasional spraints were also found. There were two potential otter holts identified on this river to – in the area of National Grid Reference NH 904128, where prints and a spraint were also found, and in the area of NGR NH 908130, with prints nearby. In addition, a possible otter slide was found on the western bank of the River Spey near here. It is likely that the mature islands on the River Spey, within the wider survey area, are used regularly by otter as resting up areas due to the lack of disturbance. It is likely that these islands contain holts (possibly at least one breeding holt) and couches. These islands were not surveyed because they would not be affected by any element of the proposed development contained within the outline planning application and it was felt that they should not be unnecessarily disturbed by human presence.
- 4.3.120** Prints and spraints were found regularly along the River Druie within the wider survey area, with a particular concentration just upstream from the Fishery and around the Fishery itself. Fish feeding remains were seen regularly at the Fishery and a dog otter was seen crossing a track at the Fishery at night in July 2008. Just downstream of the Dell Farm bridge, prints, spraints and a couch / open holt with further spraints were found in close proximity to each other. This couch / open holt was not in active use in the late summer of 2008 but had been used within the previous 6 months and is likely to be used occasionally in the future. At the small bridge across the flood channel near Dell Farm an otter spraint was found on a rock under the bridge alongside fresh footprints. A possible low water couch site in occasional use was also identified here. Further otter signs were found close to the fish farm footbridge. No holts or couches were found in the vicinity of the substation or the proposed substation route for the bridges, although otter regularly pass through this area of river and the wet woodland riverine edge habitat.

Wildcat

- 4.3.121** Northeast Scotland is a stronghold for wildcat, with an estimated 30.3 cats per 100 km², while western Scotland is thought to hold only 8 cats per 100 km² (Harris and Yalden, 2008). However, estimating population sizes is difficult due to hybridisation with 'domestic' cats. In 2006 SNH estimated that the total population of pure Scottish wildcat may be as low as 400 animals. The wildcat is listed as a protected species in Appendix II of the 1979 Bern Convention on the Conservation of European Wildlife and Natural Habitats. Wildcat is afforded European protection through its inclusion in Annex IV of the Habitats Directive. Wildcats are also protected in the UK through The Conservation (Natural Habitats, &c.) Regulations 1994 (as recently amended by The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007). It is illegal to intentionally or recklessly kill, take or injure a wildcat, intentionally or recklessly disturb a wildcat in its place of shelter and intentionally or recklessly damage, destroy or obstruct access to a place of shelter. A licence may be required for development works to legally proceed that could affect wildcat. Wildcat is also a priority species in the UK Biodiversity Action Plan (UKBAP) but details have still to be published on its action plan.
- 4.3.122** The NBN Gateway holds historical records of wildcat in the surrounding area of the wider survey area at a 1 km² resolution. The nearest specific record is c. 2.5 km northeast of An Camas Mòr. For details of this record, see Appendix 4A.
- 4.3.123** During all the surveying of the wider study area no sightings or evidence of any denning, feeding or other presence of wildcat was found. Estate workers have seen evidence of wildcat / sightings in the past to the east of the wider study area and there are anecdotal records of several cats, possibly wildcat, having been recorded at the A970 within the wider study area in the past. Recently, the only sightings of wildcat within the wider area that MBEC are aware of
- were approximately 3.5 km to the south with two sightings (one filmed by BBC Springwatch) in early summer 2008. It was thought that one, if not both sightings were of a female wildcat and there was a suggestion that cubs could have been present close by.

Water Vole

- 4.3.124** A recent population estimate, based on the number of latrines found, suggested a total British pre-breeding population of 1, 200, 000 animals. The water vole population in Scotland has been estimated at 380, 000 (UKBAP website, accessed August 2007). However, water vole is known to be under-recorded and this is particularly the case in rural areas of Scotland.
- 4.3.125** Water vole habitat is protected under Section 9 of the Wildlife and Countryside Act 1981 (as amended). It is illegal to intentionally damage, destroy or obstruct access to any structure or place that water voles use for shelter or protection. In addition, it is illegal to disturb water voles while they are using such a place. At present, in Scotland, water voles are not fully protected, although they have recently received full legal protection in England and Wales (in April 2008). Water voles are listed as a priority species within the UKBAP: the objectives are to maintain the current distribution and abundance of water voles and to restore their former widespread distribution.
- 4.3.126** There are no historical records of water vole within the wider study area or the immediate vicinity. However, evidence of water vole was found around the Rothiemurchus Fishery and the surrounding wetland areas. See Figure 4.6 for the locations of all water vole signs. In the northwest corner of the main fishing loch a water vole latrine, feeding remains and runs through the vegetation leading to the water's edge were found. In addition, as the surveyor approached the area, sounds of movement in the marginal vegetation were heard, followed by the classic plop sound of a water vole in water. An angler had also claimed to have seen a water vole on the southwest bank of the main fishing loch (pers comm., 18 August 2008).
- 4.3.127** The majority of water vole signs were found around a small pond (U-shaped pond) to the southeast of the main fishing loch, where there are small areas of marshy grassland on the north bank. Several latrines, feeding remains and runs were found in this area. In addition, three probable water vole burrows were found here, fairly well hidden and situated above the waterlogged areas.
- 4.3.128** To the north of the Fishery is an area of marshy grassland with a small area of open water (see Figure 4.5 for the location of this). Despite this being suitable water vole habitat, this area was carefully searched in 2006 and 2008 and no signs of water vole presence were found. This would be an obvious "overflow" area for additional water voles from the Fishery area, during temporary or permanent population increases.
- 4.3.129** In the wider area, possible water vole prints were noted further north along the west bank of the River Spey, although this was inconclusive. Although the pond just off the B970 north-south road within the core development area contains suitable habitat for water vole, extensive and detailed surveying in 2008 failed to find any water vole evidence and it was concluded that the evidence of feeding remains and a run found in 2006 were more likely to have been field vole rather than water vole. Field vole numbers were found to be high around this pond and they had been feeding extensively around the pond margins.
- 4.3.130** It is worth noting that the presence of mink along the Spey may have had a suppressing effect on all water vole populations that are / were present in this area. Little direct evidence of mink was recorded during surveys. Mink prints were seen in the sand on the west bank of the Spey

(in the area of NGR NH 901127) and mink sightings have been recorded by visitors to the bird hide at Rothiemurchus Fishery fairly regularly. Mink are actively trapped on the Estate at the fish farm all year round.

Red Squirrel

- 4.3.131** Harris *et al.* (2008) estimated the UK red squirrel population to be 161 000, with approximately 30 000 in England, 10 000 in Wales and 121 000 in Scotland. Therefore, between 70 and 75 % of the UK red squirrel population is within Scotland. This species occupies boreal, coniferous woods, preferring a stand of mixed age conifers, such as Scots pine, Norway Spruce, European larch, Lodgepole Pine, Fir species, Common Yew and broadleaved tree species, such as Birch species, rowan, ash, alder and hawthorn (Forestry Commission, 1998). When their presence is not threatened by grey squirrels they also occupy broad-leaved woodlands with a mixture of tree and shrub species. Grey squirrel establishment in this area (as has already occurred in other parts of Scotland) is the major threat to existing stable red squirrel populations. This is due chiefly to direct competition and the transmission of a deadly viral disease.
- 4.3.132** Red squirrels are listed on Schedules 5 and 6 to the Wildlife and Countryside Act 1981 (as amended). Under Section 9 of the Act it is an offence to recklessly or intentionally kill, injure, take or sell an animal, or damage, destroy or obstruct access to its nesting place. The red squirrel is also listed in Appendix III of the Bern Convention; however, it is not listed on the Annexes of the EC Habitats Directive because it is widespread in other parts of Europe and Scandinavia. Red squirrels are a UKBAP priority species, the objectives of which are to maintain, enhance and re-establish red squirrel populations.
- 4.3.133** The NBN Gateway holds historical records of red squirrel within the wider study area at Inverdrue and Coylumbridge. Full record details and locations are provided in Appendix 4A. Data from "Red Squirrels in the Highlands" provides details of several red squirrel records close to the wider study area. There are records close to the River Druie, on the west bank of the River Spey, and to the north east of Loch Pityoulish. The woodland along the banks of the River Druie in the south of the wider study area and the woodlands to the immediate east of Coylumbridge in the wider study area have been identified as a Candidate Red Squirrel Stronghold Sites, as have many of the other woodlands surrounding the proposed development but outwith the wider study area. No stronghold sites have been proposed within the proposed core development area. Figure 1 in Appendix 4L indicates the boundaries of these sites in relation to An Camas Mòr. The list of red squirrel strongholds has not yet been finalised and is still at the consultation stage at present. The consultation is due to end on the 26th June 2009.
- 4.3.134** The central area of the proposed core development area and the other younger tree planted areas on the western and eastern edges are currently still quite open with only scattered trees and are not currently high quality red squirrel habitat. They also only provide quite limited connectivity for red squirrels at canopy level and this is much better outside of the core development area in the riverine trees and connecting escarpment plantings to the west and to the south of the wider survey area. The mature larch copses, riverine habitats and the forested western edge of the proposed development site are likely to act as current and future movement corridors for this species to access areas further north in particular. As the forested areas to the west of the core development area grow they are likely to become more important to red squirrel.

- 4.3.135** In terms of overall habitat quality, the best woodland for red squirrel specific habitat within the proposed core development area is the older plantation to the east near the pond (see Figure 2 in Appendix 4L). The woodland to the south of this adjacent to and going south from the core development area and the area immediately to the east of Coylumbridge also offers areas of higher quality red squirrel habitat. Overall the highest quality red squirrel habitat is in the south of the wider study area in the woodlands just to the north of the River Druie (see Figure 2 in Appendix 4L).
- 4.3.136** Figure 2 in Appendix 4L also indicates the target note locations which give details of all the red squirrel signs seen during surveying. The target note descriptions are given in Appendix 4L. Red squirrels were sighted quite frequently during surveying and the target notes in Appendix 4L detail the key sightings. The highest number were seen around Coylumbridge.
- 4.3.137** There are red squirrel dreys present within the core proposed development area. In 2008 these were all in the mature plantation woodland near the pond. Limited feeding remains were found in this area and there were suitable coning trees present. Prior to 2008 several dreys were found in the larch escarpment plantings to the west of the proposed core development area but these were not present in 2008. In the surrounding area, within the wider survey area there are many more dreys and quite high population densities of red squirrel. These are concentrated in the woodlands close to the River Druie in the south and to the immediate east of Coylumbridge. Appendix 4L provides further details. Feeding remains - "squirreled" cones - were also found in these woodlands, and provide further evidence that there is a substantial red squirrel population within the wider study area.

Pine Marten

- 4.3.138** There are an estimated 3,500 pine marten in Scotland (Harris *et al.*, 2008). They inhabit mature forest, usually of coniferous or mixed and occasionally deciduous stands. Their dens include hollow trees, old squirrel dreys, large (owl) nest boxes and rock crevices (Macdonald and Barrett, 1993).
- 4.3.139** In the UK, the pine marten is fully protected under Schedule 5 and 6 of the Wildlife and Countryside Act of 1981 as amended. The pine marten is listed as a protected species in Appendix III of the 1979 Bern Convention on the Conservation of European Wildlife and Natural Habitats. It is also included in Annex V of the EC Habitats Directive of 1992, as a species "of Community interest whose taking in the wild and exploitation may be subject to management measures". Pine marten is also a UKBAP priority species, but details of the action plan for this species have yet to be published.
- 4.3.140** The NBN Gateway holds historic records of pine marten in the vicinity of the development area at a 10 km² resolution. The nearest specific record is c. 5.5 km north of the site at Kinveachy Forest. For full details of the recorded details, see Appendix 4K and Figure 4.6.
- 4.3.141** The woodlands in the wider study area provide good potential habitat for pine marten. Several pine marten scats were found around the Callart Hill forestry plantation on prominent tracks in the north east of the wider study area. A potential pine marten denning hole was noted in conifer plantation to the northwest of Callart Hill (in the area of NGR NH 913133) within the wider survey area. Additionally, pine marten scats were noted on bowed 'granny pines' and under single conifer trees within the core development area. No potential or actual denning sites were found within the core development site and the habitat is not ideal for these. See

Figure 4.6 for the location of all recorded pine marten signs and Appendix 4K for the related target note descriptions.

4.3.142 Pine marten numbers are not high within the wider study area, probably only a few animals present in the area. However, they range widely and nightly, and they are likely to be passing through the wooded areas regularly during foraging trips. It is known that pine marten have raided dustbins in Inverdrue and they have been seen at the Fishery in the past. It is quite possible that this is the same animal or several animals that appear to be centred in the less disturbed forestry plantations to the north of the wider development area at Callart Hill and beyond. As the planted woodland to the west of the core development site matures this should assist in the continued movement of animals from north to south.

Badger

4.3.143 The Scottish population of badger is currently estimated at 25 000 (SNH, 2007). Badgers are mainly found within a mosaic landscape of woods and pasture, favouring deciduous woods and clearings; their distribution does not normally exceed the natural tree line (*i.e.* c. 600 m altitude in Scotland) (Macdonald and Barrett, 2003). Where badgers forage in heathland, moorland and coniferous plantations they have to range widely and have much larger territories normally to find enough food and are at much lower densities than they would be in optimal habitat types.

4.3.144 Badger and their setts are protected under the Protection of Badgers Act 1992 and by the Wildlife and Countryside Act (1981 as amended). Both Acts have recently been updated by the Nature Conservation (Scotland) Act 2004. Badger are also listed in Appendix III of the Bern Convention. In summary, it is illegal to kill, injure or maim a badger and badger setts are protected from interference.

4.3.145 The NBN Gateway holds records for badger within the local area of the proposed An Camas Mòr development at both 10 km² and 100 m² resolutions. Due to threats of persecution further details of the specific badger records are only available in the Confidential Annex.

4.3.146 Extensive and detailed surveying over a five year period has been completed for badger. There is a healthy population of badgers present within the wider study area. Active setts are present within the wider study area and this area is thought to contain at least three badger groups (or clans) two of whose overall territories converge within the proposed core development area. The third is relatively isolated from the core development area. In summary, the recently active setts which occur within the core development area are smaller setts likely to be from two of the clans present. Activity levels in these outliers has varied considerably within the last five years and they have not been constantly active suggesting that they are "overspill" small sets for one or two of the clans. The key foraging areas for badger are outwith the core development area although there is evidence of occasional presence and movement within the core development area, probably mainly for territory edge re-establishment, checking and occasional foraging. The foraging available within the core development area, particularly in the more open central area of heathland is limited with the best foraging being available in the mature more open woodland areas and woodland edge areas e.g. along the riverine edge habitat, the intensive farmland and edges and the semi-natural woodland in the south of the core development area and further south. To be clear there is evidence of regular badger foraging activity over the majority of the wider study area and this is evidenced by foraging signs, sightings and badger paths.

4.3.147 The detailed badger survey results are presented in the Confidential Annex.

Invertebrates

4.3.148 Freshwater pearl mussel is dealt with in separately headed sections and in the Confidential Annex. A variety of invertebrate species are afforded various levels of protection under the Habitats Directive and are listed under the Bern Convention. Some species of butterflies, moths, bugs, crickets, beetles, dragonflies, damselflies, spiders and freshwater aquatic invertebrates have special protection under the Wildlife and Countryside Act 1981 as amended.

4.3.149 As would be expected, the NBN Gateway hold records for large numbers of invertebrates in the vicinity of the proposed An Camas Mòr development. For a list of these records, see Appendix 4A.

4.3.150 Various invertebrate surveys have been completed within the wider study area. During the earlier surveying a large number of Scottish wood ant nests were found in the wider study area and mapped, concentrated mainly in the woodland on the southern edge of the proposed core development area. Scottish wood ants have a limited distribution in Britain, concentrated in Scotland. In the central Highlands they can be very common, as they are around the wider Aviemore area, however, overall in Britain they are classified as nationally scarce and globally as "lower risk - near threatened" (IUCN Red List, 2003). Lepidoptera and Odonata were also surveyed within the wider study area in 2006 and species recorded. The highest numbers and diversity of species was found in the semi-natural and plantation coniferous woodland towards the south of the wider study area, around the pond within the core development area and around the main Fishery loch, within the wider survey area. Full details of the species recorded and their locations can be found in Appendix 4M. These earlier survey records were recognised as being incomplete and an independent specialist entomologist (Martin Townsend) was commissioned to complete more detailed invertebrate survey of the study area.

4.3.151 A more detailed terrestrial and aquatic entomological survey was undertaken in October 2007, and June and July 2008 for the most important habitat areas, concentrating on the proposed core development area but also including the woodland areas to the south in the wider development area. This is all reported in Appendix 4H. A total of 686 species were recorded, including a Red Data Book 2 (Nationally Vulnerable) damselfly, a Red Data Book 3 (Nationally Rare) fly, 21 Nationally Scarce species and 61 Nationally Local species. The most important habitats overall in the study area for spiders, ants, a damselfly and flies are the wooded and / or wetter areas. The currently open heathland is more important for moths, butterflies, aculeates, beetles, and bugs. Broom-feeding species are well represented. The single pond within the core development area is recognised as being an important feature for entomology, but the small basin bog within the forestry plantation (see Figure 4.5 for its location) within the mature plantation, is too small and isolated to support a significant assemblage of insects.

4.3.152 For complete details of the entomological survey findings see Appendix 4H and 4M.

Brown Hare

- 4.3.153** The brown hare is a priority species under the UKBAP, as well as a Scottish Biodiversity List species. The objectives of the UKBAP for this species are to maintain and expand existing populations, doubling spring numbers in Britain by 2010. Brown hare is a game species and can be hunted within a set period of the year.
- 4.3.154** The UKBAP reports there are an estimated 817,000 to 1.25 million brown hares in Britain (1995). However, Harris and Yalden (2008) give pre-breeding numbers estimated at 1.3 to 2 million for Britain and at 217 520 ± 137 251 for Scotland.
- 4.3.155** Brown hare numbers are low within the area. However, this species is present within the wider study area with most evidence and sightings being to the east of the proposed core development area in the fields close to the B970 near Guislich Farm. Most forms found and sightings have been in this area with the maximum number seen together being three. However, the occasional brown hare has been seen crossing the B970 and several, on separate occasions, have been seen feeding near the verges of the B970 within the edge of the proposed core development area. One form was seen close to the road within the core development area but had not been used recently. No brown hare sightings or evidence has been seen in other areas of the proposed core development area. Single sightings of brown hare have been made to the south of the wider study area in the fields around Dell Farm and it is likely that forms are also used in this area, although none were found during all the surveys.

Reptiles and Amphibians

- 4.3.156** Although no herptile specific surveys were undertaken, during all other ecological surveys completed within the core and wider study area no snake species or evidence of their presence was found. There is suitable habitat present for common adder in the centre of the core development area in the heathland areas, however, despite walkover surveys during suitable times of year and during suitable weather conditions no evidence of their presence was found. There are no recorded historic records of adder within the surrounding wider study area, the closest being approximately 9 km away at Ryvoan. It may well be that the An Camas Mòr area, particularly the heathland, is too isolated for a population of common adder to be present. Other species of British snake are very unlikely to be present within the wider study area.
- 4.3.157** Two sightings of common lizard (viviparous lizard) were made during the ecological surveys. These were towards the north of the core development area in mixed acid grassland and heath habitat. There is suitable habitat present in heathy and grassy areas within both the proposed core development area and the wider study area for this species. However, the habitat quality for this species will decline as the planted and naturally regenerating trees present on the core development area form a canopy in the future. There is also suitable habitat present within the wider study area for slow worm but no evidence of their presence was found. The nearest recorded historic record of slow worm is near Kinveachy, approximately 2 km away from the wider study area boundary. Again, it may be that the area is too isolated from other populations for them to exist within the wider study area.

- 4.3.158** There are historic records of both common toad and common frog within the wider study area. During surveying common frogs were seen in both the Fishery area and the pond margins within the proposed core development area. Surrounding marginal habitats at both locations are suitable for both these species to be present and it appeared that there was a healthy common frog population in the area.
- 4.3.159** There is a historic record of great crested newt to the south of the wider survey area near Inverdrue. There is no longer a population present in this area. Although theoretically the Fishery and the small pond provide suitable habitat for newts the presence of trout at the Fishery and its relatively recent construction means they are very unlikely to be present. The small pond within the core development area is very isolated from surrounding suitable habitat and any known populations and therefore this pond is deemed to be extremely unlikely to support a population of this species. During all surveys, particularly aquatic entomological surveying, no evidence of great crested newt or the other commoner species of newts was found.
- 4.3.160** There were no recorded historic records or field records of any other reptile or amphibian species within the area.

Other Common Fauna

- 4.3.161** Although not historically recorded within the immediate wider study area roe deer are common and were recorded frequently during surveying, particularly in the fields and woodland edges around the proposed core development area. Red deer were also commonly seen within the wider survey area particularly during the winter and spring. There was one sighting of a sika deer during field surveying and this was likely to be passing through the area. Sika deer are not native and vigorously controlled by the Estates in the area to try to prevent interbreeding with red deer populations and their wider establishment.
- 4.3.162** Other common mammal species that are known to be present in the wider survey area (both from records and surveying) include: fox (dens found within the core and wider survey area), stoat, weasel, rabbit, mole, field vole (a good population present around the small pond in particular), wood mouse and house mouse. Estate notes on aquatic mammals record water shrew being present at the Fishery, although these were not seen or specifically surveyed for during the current ecological surveys. Appendix 4A contain lists of historic records. Not all field observations during surveying within the core and wider survey area for common species were formally recorded because this was not felt necessary, where species were known to be widespread and common. Other mammal species that were not recorded but are considered very likely to be present in the area include hedgehog, brown rat, bank vole, pygmy shrew and common shrew.

Avifauna

Summary of Relevant Legislation

- 4.3.163** The following is a brief summary of the legal framework for the conservation of birds in the UK and Europe. The EC Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds), in combination with the Habitats Directive, includes obligations for signatory States to

identify and classify Special Protection Areas for rare or vulnerable bird species listed in Annex I of the Directive and to implement a general framework of legal protection for all wild birds. These provisions of the Birds Directive are implemented in Scotland primarily through the Wildlife & Countryside Act 1981, as amended and the Conservation (Natural Habitats, &c.) Regulations 1994, as amended. All wild birds, their nests and eggs are protected to varying extents. In relation to development the potentially relevant offences, with certain exceptions, can be summarised as follows. It is illegal:

- To intentionally kill, injure or take any wild bird;
- To intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built; and
- To intentionally or recklessly disturb any wild bird listed on Schedule 1 to the Wildlife and Countryside Act while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Brief Description of General Area and Relevant Designated Sites

4.3.164 The Cairngorm, Rothiemurchus and Glenmore area is renowned for the characteristic and important montane, moorland, native woodland and wetland bird communities the area supports, including many bird species of national and international conservation concern and restricted range in the UK.. There is also one species, Scottish crossbill (the only endemic bird species in the UK), present in the Strathspey area and this area supports an important population of this species. The presence of some of the largest areas of semi-natural pine wood remaining in the UK, adjacent to lochs, wetlands, moorland and extensive montane areas provides a unique diversity of habitats and associated populations of bird species, which is partly reflected in the designation of the area as part of the Cairngorms National Park.

4.3.165 Figure 4.3 provides a map showing the location of sites designated for nature conservation interest within and adjacent to the proposed An Camas Mòr development area and those with particular bird interest are described within this document. The proposed development site is not located within any statutory designated site for ornithological interest (e.g. SSSI, SPA, NNR, Ramsar Site etc.).

4.3.166 The North Rothiemurchus pinewood is an important area for Scottish crossbill. Other birds with a restricted distribution which nest here include crested tit which is mainly restricted to Speyside and Morayshire. Capercaillie, which is mainly confined to old pinewoods in Scotland also breeds and feeds in North Rothiemurchus pinewood. The Cairngorms SPA supports internationally important populations of Scottish crossbill and nationally important populations of golden eagle, peregrine, merlin, osprey, capercaillie and dotterel.

4.3.167 Craigellachie SSSI and NNR includes one of the largest birchwoods in Strathspey. Moorland, small lochs and cliffs add diversity to the site. The combination of birchwood, moorland, lochans and cliffs brings together an important community of birds including breeding peregrine, black grouse, common buzzard, woodcock, tree pipit, wood warbler and pied flycatcher.

4.3.168 The pinewood of Kinveachy is one of the major tracts of remnant Caledonian Pine Forest in Strathspey. Kinveachy Forest SPA supports internationally important populations of capercaillie and Scottish crossbill.

Brief Description of the Study Area

4.3.169 The habitats present within the An Camas Mòr core development area and surrounding adjacent wider survey area support a suite of breeding bird species which are considered broadly typical of the habitats present. Several species of high conservation concern that are known to have populations present in the surrounding general area, and for which the site may provide some suitable habitat, have not been recorded within or adjacent to the proposed development area either during site surveys from 2005 to 2008 or from desk study records (e.g. capercaillie, black grouse). There is also no evidence from site surveys or desk study of breeding activity by any species listed on Annex 1 of the EC Birds Directive or Schedule 1 to the Wildlife and Countryside Act (1981 and as amended) within the proposed core development area.

4.3.170 The diversity of habitat types within the proposed core development area and the wider survey area is reflected in the number of bird species recorded, with an assemblage of 82 species (of which 33 species in total were confirmed as breeding within the core development area and 60 species in total were confirmed as breeding in the wider survey area). Within the list of those species recorded as breeding in the core development area a total of four species are on the UK red list of Birds of Conservation Concern (Gregory *et al.*, 2002), 11 species are on the UK amber list of Birds of Conservation Concern, nine species are Priority species within the UKBAP and five species are included in the Scottish Biodiversity List (see Table 4.9). A complete list of all bird species recorded within the core development site and surrounding area is provided in Appendix 4I. The collated results of the breeding bird surveys undertaken in 2005 and 2007 are presented in the Figures within Appendix 4I.

Table 4.9: Bird species of conservation concern confirmed breeding within the proposed core development area, estimated apparent territories (peak value from surveys undertaken in 2005 and 2007) and their conservation status*

Common Name	Latin Name	BoCC Status ⁱ	BAP ⁱⁱ	SBL ⁱⁱⁱ	Peak No. Territories ^{iv}
Common kestrel	<i>Falco tinnunculus</i>	amber		✓	1
Cuckoo	<i>Cuculus canorus</i>	amber	UK		2
Skylark	<i>Alauda arvensis</i>	red	UK	✓	1
Tree pipit	<i>Anthus trivialis</i>	amber	UK		16
Meadow pipit	<i>Anthus pratensis</i>	amber			2
Dunnock	<i>Prunella modularis</i>	amber	UK		3
Stonechat	<i>Saxicola torquata</i>	amber			2
Song thrush	<i>Turdus philomelos</i>	red	UK	✓	3
Mistle thrush	<i>Turdus viscivorus</i>	amber			1
Wood warbler	<i>Phylloscopus sibilatrix</i>	amber	UK	✓	2
Willow warbler	<i>Phylloscopus trochilus</i>	amber			38

Common Name	Latin Name	BoCC Status ⁱ	BAP ⁱⁱ	SBL ⁱⁱⁱ	Peak No. Territories ^{iv}
Goldcrest	<i>Regulus regulus</i>	amber			7
Spotted flycatcher	<i>Muscicapa striata</i>	red	UK	✓	1
Lesser redpoll	<i>Carduelis cabaret</i>	amber	UK		1
Yellowhammer	<i>Emberiza citrinella</i>	red	UK		10

***NB: none of the species recorded as breeding within the site are subject to enhanced statutory protection or specific conservation measures under the Wildlife and Countryside Act or the EC Birds Directive.**

i. UK Birds of Conservation Concern (Gregory et al 2002).

ii. Species identified for priority action within National (UK) or Local (L) Biodiversity Action Plans

iii. Species on the Scottish Biodiversity List

iv. Estimated apparent territories within the core development area, peak estimates from breeding bird surveys undertaken in 2005 and 2007.

4.3.171 Other ‘notable’ species recorded as breeding include common buzzard (at least one territory in the wider survey area) and tawny owl (one estimated territory within the core development area) and crested tit (one breeding record in 2007 outside of the core development area but within c. 200 m from the core development area boundary, see Figures in Appendix 4I). Additionally, the Rothiemurchus fish farm is a well known haunt for foraging ospreys that nest in the wider surrounding area (i.e. outwith the An Camas Mòr wider study area). Osprey are also known to hunt for fish at Loch Morlich, Loch Insh and along the River Spey. Osprey, commuting between breeding and foraging sites, have been regularly recorded passing over the core development area.

4.3.172 The Badenoch and Strathspey area supports the majority of the UK breeding common goldeneye population. The national population has been estimated at 150 pairs and over 95 % of nesting attempts occur in this area in most years (Forester *et al.*, 2007). Goldeneye are listed on Schedule 1 of the Wildlife and Countryside Act (between 1 February and 31 August) which affords this species enhanced legal protection from disturbance during the breeding season. This species is heavily dependant on nest boxes as the availability of natural tree holes for nesting is very limited. Goldeneye nest boxes have been installed within the wider study area on mature trees close to watercourses (approximately 25 boxes have been installed on Rothiemurchus Estate). Although the areas where the nest boxes are located (along the River Spey and the Fishery) would not be directly affected by the proposed development, there is the potential for indirect adverse impacts from disturbance associated with the anticipated increased use of the general area by residents of the proposed housing development. There is no suitable foraging habitat within the core development area for goldeneye, the main foraging sites in the wider area are assumed to be the River Spey, Loch Pityoulish and the Rothiemurchus Fishery.

4.3.173 To the south of the core development area there are woodlands and open farmland. The breeding bird community associated with the riparian woodlands in particular, includes a number of species of nature conservation interest such as spotted flycatcher, tree pipit, song thrush and wood warbler. The open fields, depending on the cropping regime, provide roosting and foraging opportunities for wader species such as oystercatcher and lapwing, and are also used occasionally by roosting black-headed gull and hunting long-eared owl and barn owl. The edges of the fields, where there is scrub, are also used by singing yellowhammer. The mature woodland along the southern edge of the core development area supports a

relatively diverse suite of songbirds including common species as well as species of conservation concern such as willow warbler, wood warbler, song thrush and cuckoo. Crested tit have also been recorded in this area of woodland.

Historical Avifauna Records

4.3.174 Historical records of birds of conservation concern in the vicinity of the wider study area were requested from the RSPB. Full details are provided in a separate Confidential Annex. There are no historical records of any species of conservation concern for the core development area. In the wider area, where transport infrastructure associated with the An Camas Mòr development is proposed, there are historical records of species of conservation concern for OS 1 km Grid squares NH 90 11 and NH 91 10, which part of the wider study area is partly within. Although the majority of these records are more than 10 years old there are breeding records for barn owl and crested tit for Grid square NH 91 10 both recorded in 1997. Rothiemurchus Estate maintains records of capercaillie for the entire landholding but do not have any recorded sightings or evidence (e.g. moulted feathers, droppings) of this species for the core development area. The majority of records relate to areas of mature pine and birch woodland more than 1km from the core survey area, with no records in the vicinity of the proposed road links to the development area.

4.4 Nature Conservation Evaluation

4.4.1 The following section provides an assessment of the nature conservation value of the ecological receptors (habitats and populations) summarised in the baseline descriptions (Section 4.3). The assessment of nature conservation value is based on a systematic evaluation of the importance of the wider survey area in an international, national, regional, and local context, based on the information available at the time of this assessment. Explanation of the criteria used to assigning sensitivity levels is provided in Table 4.3. The ecological receptors are considered in the same order as that used in the baseline descriptions in Section 4.3. The conservation value given to the habitats present is based on the inherent value of the habitat itself, not its indirect value for faunal species (this aspect is considered within the assessment itself). A summary table of the overall nature conservation evaluation is provided in Table 4.11 (habitats and faunal receptors) at the end of this section.

Statutory Designated Sites

4.4.2 There no statutory designated sites within the core development area. However, the Cairngorms SAC and SPA, and the North Rothiemurchus SSSI just overlap the wider study area to the east, at Coylumbridge. In addition, the River Spey SAC overlaps the wider study area to the west and the south. Due to the international level of these designations and their overall inherent nature conservation value these are valued collectively as **Exceptional**.

Non-statutory Sites

4.4.3 Non-statutory sites within the wider study area are all related to ancient woodland. These are valued in terms of their inherent habitat value rather than their non-statutory status and are detailed below under their relevant woodland types. Woodland Grant Scheme areas are dealt with in the same way.

Habitats and Flora

4.4.4 The overall value of the habitats and flora within the wider study area are considered together and determined by taking the highest individually valued habitats and flora (see text below and Table 4.11) and ensuring this adequately values the overall mosaic of habitat importance present. This evaluation must also account for the known baseline changes in land management that apply to parts or all of the area; in this case woodland planting and natural regeneration on the heathland areas within the proposed core development area.

Broad-leaved Semi-natural Woodland

4.4.5 The birch dominated woodland within the core development area is a good quality habitat which is developing further through ecological succession processes. Generally this woodland is included as a broad habitat type within the UKBAP. The wet woodland patches along the Spey and Druie within the wider study area are included within a UK Priority Habitat Action Plan (HAP) as habitat characterised by poorly drained or seasonally wet soils. Wet woodlands are valuable because they generate humid conditions ideal for bryophytes and some insects. Wet woodland is considered uncommon overall in Scotland. Most of the broad-leaved semi-natural woodland within the wider study area is included under one of the three categories of ancient woodland (see Figure 4.4) and therefore has a significant history of presence in the area to varying extents, which can relate to relative ecological importance.

4.4.6 Semi-natural broad-leaved woodland including wet alder dominated woodland provides an important species and structural component within the wider study area and is of a locally high conservation value (i.e. they are of **Low - Local High** Importance).

Coniferous Semi-natural Woodland

4.4.7 Coniferous woodland is defined as a habitat type that consists of coniferous stands where broad leaved trees make up less than 20% of the cover. Semi-natural coniferous woodland provides an important species and structural component within the development area. Semi-natural coniferous woodland is a UK HAP priority habitat. The majority of this woodland type area within the wider study area is included in the Ancient Woodland Inventory, mostly as being long-established of plantation origin or as other (on Roy map) (see Figure 4.4). As a whole, areas of semi-natural coniferous woodland within the wider survey area considered to have a locally high conservation value (i.e. they are of **Low - Local High** Importance).

Coniferous Plantation

4.4.8 Coniferous woodland is defined as a broad habitat type and consists of coniferous stands where broad leaved trees make up less than 20% of the cover. The majority of the conifer plantation to the south of the proposed core development area is considered to be fairly naturalised and has elements of native vegetation developing but is of a relatively low conservation value due to its even-age structure fairly high density and relative lack of species diversity. The denser older stands, particularly the ploughed stand within the core development area and the stands to the

north of the wider study area are of a low conservation value. While the younger plantings within the proposed core development area currently still have a good ground flora this will diminish rapidly as canopy closure occurs in the near future and therefore they are also of a low conservation value overall. Bearing their actual ecological value in mind, it is important to note that the majority of this habitat type in the wider study area is included in one of the Ancient Woodland Inventory categories, despite the fact that two of the larger stands (south Cambusmore and Callart Hill) have been ploughed in the past. Overall, this habitat is considered to have a locally low conservation value (i.e. they are of **Low - Local Low** Importance).

Mixed Semi-natural Woodland

4.4.9 Semi-natural mixed woodland is a broad habitat type within the UKBAP but wet woodland within it would be regarded as a priority habitat. There are fairly species rich areas present in the south and south east of the wider study area. Some of these areas also contain creeping lady's tresses which suggests a fairly undisturbed history. Most of these larger areas are included in the Ancient Woodland Inventory under one of the three categories. Overall, this habitat is considered to have a locally high conservation value (i.e. they are of **Low - Local High** Importance).

Dense / Continuous Scrub (including juniper scrub) and Scattered Scrub

4.4.10 Juniper is a priority UK BAP and Local BAP species. Areas of juniper scrub are threatened by overgrazing, clearance and excessive burning. These can reduce the potential for natural regeneration and reduce suitable areas for new growth. There is evidence of a long-term decline in the population although the extent and speed of this decline is unclear. However, this wider situation is not the case within the wider study area at Rothiemurchus and stands are generally healthy and reproducing with young regeneration present in many of the woodland areas. Dense / Continuous Scrub (including Juniper scrub) provides an important species and structural component in the suite of heathland / woodland habitats within the wider study area. As a whole, areas of dense / continuous scrub identified during surveys of the wider study area are considered to have up to a **Medium** conservation value because although juniper scrub is fairly common and reproducing well in this area, this is exceptional and larger areas are of up to regional value overall.

4.4.11 Scattered Scrub, although a common habitat, does provides an important variation in the structural component in the suite of moorland habitats within the wider study area. As a whole, scattered scrub identified during surveys of the wider study is are considered to be of **Low - Local Low** conservation value.

Parkland / Scattered Trees

4.4.12 Broad leaved and mixed parkland / scattered trees can be the products of historic land management systems, and represent a vegetation structure rather than being a particular plant community. Typically this structure consists of large, open-grown or high forest trees (often pollards) at various densities, in a matrix of grazed grassland, heathland and / or woodland floras. Lowland Broad-Leaved Parkland is regarded as a UK priority habitat. However, the small areas present within the wider study area are not of this quality and history. Broad-Leaved

Parkland / scattered trees do provide a structural component in the suite of habitats within the wider study area and are therefore of some limited ecological value.

4.4.13 Coniferous parkland / scattered trees can also be the products of historic land management systems, and represent a vegetation structure rather than being a particular plant community. Again this structure consists of often large, open-grown or high forest trees at various densities, in a matrix of grazed grassland, heathland and / or woodland florae. The An Camas Mòr proposed core development area and the wider surrounding study area has small areas of scattered coniferous trees which are the result of historic land management practices. These are ecologically relevant in a local context. Overall Parkland and scattered trees within the wider development area considered to be at a maximum conservation value of **Low - Local Medium**.

Unimproved Acid Grassland

4.4.14 Acid grassland is a broad habitat type in the UKBAP. Lowland acid grassland is more restricted in extent and under greater threat from development and agricultural intensification than upland acid grassland. The unimproved acid grassland within the wider study area is of a common type but is lowland in character. The acid grassland found in the northern end of the core development area has been subject to accidental burning and past grazing. The unimproved acid grassland / heath mosaic which is present in places within the core development area has a slightly higher habitat value overall. However, virtually all of the unimproved acid grassland present within the core development area of the site has previously been planted with trees and is also naturally regenerating to woodland at present. Therefore, the ecological value of unimproved acid grassland within the core part of the study area will decrease in value as woodland takes over.

4.4.15 Overall, the acid grasslands found within the wider survey area as a whole are generally of limited nature conservation interest. While the unimproved acid grassland / heathland mosaic is of slightly higher inherent conservation value, its current succession to woodland must be taken into account. The unimproved acid grassland habitat within the survey area (including this component within the mosaic habitat) is considered to have a **Low – Local Medium** nature conservation value.

Semi-improved Acid Grassland

4.4.16 This is a common habitat which is influenced by farming. It is not of any particular nature conservation value as a habitat and is generally plant species poor. At most its nature conservation value is **Low – Local Low**.

Poor Semi-improved and Improved Grassland

4.4.17 Poor semi-improved grassland is species poor and a very common habitat both nationally and in the surrounding area. Improved grassland is a UKBAP broad habitat, with objectives to enhance areas of improved grassland and restore semi-natural vegetation on sites where this would enhance their value for wildlife. Improved grasslands are species-poor and account for the majority of all grassland found in rural and urban parts of the UK. They are dominated by grasses with often abundant white clover and have low biodiversity due to modification by fertilisers, ploughing, herbicides and grazing. There is little growth of other plant species due to

fertilisers stimulating the growth of competitive grasses, although common ragwort, thistle species and dock species can be frequent.

4.4.18 Generally these grasslands support a very impoverished flora. The poor semi-improved and improved grassland found within the wider survey area is generally of very limited nature conservation interest, due to its low species diversity. Within the wider study area these habitats are considered to have a nature conservation value of **Negligible**.

Marsh / Marshy Grassland

4.4.19 Grazing marsh and rush pasture habitats in the UK have declined in recent years, primarily due to agricultural modification and reclamation. However the species composition of these UK BAP habitats is varied and more species rich, unlike the marshy grassland habitats found within the survey area, which have limited common species and while providing diversity of habitat are a common habitat type in the surrounding area. However, this habitat does have some inherent value within the wider study area and has been assessed as having a nature conservation value of **Low – Local Medium**.

Dry Dwarf Shrub Heath

4.4.20 Dry heath vegetation communities are habitats of EU interest listed on Annex 1 of the Habitats Directive and can be formally protected within SACs. Lowland heathland (which the heathland within An Camas Mòr can be counted as) is a priority habitat under the UKBAP and listed in the Local BAP. Dry Dwarf Shrub Heath provides an important species and structural component in the suite of habitats within the development area. It is also an important component of the acid grassland / heathland mosaic habitat which is also present. However, the main areas containing this habitat within the proposed core development area have been tree planted and are also naturally regenerating / succeeding to woodland and therefore the overall quality and area of this habitat will decline as canopy closure occurs. Overall, without the planting and natural regeneration which has occurred within the proposed core development area this relatively large area of dry dwarf shrub heath (including its component in the acid grassland mosaic) would be regarded as being of a Medium conservation value, however, given the current land management of the proposed core development area, its overall value within the wider study area, accounting for future shrub / canopy closure within the proposed core development area, is **Low – Local Medium** overall. Other areas of heathland habitat present in the wider study area, although much smaller in area, are of sufficient ecological quality to be valued at **Medium** overall.

Wet Modified Bog

4.4.21 The small modified bog which has been affected by drainage but still contains sphagnum and plant species which are not present elsewhere within the wider study area has been valued as being of **Low – Local Medium** conservation value. The nature conservation value of this bog may further decline in the future if Scots pine seedlings manage to establish.

Waterbodies

- 4.4.22** Oligotrophic lakes are a priority habitat within the UKBAP and Loch Pityoulish is a good example of a nutrient poor, deep loch. Other smaller areas of stillwater and slower stream within the wider study area, including the small pond within the proposed core development area are more mesotrophic in character. Overall, these areas support a good range of flora and habitats, particularly on their margins and all standing water is classified overall as being of **Low – Local Medium** nature conservation value.
- 4.4.23** Rivers are priority habitats within the UKBAP. The wide diversity of features found in rivers support a diverse range of plants and animals. Riffles, pools, shingle beds, gravel sidebars etc. are all important habitats. Marginal and immediate bank edge vegetation also support a wide diversity of plant species. Rivers and streams margins also often provide a wildlife corridor link between other fragmented habitats. The River Spey, which flows along the west of the wider study area, is one of the largest rivers in Scotland and one of the most unpolluted in the UK. As noted above in this section, within the wider survey area the ecology and nature conservation value of the River Spey and the River Druie are recognised at an International level in the SAC designation. Both rivers including sidebars and immediate banks are of a **Exceptional** nature conservation value within the wider study area.

Quarry

- 4.4.24** The nature conservation value of the largely re-vegetated small quarry area towards the south of the wider study area is accounted for within the values given to the actual habitat types present i.e. dry dwarf shrub heath and coniferous semi-natural woodland and the quarry is not considered separately any further.

Arable Fields / Amenity Grassland / Ephemeral and Short Perennial and Other Habitats

- 4.4.25** These additional habitat types are all common and of very low nature conservation value, being of low diversity and in generally disturbed habitats. Any higher value habitats included in the "Other Habitats" description such as river sidebars and side channels are all included within the River Spey and River Druie nature conservation evaluation. These habitats are all of a **Negligible** nature conservation value overall within the wider study area.

Fish

- 4.4.26** The Atlantic salmon is a UKBAP priority species and an LBAP species, as well as being included within the Habitats Directive. It is a species widely distributed around the countries bordering the North Atlantic, and Scottish rivers in particular are a European stronghold for the species. The brown / sea trout is also a UKBAP priority species and an LBAP species. As well as salmonids, lamprey species are present within the River Spey catchment and these, along with European eel are also important from a nature conservation perspective (river and sea lamprey and eel are UKBAP priority species). All three lamprey species are included within the Habitats Directive. Given this level of overall protection, the concern about fish stocks generally and the River Spey SAC designation, fish overall are at a **High** conservation value within the wider study area.

Protected Fauna of Conservation Concern

Freshwater Pearl Mussel (FWPM)

- 4.4.27** FWPM could be present within the wider survey area, although not found to be present in the section of the River Druie and part of the immediately linked section of the River Spey. Given their vulnerable status and the fact that certain areas of the Spey are thought to hold relatively healthy populations and considering that they are part of the River Spey SAC designation they are accorded an **Exceptional** conservation value for the wider study area.

Bats

- 4.4.28** Although there were moderate levels of bat activity recorded from the relatively common species which would be expected to be present, much of the core development area does not provide optimal bat foraging and roosting habitat. In the wider study area the riverine corridors do provide relatively higher quality foraging habitat and also tree roosting opportunities for bats generally. Overall, taking into consideration the conservation status of bats and their legal protection the wider study area is of **Low – Local High** importance for bat species.

Otter

- 4.4.29** Although otter is a species of conservation importance in this part of Scotland otter populations are known to be healthy and increasing at present. The River Spey and its subcatchments have a high number of active otter territories present and provides close to optimal habitat for otter. In addition, the extra available food available all year round from the Rothiemurchus Fishery provides otter in the area with an easy additional food source. Given the favourable conservation status of otter in the wider survey area they are assessed as being at a **Low – Local High** conservation value.

Wildcat

- 4.4.30** No evidence of wildcat being present within the wider study area was found during any of the surveying. However, they are extremely secretive and shy and do range over large areas so it is possible that they occasionally pass through the wider study area. There is some anecdotal evidence of this in the past from sightings on the B970. Although an animal may occasionally pass through on hunting forays they are unlikely to be resident within the wider study area and the habitat present (given the existing noise and lights from Aviemore and Inverdruie) is likely to be sub-optimal at best. Taking this into consideration along with their conservation status, the wider study area is judged to be of **Low – Local Medium** value for wildcat, at best.

Water vole

4.4.31 Water vole signs recorded within the wider survey area were fairly limited overall. However, there does appear to be a permanent, if fairly small, water vole population centred around the Fishery. There may also be water voles on the margins of the River Spey, within the study area. There is suitable habitat present for this population to expand and perhaps with future further management of mink in the area this may happen. Overall, taking into account habitat suitability and the existing population the wider study area is of **Low – Local High** conservation value for water vole.

Red Squirrel

4.4.32 The red squirrel population in the Aviemore area is currently healthy and there are quite high population densities present due to generally suitable habitat and feeding sources being present and this has recently been recognised by the proposal for stronghold areas surrounding the proposed core development area. Given the importance of the wider study area to red squirrel and taking into account its current conservation status and threat level within the area it is currently assessed as being at up to **Medium** conservation value. However, the proposed core development area is assessed to be of currently lower conservation value for red squirrel (Low – Local Medium) but this will increase in the future to the same level as the wider study area as the plantings and natural regeneration of trees form a woodland setting.

Pine Marten

4.4.33 Population densities of pine marten are very low to low within the wider study area and their core habitat areas are likely to be on the boundaries of the wider study area. The wider study area provides foraging opportunities for them but the proposed core development area, although they do pass through it, is not currently high quality habitat for them. It is likely that as the woodland in the west of the core development area develops further this will aid the movement of pine marten in the area. In Scotland, pine marten numbers are generally increasing and populations, although scattered are thought to be very healthy. The wider study area, as a whole, is of **Low – Local High** nature conservation value for pine marten,

Badger

4.4.34 There are well established medium to high densities of badgers within the wider study area. The legal and conservation situation with badger is complex and legislation is related to persecution more than nature conservation. However, in Scotland badgers are less common in some areas than they are elsewhere in Britain. Within Strathspey there are relatively high populations of badger in lower lying areas and they are not threatened from a nature conservation perspective. Taking into consideration the relevant information badger is assessed as being of **Low – Local Medium** conservation value within the wider study area.

Invertebrates

4.4.35 The core and wider study area supports a diverse range of habitat types and the surrounding wider area supplements this considerably. Given this habitat diversity and the location it is not surprising that the entomological studies have listed several nationally rare and vulnerable species, along with higher numbers of nationally scarce and local species. This would be the case in any similar areas of habitat in the Strathspey area and in many other areas of Scotland. It is also quite likely that if further exhaustive surveying was completed for insects (and fungi) that further uncommon species would be recorded. Many are only identifiable for very short periods of time and are unlikely to be recorded. However, in planning terms, under the process of impact assessment for ecology we have taken this into account. It is accepted that this process cannot be totally exhaustive and identify every single species present within sites and for this reason, the conservation evaluation for habitats (particularly related to fungi but also for insects) has included for this in the inherent nature conservation value awarded to habitats in this assessment. In addition, a separate conservation evaluation has been undertaken specifically for invertebrates and this has concluded that the conservation value of the wider study area for all invertebrates (aquatic and terrestrial) is **Low – Local High**. This evaluation also takes into consideration the local surrounding context of the area with, for example, the North Rothiemurchus pinewoods being close to the boundary of the wider study area and the overall high diversity of invertebrate species that are present.

Brown Hare

4.4.36 Brown hare are present within the wider study area in fairly low numbers being concentrated in the farmed areas and their surrounding margins. Overall the wider survey area, particularly the farmed fields and their margins are of **Low – Local High** nature conservation value for brown hare.

Reptiles and Amphibians

4.4.37 Common lizard, common frog and common toad (likely to be present, not recorded during surveying) are present within the wider study area. No evidence of other reptile or amphibian species was found. The breeding habitat for amphibians is fairly limited within the wider study area but there is currently good habitat within heathland and acid grassland for reptiles (this will diminish as plantings and natural regeneration of trees close the more open habitats within the proposed core development area). Overall the nature conservation value of the wider study area for these groups is **Low – Local Low**.

Other Common Fauna

4.4.38 There are a variety of common species present within the wider study area and these are also widespread in the surrounding Strathspey area. They have no particular conservation value since they are common and widespread in Scotland and are not threatened in any way. The one exception to this is hedgehog, the numbers of which have declined recently, although they

are still regarded as a common species in Scotland, within suitable habitat. Jointly, all these species are assessed as having an overall nature conservation value of **Negligible**.

Avifauna

- 4.4.39** The following provides a discussion of the nature conservation value of the populations (or supporting habitats) of bird species of conservation concern within the core and wider survey areas. The summary results of the assessment of avifauna nature conservation value are provided in Table 4.11 at the end of this section. A complete list of species recorded, their site status (*i.e.* breeding, wintering or passage visitors), and their conservation status is provided in Appendix 4I.
- 4.4.40** Regional population estimates for most species are not available at the time of writing. The relative abundance of the species in Highland Region is noted (where this information is available) based on the 2005 Highland Bird Report. The terms used in describing abundance in the Bird Report, and as referred to in the text below and in Table 4.10, are as follows: 'abundant' (widespread and numerous), 'common' (regularly encountered), 'uncommon' (less than 100 records annually) and 'scarce' (annual in small numbers).
- 4.4.41** No species listed on Schedule 1 to the Wildlife and Countryside Act and / or Annex 1 of the EC Birds Directive were recorded as breeding within or immediately adjacent to the proposed development area and the site is not known to provide critical supporting habitat for such species.
- 4.4.42** A single crested tit breeding registration was recorded within mature mixed pine and birch woodland close to the southern edge of the core development area in 2007 (see Figures in Appendix 4I). This is within woodland to the south of the main development area. This species is listed on Schedule 1 to the Wildlife and Countryside Act 1981 (therefore is subject to enhanced legal protection). Based on this recorded and the presence of good quality habitat for this species in the wider area an evaluation of **Low (Local High)** is considered appropriate for the core development area and **Medium** for the wider survey area.
- 4.4.43** Goldeneye nest boxes are located within c. 500 m of the proposed development area (*i.e.* within the wider survey area). Records relating to these are included within the Confidential Annex. This species is listed on Schedule 1 Part 2 to the Wildlife and Countryside Act 1981. Based on the importance of the breeding population in Strathspey, and the presence of good quality breeding habitat for this species in the wider area (the core development area does not provide any suitable foraging habitat), an evaluation of **Low (Local Low)** is considered appropriate for the core development area and **High** for the wider area.
- 4.4.44** Species listed on Schedule 1 to the Wildlife and Countryside Act and / or Annex 1 of the EC Birds Directive that do not breed but may occasionally use habitats within the proposed core development area and wider study area for foraging, during or outside of the breeding season, include merlin, hen harrier (*Circus cyaneus*), peregrine, short-eared owl (*Asio flammeus*) and crossbill species (common and Scottish crossbill have been recorded in the wider area, see below for further discussion of these species). For non-breeding Schedule 1 / Annex 1 populations present in the wider area, a nature conservation value of no greater than **Low (Local high)** is considered appropriate for the core development area and **Medium** is considered appropriate for the wider area.
- 4.4.45** The core development area provide a range of habitats supporting a diverse suite of songbird species including several species of relatively high national conservation concern, such as skylark (UK Red list, UK BAP), song thrush (UK Red list, UK BAP), spotted flycatcher (UK Red list, UK BAP) and yellowhammer (UK Red list, UK BAP). There are also relatively high, although not regionally significant, populations of breeding willow warbler (UK Amber list) and tree pipit (UK Amber list, UK BAP) present.
- 4.4.46** The density of yellowhammer territories appears to be relatively high (9.6 / km²) given the lack of farmland within the core survey area, although the results of the survey in 2005 indicate that areas of suitable habitat surrounding the proposed development site (wider study area) also support populations of this species (see Figures, in appendix 4I). Densities of 20-25 pairs / km² have been suggested as indicative of optimal habitat (Forrester *et al.* 2007). Yellowhammer is considered to be a 'locally common' breeder in the east Highland region in the Highland Bird Report (2005), although it is noted as 'declining, especially in Badenoch and Strathspey'. In terms of peak apparent territories (10 territories recorded within the core development area in 2007), this 'population' is of negligible importance at a national and regional level (Forrester *et al.* provide an estimate of the breeding population in Scotland within the range 140,000-220,000 pairs). However, this population is considered to be important at a local level.
- 4.4.47** The number and density of breeding tree pipit territories is also considered to be important in a local rather than regional context. The population breeding within Scotland has been estimated at 43 000 pairs, this is considered to be an underestimate (Forester *et al.*, 2007). Currently there are no population estimates for the region (*i.e.* political or biogeographical region) although this species is considered to be 'locally common' within the region covered by the Highland Bird Report (SOC, 2005). The population in central and south-east England has been subject to a significant range contraction and population decline from 1985 to 2000; resulting in the current unfavourable conservation status of the species in the UK (*i.e.* it is on the Amber list Birds of Conservation Concern and a UK Priority BAP species). However the Scottish population does not appear to have been as badly affected (Forrester *et al.*, 2007).
- 4.4.48** Other species are present in relatively low numbers within the proposed core development area and are considered to be no greater than locally important. Taking into consideration the national conservation status of the passerine species recorded as breeding within the core development area (*i.e.* including several UK Red list and UK BAP Priority Species), the breeding songbird community is considered to be overall of **Medium** nature conservation value.
- 4.4.49** Small parties of crossbills (*Loxia* sp.) were recorded in flight over the area during surveys in 2005 and 2007. The species of crossbill was not confirmed. Reliable separation of common crossbill (*Loxia curvirostra*) and Scottish crossbill (*L. scotica*) is difficult to achieve in the field, based on the morphology of free ranging birds. Although there are diagnostic differences between the flight calls of these species this can also be difficult to reliably discriminate in the field without recording equipment. The difference in flight calls has been used as a census method, *i.e.* using call play-back techniques, to achieve a reliable identification of both species in the field (Summers, 2004). Both species are listed on Schedule 1 to the Wildlife and Countryside Act and Scottish crossbill is also listed on Annex 1 of the EC Birds Directive. In this area the ranges of both species overlap and Scottish crossbill has been recorded historically within the wider surrounding area (see RSPB records, Confidential Annex). Recorded breeding locations are primarily associated with areas of old Scots pine forest (*e.g.* in Strathspey, Deeside and Easter Ross), although forests comprised of other conifer species are also used for nesting (Summers *et al.*, 2002). Both species can range over relatively large distances in response to a number of factors, principally the availability of suitable cone crops. The breeding population has been estimated at 300-1300 pairs (BirdLife International, 2004), although a full

census has yet to be undertaken. The size of the common crossbill breeding population varies widely in relation to the number of birds invading from mainland Europe although in most years it is assumed to be over 10 000 birds (Forrester *et al.*, 2007). Therefore it is considered more likely that the species recorded occasionally foraging and overflying the core survey area was common crossbill. However, as confirmation of the species was not possible during the surveys, it can not be ruled out that all or some of these birds were Scottish crossbill. Scottish crossbill is the only endemic bird species in the UK. It is on the IUCN Red List and is a species of European conservation concern (SPEC 1). Given the distribution and quality of suitable foraging and potential nesting habitat in the wider survey area, the conservation value of the core area is considered to be **Medium** and the wider area has been conservatively assessed as **Medium to High**.

4.4.50 Although there is no suitable foraging habitat for osprey within the core development area, they have occasionally been recorded commuting over the core development area. There is currently no evidence of recent or historical nesting within the wider study area or any regularly used roosting or perching locations. The Rothiemurchus Fishery to the south provides an important foraging resource for ospreys that breed in the wider region. The core development area is considered to be of no direct value to this species other than as a commuting route, particularly in relation to breeding pairs to the north and east of the wider survey area.

4.4.51 Other species of conservation concern (*i.e.* listed on Schedule 1 of the Wildlife and Countryside Act and / or Annex 1 of the EC Birds Directive and / or on the UK Red list of birds of conservation concern) that have been recorded in the area but not as a breeding population within the core development area are goldeneye and golden plover. Occasional flights by hen harrier and peregrine falcon have been recorded over the core development area, although there is no evidence to suggest that the site provides critical habitat (in terms of foraging or roosting) for these species.

4.4.52 A number of wader species have been recorded as breeding in the agricultural fields and areas of marshy grassland to the east of the core development area. Oystercatcher (*Haematopus ostralegus*), lapwing (*Vanellus vanellus*), common snipe (*Gallinago gallinago*), woodcock (*Scolopax rusticola*), curlew (*Numenius arquata*), and common redshank (*Tringa tetanus*) have all been recorded breeding in the wider area. Curlew have been recorded displaying over the large area of dwarf shrub heath within the core development area and over the fields to the immediate east of the core development area on several occasions in 2005 and 2007, although no evidence of breeding within the core development area was recorded.

4.4.53 Although the site supports some apparently suitable habitat there have been no records of capercaillie or black grouse (including during survey visits undertaken in the winter months) using the core development area or the immediate surrounding area (including all areas potentially affected by the proposed development and access routes). Although there does not currently appear to be a population present in this area, due to their being suitable breeding habitat for capercaillie, particularly towards the southern and eastern portions of the wider survey area, the unfavourable conservation status of the species in Scotland and the presence of a population in nearby areas of Rothiemurchus / Glenmore, a conservative evaluation of **Low (Local High)** is considered to be appropriate for this species. The core development area is considered to be of **Low (Local Medium)** value for this species.

4.4.54 No evidence was found for significant or regular use of the core development area by wintering geese or swans. Small numbers of pink-footed goose (*Anser brachyrhynchus*) and greylag goose (*Anser anser*) were recorded in fields adjacent to the proposed core development area (other side of the B970) in 2005. Generally, the core development area does not provide

suitable foraging habitat or roosting opportunities for wildfowl and its potential value to wildfowl is decreasing with the plantation, planting and encroachment and natural regeneration of woodland.

4.4.55 Nature conservation values for other species of conservation concern breeding within habitats through which the proposed main site access road is routed are provided in Table 4.10. None of these species are anticipated to be present in numbers exceeding national or regional level importance thresholds.

Table 4.10: A summary of the nature conservation values of bird species of conservation concern (*i.e.* species listed on Annex 1 of the EC Birds Directive, and / or Schedule 1 of the Wildlife and Countryside Act, and / or the UK Red and Amber list of Birds of Conservation Concern, and / or uncommon in the region) for the core development area and wider area (*i.e.* up to c. 1km from the boundary of the core development area and including the route of the proposed site access roads).

Species	Breeding status B = breeding NB = non-breeding		Conservation Value		Highland Bird Report Breeding Status
	Core area	Wider area	Core area	Wider area	
Mute swan	NB	B	n/a	Low (Local High)	Uncommon
Wigeon	NB	Pot. B	n/a	Low (Local High)	Uncommon
Goldeneye	NB	Pot. B	Low (Local Low)	High	Scarce local
Goosander	NB	B	n/a	Low (Local High)	Uncommon
Hen harrier	NB	NB	Low (Local High)	Medium	Uncommon
Goshawk	NB	Pot. B	n/a	Low (Local High)	Scarce local
Osprey	NB	NB	n/a	Medium	Uncommon
Common kestrel	B	Pot. B	Low (Local High)	Low (Local High)	Common
Peregrine	NB	NB	Low (Local High)	Medium	Uncommon
Merlin	NB	NB	Low (Local High)	Medium	Uncommon
Short-eared owl	NB	NB	Low (Local High)	Medium	Uncommon
Capercaillie	NB	NB	Low (Local Medium)	Low (Local High)	Locally Common
Black grouse	NB	NB	Low (Local Medium)	Low (Local High)	Locally Common

Species	Breeding status		Conservation Value		Highland Bird Report Breeding Status
	B = breeding NB = non-breeding		Core area	Wider area	
	Core area	Wider area			
Grey partridge	NB	Pot. B	n/a	Low (Local High)	Uncommon
Oystercatcher	NB	B	n/a	Low (Local High)	Common
Lapwing	NB	B	n/a	Low (Local High)	Common
Golden plover	NB	NB	n/a	Low (Local High)	Locally Common
Common snipe	NB	B	n/a	Low (Local High)	Common
Woodcock	NB	B	Low (Local High)	Low (Local High)	Uncommon
Curlew	NB	B	Low (Local Mod.)	Low (Local High)	Common
Common redshank	NB	B	n/a	Medium	Uncommon
Cuckoo	B	B	Low (Local High)	Low (Local High)	Common
Skylark	B	B	Medium	Medium	Common
Sand martin	NB	B	Low (Local Mod.)	Low (Local Mod.)	Locally common
Swallow	NB	B	Low (Local Mod.)	Low (Local Mod.)	Common
House martin	B	B	Low (Local Mod.)	Low (Local Mod.)	Locally common
Tree pipit	B	B	Medium	Medium	Locally common
Meadow pipit	B	B	Low (Local Mod.)	Low (Local Mod.)	Abundant
Dunnock	B	B	Low (Local Mod.)	Low (Local Mod.)	Common
Common redstart	NB	B	n/a	Low (Local Mod.)	Locally common
Stonechat	B	B	Low (Local Mod.)	Low (Local Mod.)	Common
Song thrush	B	B	Medium	Medium	Common
Mistle thrush	B	B	Low (Local Mod.)	Low (Local Mod.)	Common

Species	Breeding status		Conservation Value		Highland Bird Report Breeding Status
	B = breeding NB = non-breeding		Core area	Wider area	
	Core area	Wider area			
Grasshopper warbler	NB	B	n/a	Low (Local High)	Uncommon
Garden warbler	NB	B	n/a	Low (Local High)	Uncommon
Blackcap	NB	B	n/a	Low (Local High)	Uncommon
Wood warbler	B	B	Low (Local High)	Low (Local High)	Locally common
Willow warbler	B	B	Medium	Medium	Abundant
Goldcrest	B	B	Low (Local Low)	Low (Local Low)	Abundant
Spotted flycatcher	B	B	Medium	Medium	Common
Crested tit	NB	B	Low (Local High)	Medium	Uncommon
Starling	NB	Pot. B	n/a	Low (Local Low)	Common
Lesser redpoll	B	B	Low (Local High)	Low (Local High)	Common
Crossbill sp.	NB	Pot. B	Medium	Medium to High	Uncommon
Bullfinch	NB	Pot. B	n/a	Low (Local High)	Locally common
Yellowhammer	B	B	Medium	Medium	Locally common

Summary of the Nature Conservation Evaluation

4.4.56 A summary Table presenting the nature conservation value of each of the key assessed receptors for the wider study area is provided in Table 4.11 below. See the immediately preceding sections of the text for the explanations behind these values.

Table 4.11: Summary of the Nature Conservation Value of the Key Ecological Receptors for the Whole of the Wider Study Area

Key Receptor	Conservation Value
Statutory Designated Sites	Exceptional
Semi-natural Broad-leaved Woodland	Low - Local High
Semi-natural Coniferous Woodland	Low - Local High

Key Receptor	Conservation Value
Coniferous Plantation	Low - Local Low
Mixed Semi-natural Woodland	Low - Local High
Dense / Continuous Scrub (including juniper scrub)	Medium
Scattered Scrub	Low - Local Low
Parkland / Scattered Trees	Low - Local Medium
Unimproved Acid Grassland	Low - Local Medium
Semi-improved Acid Grassland	Low - Local Low
Poor Semi-improved Grassland	Negligible
Improved Grassland	Negligible
Marsh / Marshy Grassland	Low - Local Medium
Dry Dwarf Shrub Heath	Core = Low - Local Medium, Wider = Medium
Wet Modified Bog	Low -Local Medium
Standing Water	Low - Local Medium
Running Water (Rivers Spey and Druie)	Exceptional
Arable Fields	Negligible
Amenity Grassland	Negligible
Ephemeral / Short Perennial	Negligible
Other Habitats	Negligible
Fish	High
Freshwater Pearl Mussel	Exceptional
Bats	Low - Local High
Otter	Low - Local High
Wildcat	Low - Local Medium
Water vole	Low - Local High
Red squirrel	Medium
Pine marten	Low - Local High
Badger	Low - Local Medium
Invertebrates	Low - Local High
Brown hare	Low - Local High
Reptiles and Amphibians	Low - Local Low
Other Common Fauna	Negligible
Birds (highest individual values given only)	Core = Medium, Wider = High

4.5 Impact Assessment

4.5.1 The following sections detail the relevant development aspects of the proposed An Camas Mòr community and discuss and assess the potential and likely ecological and nature conservation impacts during the construction and operation of the proposed housing development on the ecological receptors identified. The mitigation measures proposed to avoid and minimise all ecological and nature conservation impacts and the likely residual impacts are also assessed and included. Where relevant, this assessment discusses and details the impacts likely for all the particular construction phases of the proposed development.

4.5.2 This ecological and nature conservation impact assessment is provided to satisfy the requirements of the Environmental Impact Assessment (Scotland) Regulations 1999 and amendments. While it discusses and assesses impacts on any areas of relevant land and adjacent land to Natura sites (Habitats and Birds Directives), a stand alone document is also provided relating specifically to these sites and any potential for impacts on them. This separate document addressing the Conservation (Natural Habitats, &c.) Regulations 1994 and subsequent amendments is titled: Information to Inform Appropriate Assessment.

4.5.3 This assessment is based on the outline design proposals detailed in the Indicative Land Use Plan drawings and accompanying text in Volume 1 of the ES. However, mitigation proposed as a result of the visual impact assessment has altered the outline design proposals with a wider screen of planted vegetation being included adjacent to the B970. Due to the knock-on changes this could cause to the ecological impact assessment it is this revised site layout that has been assessed for the ecological impact assessment.

4.5.4 This assessment is split into construction and operational headings and elements for all of the impacts, mitigation and residual impacts on ecological receptors. Construction impacts are limited to temporary impacts and consider the total of the construction periods together. The operational impacts can be permanent or temporary and include assessment of the four development periods separately and in total i.e. cumulatively.

Summary of Potential Adverse Impacts

4.5.5 The potential adverse impacts on ecological receptors resulting from the construction and operation of the proposed development, as identified during feasibility and scoping, further consultation and ecological surveys and assessment, can be summarised as follows:

Construction Phase

4.5.6 Habitats, plants and faunal receptors:

- Works associated with the construction of the development infrastructure (e.g. soil / peat stripping, excavated mineral spoil storage, temporary lay down areas for construction materials);
- Potential for direct and indirect disturbance to hydrologically sensitive habitats and fauna;

- Potential for loss of / direct disturbance to other sensitive habitats through vehicle / plant trafficking, etc.
- Potential for loss / degradation of sensitive habitats from erosion and deposition, due to construction excavation, drainage / de-watering activities;
- Potential for pollution of watercourses by construction materials, hydrocarbons, silt, etc.;
- Potential disturbance (e.g. displacement) to protected mammals and birds taking shelter (e.g. holts, nests, roosts) in the proposed development area;
- Potential disturbance to protected mammals and birds, foraging or commuting through the proposed development area, arising from the construction works (e.g. through human presence, vibration, light, dust etc.);
- Potential habitat fragmentation and prevention of free movement of sensitive fauna; and
- The potential for adverse cumulative effects to arise from this with other proposals in the vicinity of the proposed development.

Operational Phase

4.5.7 Habitats, plants and faunal receptors:

- Potential loss / degradation (direct and indirect) / fragmentation of habitats of conservation importance (e.g. UKBAP, EU priority habitats etc.) or importance to species of conservation concern, related to the permanent development infrastructure (houses, roads, run-off storage / treatment, etc.);
- Potential disturbance impacts to sensitive habitats and species associated with on-going maintenance requirements of the development and access roads;
- Potential for disturbance to sensitive fauna from the residences of the development (e.g. traffic, noise, visual disturbance, pets);
- Potential loss / degradation (direct and indirect) / fragmentation of habitats of conservation importance (e.g. UKBAP, EU priority habitats etc.) or importance to species of conservation concern due to garden plant escapees, picking, nutrient enrichment, fly-tipping, direct damage to surrounding habitats etc.;
- Potential loss / degradation (direct and indirect) / fragmentation of habitats of conservation importance (e.g. UKBAP, EU priority habitats) or importance to species of conservation concern due to change in use or commencement of use of local surrounding habitats by local residents;
- Potential for soil / peat from construction resulting in surrounding vegetation changes;
- The potential for future land-use / management changes to positively or negatively affect species and habitats; and

- The potential for adverse cumulative effects to arise from this with other proposals in the vicinity of the proposed development.

The Mitigation Process

4.5.8 Mitigation has been part of the iterative planning for the proposed development. This is particularly the case for ecology and nature conservation where every attempt has been made to identify significant constraints at as early a stage as possible to inform the iterative design process for the outline planning stage of An Camas Mòr. For example, the main site access route has been selected, rejecting an earlier favoured option, so that a likely significant impact on a valuable area of woodland can be avoided. Another example of design mitigation relates to the woodland to the south in the proposed core development area, which is of higher ecological quality than that elsewhere within the proposed core development area. This area was zoned for development within the Local Plan boundary. However, due to the level of ecological impact predicted at the feasibility stage housing development has been removed from this area to minimise the ingress and impacts on this woodland. Other situations where iterative outline design has been part of the outline mitigation are mentioned in the following assessment where relevant.

4.5.9 Where potentially adverse ecological impacts could not be totally avoided during the outline design development of An Camas Mòr and have resulted in significant impacts under the EIA (Scotland) Regulations 1999 as amended (i.e. at a significance level of Moderate or Major), mitigation / management measures have been proposed to address them within the ecological and nature conservation assessment. The overall approach to the potentially significant adverse impacts on ecological receptors has been and continues to be to address them in three main ways (in descending order of priority):

- Avoid / minimise impacts through alterations to the proposed scheme layout and outline design based on best available baseline data (i.e. outline design mitigation);
- Avoid / minimise impacts through programming and the approach to construction; and
- Offset adverse impacts through the implementation of appropriate habitat and species management and enhancement measures, including monitoring.

4.5.10 The predicted beneficial effect of all such proposed outline mitigation measures are considered as part of the assessment and the outcome is then reported as the residual impacts and residual significance levels. There has also been a desire during the development of the outline design to seek to achieve a net enhancement for the area, including ecological enhancement, and measures to achieve this have been incorporated wherever possible.

Relevant Development Elements of the Proposal

4.5.11 The relevant elements of the proposed An Camas Mòr development are all explained in chapter 5 of Volume 1 of the ES. These elements are all referred to in the ecology and nature conservation assessment which follows where there could be an adverse impact on an ecological receptor either directly or indirectly. A summary map of the habitat types present in all of the wider study area with the development footprint overlaid according to the proposed development periods is provided in Figure 4.7.

4.5.12 The An Camas Mòr development is proposed to be completed over approximately 20 years, divided into four periods of development. The operational impacts of An Camas Mòr will be assessed for each of the four development periods but the temporary construction impacts will be assessed as a total for all periods of construction.

4.5.13 The impact assessment considers the potential adverse impacts associated with the construction and operation of all the built structures associated with the housing development (*i.e.* houses, access and internal roads, drainage infrastructure, utilities, temporary construction compounds, storage areas, and landscaped areas). The following list is a brief summary of the key elements of the scheme relevant to the assessment of impacts on ecological receptors (see Figure 4.7 for a summary of the construction footprint relative to the habitats present):

- Main access roads to the site – includes the existing B790, a new section of road at Colylumbridge and a new road into the site called the “substation route”. Utilities may also utilise some of these footprints;
- Construction access for the site – it is assumed that the main construction access for the development site would be via the Colylumbridge road upgrade and new section of road once built, however earlier, the existing Dell Farm access and estate track are likely to be utilised;
- New combined pedestrian and cycle routes would be built during different periods of the development. These are all new footprints. Utilities are likely to utilise some of these footprints;
- The areas of buildings and infrastructure (internal roads, paths, car parking etc.) within the proposed core development area which would be developed over four time periods and with up to a total of 1,500 new houses;
- The new school within the core development area and as new set of playing fields outwith the core development area towards the River Spey, both to be built by approximately 2018;
- A further area of playing fields and related development which would be built by 2027; and
- The felling of trees, clearance of vegetation and development of landscaping and greenspaces throughout the periods of the development.

Impact Assessment for Habitats and Flora

4.5.14 Adverse impacts on habitats (flora are included within the habitats assessment) during construction could result in temporary losses and / or temporary damage. During operation (*i.e.* the complete time the development is in place; assumed to be permanent) there would be areas of permanent habitat loss from land use change, as well as temporary adverse impacts from ongoing maintenance activities (*e.g.* road maintenance).

Construction Phase Impacts

4.5.15 Damage and / or disturbance to sensitive habitat and plant receptors could occur through a number of sources including human and construction plant movement, which could lead to physical damage to habitats, pollution (*e.g.* dust pollution and point source pollution incidents), movement and physical disturbance of vegetation and soils (*e.g.* poor siting of construction compounds). These impacts can lead to the temporary loss of vegetation and / or changes in vegetation communities and habitats in response to changes in environmental conditions. The

habitats which are considered particularly sensitive to damage during construction works include dry dwarf shrub heath, riverine habitats, semi-natural woodlands, and the small area of mire.

4.5.16 The likely impact magnitude and significance for each receptor is summarised below in Table 4.12 based on the estimated extent of habitats potentially affected and their assessed nature conservation value (potentially significant unmitigated impacts are highlighted in bold in this and all following tables). It is important to note that Table 4.12 refers to potential and totally unmitigated adverse impact significance, in other words, it is a theoretical worst case scenario of impacts and effects.

Table 4.12: Potential Unmitigated Adverse Impacts due to Temporary Construction on Habitats and Plants for the Total Construction Phase

Receptor	Conservation Value	Impact Magnitude	Adverse Effect Significance	Temporary Duration
Semi-natural Broad-leaved Woodland	Low (Local High)	Medium	Moderate	Medium-term
Semi-natural Coniferous Woodland	Low (Local High)	Medium	Moderate	Medium-term
Coniferous Plantation	Low (Local Low)	High	Moderate	Medium-term
Mixed Semi-natural Woodland	Low (Local High)	Low	Slight	Medium-term
Dense / Continuous Scrub	Medium	Low	Slight	Short-term
Scattered Scrub	Low (Local Low)	Negligible	Negligible	Short-term
Parkland / Scattered Trees	Low (Local Medium)	High	Moderate	Medium-term
Unimproved Acid Grassland	Low (Local Medium)	Medium	Moderate	Medium-term
Semi-improved Acid Grassland	Low (Local Low)	Low	Slight	Short-term
Poor Semi-improved Grassland	Negligible	Low	Slight	Short-term
Improved Grassland	Negligible	Medium	Slight	Short-term
Marsh / Marshy Grassland	Low (Local Medium)	Negligible	Negligible	Medium-term
Dry Dwarf Shrub Heath	Low (Local Medium) / Medium	High	Moderate	Medium-term
Wet Modified Bog	Low (Local Medium)	Medium	Moderate	Medium-term
Standing Water	Low (Local Medium)	Medium	Slight	Short-term

Receptor	Conservation Value	Impact Magnitude	Adverse Effect Significance	Temporary Duration
Running Water (Rivers Spey and Druie)	Exceptional	Low	Moderate	Short-term
Arable	Negligible	Low	Slight	Short-term
Amenity Grassland	Negligible	High	Slight	Short-term
Ephemeral / Short Perennial	Negligible	Medium	Slight	Short-term
Other Habitats	Negligible	Low	Slight	Short-term

Construction Phase Mitigation

- 4.5.17** Table 4.12 illustrates that there is the potential for significant adverse impacts on habitats and plants arising from construction works. Although such impacts are temporary, those with the potential to have long-term temporary effects must be mitigated to minimise their effects as much as possible. The following text provides an outline of the mitigation provided to minimise construction phase impacts and effects.
- 4.5.18** Advice from suitably qualified and experienced ecologists would be sought during the development of the detailed design of the housing development, including the precise micro-siting of roads, road upgrades and the pedestrian / cycleway network, road construction methods, construction and operational drainage design, and the precise siting of other major infrastructure, including temporary compounds and the upgrading of the Dell track for construction use. This would help to ensure that all temporary damage to habitats and plants is minimised. For example, there is an area containing creeping lady's tresses to the north of Coylumbridge which it should be possible to avoid with careful siting of the proposed new road.
- 4.5.19** There are other standard measures which can also be employed to minimise accidental habitat damage associated with disturbance during construction. For example, a strict work area for plant and construction can be maintained at particular times by using robust fencing set out to the minimum work area required. This would be particularly important around the margins of the core development area and for all road and pedestrian / cycleway construction. The River Druie and the woodland areas are particularly important in this regard. On-site supervision throughout construction by an Ecological Clerk of Works representing the Estate rather than contractors would help to ensure that such mitigation is fully implemented and ensure that construction workers operate within these strict limits.
- 4.5.20** Detailed method statements relating to all activities that have the potential to adversely impact sensitive habitats would be developed and agreed, in consultation and agreement with an ecologist and the relevant consultees and this would all be agreed in advance of those particular construction works commencing. Designs detailing specific pollution control measures (e.g. concrete use, dust control etc.) and specifically tailored to the risks identified from the proposed works within each area of the site would also be developed in advance of the construction work commencing.

4.5.21 Other accepted and standard measures to limit additional loss and damage to habitats and plants during construction would also be undertaken and supervised by an ecologist. For example, in important habitat areas vegetated turves would be removed prior to construction and carefully stored for re-use in suitable areas which have been temporarily disturbed during construction works. Best practice measures to encourage rapid stabilisation and re-vegetation of exposed soils and sands would be implemented where required (e.g. using an appropriate nurse seed mix to stabilise the earth and with the longer-term aim of restoring e.g. heather cover, through the use of heather brushings and turves). The progress of the recovery of natural vegetation cover in areas of reinstatement would be regularly monitored by a suitably experienced ecologist and reasonable remedial measures implemented to address any problem areas (see also discussion of site ecological monitoring below).

4.5.22 In summary, proposed outline mitigation relevant to the identified potential construction impacts on habitats and flora are as follows:

- Development of suitably detailed method statements, in consultation with SNH and CNPA, detailing best practice procedures to follow for all relevant construction and reinstatement works (e.g. relating to vegetation and soil stripping, storage of soils, protection and storage of vegetated turves, effective vegetation re-instatement, storage of construction materials, tree felling works, pollution control measures etc.);
- During detailed design, site infrastructure would be designed / sited to further reduce impacts on habitats of highest sensitivity as far as possible;
- Final locations of site infrastructure would be micro-sited to minimise impacts on sensitive habitats;
- Demarcation of defined working areas during construction phase to prevent unnecessary entry to and disturbance of sensitive habitats; and
- The implementation of a long-term Ecological Management Plan (EcMP, see below) would help to maintain and improve the ecological and nature conservation quality of the areas of woodland and heathland remaining within the core and wider study area.

Construction Residual Impact Assessment

4.5.23 Taking into account the potential impacts and the outline mitigation which would be detailed further and implemented, the residual impact of temporary construction disturbance on all habitat types and flora would not be significant for any habitat or floral receptor. This residual assessment assumes that there is potential to offset / repair damage to sensitive habitats through the proposed EcMP. This is a reasonable assumption to make given the commitment to mitigation that is already shown within this outline planning application, even although the full details of the EcMP would not be developed until detailed design is undertaken. The residual impact magnitude and residual significance for each relevant habitat (and floral) receptor is provided in Table 4.13 below for the complete phase of construction works.

Table 4.13: Likely Residual Adverse Impacts due to Temporary Construction on Habitats and Plants for the Total Construction Phase

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Temporary Duration
Semi-natural Broad-leaved Woodland	Moderate	Low	Slight	Medium-term
Semi-natural Coniferous Woodland	Moderate	Low	Slight	Medium-term
Coniferous Plantation	Moderate	Medium	Slight	Medium-term
Mixed Semi-natural Woodland	Slight	Low	Slight	Medium-term
Dense / Continuous Scrub	Slight	Low	Slight	Short-term
Scattered Scrub	Negligible	Negligible	Negligible	Short-term
Parkland / Scattered Trees	Moderate	Low	Slight	Medium-term
Unimproved Acid Grassland	Moderate	Low	Slight	Medium-term
Semi-improved Acid Grassland	Slight	Negligible	Negligible	Short-term
Poor Semi-improved Grassland	Slight	Negligible	Negligible	Short-term
Improved Grassland	Slight	Medium	Slight	Short-term
Marsh / Marshy Grassland	Negligible	Negligible	Negligible	Medium-term
Dry Dwarf Shrub Heath	Moderate	Low	Slight	Medium-term
Wet Modified Bog	Moderate	Negligible	Negligible	Medium-term
Standing Water	Slight	Low	Slight	Short-term
Running Water (Rivers Spey and Druie)	Moderate	Negligible	Negligible	Short-term
Arable	Slight	Low	Slight	Short-term
Amenity Grassland	Slight	Medium	Slight	Short-term

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Temporary Duration
Ephemeral / Short Perennial	Slight	Low	Slight	Short-term
Other Habitats	Slight	Low	Slight	Short-term

Operational Impacts

Direct Habitat Loss

4.5.24 The likely significance of permanent impacts from habitat loss due to the built ‘footprint’ of the proposed development is considered in this section (e.g. from construction of roads and paths, buildings, playing pitches etc.). Such impacts could also include landscaping and garden design, where the habitat lost is of a greater value than that being created. In addition, during the operational phase there is the potential for temporary impacts from maintenance activities or emergency works resulting in disturbance to remaining sensitive habitats.

4.5.25 Impact magnitude takes into account the relative size of the habitat affected in relation to the extent of that habitat in both the core and wider survey areas, and also how the area and spatial extent of the loss predicted could adversely influence the longer-term ecological structure and function of the habitat. The impact magnitude and significance of habitat loss before mitigation on all of these receptors is summarised below in Table 4.14.

Table 4.14: Potential Unmitigated Adverse Impacts due to Permanent Operation on Habitats and Plants

Receptor	Conservation Value	Impact Magnitude	Adverse Effect Significance (up to Permanent)	Development Period
Semi-natural Broad-leaved Woodland	Low (Local High)	Low	Slight	A
		Negligible	Negligible	B
		Medium	Moderate	C
		Negligible	Negligible	D
		Medium	Moderate	Total
Semi-natural Coniferous Woodland	Low (Local High)	Low	Slight	A
		Neutral	Neutral	B
		Neutral	Neutral	C
		Neutral	Neutral	D
		Low	Slight	Total
Coniferous Plantation	Low (Local Low)	Low	Slight	A
		Neutral	Neutral	B

Receptor	Conservation Value	Impact Magnitude	Adverse Effect Significance (up to Permanent)	Development Period
		Medium	Slight	C
		High	Moderate	D
		High	Moderate	Total
Mixed Semi-natural Woodland	Low (Local High)	Low	Slight	A
		Neutral	Neutral	B
		Low	Slight	C
		Neutral	Neutral	D
		Low	Slight	Total
Dense / Continuous Scrub	Medium	Negligible	Negligible	A
		Neutral	Neutral	B
		Negligible	Negligible	C
		Negligible	Neutral	D
		Low	Slight	Total
Scattered Scrub	Low (Local Low)	Neutral	Neutral	A
		Neutral	Neutral	B
		Negligible	Negligible	C
		Negligible	Negligible	D
		Negligible	Negligible	Total
Parkland / Scattered Trees	Low (Local Medium)	Negligible	Negligible	A
		Low	Slight	B
		Low	Slight	C
		Low	Slight	D
		Medium	Moderate	Total
Unimproved Acid Grassland	Low (Local Medium)	Negligible	Negligible	A
		Low	Slight	B
		Neutral	Neutral	C
		Medium	Slight	D
		Medium	Slight	Total
Semi-improved Acid Grassland	Low (Local Low)	Low	Slight	A
		Neutral	Neutral	B
		Neutral	Neutral	C
		Neutral	Neutral	D
		Low	Slight	Total
Poor Semi-	Negligible	Negligible	Negligible	A

Receptor	Conservation Value	Impact Magnitude	Adverse Effect Significance (up to Permanent)	Development Period
Improved Grassland		Neutral	Neutral	B
		Neutral	Neutral	C
		Neutral	Neutral	D
		Negligible	Negligible	Total
Improved Grassland	Negligible	Negligible	Negligible	A
		Neutral	Neutral	B
		Low	Slight	C
		Neutral	Neutral	D
		Low	Slight	Total
Marsh / Marshy Grassland	Low (Local Medium)	Neutral	Neutral	A
		Neutral	Neutral	B
		Neutral	Neutral	C
		Neutral	Neutral	D
		Neutral	Neutral	Total
Dry Dwarf Shrub Heath	Low (Local Medium) / Medium	Medium	Moderate	A
		High	Moderate	B
		High	Moderate	C
		High	Moderate	D
		Near Total	Major	Total
Wet Modified Bog	Low (Local Medium)	Neutral	Neutral	A
		Neutral	Neutral	B
		Neutral	Neutral	C
		Total	Moderate	D
		Total	Moderate	Total
Standing Water	Low (Local Medium)	Neutral	Neutral	A
		Neutral	Neutral	B
		Neutral	Neutral	C
		Neutral	Neutral	D
		Neutral	Neutral	Total
Running Water (Rivers Spey and Druie)	Exceptional	Neutral	Neutral	A
		Neutral	Neutral	B
		Neutral	Neutral	C
		Neutral	Neutral	D
		Neutral	Neutral	Total

Receptor	Conservation Value	Impact Magnitude	Adverse Effect Significance (up to Permanent)	Development Period
Arable	Negligible	Negligible	Negligible	A
		Neutral	Neutral	B
		Low	Slight	C
		Low	Slight	D
		Low	Slight	Total
Amenity Grassland	Negligible	Neutral	Neutral	A
		High	Slight	B
		Neutral	Neutral	C
		Neutral	Neutral	D
		High	Slight	Total
Ephemeral / Short Perennial	Negligible	Negligible	Negligible	A
		Neutral	Neutral	B
		Negligible	Negligible	C
		Neutral	Neutral	D
		Negligible	Negligible	Total
Other Habitats	Negligible	Negligible	Negligible	A
		Negligible	Negligible	B
		Negligible	Negligible	C
		Negligible	Negligible	D
		Low	Slight	Total

Indirect Habitat Loss / Fragmentation / Degradation

4.5.26 During the operational phases of the development there is the potential for further loss and degradation of sensitive habitats as a result of changes to land use and use frequency (indirect habitat loss). For example, the use of the wider area, away from paths using desire lines for e.g. dog walking and general recreation / mountain-biking could causing damage, if not mitigated. In addition, there are dangers to local habitats within and adjacent to the development from e.g. the escape and aggressive spread of non-native plants from residents' gardens and fly-tipping. An additional concern is vandalism or accidental habitat loss from e.g. heathland fires in remaining areas of heath and woodland. Particularly sensitive to these kinds of impacts are the woodlands adjacent to the development and woodland edges adjacent to the River Spey, and remaining dry heath and acid grasslands.

4.5.27 During operational on-going maintenance and emergency works from time to time, there may be temporary damage to the vegetation, thereby resulting in temporary or permanent further habitat loss or degradation. Maintenance to roads and paths and utilities routes in particular and

associated drainage has the potential to cause or to exacerbate impacts on sensitive habitats such as woodland edges and remaining heathland and acid grassland.

4.5.28 The implementation of a development such as this can cause indirect habitat loss through habitat fragmentation which can limit the ability of plants to spread and colonise new and existing habitats. This is often caused by the clearance of linking habitats to provide "stepping stones". It is important to take into consideration the existing degree of fragmentation and the wider study area is already quite fragmented due to agriculture, however, there is some recent coniferous plantation linkage and linkage along the River Spey, particularly from north to south. The completed loss of the coniferous plantations (although most are fairly young) would cause fragmentation. The construction of the new access road from the Inverdrue and the new Coylumbridge road also has the potential to cause a degree of habitat fragmentation of broad-leaved woodland, mixed wet woodland and coniferous woodland, however, the roads proposed are fairly narrow. If the proposed bridges across the River Drue were not designed carefully they could also cause some fragmentation of habitat along the river. Table 4.15 summarises the impacts discussed above and their likely level of significance and duration, before considering mitigation.

4.5.29 The proposed development area can currently be considered rural. An introduction of housing would bring with it a significant increase in combustion vehicles. There is expected to be a slight rise in air-pollution from the increase in personal cars, buses, chimneys etc. This has been assessed in the air quality assessment but is not likely to be significant on remaining habitats within the surrounding area. This is not considered further in this assessment.

Table 4.15: Summary of Potential Adverse Operational Impacts on Habitats and Plants Due to Indirect Habitat Loss, Fragmentation and / or Degradation

Impact Type	Overall Conservation Value	Overall Impact Magnitude	Adverse Effect Significance & (up to Permanent)	Development Period
Indirect Habitat Loss	Medium	Low	Slight	A
		Medium	Moderate	B
		Medium	Moderate	C
		Medium	Moderate	D
		High	Moderate	Total
Terrestrial Habitat Fragmentation	Low (Local High)	Low	Slight	A
		Low	Slight	B
		High	Moderate	C
		Medium	Moderate	D
		High	Moderate	Total
Aquatic Habitat Fragmentation	Exceptional	Negligible	Negligible	A
		Neutral	Neutral	B
		Low	Slight	C
		Neutral	Neutral	D
		Low	Moderate	Total

Operational Mitigation

Direct Habitat Loss

- 4.5.30** The direct loss of habitat (permanent impact) due to the development of An Camas Mòr and the related infrastructure) would be significant if unmitigated for certain habitat types (see Table 4.14). However, the footprint of the development (Figure 4.7) does not necessarily mean the destruction of all habitat features within it. There would be much that can be mitigated within the footprint to minimise the loss of key habitats. Where mitigation to minimise impacts on habitats and flora cannot decrease effects to a non-significant level (i.e. to Slight or below), offsetting mitigation in the surrounding area has been agreed in outline with the Cairngorms National Park Authority, Scottish Natural Heritage and Forestry Commission Scotland. All these aspects of habitat and plant impacts and mitigation are outlined below in this section.
- 4.5.31** The loss of dry dwarf shrub heath and acid grassland on the site is prior to mitigation considered to be significant within the wider study area, however, it is of low significance on a regional scale. It is significant within the assessment largely because this type of lower lying heathland is not common within the surrounding area. It should be borne in mind that this area has already been planted and is naturally regenerating with trees at present so its value would decrease regardless of the proposed development commencing. The total area of unmitigated dry heath loss is still relatively small overall at c. 25 ha and an additional 9 ha of mosaic habitat. Offsetting mitigation, along with some retention within the site is proposed.
- 4.5.32** The main loss of woodland is of conifer plantation rather than semi-natural woodland, which is currently managed commercially and although part of it is within the AWI it has been ploughed and is of a lower ecological value. Loss of other woodland types has been minimised and would be further reduced by careful micro-siting and detailed route design. In addition, much of the recent conifer planting was created in anticipation of this development and in time would help to provide wildlife corridors, as well as landscaping. It is also important to note that it has been agreed in principle that the majority of individual mature trees (e.g. scattered trees including granny pines within the core development area) would be retained and a mechanism used to prevent future felling. This may be through Tree Preservation Orders (TPOs) or by remaining within the Estates ownership. At this outline stage, the precise mechanism has still to be determined but a clear principle has been put in place.
- 4.5.33** While the footprint of the development has been assessed as destroying all habitats within it for the potential impacts (Table 4.14), there would be up to approximately 30% of the Local Plan area which would not be developed (Table 5.1, Chapter 5). This undeveloped area does include the woodland to the south east of the Local Plan area which is approximately 18% of the area and the edge plantation woodland. It is important to note that the woodland to the south east of the Local Plan area was intentionally removed from the developable area on nature conservation grounds because it is of much greater value than the plantation areas. The small area of bog (or mire), the planted forestry edges, the kettle hole areas to the north and the mixed heath and dry dwarf shrub areas near the B970 and around the south west corner of the Local Plan area would not be developed. There would also be other open areas kept within the development which would not be formally landscaped and be left as they are, with appropriate management. The lower density housing proposed around the edges of the site would also clearly be within a plantation / woodland setting which would allow appropriate habitat

management to increase the current value of these habitats. In addition, it is also intended that parts of the gardens, particularly in the lower density housing, would not be disturbed or developed but left as they are with the ground vegetation in-tacked and safeguarded. This would include areas of heathland (dry dwarf shrub heath) and acid grassland (unimproved particularly) being left within the bottom of gardens. While at this outline stage all the precise mechanisms to ensure this have not been finalised, the principles are set out and committed to. Sensitive areas of habitat would also be safeguarded, where possible, by careful micro-siting to minimise impacts on habitats and flora, as the detailed design of the development periods is developed further.

- 4.5.34** An outline Nature Conservation Strategy (NCS) has been formulated for the proposed development. This outline document sets out the key principles related to ecology and nature conservation. It also includes a commitment for three areas of land outside of the wider development area which would receive particular nature conservation management to enhance them. The location of these three areas, their overall extent and an outline of the mitigation they would provide is given in the NCS which is contained in the Supporting Documents of the ES. Three areas of land for offsetting mitigation are provided and while the precise detail of these have still to be determined the principles are as follows:

- Creag a' Chalamain – up to approximately 76 ha which would be used for montane woodland regeneration;
- Area near the River Spey – up to approximately 3.5 ha which would be used for wet woodland / wetland habitat creation; and
- Ord Ban – up to approximately 20 ha which would be managed for heathland and moorland retention.

While it is recognised that management of these areas for nature conservation does not provide direct offsetting for the net habitat loss which would occur at An Camas Mòr, the areas have been chosen because they have the combination of being as close to the development area as possible and they have the potential to create habitats that are of an equivalent or greater nature conservation value to that being lost. This offsetting land is not intended to be a complete replacement in area for the development rather to provide valuable nature conservation offsetting and enhancement for the potentially significant habitat and plant loss impacts on the site.

- 4.5.35** Also borne out of the NCS, an ecological management plan (EcMP) would focus on the area within and surrounding the proposed An Camas Mòr development. This EcMP would be developed and agreed with SNH and the CNPA prior to the development commencing. The EcMP would involve and encourage the participation of the new local residents, while certain provisions would be written into the title deeds of the property to ensure the mitigation infrastructure is protected. Local habitats, both existing and new would be a main concern for protection and enhancement. For example, a proportion of the woodland was planted specifically in advance of this development and where this would be retained it can be managed for joint roles of landscape and nature conservation. A brief outline of the kind of control and management which is intended within the area is provided within the NCS (Supporting Documents). As the shelter belts grow and are thinned, the natural generation of ground flora would be encouraged to dry heath, as is found locally. The EcMP objectives would also be implemented through the detailed design of the development to protect important ecological and geological features. For example, several kettle holes are present to the north of the core development area and these would be retained. They currently support localised habitats such

as marshy grassland and dry heath and these would be managed and safeguarded appropriately.

Indirect Habitat Loss / Fragmentation / Degradation

- 4.5.36** Outwith the mitigated direct habitat loss associated with the built structures of the development, there is also the potential for indirect damage to occur on those habitats remaining, particularly those immediately adjacent to the development. Indirect impacts such as dumping of garden waste and the spread of invasive plant species would be controlled through community involvement and formal Estate management and these measures would be all be included and detailed within the EcMP. The movement of pedestrians and cyclists, while being encouraged around the area, would require careful detailed design and management to encourage use in a formal and sustainable way which would limit loss and disturbance to retained habitats and plants. For example the use of localised native blackthorn planting and appropriate fencing may be necessary to prevent access to more sensitive habitats, particularly close to the River Spey. This would require further detailed design work, although an outline of the proposed paths is included within the Outline Application (see Figure 4.7 for the locations of proposed paths). Generally, a community group focussing on the issues of the living in a beautiful and sensitive environment would be critical and would help to instil a sense of pride and stewardship of the surrounding area, as well as educate residents how to avoid the more potentially destructive practices that can often be practiced in urban areas such as garden creep and the building of paths out of gardens.
- 4.5.37** On going maintenance and emergency works, which, if completed carelessly could cause unnecessary damage to habitats and plants, can and would be controlled. This has been partly dealt with in the outline design by the routeing of the main utilities into the site using land immediately adjacent to the access route. Further mechanisms would be developed through site management to control this during the operation of the development. All access would be confined to areas previously used during construction activity, ensuring that further habitat loss or temporary damage to retained habitats does not occur. Other measures such as method statements in advance of maintenance or emergency works being needed would be used and procedures identified in advance for the minimisation of construction impacts would also be applied to minimise the potential damage of habitats during maintenance operations.
- 4.5.38** Potential fragmentation issues are discussed above for the operational aspects of the development. While there is the potential for fragmentation of habitats the tree planting which has already occurred and would remain to the west of the site and to a lesser extent to the east of the site, would help to maintain and increase linkages to the north and south of the development. With appropriate nature conservation led management ground cover habitats would develop in these areas which would assist in linking habitats around the development. The River Spey to the west will also continue to provide an important habitat link between the north and south of the site. The River Druie corridor to the south and the plantations and other habitats to the north will also continue to link the east and west areas within the wider area. The central area of the development has been quite isolated, however, the retention of trees and planting of further native tree species would help to provide a degree of habitat linkage within the site. Given the limited width of the main access road, the limited upgrading of the B970, the careful location of the Coylumbridge road and the limited size of the cycleways / footpaths it is not likely that these would cause significant habitat and floral fragmentation on their own. The bridges across the River Druie have also been designed in outline to be narrow and this would limit any habitats fragmentation along the riverine corridor.

Operational Residual Impact Assessment

Direct Habitat Loss

- 4.5.39** Potentially significant impacts from direct habitat loss of semi-natural broad-leaved woodland, coniferous plantation, parkland / scattered trees, dry dwarf shrub heath and wet modified bog were identified in the potential impact assessment. However, as noted in the mitigation discussion above impacts would be reduced considerably by on site detailed design including careful micrositing, habitat retention within the proposed local plan area and through offsetting habitat management and enhancement in three areas in the wider surroundings. Taking all these outline mitigation measures into account and using MBEC's experience of what is likely to be achievable on the ground as detailed design is developed then there would be a reduction from the theoretical potential impact significances. The residual magnitude and effect significance taking into consideration the successful implementation of the proposed outline mitigation and offsetting would not be of adverse significance for habitats and plants. Table 4.16 summarises the residual impact assessment for habitats and plants.

Table 4.16: Likely Residual Adverse Impacts due to Permanent Operation on Habitats and Plants

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
Semi-natural Broad-leaved Woodland	Slight	Low	Slight	A
	Negligible	Negligible	Negligible	B
	Moderate	Low	Slight	C
	Negligible	Negligible	Negligible	D
	Moderate	Low	Slight	Total
Semi-natural Coniferous Woodland	Slight	Low	Slight	A
	Neutral	Neutral	Neutral	B
	Neutral	Neutral	Neutral	C
	Neutral	Neutral	Neutral	D
	Slight	Low	Slight	Total
Coniferous Plantation	Slight	Low	Slight	A
	Neutral	Neutral	Neutral	B
	Slight	Medium	Slight	C
	Moderate	Low	Slight	D
	Moderate	Medium	Slight	Total
Mixed Semi-natural Woodland	Slight	Low	Slight	A
	Neutral	Neutral	Neutral	B

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
	Slight	Low	Slight	C
	Neutral	Neutral	Neutral	D
	Slight	Low	Slight	Total
Dense / Continuous Scrub	Negligible	Negligible	Negligible	A
	Neutral	Neutral	Neutral	B
	Negligible	Negligible	Negligible	C
	Neutral	Negligible	Neutral	D
	Slight	Low	Slight	Total
Scattered Scrub	Neutral	Neutral	Neutral	A
	Neutral	Neutral	Neutral	B
	Negligible	Negligible	Negligible	C
	Negligible	Negligible	Negligible	D
	Negligible	Negligible	Negligible	Total
Parkland / Scattered Trees	Negligible	Negligible	Negligible	A
	Slight	Negligible	Negligible	B
	Slight	Negligible	Negligible	C
	Slight	Negligible	Negligible	D
	Moderate	Low	Slight	Total
Unimproved Acid Grassland	Negligible	Negligible	Negligible	A
	Slight	Low	Slight	B
	Neutral	Neutral	Neutral	C
	Slight	Medium	Slight	D
	Slight	Medium	Slight	Total
Semi-improved Acid Grassland	Slight	Low	Slight	A
	Neutral	Neutral	Neutral	B
	Neutral	Neutral	Neutral	C
	Neutral	Neutral	Neutral	D
	Slight	Low	Slight	Total
Poor Semi-improved Grassland	Negligible	Negligible	Negligible	A
	Neutral	Neutral	Neutral	B
	Neutral	Neutral	Neutral	C
	Neutral	Neutral	Neutral	D
	Negligible	Negligible	Negligible	Total
Improved	Negligible	Negligible	Negligible	A

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
Grassland	Neutral	Neutral	Neutral	B
	Slight	Low	Slight	C
	Neutral	Neutral	Neutral	D
	Slight	Low	Slight	Total
Marsh / Marshy Grassland	Neutral	Neutral	Neutral	A
	Neutral	Neutral	Neutral	B
	Neutral	Neutral	Neutral	C
	Neutral	Neutral	Neutral	D
	Neutral	Neutral	Neutral	Total
Dry Dwarf Shrub Heath	Moderate	Negligible	Negligible	A
	Moderate	Low	Slight	B
	Moderate	Low	Slight	C
	Moderate	Low	Slight	D
	Major	Low	Slight	Total
Wet Modified Bog	Neutral	Neutral	Neutral	A
	Neutral	Neutral	Neutral	B
	Neutral	Neutral	Neutral	C
	Moderate	Neutral	Neutral	D
	Moderate	Neutral	Neutral	Total
Standing Water	Neutral	Neutral	Neutral	A
	Neutral	Neutral	Neutral	B
	Neutral	Neutral	Neutral	C
	Neutral	Neutral	Neutral	D
	Neutral	Neutral	Neutral	Total
Running Water (Rivers Spey and Drurie)	Neutral	Neutral	Neutral	A
	Neutral	Neutral	Neutral	B
	Neutral	Neutral	Neutral	C
	Neutral	Neutral	Neutral	D
	Neutral	Neutral	Neutral	Total
Arable	Negligible	Negligible	Negligible	A
	Neutral	Neutral	Neutral	B
	Slight	Low	Slight	C
	Slight	Low	Slight	D
	Slight	Low	Slight	Total

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
Amenity Grassland	Neutral	Neutral	Neutral	A
	Slight	High	Slight	B
	Neutral	Neutral	Neutral	C
	Neutral	Neutral	Neutral	D
	Slight	High	Slight	Total
Ephemeral / Short Perennial	Negligible	Negligible	Negligible	A
	Neutral	Neutral	Neutral	B
	Negligible	Negligible	Negligible	C
	Neutral	Neutral	Neutral	D
	Negligible	Negligible	Negligible	Total
Other Habitats	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Negligible	Negligible	Negligible	C
	Negligible	Negligible	Negligible	D
	Slight	Low	Slight	Total

Indirect Habitat Loss / Fragmentation / Degradation

4.5.40 Indirect habitat loss during the operational phase could result in further loss and degradation of sensitive habitats as a result of peoples’ actions in the area. However, with the development of detailed mitigation and management there is no reason why the majority of such additional impacts cannot be avoided. Similarly, with on-going maintenance and similar works, there is no reason why proper planning and management cannot be implemented to ensure minimal impacts and resulting effects. Given the outline mitigation that is already fully included to the western edge of the site to maintain and enhance north-south habitat linkages, the existing riverine corridor, the retention of trees within the development and the maintenance of the links east-west to the north and south of the development the impacts and effects from fragmentation on habitats and plants would not be significant. Table 4.17 summarises the overall residual adverse effects on habitats and plants as a result of indirect habitat loss, fragmentation and / or habitat degradation. Such adverse residual impacts can result in effects which are from short-term temporary through to permanent.

Table 4.17: Summary of Likely Residual Adverse Operational Impacts on Habitats and Plants Due to Indirect Habitat Loss, Fragmentation and / or Degradation

Impact Type	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance & (up to permanent)	Development Period
Indirect Habitat Loss	Slight	Negligible	Negligible	A
	Moderate	Negligible	Negligible	B
	Moderate	Negligible	Negligible	C
	Moderate	Low	Slight	D
	Moderate	Low	Slight	Total
Terrestrial Habitat Fragmentation	Slight	Negligible	Negligible	A
	Slight	Negligible	Negligible	B
	Moderate	Low	Slight	C
	Moderate	Low	Slight	D
	Moderate	Low	Slight	Total
Aquatic Habitat Fragmentation	Negligible	Negligible	Negligible	A
	Neutral	Neutral	Neutral	B
	Slight	Negligible	Negligible	C
	Neutral	Neutral	Neutral	D
	Moderate	Negligible	Negligible	Total

Impact Assessment for Aquatic Fauna

4.5.41 This section of the impact assessment for ecology and nature conservation includes fish, fresh water pearl mussel and freshwater invertebrates since similar impacts would apply to all of these. Otter and water vole are included within terrestrial fauna, as are terrestrially based invertebrates.

Construction Phase Impacts

4.5.42 One of the most important potential adverse impacts from the proposed construction works is pollution from the mobilisation of fine sediments into the water associated with earthworks. Given the high permeability of the ground within the core development area, this is only really of concern related to works for the path / cycleway and the access road in the immediate vicinity of the River Drue. It is also possible that extreme winter flooding could affect the construction of the road and cycleway / footpath across the Dell Farm fields. However, given the mobilisation of sediments and the dilution of pollution that occurs within the Spey catchment when this occurs it is highly unlikely that any temporary construction effects could be of any significance and therefore this is not covered further in the assessment.

4.5.43 A substantial amount of design mitigation has already been included within the outline design for the two new bridges across the River Druie and this is included within the potential impact assessment because it is clear at this stage that it would be implemented. To construct the two new bridges across the River Druie it is proposed to use one set of foundations to be built together and then to build the bridge decks separately. The River Druie would have no piers within the watercourse or on the immediate banks: they would be set-back, leaving both immediate banks undisturbed, to avoid the need for any work within the river channel. This would also involve crossing the intake for the Fishery and the safest way to complete this would be to build a new intake channel, complete groundworks and foundations and then divert the intake into the new channel. This would help to reduce the risk of pollution to both the Fishery, and the River Druie from the return flows. The parts of this process which could involve the release of significant pollution into the River Druie relate to the earthworks and the construction of foundations. As well as the release of silt with water, a key concern with bridge foundations is always the release of liquid concrete into watercourses. Once this process is completed there is unlikely to be any release of pollution because while works would still be occurring over the river, if pre-cast concrete or other materials are used the risk of pollution would be much less, given good construction practices.

4.5.44 Such water based pollution may adversely affect fish and invertebrates, particularly salmonids and freshwater pearl mussel populations. Assessing the risks of pollution in the aquatic environment is particularly important due to the potential for pollutants to be dispersed downstream, and due to the particular sensitivity of aquatic species. Of primary potential concern would be run-off from construction areas, storage compounds, concrete batching, and engineering works associated with the watercourse crossings to cause in-stream pollution through the generation of sediments and other particulate matter and / or accidental chemical pollution (e.g. from concrete, oil, fuels).

4.5.45 Fish and freshwater pearl mussel are particularly vulnerable to changes in oxygen levels, pH and suspended fine sediments. Such pollution can arise due to disturbed soil on the banksides and small tributaries being washed into the river and down the sub-catchment.

4.5.46 The aquatic species of greatest concern, in relation to potential adverse impacts from construction of the development, is Atlantic salmon (although potential impacts on brown trout, eel, and lamprey are also possible and have been considered in the assessment of effect significance). Construction phase impacts could affect various stages in the salmon life-cycle by causing, for example, direct injury or mortality of eggs, juveniles and adults (i.e. through pollution, although physical injury is also possible), changes in invertebrate prey abundance, avoidance of important habitats, hindering or prevention of free movement to and from spawning habitat, and physical damage of in stream / riparian habitat. Freshwater pearl mussel are viewed as slightly less likely to be affected than salmon simply because surveying has shown that they are not present in the immediate vicinity downstream, whereas salmon are.

4.5.47 Increased levels of suspended sediments can reduce dissolved oxygen levels, resulting in the suffocation of fish or damage to gills through abrasion. As there is also spawning habitat present there is the potential for fine sediment to settle and inhibit oxygen transfer for eggs present within gravel beds downstream of the works. There is also the possibility of disturbance to fish in the vicinity of construction activities, for example, through the use of lights and vibration from construction activity.

4.5.48 Another form of potential aquatic pollution is from man-made chemicals (including hydrocarbons and concrete) used on-site. For example, excess grease and oil may wash off an excavator

operating close to a watercourse. Other examples may include leaking fuel drums, cleaning / dumping liquid concrete from plant, loss from stored chemicals, construction materials or spoil. These could result in direct pollution into the aquatic environment or indirectly through seepage from surrounding terrestrial habitats.

4.5.49 Construction disturbance to aquatic fauna (habitat and flora risks have been assessed in the previous section) has been assessed on a worst case scenario, assuming the least favourable timing of the works and no good construction practice (potential impacts). The potential significance of construction related impacts, without considering the successful implementation of specific and standard mitigation measures, is summarised in Table 4.18 below. However, by adopting best practice and all the mitigation measures outlined in the following section such risks would be markedly reduced and minimised to exceptional weather conditions, which would be at a time when the catchment is much less sensitive.

Table 4.18: Potential Unmitigated Adverse Impacts due to Temporary Construction on Aquatic Fauna for the Total Construction Phase

Receptor	Conservation Value	Impact Magnitude	Adverse Effect Significance	Temporary Duration
Aquatic Invertebrates	Low (Local Low)	Medium	Moderate	Short-term
Freshwater Pearl Mussel	Exceptional	Low	Slight	Short-term
Fish Populations	Exceptional	Medium	Major	Short-term

Construction Phase Mitigation

4.5.50 The overall design of the development has been optimised to ensure there is a large separation of housing, construction compounds / storage areas and other elements of construction and development from watercourses. The siting of the two bridges has also been carefully considered. As noted in the previous text, the risk of significant pollution events occurring during construction of the two bridges has been reduced through the approach to the design, however, there is still a significant potential risk that must be mitigated to the maximum extent possible.

4.5.51 While the outline design of the development has greatly reduced the potential risk of adverse impacts on surface waters and associated aquatic ecological receptors, it is critical that all construction activities follow best practice procedures to minimise the risk of significant pollution events occurring. A Drainage Design and Pollution Management Plan would be developed in advance of all construction works commencing. This plan would detail all specific mitigation measures applicable to the control of siltation and chemical pollution risks, and precisely how they would be applied. The contractor would be required to demonstrate practical understanding of the range of SEPA PPG's within Construction Method Statements, to be developed in consultation with SEPA at least one month prior to commencement of any construction, and a detailed drainage plan would be developed prior to the commencement of construction.

4.5.52 The Construction Method Statements, to be agreed with SEPA and SNH in advance of construction works, would include methods relating to the following:

- Water quality – sedimentation control;
- Tracks and drainage management;
- Water crossings;
- Management of any peat and soil storage areas;
- Dewatering;
- Concrete batching; and
- Water Quality – Oil, Fuel and Chemical Contamination.

4.5.53 The timing of all bridge works to avoid the most sensitive periods of the year (i.e. salmonid spawning and alvin production) would be considered in consultation with SEPA and the Spey District Salmon Fisheries Board (SDSFB). Detailed design, drainage and pollution control measures and a programme of works for the construction of the proposed bridge crossings of the River Drueie would also be agreed in consultation with SEPA and SDSFB in advance of any works commencing. Works would be timed to minimise potential impacts to salmon.

4.5.54 The detailed Drainage Design and Pollution Management Plan and associated construction method statements would be developed and agreed in consultation with SNH and SEPA. It is also agreed that there would be on-site supervision of all works by a suitably qualified and experienced Ecological Clerk of Works to ensure that all aspects of the Drainage Design and Pollution Management Plan and all associated method statements are correctly implemented. This ecological supervision is considered critical to the successful implementation of the proposed mitigation measures and the avoidance of all significant impacts on sensitive aquatic habitats.

4.5.55 A range of detailed measures would also be incorporated into the detailed design of the River Drueie crossings to prevent erosion, and scouring of the watercourse bed, and any possible scouring of the banks. These measures would be subject to discussions with SEPA and consenting under the Controlled Activities (Scotland) Regulations 2005. In addition, the Drueie crossings would be designed following current best practice to avoid any impediment to free movement of fish, as well as terrestrial fauna (e.g. otter and water vole).

4.5.56 The proposed monitoring of water quality prior to, during and after construction will be developed further during detailed design.

Construction Residual Impact Assessment

4.5.57 Taking into consideration both the existing outline design proposed and the detailed mitigation measures which would be developed from the outline mitigation, the residual impacts and effects from the construction of the proposed bridges are not likely to be significant. With the implementation of all available best practice detailed design and construction the risk of a pollution incident can never be zero, accounting for weather, however, the risks can be reduced

to negligible with the correct on-site ecological supervision. The residual impact assessment for aquatic receptors is summarised in Table 4.19.

Table 4.19: Likely Residual Adverse Impacts due to Construction on Aquatic Fauna for the Total Construction Phase

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Temporary Duration
Aquatic Invertebrates	Moderate	Negligible	Negligible	Short-term
Freshwater Pearl Mussel	Slight	Negligible	Negligible	Short-term
Fish Populations	Major	Negligible	Negligible	Short-term

Operational Impacts

4.5.58 In the previous section construction impacts and effects on sensitive aquatic fauna were addressed specifically for the River Drueie and indirectly for the River Spey downstream. Other watercourses / bodies in the core and wider study area (i.e. the small pond, Kinchyles Burn and Loch Pityoulsh) would not be affected by any construction impacts. Operational impacts and effects on aquatic fauna relate to the permanent drainage of the proposed development and any potential impacts on the River Drueie (and River Spey downstream) from the operation of the two bridges. Again, the fauna of other watercourses / bodies would not be affected by operational impacts. Broadly speaking, there is the potential for aquatic fauna to be affected by the following potential operational impacts from the proposed scheme: habitat fragmentation due to impediments to the free movement of fish to and from spawning areas; pollution from the development including from resident vehicles; and operational maintenance activities.

4.5.59 Fragmentation of habitat has been assessed earlier in this chapter. However, there is also a separate specific potential impact that is possible related to fragmentation of the River Drueie for migratory fish. This could be due to permanent altering of the river course or due to operational disturbance over the river channel of the Drueie. There would be no works within the River Drueie channel so free passage of fish cannot be altered due to this in either direction. The operation of the bridges could theoretically cause disturbance to migratory fish movements due to permanent lighting over the watercourse and / or noise and vibration over the Drueie from traffic. These potential impacts are addressed below.

4.5.60 There is some potential for water quality reductions in the River Spey due to operational pollution from the development which is either purposefully channelled into the River Drueie or the River Spey, or is infiltrated within the development to the ground. Ground infiltration of water carried pollution in a very permeable substrate could result in the groundwater resource being contaminated and given the intimate connection this has with the hyporheos, it is possible that such pollution could enter the River Spey.

4.5.61 There is also the potential for aquatic fauna to be affected by maintenance activities, particularly related to the need for future bridge maintenance and perhaps the addition or changing of

utilities attached to the pedestrian / cycleway bridge. Such works have the potential for temporary construction pollution in the same way as that outlined in the previous section of text.

4.5.62 The unmitigated potential of these impacts has been considered for the aquatic faunal receptors and summarised in Table 4.20, below.

Table 4.20: Potential Unmitigated Adverse Impacts due to Permanent Operation on Aquatic Fauna

Receptor	Conservation Value	Impact Magnitude	Adverse Effect Significance (up to Permanent)	Development Period
Aquatic Invertebrates	Low (Local Low)	Negligible	Negligible	A
		Negligible	Negligible	B
		Low	Slight	C
		Low	Slight	D
		Low	Slight	Total
Freshwater Pearl Mussel	Exceptional	Negligible	Negligible	A
		Negligible	Negligible	B
		Low	Slight	C
		Low	Slight	D
		Low	Moderate	Total
Fish Populations	Exceptional	Negligible	Negligible	A
		Negligible	Negligible	B
		Low	Slight	C
		Low	Slight	D
		Low	Moderate	Total

Operational Mitigation

4.5.63 The potential impact and effects from the restriction of free passage of migratory fish is theoretical because this would not occur because there would be no works within the River Druie channel. However, operational disturbance to fish through permanent lighting and noise and vibration could occur. In this particular situation, any street lighting needed can and would be carefully designed to ensure that downlight is shed only on to the hard surfaces of the bridge decks and it would be ensured that there would be no light shed on to the river channel. During detailed design this would be incorporated into the lighting designs. Noise and vibration could be an issue if there was large amounts of heavy traffic using the bridge 24 hours every day, however, the predicted traffic figures for the development do not predict this. It is often the case that migratory fish move upstream at night and even if they are held below such a structure in a pool during the day they would continue once the noise and vibration becomes less. Given the relatively low amounts of traffic that would be utilising this vehicular bridge and given modern design methods to lower the transfer of noise and vibration through to foundations, this is not seen to be a concern, in this particular situation. It is very unlikely that a pedestrian / cycleway bridge could cause continual noise and vibration to an extent that would affect the free passage

of migratory fish, even if a few fish were disturbed their determination is such that they would move through once the temporary disturbance abates.

4.5.64 Operational pollution from both the development and the related infrastructure could theoretically enter the hyporheos through the porous sands and gravels in the area. However, the design of the Sustainable Urban Drainage System (SUDS) for the site and the roads would help to ensure this does not occur. Where a slightly higher risk of pollution is likely, particularly the car parking areas and the main roads, a closed drainage system would be used initially with a hydrocarbon separator to ensure that hydrocarbon build-up is not allowed to infiltrate directly to ground water. At the detailed design stage the maintenance of such a system would be detailed to ensure they remain effective throughout the life of the development. It is not thought that any additional measures within the SUDS system are necessary for this development, as a level of treatment would occur during initial infiltration to the ground and during periods of heavy rainfall a large dilution would occur to what would be low levels of pollution. There is a slight potential for pollution to occur from a source such as a burst sewage pipe and this could cause significant short-term pollution if it was over or close to the River Druie, in particular. However, the chances of this occurring can be minimised by using double skinned pipes with monitoring, which would be included in the detailed design. It would also be important that regular maintenance works are carried out on such systems and this has the potential to cause pollution. All on-going maintenance operations which could affect groundwater or the Spey catchment are subject to separate strict regulation, however, in addition, the control of the Estate in the running of An Camas Mòr would assist in ensuring such maintenance is on-going during the life of the development. The risk of physical damage and pollution during maintenance operations would be addressed through method statements for all operatives to follow for the various potential types of activity, so that the risk to all sensitive aquatic receptors is reduced.

4.5.65 As previously mentioned, a community focussed EcMP would minimise all damage to aquatic ecology by local residents and would encourage reporting of concerns which would include the surrounding aquatic environment.

Operational Residual Impacts

4.5.66 The residual operational impacts on aquatic fauna, taking into consideration the proposed outline mitigation, are summarised in Table 4.21 below.

Table 4.21: Summary of Likely Residual Adverse Operational Impacts on Aquatic Fauna

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
Aquatic Invertebrates	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Slight	Negligible	Negligible	C
	Slight	Negligible	Negligible	D
	Slight	Negligible	Negligible	Total
Freshwater Pearl Mussel	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
	Slight	Negligible	Negligible	C
	Slight	Negligible	Negligible	D
	Moderate	Negligible	Negligible	Total
Fish Populations	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Slight	Negligible	Negligible	C
	Slight	Negligible	Negligible	D
	Moderate	Negligible	Negligible	Total

Impact Assessment for Terrestrial Fauna

- 4.5.67** The impact assessment for terrestrial fauna includes terrestrial insects and all land based animals including otter and water vole. Avifauna are included in a separate section which follows on from terrestrial fauna. All impacts and effects relevant to terrestrial fauna for both construction and operation of the proposed development are included within this section. Such impacts include loss of habitat used by them and the various forms of disturbance which could affect them.
- 4.5.68** Potential impacts on terrestrial fauna during construction could result in temporary changes to population sizes, temporary changes in habitat use and / or temporary disturbance. During operation (*i.e.* the residency period of the development) there would be areas of habitat lost which could potentially be used by species for foraging and sheltering, as well as commuting. Operational disturbance is also an important consideration in this assessment for the impacts on fauna within the area.
- 4.5.69** Although there are records of wildcat within the wider surrounding area, the surveys did not indicate the presence of wildcat within the core or wider study area. It is therefore considered unlikely that wildcat would be adversely affected by the proposed development and no further assessment of this species is included.

Construction Phase Impacts

- 4.5.70** Disturbance which could potentially adversely affect terrestrial fauna during construction activities can take a variety of forms, including:
 - Noise and vibration: disturbance from tree felling works, operating plant, generators, and people accessing and exiting the construction sites;
 - Visual disturbance due to the presence of people and unnatural elements in an area including lighting, either at a small or large distance from the receptor; and

- Olfactory disturbance due to the presence of human scent over time and the presence of other smells not normally associated with the area.

- 4.5.71** There is the potential for construction operations that may cause significant light, noise, vibration or visual disturbance to adversely affect breeding and / or feeding mammals in the area. The total construction period, while temporary is still likely to last for up to 20 years. Whilst the working hours are anticipated to vary throughout the year, depending on day length, they are likely to be up to 10 hours per day, 6 days per week. With respect to the susceptibility of the terrestrial animal receptors to disturbance, this varies throughout the year but generally:
 - Bats are nocturnal;
 - Otters and pine marten are mainly nocturnal but also crepuscular; and
 - Red squirrel and other mammals, reptiles and amphibians are generally diurnal, often with peaks of activity in early morning and early evening.
- 4.5.72** Early morning and late evening construction activities can be particularly disturbing to a variety of species, particularly during autumn, winter and early spring when the daylight hours are shorter. The animal receptors considered to be most sensitive to construction disturbance considering the specifics of this area are otter, badger, and red squirrel. All three species are highly mobile and can move away and avoid sources of disturbance. However, there is the potential for active badger setts containing a badger or badgers to be adversely affected, particularly due to vibration from nearby works and they are regarded as being particularly sensitive.
- 4.5.73** Potential sources of disturbance include people, vehicles, generators, lights, vibration, noise and similar forms of nuisance. The increased presence of people (*i.e.* construction workers) in an area can also affect fauna in terms of olfactory disturbance, particularly at shelter sites. The extent of the zone of disturbance would vary depending on the scale of the source of disturbance, the surrounding topography / tree cover and the timing of the works. There is also likely to be variation in species-specific responses to disturbance sources, for example, badgers, otters and red squirrels can tolerate a degree of disturbance and become habituated to it over time.
- 4.5.74** There is also the potential for aquatic pollution during construction to directly and / or indirectly affect several species. Although this has been included elsewhere within the assessment, the potential for aquatic pollution to adversely affect otter, water vole and amphibians is addressed in this section. Existing habitat where water vole and amphibians are known to be regularly present is unlikely to be directly affected by any construction work. However, otter range widely and may directly or indirectly be adversely affected by aquatic pollution. There is the potential for run-off from construction areas, storage compounds, concrete batching and engineering works associated with the bridge crossings on the River Druie to cause in-stream pollution through the generation of sediments and other particulate matter and / or accidental chemical pollution (e.g. from concrete, oil, fuels) and this could directly, or indirectly impact on otter due to direct toxicity, or more likely through adverse effects on prey sources.
- 4.5.75** Taking these potential temporary construction impacts and levels of susceptibility into consideration and the nature conservation value of each of the identified ecological receptors and assuming the least favourable timing for construction works and greatest levels of impact without mitigation, the impact magnitude and potential significance have been determined and are summarised below in Table 4.22.

Table 4.22: Potential Unmitigated Adverse Impacts due to Temporary Construction on Terrestrial Fauna

Receptor	Conservation Value	Impact Magnitude	Effect Significance	Duration
Bats	Low (Local High)	Negligible	Negligible	Medium-term
Otter	Low (Local High)	Low	Slight	Short-term
Water vole	Low (Local High)	Negligible	Negligible	Short-term
Red squirrel	Medium	Medium	Moderate	Short-term
Pine marten	Low (Local High)	Low	Slight	Medium-term
Badger	Low (Local Medium)	Medium	Moderate	Medium-term
Terrestrial Invertebrates	Low (Local High)	Low	Slight	Short-term
Brown hare	Low (Local High)	Low	Slight	Medium-term
Reptiles and Amphibians	Low (Local Low)	Low	Slight	Short-term
Other Common Fauna	Negligible	Low	Slight	Medium-term

Construction Phase Mitigation

4.5.76 The resting sites of any European protected mammals have not been identified in the immediate vicinity of the development. In other words, although bat roosts and otter holts and couches are present in the wider surrounding area, none have been identified that would be directly affected by construction of the An Camas Mòr development. The resting sites of badger (setts) and red squirrel dreys, species protected under domestic legislation, have been recorded within areas of the core and wider study area. It is also likely that the baseline situation for badger and red squirrel, in particular, would change before the construction works would commence. As a consequence, pre-felling / pre-construction surveys would be undertaken in order to provide up to date information on the use of the area by species of conservation concern that can direct specific mitigation measures to avoid disturbance to these species. Should any resting-up sites be found in the vicinity of proposed construction works at that time, specific mitigation proposals, including localised micro-siting to avoid and any licence mitigation necessary for badger would be completed and discussed with SNH in advance of any works. A development licence would be required for any construction works that would disturb the resting site of a European Protected Species or come in the vicinity of a badger sett. While it is quite likely that several small badger setts may need to be licenced because it would not be possible to avoid them all, every effort would be made to avoid the need for any licencing of European Protected Species. On the strength of the baseline, as it is at present, there would be no requirement to apply for an European Protected Species licences but several disturbance licences and several closure licences would be required for badger. In addition, there are numerous small, often single hole badger setts, that surveying has shown are inactive for the vast majority of the time. If these stay inactive between now and pre-construction surveying (ecological monitoring would be continued on a yearly basis), they would be discussed with SNH and agreed on individually, what the best course of action would be. In many cases it would be possible to protect these

small setts but there is a need for careful judgement about precisely what is best for any badgers using them e.g. if they are close to a road etc. There is a legal requirement for path construction and felling activities to be kept at a distance of at least 30 m from badger setts (without a licence). Detailed ecological advice would be required on this as the detailed design is developed. For sett safeguarding fenced working zones would be erected for badger to ensure no plant or activity crosses into a 30 m wide buffer zone.

4.5.77 Method statements (as part of the EcMP) would be created and agreed upon to minimise the risk of disturbance to all relevant fauna, prior to the construction of the development. Such method statements would all follow current best ecological practice. Such construction elements as artificial lighting and severe vibration (e.g. any piling required) should be avoided, if possible, beside / on watercourses and woodlands. If lighting is strictly necessary for construction, the use of appropriately shielded lighting, would help to mitigate the impact of any construction disturbance. Fencing would be used to mark working areas to avoid plant and people trafficking outside these areas. Ramps or an alternative exit route (preferably earth) would be placed in any steep-sided holes, allowing animals to exit, should they enter. This impact would also be mitigated through the timing of particularly disturbing works. The on-site Ecological Clerk of Works would be able to advise on the need for and supervise all such mitigation.

4.5.78 Red squirrel dreys are present within areas which would be developed, particularly related to the building of the new Coylumbridge road and the building of the access roads for the core development site. While it is recognised that licenses for red squirrel dreys cannot be issued and that they cannot be disturbed. There is ecological surveying and mitigation which can be put in place to ensure that dreys are inactive and that squirrels and their young are not disturbed. A detailed ecological method statement would be put in place after pre-construction surveys and before any felling is undertaken. The development team are confident that this can be undertaken in a legal and careful manner. The method statement would rely on the timing of works in particular areas with detailed ecological checking immediately before felling and the ability to adapt the felling of areas on a day to day basis related to particular dreys and ensuring they are old and no longer in use. There are many mitigation options which would safeguard squirrels and their active dreys, for example, if necessary, in particular locations remote cameras could be set up to carefully monitor squirrel activity in particular areas / dreys before any felling work is undertaken in a particular area. It is also important to note that the retained woodland planting, particularly around the lower density housing would increase available red squirrel habitat as it matures and additional measures such as the provision of drey boxes would be used (it is also planned to use other boxes and building design to enhance current opportunities for other species including bats and birds).

4.5.79 As mentioned above it is unlikely that any construction activities could affect water vole or amphibians. However, there is a possibility of otter being adversely affected by the works on the River Druie. From experience on a wide range of other construction sites, it is MBEC's view that this can be fully mitigated. The current surveys indicate no holt or couch activity in the vicinity of the proposed bridges, this would be re-checked with pre-construction surveys. The key concern is otter moving through the active construction site and being trapped in e.g. pipes or holes. This is easily mitigated with good construction practice and this would be ensured through method statements which would be agreed with SNH in advance of any works close to the River Druie. Aquatic pollution, directly or indirectly, has the potential to affect otter, again, this can be mitigated using good construction practices and careful ecological supervision and this would all be detailed in advance in a method statement which the contractor would have and agree to implement via contract documentation. This is standard construction practice and with close ecological supervision, there is no reason to expect that it otter cannot be fully protected.

4.5.80 Best practice recommendations would be followed in relation to tree felling. This includes pre-construction checking for bats, pine marten dens and red squirrel dreys with the lowering of branches / limbs with e.g. bat roost potential to allow the potential for any trapped bats to leave the branches unharmed. In the unlikely event that any bats, squirrel dreys etc. are encountered without previous survey knowledge, during the work operations, they would be left *in situ* and not disturbed. SNH and a licensed bat worker / ecologist would then liaise to decide on the best course of action immediately.

4.5.81 Along with mitigation mentioned previously for fauna, additional mitigation would include the following. All tree felling / vegetation clearance would be completed outside of the main bird, bat and red squirrel breeding seasons (i.e. March – August, April – September, and February – September, respectively). The ideal months for felling are October and November. If some felling or vegetation clearance is necessary outwith this period, then it would only be done following specific nest / roost / drey survey by the Ecological Clerk of Works to ensure that potential impacts on breeding fauna are avoided (in compliance with the provisions of the Wildlife and Countryside Act, etc.).

4.5.82 While all other species of fauna have not been mentioned specifically in relation to mitigation, best construction practices and safeguarding would be used, as appropriate for all species. Species such as pine marten, brown hare, deer and fox are likely to avoid areas of construction but best practice such as allowing safe exit from holes and closing off pipes would also benefit these species. The best way to minimise impacts on terrestrial invertebrates is to minimise all vegetation and soil disturbance to that strictly necessary and to store soils and vegetation turves carefully for re-use, where possible. In addition, the pre-construction surveys would also consist of specific insect surveys, particularly for wood ant nests. Although the core development area has been designed to avoid the majority of wood ant nests on the site it is likely that a few would need to be carefully moved for the construction of the main access road. This would all be detailed in a method statement and undertaken in advance of any construction work. Depending on the numbers of common lizard that are present close to construction within the core development area, it may be necessary to complete methodical searches and move them in advance of vegetation clearance. The details of this are uncertain at present because the tree canopy within the core development area may be closed by the time pre-construction surveying and detailed method statements are drawn up and it may be the case that the habitat has already become unsuitable for common lizard.

Construction Phase Residual Impacts

4.5.83 The residual impact assessment for construction phase impacts and effects for all relevant faunal species is summarised below (Table 4.23) taking into account the implementation of the relevant proposed mitigation measures summarised above.

Table 4.23: Summary of Likely Residual Adverse Impacts due to Temporary Construction on Terrestrial Fauna

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Duration
Bats	Negligible	Negligible	Negligible	Medium-term
Otter	Slight	Negligible	Negligible	Short-term
Water vole	Negligible	Negligible	Negligible	Short-term
Red squirrel	Moderate	Low	Slight	Short-term
Pine marten	Slight	Low	Slight	Medium-term
Badger	Moderate	Low	Slight	Medium-term
Terrestrial Invertebrates	Slight	Low	Slight	Short-term
Brown hare	Slight	Negligible	Negligible	Medium-term
Reptiles and Amphibians	Slight	Negligible	Negligible	Short-term
Other Common Fauna	Slight	Negligible	Negligible	Medium-term

Operational Impacts

4.5.84 The potential significance of permanent impacts from habitat loss on fauna, before mitigation, due to the built 'footprint' of the proposed development is considered in this section (e.g. from construction of internal access roads and paths, buildings, landscaped greenspaces etc.). In addition, during operation there is potential for temporary disturbance impacts from maintenance activities or emergency works and from the increased presence of people, resulting in disturbance to areas used by fauna both within the proposed development and surrounding it.

4.5.85 Estimating the areas of vegetation types that would be removed is imprecise at this outline stage because, for example, coniferous plantation areas would be retained, particularly in the lower density housing and areas of heathland would also be retained within gardens and open areas. However, an estimate would be that approximately 35 ha of conifer plantation would need to be felled to accommodate the proposed development and approximately 35 ha of scrub, dwarf-shrub and grassland vegetation cleared. This would permanently change the habitat available for faunal species. Approximately 70 % of the core development area would become housing and areas of hard-standing and the remainder would be open space.

4.5.86 The main permanent habitat loss which would directly affect faunal species is the loss of the mature coniferous plantation and the loss of the small areas of woodland associated with the proposed new roads and road upgrades. The permanent loss of the dwarf shrub heath would have less of an effect on most fauna with the exception of insects, common lizards and occasional use by badgers for foraging and marking territorial boundaries. Pine marten do currently use the core development site mainly for passing through but also to a limited extent for foraging.

4.5.87 Currently the level of bat activity within the core development area is considered to be very low. Bat roosting potential is negligible, while the wider area offers only slightly better opportunities. The bats that are using the edges of the core development site would be likely to continue use in a similar way when the vegetation is cleared from the central areas in stages. Additionally, considering the bats species known to be present (e.g. pipistrelle spp. and Daubenton’s) are not likely to be hindered from free movement alongside watercourses. Much of the woodland present on the site has been classified as having low bat roost potential, the exception being the wet mixed woodland along the River Druie. The tree felling required in this area is minimal.

4.5.88 Overall, the development would proceed in stages (periods) over up to a 20 year period and therefore wildlife, particularly animals would have time to adapt to the changes. Otter, water vole and brown hare are unlikely to experience impacts from permanent habitat loss as the relative amount of habitat directly affected is considered to be negligible for these species.

4.5.89 Impacts to faunal receptors from maintenance operations are broadly similar in type to those described for the assessment of construction related disturbance, although such impacts during operation would all be of a short-term, temporary nature.

4.5.90 The main increase in disturbance for local wildlife would come from the increase in the activities of residents in and around the new development. This would increase over time as the development phases are completed and the number of residents increases, which would give wildlife some time to adapt to an extent. Dogs and cats in particular may cause significant disturbance and in some cases mortality to wildlife. A particular risk in the wider surrounding area is that of increased hybridisation of domesticated cats with wildcats, although it is not thought that wildcat are presence in the vicinity of the proposed development area..

4.5.91 Light, noise and olfactory pollution may also disturb local wildlife, causing a change in behaviour, although most wildlife would adapt to an extent. The new housing would increase the number of people using the site at all times of the day and throughout the year (*i.e.* including cars, new footpaths, lighting, noise, walkers with dogs) which can be disturbing for animals.

4.5.92 It is also important to consider that the presence of humans and associated products / habitats may entice certain species (e.g. foraging badger) into the development, potentially increasing the risk of traffic accidents.

4.5.93 The strip of riparian woodland and scrub adjacent to the River Spey, and the river itself and the area of marshy grassland to the south of Loch Pityoulish and the Loch, are all considered to be of relatively high sensitivity to increased human disturbance. While paths would be routed carefully, it is likely that people would explore these areas to a greater extent than currently occurs.

4.5.94 Access on foot along the immediate banks of the River Spey would not be encouraged. The creation of defined cycle and pedestrian routes (see Figure 4.7) away from these areas that support notable species that are considered to have a greater sensitivity to human disturbance would help in reducing the magnitude of this impact. In the longer-term the proposed habitat creation / enhancement measures elsewhere within Rothiemurchus Estate would also help in offset the adverse impacts of increased disturbance and displacement from the core development area and wider study area.

4.5.95 A particular concern relates to the encouragement of swimming within the River Spey close to the development which could have an adverse disturbance effect on otter. However, the current is quite fast in the area of the development with quite steep banks; there is an existing, if little

used swimming area, on the same bank approximately 100 m downstream and an existing area on the opposite bank further upstream at the old bridge which is slightly more popular.

4.5.96 Potential impact magnitude and significance levels for each of the key faunal receptors due to operational changes is summarised below in Table 4.24.

Table 4.24: Potential Unmitigated Adverse Impacts due to Operation on Terrestrial Fauna

Receptor	Conservation Value	Impact Magnitude	Effect Significance	Development Period
Bats	Low (Local High)	Low	Slight	A
		Negligible	Negligible	B
		Low	Slight	C
		Negligible	Negligible	D
		Low	Slight	Total
Otter	Low (Local High)	Negligible	Negligible	A
		Negligible	Negligible	B
		Negligible	Negligible	C
		Low	Slight	D
		Low	Slight	Total
Water vole	Low (Local High)	Neutral	Neutral	A
		Neutral	Neutral	B
		Neutral	Neutral	C
		Negligible	Negligible	D
		Negligible	Negligible	Total
Red squirrel	Medium	Medium	Moderate	A
		Negligible	Negligible	B
		Low-Medium	Moderate	C
		Low	Slight	D
		Medium	Moderate	Total
Pine marten	Low (Local High)	Negligible	Negligible	A
		Negligible	Negligible	B
		Low	Slight	C
		Low	Slight	D
		Low	Slight	Total
Badger	Low (Local Medium)	Low	Slight	A
		Low	Slight	B
		Low-Medium	Moderate	C
		Medium	Moderate	D

Receptor	Conservation Value	Impact Magnitude	Effect Significance	Development Period
		Medium	Moderate	Total
Terrestrial Invertebrates	Low (Local High)	Negligible	Negligible	A
		Negligible	Negligible	B
		Low	Slight	C
		Low	Slight	D
		Low	Slight	Total
Brown hare	Low (Local High)	Negligible	Negligible	A
		Negligible	Negligible	B
		Low	Slight	C
		Negligible	Negligible	D
		Low	Slight	Total
Reptiles and Amphibians	Low (Local Low)	Negligible	Negligible	A
		Negligible	Negligible	B
		Negligible	Negligible	C
		Negligible	Negligible	D
		Low	Slight	Total
Other Common Fauna	Negligible	Negligible	Negligible	A
		Negligible	Negligible	B
		Negligible	Negligible	C
		Negligible	Negligible	D
		Low	Slight	Total

Operational Mitigation

4.5.97 The phasing of the development would mean that vegetation clearance need not be completed in one operation, as often happens on standard housing sites. There would not be large-scale earthworks on this site resulting in complete flattening of the core development area. Areas of vegetation would be left and local topography used. For example, the basin bog and kettle holes, along with localised slopes and features would be left and the development would be built around those. Similarly, although only at outline design stage at present, it is hoped that houses would be built on a house by house basis, rather than as whole areas of the site being controlled by one developer / contractor. This would allow the retention of a much greater amount of the surrounding vegetation and the ability to retain elements of native vegetation within gardens and across boundaries. The ability to clear vegetation in stages, perhaps even on a house by house basis, once the key infrastructure is in place would help species to adapt in stages to the changes.

4.5.98 Whilst the location of the two river crossings have been carefully positioned, they would be further micro-sited with detailed design to minimise disruption to the free movement of all relevant species (including otter). All bridge abutments would be set back from the bank-tops to reduce the impacts on the watercourse geo-morphology as well as preserve the permanent corridor for terrestrial mammals (e.g. otter and water vole). There would be no piers in the river channels. Mammal crossings (e.g. dry badger pipes) would be included in the detailed design for relevant elements of the development to minimise the interaction between wildlife and human traffic. In addition, all areas of the development, including the main access road would have a 20 mph maximum speed limit, which if enforced, should greatly reduce wildlife casualties due to vehicles within the development.

4.5.99 As mentioned in the preceding Habitats and Plants Section, a Nature Conservation Strategy would be implemented for the An Camas Mòr development. The strategy includes the provision of off-setting mitigation on three areas of land outside of the wider study area, but fairly close by. Although all three proposed areas provide offsetting and enhancement for wildlife within the National Park, the proposed montane woodland in particular would in time provide good quality native pine, away from urban influences for species such as red squirrel and pine marten to use and would link to existing woodland areas. Taking into consideration the habitats affected and the time required for them to develop, such mitigation / enhancement would be progressed during the early stages of the development to allow their benefits to accrue as soon as possible.

4.5.100 In addition to compensating for losses of species habitat, the development also poses an opportunity to provide new habitat for species which do not have a strong presence on the site, such as bats and certain invertebrate species (e.g. bumblebees and honeybees). Bat roosting spaces would be incorporated into new buildings and on mature trees, providing roosting opportunities that were not previously available. Carefully chosen native landscaping species would be used to attract insects such as bumblebees and provide additional insect prey for bats, which would be further aided by the localised increase in temperature that would accompany the residential development. Community involvement in the Ecological Management Plan would help identify those species of plants and methods for aiding local wildlife further, while also increasing awareness and appreciation through education.

4.5.101 The proposed Nature Conservation Strategy includes various measures to protect and enhance semi-natural habitats within the core development area and the creation and enhancement of habitats of conservation concern elsewhere within Rothiemurchus Estate. In areas of low-medium density housing some areas of existing mature trees and a network of dwarf-shrub heath vegetation would be retained within habitat 'wedges' of various sizes and within garden plots. Although the existing habitats would be fragmented by the proposed development, there is likely to be enough retained and created woodland and scrub-like habitat (through the landscape planting proposals) to support a range of species including badger and red squirrel. As the trees within the development and on the western edge mature there would be an increase in available habitat for red squirrel in particular, over that currently available within that area.

4.5.102 The Ecological Management Plan would also include provisions for managing ongoing disturbance to local wildlife, as the development is populated and becomes operational. The micro-siting of paths and the discouragement of human disturbance next to the River Spey would be critical (particularly related to dogs and use of the river for human and dog swimming to minimise disturbance on otter) but can be achieved during detailed design. This would be supported by legal agreements / documentation, where necessary; for example, it is hoped that property title deeds may be a vector for setting specific parameters related to gardens and

pet control. The use of local bylaws, if necessary, would also be possible. Conditions may include provisions such as bells, lights and collars for pet cats and spaying / neutering of cats. During the breeding bird season, cat owners would be asked to keep their cats indoors at night. Residents can be encouraged to set out feeders for birds in their gardens and discouraged from feeding species, such as badgers and foxes. The access principles which have been agreed in outline can be summarised as follows:

- The sensitive habitats and species are the steeper banks of the rivers and other areas some distance from the proposed development. Public access and outdoor recreation facilities would enable enjoyable experiences for all without disturbing these places. The Scottish Outdoor Access Code (SOAC) provides guidance on responsible access;
- Interpretation information and the masterplan would support the responsible use of the countryside and this would be located centrally at access points that lead through the woodland shelterbelt into the wider surrounding landscape;
- Sensitive areas could be promoted by the use of carefully sited viewpoints and protected by leading paths around them and by creating natural barriers such as dense strips of native shrub species; and
- An important part of the management would be the provision of attractive fenced dog exercise areas within appropriate parts of the development. According to the SOAC, dog owners would keep their pets under close control and on a lead in the presence of ground nesting birds.

4.5.103 The mitigation measures proposed to address construction disturbance would also apply to operational maintenance activities and for brevity are not repeated again here.

Operational Residual Impacts

4.5.104 Table 4.25 summarises the likely operational residual impacts on terrestrial fauna taking into account the outline mitigation proposals and how they would be developed further.

Table 4.25: Likely Residual Adverse Impacts due to Operation on Terrestrial Fauna

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
Bats	Slight	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Slight	Negligible	Negligible	C
	Negligible	Negligible	Negligible	D
	Slight	Negligible	Negligible	Total
Otter	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Negligible	Negligible	Negligible	C
	Slight	Negligible	Negligible	D

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
	Slight	Low	Slight	Total
Water vole	Neutral	Neutral	Neutral	A
	Neutral	Neutral	Neutral	B
	Neutral	Neutral	Neutral	C
	Negligible	Negligible	Negligible	D
	Negligible	Negligible	Negligible	Total
Red squirrel	Moderate	Low	Slight	A
	Negligible	Negligible	Negligible	B
	Moderate	Low	Slight	C
	Slight	Low	Slight	D
	Moderate	Low	Slight	Total
Pine marten	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Slight	Low	Slight	C
	Slight	Low	Slight	D
	Slight	Low	Slight	Total
Badger	Slight	Negligible	Negligible	A
	Slight	Low	Slight	B
	Moderate	Low	Slight	C
	Moderate	Low	Slight	D
	Moderate	Low	Slight	Total
Terrestrial Invertebrates	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Slight	Low	Slight	C
	Slight	Low	Negligible	D
	Slight	Low	Slight	Total
Brown hare	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Slight	Low	Slight	C
	Negligible	Negligible	Negligible	D
	Slight	Low	Slight	Total
Reptiles and Amphibians	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Negligible	Negligible	Negligible	C

Receptor	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
	Negligible	Negligible	Negligible	D
	Slight	Low	Slight	Total
Other Common Fauna	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Negligible	Negligible	Negligible	C
	Negligible	Negligible	Negligible	D
	Slight	Low	Slight	Total

Impact Assessment for Avifauna

4.5.105 The following section discusses and assesses the potential impacts on bird receptors during construction and operation. The mitigation measures proposed and the likely residual impacts are also provided. The potential adverse impacts can be summarised as follows:

Construction Phase:

- Potential disturbance to bird habitats arising from vegetation clearance / tree felling in advance of each of the construction phases;
- Potential disturbance to nesting or foraging birds of conservation concern (for example, displacement of birds from important habitats) resulting from the construction works; and
- The potential for adverse cumulative effects to arise from other proposals in the vicinity of the proposed development.

Operational Phase:

- Permanent habitat loss, fragmentation and degradation of bird habitats arising from the project;
- Potential disturbance to nesting or foraging birds of conservation concern (for example, displacement of birds from important habitats or long-term reduced breeding success) resulting from the operation of the site and increased road traffic and recreational activity within the area; and
- The potential for adverse cumulative effects to arise from other proposals in the vicinity of the proposed development.

4.5.106 Where these potential impacts have been assessed as being significant, mitigation / management measures have been proposed to address them. The predicted beneficial effect of the proposed mitigation measures is also assessed and the associated residual significance level reported.

4.5.107 Potential cumulative effects from other proposals have not been considered further in this assessment as no projects that have the potential to cumulatively affect the same avifauna receptors, as are assessed here, have been identified.

Construction Phase Impacts

4.5.108 Chapter 5 describes in detail the proposed construction process and phasing schedule for the proposed development. Construction impacts include the potential disturbance to breeding / foraging birds (including dependant young) or sensitive sites such as nests, and the direct / indirect, temporary / permanent loss of habitat as a result of the works. Permanent habitat loss or degradation as a result of the development is assessed under 'Operational Impacts' below.

Tree / Vegetation Clearance

4.5.109 Tree felling, scrub and ground vegetation clearance would be required to be completed in advance of works undertaken during each of the proposed construction Phases. The exact amount of tree felling / vegetation clearance is not known at this time due to the outline nature of the proposal. However, as part of the ecological mitigation strategy for the development c. 30% of the existing habitats of conservation value within the core development area would be retained and remain permanently undeveloped. It is also important to note that vegetation clearance would be divided between the four proposed phases of the development (i.e. over approximately a 20 year period), such that vegetation clearance would occur periodically, in advance of each of the four phases, and only what is necessary to clear for the construction works to progress for each phase, and perhaps for each area of construction. Assuming the least favourable timing for works in respect of the bird breeding season then the impacts associated with tree felling and vegetation clearance have the potential to be of medium magnitude and **Moderate Adverse** and significant overall for avifauna receptors for each separate construction phase of the development.

4.5.110 Mitigation measures to address this potentially significant adverse impact would include the following. All tree felling / vegetation clearance would be completed outside of the main bird breeding season (i.e. March – August). If some felling or vegetation clearance is necessary within this period then it would only be done following a nest survey by a suitably experienced ecologist to ensure that potential adverse impacts on breeding birds are avoided (in compliance with the provisions of the Wildlife and Countryside Act). Due to the potential for nesting crossbill spp. to the present in the area specific survey methods would be needed as crossbills may breed outside of the typical main bird breeding season. The same concern would also apply to forest owl species such as tawny and long-eared owl. Because of the presence of these species in the area an appropriately timed survey would be undertaken in advance of tree felling to determine if breeding activity is occurring.

4.5.111 With the implementation of the above mitigation measures the residual impact is considered to be no greater than low magnitude and Slight adverse for any receptor for each development phases.

General Construction Disturbance

- 4.5.112** There is the potential for construction operations that may cause significant light, noise, vibration or visual disturbance to adversely affect breeding and / or feeding birds. Construction related impacts are considered to be only potentially significant during the main bird breeding season (i.e. March to August inclusive) as winter use of the site by most bird species of conservation concern is considerably lower than during the spring and summer. Such disturbance impacts can be particularly damaging if they occur at sensitive periods. For example, if adult birds are disturbed from a nest during incubation then eggs can cool rapidly and fail to hatch. Also, when chicks are present in tree nests sudden noise can cause the adults to startle and accidentally knock chicks out of the nest. Repeated and severe disturbance can result in failure to breed or reduced breeding success. The proposed construction works would be completed over an estimated 20 year period, divided into four main phases. Although works would tend to be focused in specific areas of the site such that disturbance is not occurring across the entire area simultaneously for extended periods there is the potential for some birds to experience failed or reduced breeding success over several consecutive breeding seasons.
- 4.5.113** Potential sources of disturbance include vehicles, generators, lights, vibration, etc. The increased presence of people (i.e. construction workers) in the area can also affect birds in terms of visual disturbance at nest sites. The extent of the zone of influence would vary depending on the scale of the source of disturbance, the surrounding topography / tree cover and the timing of the works (vegetation clearance undertaken in advance of construction works outside of the main bird breeding season would act to reduce the potential magnitude of construction disturbance impacts). There is also likely to be variation in species-specific responses to disturbance sources (e.g. some passerine species are likely to be able to better tolerate a noise disturbed environment than some raptor or wader species). Assuming the least favourable timing for construction works (i.e. during the main bird breeding season) and taking into consideration the areas of the site that would be directly affected by the works the combined potential disturbance impacts from all of the proposed construction works has been assessed as being of potential medium magnitude and **Moderate Adverse** during all development construction phases.
- 4.5.113** This impact would be mitigated through the timing of particularly disturbing works outside of the onset of the breeding season. Also pre-construction surveys (at appropriate times of year) would be carried out to determine the risk to any breeding birds with particular focus on species of conservation concern and enhanced statutory protection. This is also necessary to ensure that any works minimise the potential for breeding birds to be disturbed (in particular Schedule 1 species, in relation to the requirements of the Wildlife and Countryside Act 1981, as amended) and because there is the potential for the avifauna of the area to change (e.g. increase in nature conservation value / sensitivity) in the intervening period between the EIA baseline surveys and commencement of each of the construction phases. Surveys would be undertaken by a suitably experienced ornithologist to fully determine the potential risk to such species and to determine appropriate, detailed mitigation for each construction phase. Should any such species be at risk of disturbance from the works then appropriate protective measures would be taken (e.g. establishment of appropriate 'disturbance-free' buffer zones), in consultation and agreement with SNH, to ensure that the potential for any significant impact is avoided. Measures to reduce the attractiveness of habitats for ground-nesting birds (e.g. the use of high visibility tape along the route of a proposed access road to discourage nesting by ground-nesting songbirds) would be employed, where appropriate and under supervision of the Ecological Clerk of Works, to reduce the potential for nesting birds that are not subject to

enhanced statutory protection from establishing breeding territories with the areas affected by the construction works.

- 4.5.114** Assuming the implementation of these mitigation measures the residual impact for all bird species would be reduced to no greater than low magnitude and Slight Adverse and not significant for any of the construction phases.

Operational Phase Impacts

Habitat Loss

- 4.5.115** The total amount of the various habitat types present within the core development area is provided in Table 4.7. The precise amount of loss of these existing habitats is not known at this time due to the outline design nature of the ILUP. The majority of woodland that would be lost to the proposed development is of relatively low overall ecological value being conifer plantation, although some limited areas of semi-natural woodland (broadleaved and mixed) and scattered mature pine and birch trees would require to be felled to accommodate the site access routes. Not all of the woodland within phase D of the development would be felled, although the exact amount of retention of existing plantation woodland in this area is not known at present. Similarly, in relation to dwarf-shrub heath and grassland habitats the precise amount of habitat loss is not known.
- 4.5.116** Habitat loss can remove (or make inaccessible) critical habitat to survival and / or reproductive success. This results in mortality and / or reduced rates of recruitment to the breeding population resulting in population decline. In response to habitat loss, individuals may seek alternative habitats. In this case there are alternative similar habitats available in the wider area (particularly to the north, east and south), however, the extent to which there is capacity to support immigrants from areas of habitat loss is unknown and can not be readily quantified. For some species, such as crossbills, the limited loss of foraging habitat (there is currently no evidence of nesting occurring with the proposed development area) resulting from the proposed felling is considered unlikely to be significant given their nomadic behaviour and the extent of conifer plantation of similar tree species mix, age and cone-bearing capacity in the surrounding area. For all other breeding species of conservation concern within the core development area it has been assumed that habitat loss equates to the loss of all breeding territories (on the assumption that species of relatively greater conservation concern are often of relatively greater sensitivity to habitat loss and fragmentation and that it can not be assumed that pockets of retained habitats would be adequate to support these species). For many of the more common species recorded as breeding within the site habitat loss would not be complete as they would be able to use areas of retained habitats and to exploit landscape planting and garden vegetation once it establishes following the construction phases. Other species, of national or regional conservation concern and relatively high conservation value (in particular yellowhammer, tree pipit, song thrush, wood warbler) recorded breeding within the site would be subject to at least partial displacement and assumed partial loss from the local population. For these species the unmitigated impact is considered to be significant, but due to the number of territories relative to the national and assumed regional populations, the impact on the songbird community is considered to be not greater than medium magnitude and **Moderate Adverse**. A breakdown of the assessment of unmitigated operational habitat loss impacts on avifauna receptors of conservation concern is provided in Table 4.26 below.

Table 4.26: Summary of Likely Unmitigated Adverse Operational Impacts Associated with Habitat Loss for Avifauna

Receptor (species groups)	Conservation Value (max within group)	Impact Magnitude	Adverse Effect Significance	Development Period
Wildfowl	Low (core area)	Negligible	Negligible	A
		Negligible	Negligible	B
		Negligible	Negligible	C
		Negligible	Negligible	D
		Negligible	Negligible	Total
Raptors	Low (core area)	Low	Slight	A
		Negligible	Negligible	B
		Low	Slight	C
		Low	Slight	D
		Low	Slight	Total
Forest grouse	Low (core area)	Low	Slight	A
		Negligible	Negligible	B
		Negligible	Negligible	C
		Low	Slight	D
		Low	Slight	Total
Waders	Low (core area)	Low	Slight	A
		Low	Slight	B
		Low	Slight	C
		Negligible	Negligible	D
		Low	Slight	Total
Passerines	Medium (core area)	Medium	Moderate	A
		Low	Slight	B
		Medium	Moderate	C
		Medium	Moderate	D
		Medium	Moderate	Total

4.5.117 The proposed Nature Conservation Strategy includes various measures to protect and enhance semi-natural habitats within the core development area and the creation and enhancement of habitats of conservation concern elsewhere within Rothiemurchus Estate. In areas of low-medium density housing some areas of existing mature trees and a network of dwarf-shrub heath vegetation would be retained within habitat ‘wedges’ of various sizes and within garden plots. Overall, approximately 30% of existing vegetation within the core development area

would be permanently retained and protected from damage during construction. For example, the majority (excluding areas of felling to accommodate the proposed new access road) of semi-natural woodland would be retained and protected. During the detailed design further development of the Nature Conservation Strategy, and specific mitigation in relation to habitat retention for bird species of conservation concern, would be undertaken with the intention of maximising the potential ecological benefit of the design and management of the proposed retention areas. Although the existing habitats would be fragmented by the proposed development there is likely to be enough retained and created woodland and scrub-like habitat (through the landscape planting proposals) to support a songbird community. This may include many of the common species present prior to development but the population size would inevitably be smaller (i.e. in terms of the number of breeding territories the area can support) and less species rich (e.g. to include relatively common species that can thrive in urban and ‘urban fringe’ habitats such as chaffinch, blue tit, great tit, coal tit, wren and some species of national conservation concern such as willow warbler, dunnock and song thrush).

4.5.118 In addition, the loss / degradation of woodland and heath would be mitigated through habitat management on three sites within the Estate. Taking into consideration the habitats affected and the time required for them to develop, such compensatory mitigation is not likely to be immediately available for use, although it is hoped that management can be started prior to construction works commencing, however, in the medium to long-term the beneficial effects of this habitat creation would accrue. In the long-term the overall residual adverse impact on the bird community is considered to be not greater than low magnitude resulting in a **Slight Adverse** impact. A breakdown of the assessment of mitigated operational habitat loss impacts on avifauna receptors of conservation concern is provided in Table 4.27 below.

Table 4.27: Summary of Likely Residual Adverse Operational Impacts Associated with Habitat Loss for Avifauna

Receptor (species groups)	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
Wildfowl	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Negligible	Negligible	Negligible	C
	Negligible	Negligible	Negligible	D
	Negligible	Negligible	Negligible	Total
Raptors	Slight	Low	Slight	A
	Negligible	Negligible	Negligible	B
	Slight	Low	Slight	C
	Slight	Low	Slight	D
	Slight	Low	Slight	Total
Forest grouse	Slight	Low	Slight	A
	Negligible	Negligible	Negligible	B
	Negligible	Negligible	Negligible	C
	Slight	Low	Slight	D

Receptor (species groups)	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
	Slight	Low	Slight	Total
Waders	Slight	Low	Slight	A
	Slight	Low	Slight	B
	Slight	Low	Slight	C
	Negligible	Negligible	Negligible	D
	Slight	Low	Slight	Total
Passerines	Moderate	Low	Slight	A
	Slight	Low	Slight	B
	Moderate	Low	Slight	C
	Moderate	Low	Slight	D
	Moderate	Low	Slight	Total

Displacement / Disturbance and Habitat Degradation

4.5.119 The new housing would increase the number of people using the site at all times of the day and throughout the year (i.e. including cars, lighting, noise, walkers with dogs, which can be particularly disturbing for birds under certain circumstances) including new footpaths. This has the potential to change the types of disturbance sources and the levels of disturbance to birds from the current baseline situation. There is also the potential for increased predation pressure from the existing baseline as a result of an increased number of domestic pets in the area, particularly cats. As a result of these factors birds could suffer increased mortality, reduced breeding success or be displaced from areas of suitable habitat that are subject to repeated disturbance. Given that the types of species present, for which the site and main access route is considered to be important, are mostly song-birds, the potential for increased human presence to cause significant adverse impacts (i.e. a measurable decrease in foraging or nesting success over the long-term) is considered to be relatively low. However, there are some species present in the wider area (e.g. breeding waders such as curlew, lapwing and redshank and an important population of breeding goldeneye) which are unlikely to be as tolerant. The strip of riparian woodland and scrub adjacent to the River Spey, and the river itself, and the area marshy grassland to the south of Loch Pityoulish and the Loch, are all considered to be of relatively high sensitivity to increased human disturbance. There is a proposed pedestrian / cycle route that runs close to the River Spey and which has the potential to increase human disturbance to this area from current baseline levels, although this would be reduced to some extent by screening from existing riparian woodland and scrub vegetation. It is not possible to fully quantify the potential extent of habitats affected in the surrounding area or the magnitude of this impact but overall is considered to be potentially significant and a **Moderate adverse** impact in the long-term. A breakdown of the assessment of unmitigated operational disturbance and displacement impacts on avifauna receptors of conservation concern is provided in Table 4.28 below.

Table 4.28: Summary of Likely Unmitigated Adverse Operational Impacts Associated with Disturbance / Displacement

Receptor (species groups)	Conservation Value (max within group)	Impact Magnitude	Adverse Effect Significance	Development Period
Wildfowl	High (wider area)	Medium	Moderate	A
		Medium	Moderate	B
		Medium	Moderate	C
		Medium	Moderate	D
		Medium	Moderate	Total
Raptors	Medium (wider area)	Low	Slight	A
		Low	Slight	B
		Low	Slight	C
		Low	Slight	D
		Low	Slight	Total
Forest grouse	Low (wider area)	Low	Slight	A
		Low	Slight	B
		Low	Slight	C
		Low	Slight	D
		Low	Slight	Total
Waders	Medium (wider area)	Negligible	Negligible	A
		Negligible	Negligible	B
		Negligible	Negligible	C
		Negligible	Negligible	D
		Negligible	Negligible	Total
Passerines	Medium (wider area)	Low	Slight	A
		Low	Slight	B
		Low	Slight	C
		Low	Slight	D
		Low	Slight	Total

4.5.120 As part of the Nature Conservation Strategy (see Supporting Documents) the detailed design of pedestrian footpath and the cycle network would aim to minimise potential disturbance impacts on sensitive ecological receptors (including avifauna) in the wider area and retained areas of habitat within the core development area. Access on foot along the bank of the River Spey would not be encouraged and existing vegetation, which acts as a visual screen and

physical barrier, would be strengthened. Dog walking areas away from sensitive areas and responsible ownership would be encouraged and enforced if necessary. These measures (discussed earlier in the assessment) would help to reduce the magnitude of the potential impact on avifauna from increased human presence in this area. There would also be a requirement for all domestic cats to have collars, lights and bells fitted which would help to reduce the impact from increased predation risk. In the longer-term the proposed habitat enhancement measures elsewhere within Rothiemurchus Estate would also help in offsetting the adverse effect of increased disturbance, displacement and habitat degradation of the core development area and the route of the main site access roads. Taking all of the proposed mitigation measures into consideration, in the long-term the residual impact on the bird community is considered to be not greater than **Slight Adverse** and not significant. A breakdown of the assessment of mitigated operational disturbance and displacement impacts on avifauna receptors of conservation concern is provided in Table 4.29 below.

Table 4.29: Summary of Likely Residual Adverse Operational Impacts Associated with Disturbance / Displacement

Receptor (species groups)	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
Wildfowl	Moderate	Low	Slight	A
	Moderate	Low	Slight	B
	Moderate	Low	Slight	C
	Moderate	Low	Slight	D
	Moderate	Low	Slight	Total
Raptors	Slight	Low	Slight	A
	Slight	Low	Slight	B
	Slight	Low	Slight	C
	Slight	Low	Slight	D
	Slight	Low	Slight	Total
Forest grouse	Slight	Low	Slight	A
	Slight	Low	Slight	B
	Slight	Low	Slight	C
	Slight	Low	Slight	D
	Slight	Low	Slight	Total
Waders	Negligible	Negligible	Negligible	A
	Negligible	Negligible	Negligible	B
	Negligible	Negligible	Negligible	C
	Negligible	Negligible	Negligible	D
	Negligible	Negligible	Negligible	Total
Passerines	Slight	Low	Slight	A
	Slight	Low	Slight	B

Receptor (species groups)	Unmitigated Adverse Effect Significance	Residual Impact Magnitude	Residual Adverse Effect Significance	Development Period
	Slight	Low	Slight	C
	Slight	Low	Slight	D
	Slight	Low	Slight	Total

Drainage and Pollution

4.5.121 The surface water drainage would be designed as SUDS to a high standard to meet SEPA requirements and to ensure that there is no adverse effect on water quality in the receiving groundwater. This is particularly important given the high status and importance of the River Spey. As the surface drainage and treatment systems are to be designed and operated to a high standard significant impacts on avifauna (particularly species that are associated with aquatic habitats) are not predicted and are not assessed in further detail here.

4.6 Cumulative Ecological Impact Assessment

4.6.1 The total effects of the four development periods for construction and operation of An Camas Mòr have been assessed within the ecology impact assessment. Therefore any cumulative impacts and effects that could arise from the various periods of construction and operation have been fully considered and assessed.

4.6.2 There are numerous small planning applications relating to the surrounding area, however, none of these that we are aware of could have any cumulative or in-combination effects along with the proposed An Camas Mòr development. There are two developments that we are aware of in the surrounding area that are slightly larger and could potentially interact with ecological receptors and the construction of the proposed development. These are a small group of houses on the opposite side of the B970, at Inverdrurie and the Scottish Water proposals for boreholes and related infrastructure in the Aviemore area.

4.6.3 The small proposed housing development is not likely to be of a sufficient scale to have any effects which could be related to the proposed An Camas Mòr development. The Scottish Water proposals consist of three planning applications: a treatment works at Kinakyle, just south of Aviemore; a large storage tank in the hills to the north west of Aviemore and boreholes at Kinakyle in the floodplain of the River Spey. The only one of these which could have any interaction with the building and operation of An Camas Mòr is the boreholes. Theoretically, these could affect the River Spey and surrounding groundwater levels and theoretically the proposed development could also affect these. It is not thought there could be any effects on water quality from the Scottish Water proposals, if careful construction practices are used, just on water quantity (groundwater levels in the area during operation). However, An Camas Mòr would provide SUDS and it is not proposed to release any water into either the River Spey or the River Drurie and therefore with the adequate installation and control of SUDS there should be no effect on the Spey with regard to water quality and / or quantity from the An Camas Mòr development. Therefore, although it is theoretically possible that there could be cumulative / in-combination effects between the two developments, in practice there would not be any interaction. In addition, it is likely that the construction timescales for both would be mainly separated (the majority of the Scottish Water proposals would probably be built before An Camas Mòr). Operationally both would be occurring at the same time, however, An Camas Mòr

is not likely to have any significant impacts or effects on water quality or quantity with the valley and it is assumed that any question of quantity effects from groundwater abstraction on the hyporheic zone of the River Spey has been fully assessed and analysed separately for that project. In summary there would be no cumulative or in-combination effects on ecological receptors related to the An Camas Mòr proposals that we are aware of in the surrounding area.

4.7 The National Park

- 4.7.1** One of the aims of the Cairngorms National Park is to both conserve and enhance the natural and cultural heritage of the area. Part of this aim refers to ecology, biodiversity and nature conservation. Therefore, it is important that An Camas Mòr should have a minimal adverse impact on ecology and nature conservation and aspire to enhance it within the area.
- 4.7.2** The planning and outline design of An Camas Mòr has sought to take advantage of the existing features of the site and fit the development into these as much as possible. As well as retaining topographical features this also includes the retention of the majority of mature trees within the site, the retention of the small basin bog and the native vegetation within the kettle hole features. This in itself helps to lessen the ecological impacts from the development. It can also be argued that the focussing of development within An Camas Mòr would lessen the need for smaller, "sporadic" development elsewhere within the National Park. In terms of ecology and nature conservation this concentration of development has the potential to reduce impacts and effects on the wider surrounding Park environment.
- 4.7.3** Inevitably in this area, there would be a loss of some semi-natural habitat, particularly an area of dwarf shrub heath which is now tree planted and starting to naturally regenerate to pine and birch woodland. As explained in the impact assessment the Nature Conservation Strategy has provided for three areas external to the development, but close by, where habitat management can be put in place to create / maintain and enhance habitats of equal or greater value for wildlife overall. When compared to the actual development area of An Camas Mòr, it should be possible to manage a total area of greater than 1:1 with these three areas for habitat offsetting and enhancement. The detail of this mitigation has still to be developed beyond the outline design stage and it would not be possible to give precise figures until full habitat assessment and further discussions with SNH, FCS and CNPA have been undertaken. However, the principles have been discussed and broadly agreed already.
- 4.7.4** As well as minimising habitat loss and providing habitat enhancement close by, the outline design and mitigation of the development has sought to include wildlife as much as possible. The detailed design has yet to be developed but many of the measures already committed to are mentioned within the ecological impact assessment in the preceding section. The An Camas Mòr team recognise the importance of this as a special development and one in which people can have a respect for nature, while enjoying it and seeing it all around them. This has a multitude of clear benefits for wildlife and people.

4.8 Assessment Conclusions and Summary Impact Tables

- 4.8.1** A wide range of ecological surveys and studies have been completed on the proposed An Camas Mòr development site and the wider surrounding study area. The studies began in 2004 and continued for 5 years, allowing a comprehensive picture to be built up of the ecology,

biodiversity and nature conservation interests of the area. These studies and surveys have been detailed in the Technical Appendix for ecology and nature conservation.

- 4.8.2** There are a range of statutory designated sites for nature conservation and areas included within the Ancient Woodland Inventory which have all been mapped and considered during the assessment. In addition all the key ecological interests of the site have been studied to a level of detail that has allowed a detailed impact assessment to be undertaken for ecology and nature conservation.
- 4.8.3** Nature conservation evaluation of the core and wider study area has shown that there are a wide range of habitats and species present with a range of values from Negligible to Exceptional, corresponding to common ecological receptors of very limited nature conservation and biodiversity importance up to Internationally designated sites bordering the wider study area and very sensitive species of very high conservation importance.
- 4.8.9** The impact assessment for ecology and nature conservation has been completed for both potential adverse impacts and effect significance, and residual adverse impacts and effect significance. Potential adverse impacts and effects being the worst case scenario and residual adverse impacts and effects being those likely to occur, should the development proceed, taking account of the proposed and best practice mitigation which can be achieved during construction and on completion of the development periods (operation). The potential adverse impacts and effects assessed for the temporary construction phase of the proposed development for ecology and nature conservation ranged from Negligible to Major (Summary Impact Table 1). However with mitigation taken into consideration the residual adverse impacts and effects for the temporary construction phase on ecological receptors were assessed as being between adverse Negligible and Slight (Summary Impact Table 1). In other words, with all mitigation and construction good practice implemented, the construction of the proposed development should not cause significant adverse impacts and resulting effects on the ecology and nature conservation resources.
- 4.8.10** The potential adverse impacts and effects assessed for the permanent operational phase (split into development periods and a total), of the proposed development for ecology and nature conservation ranged from Neutral to Major (Summary Impact Table 2). However with mitigation taken into consideration the residual adverse impacts and effects for the permanent operational phase on ecological receptors were assessed as being between Neutral and Slight (Summary Impact Table 2). In other words, with all proposed outline mitigation (to be further designed during detailed design) implemented, the permanent operation of the proposed development should not cause significant adverse impacts and resulting effects on the ecology and nature conservation resources.
- 4.8.11** The total of the potential adverse and likely effects from the proposed An Camas Mòr development have been considered within the ecology impact assessment for key ecological and nature conservation resources. There are not judged to be any cumulative or in-combination effects on ecological resources, which we are currently aware of, which could occur with other known proposed or implemented developments in the surrounding area and thus cause co-joined significant impacts.

Summary Impact Table 1: Temporary Construction Impacts on Key Ecological Receptors

Ecological Receptor		Adverse Effect Significance	
Main Descriptor	Receptor / Description	Unmitigated	Residual
Habitats and Plants	Semi-natural Broad-leaved Woodland	Moderate	Slight
	Semi-natural Coniferous Woodland	Moderate	Slight
	Coniferous Plantation	Moderate	Slight
	Mixed Semi-natural Woodland	Slight	Slight
	Dense / Continuous Scrub	Slight	Slight
	Scattered Scrub	Negligible	Negligible
	Parkland / Scattered Trees	Moderate	Slight
	Unimproved Acid Grassland	Moderate	Slight
	Semi-improved Acid Grassland	Slight	Negligible
	Poor Semi-improved Grassland	Slight	Negligible
	Improved Grassland	Slight	Slight
	Marsh / Marshy Grassland	Negligible	Negligible
	Dry Dwarf Shrub Heath	Moderate	Slight
	Wet Modified Bog	Moderate	Negligible
	Standing Water	Slight	Slight
	Running Water (Spey and Druie)	Moderate	Negligible
	Arable	Slight	Slight
	Amenity Grassland	Slight	Slight
	Ephemeral / Short Perennial	Slight	Slight
Other Habitats	Slight	Slight	
Aquatic Fauna	Aquatic Invertebrates	Moderate	Negligible
	Freshwater Pearl Mussel	Slight	Negligible
	Fish Populations	Major	Negligible
Terrestrial Fauna	Bats	Negligible	Negligible
	Otter	Slight	Negligible
	Water vole	Negligible	Negligible
	Red squirrel	Moderate	Slight
	Pine marten	Slight	Slight
	Badger	Moderate	Slight
	Terrestrial Invertebrates	Slight	Slight
	Brown hare	Slight	Negligible
	Reptiles and Amphibians	Slight	Negligible
	Other Common Fauna	Slight	Negligible
Avifauna	Tree / Vegetation Clearance	Moderate	Slight
	General Construction Disturbance	Moderate	Slight

Summary Impact Table 2: Operational Impacts on Key Ecological Receptors (Periods and Total)

Ecological Receptor		Development Period	Adverse Effect Significance	
Main Descriptor	Receptor / Description		Unmitigated	Residual
Habitats and Plants	Semi-natural Broad-leaved Woodland	A	Slight	Slight
		B	Negligible	Negligible
		C	Moderate	Slight
		D	Negligible	Negligible
		Total	Moderate	Slight
	Semi-natural Coniferous Woodland	A	Slight	Slight
		B	Neutral	Neutral
		C	Neutral	Neutral
		D	Neutral	Neutral
		Total	Slight	Slight
	Coniferous Plantation	A	Slight	Slight
		B	Neutral	Neutral
		C	Slight	Slight
		D	Moderate	Slight
		Total	Moderate	Slight
	Mixed Semi-natural Woodland	A	Slight	Slight
		B	Neutral	Neutral
		C	Slight	Slight
		D	Neutral	Neutral
		Total	Slight	Slight
	Dense / Continuous Scrub	A	Negligible	Negligible
		B	Neutral	Neutral
		C	Negligible	Negligible
		D	Neutral	Neutral
		Total	Slight	Slight
	Scattered Scrub	A	Neutral	Neutral
		B	Neutral	Neutral
		C	Negligible	Negligible
		D	Negligible	Negligible
		Total	Negligible	Negligible
	Parkland / Scattered Trees	A	Negligible	Negligible
		B	Slight	Negligible
		C	Slight	Negligible
		D	Slight	Negligible

Ecological Receptor		Development Period	Adverse Effect Significance	
Main Descriptor	Receptor / Description		Unmitigated	Residual
	Unimproved Acid Grassland	Total	Moderate	Slight
		A	Negligible	Negligible
		B	Slight	Slight
		C	Neutral	Neutral
		D	Slight	Slight
		Total	Slight	Slight
	Semi-improved Acid Grassland	A	Slight	Slight
		B	Neutral	Neutral
		C	Neutral	Neutral
		D	Neutral	Neutral
		Total	Slight	Slight
	Poor Semi-improved Grassland	A	Negligible	Negligible
		B	Neutral	Neutral
		C	Neutral	Neutral
		D	Neutral	Neutral
		Total	Negligible	Negligible
	Improved Grassland	A	Negligible	Negligible
		B	Neutral	Neutral
		C	Slight	Slight
		D	Neutral	Neutral
		Total	Slight	Slight
	Marsh / Marshy Grassland	A	Neutral	Neutral
		B	Neutral	Neutral
		C	Neutral	Neutral
		D	Neutral	Neutral
		Total	Neutral	Neutral
	Dry Dwarf Shrub Heath	A	Moderate	Negligible
		B	Moderate	Slight
		C	Moderate	Slight
D		Moderate	Slight	
Total		Major	Slight	
Wet Modified Bog	A	Neutral	Neutral	
	B	Neutral	Neutral	
	C	Neutral	Neutral	
	D	Moderate	Neutral	
	Total	Moderate	Neutral	

Ecological Receptor		Development Period	Adverse Effect Significance	
Main Descriptor	Receptor / Description		Unmitigated	Residual
	Standing Water	A	Neutral	Neutral
		B	Neutral	Neutral
		C	Neutral	Neutral
		D	Neutral	Neutral
		Total	Neutral	Neutral
		Running Water (Spey and Druie)	A	Neutral
	B		Neutral	Neutral
	C		Neutral	Neutral
	D		Neutral	Neutral
	Total		Neutral	Neutral
	Arable	A	Negligible	Negligible
		B	Neutral	Neutral
		C	Slight	Slight
		D	Slight	Slight
		Total	Slight	Slight
	Amenity Grassland	A	Neutral	Neutral
		B	Slight	Slight
		C	Neutral	Neutral
		D	Neutral	Neutral
		Total	Slight	Slight
	Ephemeral / Short Perennial	A	Negligible	Negligible
		B	Neutral	Neutral
		C	Negligible	Negligible
		D	Neutral	Neutral
		Total	Negligible	Negligible
Other Habitats	A	Negligible	Negligible	
	B	Negligible	Negligible	
	C	Negligible	Negligible	
	D	Negligible	Negligible	
	Total	Slight	Slight	
Indirect Habitat Loss & Fragmentation	Indirect Habitat Loss	A	Slight	Negligible
		B	Moderate	Negligible
		C	Moderate	Negligible
		D	Moderate	Slight
		Total	Moderate	Slight
	Terrestrial Habitat Fragmentation	A	Slight	Negligible

Ecological Receptor		Development Period	Adverse Effect Significance	
Main Descriptor	Receptor / Description		Unmitigated	Residual
		B	Slight	Negligible
		C	Moderate	Slight
		D	Moderate	Slight
		Total	Moderate	Slight
	Aquatic Habitat Fragmentation	A	Negligible	Negligible
		B	Neutral	Neutral
		C	Slight	Negligible
		D	Neutral	Neutral
		Total	Moderate	Negligible
		Aquatic Fauna	Aquatic Invertebrates	A
B	Negligible			Negligible
C	Slight			Negligible
D	Slight			Negligible
Total	Slight			Negligible
Freshwater Pearl Mussel	A		Negligible	Negligible
	B		Negligible	Negligible
	C		Slight	Negligible
	D		Slight	Negligible
	Total		Moderate	Negligible
Fish Populations	A		Negligible	Negligible
	B		Negligible	Negligible
	C		Slight	Negligible
	D		Slight	Negligible
	Total		Moderate	Negligible
Terrestrial Fauna	Bats		A	Slight
		B	Negligible	Negligible
		C	Slight	Negligible
		D	Negligible	Negligible
		Total	Slight	Negligible
	Otter	A	Negligible	Negligible
		B	Negligible	Negligible
		C	Negligible	Negligible
		D	Slight	Negligible
		Total	Slight	Slight
	Water vole	A	Neutral	Neutral
		B	Neutral	Neutral

Ecological Receptor		Development Period	Adverse Effect Significance	
Main Descriptor	Receptor / Description		Unmitigated	Residual
		C	Neutral	Neutral
		D	Negligible	Negligible
		Total	Negligible	Negligible
	Red squirrel	A	Moderate	Slight
		B	Negligible	Negligible
		C	Moderate	Slight
		D	Slight	Slight
		Total	Moderate	Slight
	Pine marten	A	Negligible	Negligible
		B	Negligible	Negligible
		C	Slight	Slight
		D	Slight	Slight
		Total	Slight	Slight
	Badger	A	Slight	Negligible
		B	Slight	Slight
		C	Moderate	Slight
		D	Moderate	Slight
		Total	Moderate	Slight
	Terrestrial Invertebrates	A	Negligible	Negligible
		B	Negligible	Negligible
		C	Slight	Slight
		D	Slight	Negligible
		Total	Slight	Slight
	Brown hare	A	Negligible	Negligible
		B	Negligible	Negligible
		C	Slight	Slight
		D	Negligible	Negligible
		Total	Slight	Slight
	Reptiles and Amphibians	A	Negligible	Negligible
		B	Negligible	Negligible
		C	Negligible	Negligible
		D	Negligible	Negligible
		Total	Slight	Slight
Other Common Fauna	A	Negligible	Negligible	
	B	Negligible	Negligible	
	C	Negligible	Negligible	

Ecological Receptor		Development Period	Adverse Effect Significance	
Main Descriptor	Receptor / Description		Unmitigated	Residual
		D	Negligible	Negligible
		Total	Slight	Slight
Avifauna – Habitat Loss	Wildfowl	A	Negligible	Negligible
		B	Negligible	Negligible
		C	Negligible	Negligible
		D	Negligible	Negligible
		Total	Negligible	Negligible
		Raptors	A	Slight
	B		Negligible	Negligible
	C		Slight	Slight
	D		Slight	Slight
	Total		Sight	Slight
	Forest grouse		A	Slight
		B	Negligible	Negligible
		C	Negligible	Negligible
		D	Slight	Slight
		Total	Slight	Slight
		Waders	A	Slight
	B		Slight	Slight
	C		Slight	Slight
	D		Negligible	Negligible
	Total		Slight	Slight
Passerines	A		Moderate	Slight
	B	Slight	Slight	
	C	Moderate	Slight	
	D	Moderate	Slight	
	Total	Moderate	Slight	
	Avifauna– Disturbance/ Displacement	Wildfowl	A	Moderate
B			Moderate	Slight
C			Moderate	Slight
D			Moderate	Slight
Total			Moderate	Slight
Raptors		A	Slight	Slight
		B	Slight	Slight
		C	Slight	Slight
		D	Slight	Slight

Ecological Receptor		Development Period	Adverse Effect Significance	
Main Descriptor	Receptor / Description		Unmitigated	Residual
		Total	Slight	Slight
	Forest grouse	A	Slight	Slight
		B	Slight	Slight
		C	Slight	Slight
		D	Slight	Slight
		Total	Slight	Slight
		Waders	A	Negligible
	B		Negligible	Negligible
	C		Negligible	Negligible
	D		Negligible	Negligible
	Total		Negligible	Negligible
	Passerines	A	Slight	Slight
		B	Slight	Slight
		C	Slight	Slight
		D	Slight	Slight
			Total	Slight