Kyleakin Fish Feed Factory

Marine Harvest

Environmental Impact Assessment - Volume 2 of 4: Main Report

Chapter 11: Terrestrial Ecology

Final

May 2017

Contents

11. Terrestrial Ecology

11.1 Introduction

This chapter presents the results of the Ecological Impact Assessment (EcIA) for the Proposed Development. The assessment considers the potential impacts on terrestrial species, habitats and ecosystems.

Assessment of the Proposed Development has been undertaken in context of it being a proposal to develop a Fish Feed Plant within the disused Allt Anavig Quarry site at Kyleakin. This will comprise an extended intake pier and quay, construction of several new buildings and warehouses, development of a bio-bed structure and the associated infrastructure around the site including access roads, drainage and security fencing. In addition to this the Allt Anavig watercourse will be redirected to the west with sections opened up where possible. Excavated material will also be located within the western end of the Development Area.

The chapter is supported by the following appendices:

- Appendix 11.1: Target Notes;
- Appendix 11.2: Phase 1 Habitat Survey Report produced by Dr Mary Elliott; and,
- Appendix 11.3: Otter Survey Report produced by Dr Mary Elliott.

The following ES chapters interlink with this chapter in relation to features assessed and the mitigation presented:

- Chapter 5: Hydrogeology and Geology;
- Chapter 6: Air Quality and Odour;
- Chapter 7: Noise;
- Chapter 14: Landscape and Visual;
- Chapter 16: Navigation;
- Chapter 17: Water Quality;
- Chapter 18: Coastal Processes and Geomorphology; and
- Chapter 19: Marine Ecology.

A landscape design has also been prepared by ASH Consultancy and their proposed layout is referred to in this document where relevant.

The aims of this EcIA are to:

- identify the presence and status of species, habitats and ecosystems (ecological features) of conservation significance within the study area through consultation, desk study and field surveys;
- evaluate the importance of ecological features;
- identify any potential impacts on important ecological features;
- present mitigation measures to address the identified potential impacts; and
- assess the residual impacts following the successful implementation of any required mitigation.

11.2 Legislative and Policy Background

The legislative background for this chapter is a combination of international conventions and directives and national legislation designed to protect wildlife, habitats and ecosystems (see **Chapter 3: Development Design and Alternatives** and **Chapter 4: Planning Policy**). The principal legislative framework for the EcIA includes:

- The Wildlife and Countryside Act 1981 (as amended) (WCA) (including updates in Scotland);

- The Conservation (Natural Habitats, &c.) Regulations (1994) (as amended in Scotland);
- The Water Framework Directive (European Council Directive 2000/60/EC);
- The Nature Conservation (Scotland) Act 2004;
- Wildlife and Nature Conservation (Scotland) Act 2011 (WANE);
- Directive 2014/52/EU of 16 April 2014 on the assessment of the effects of certain public and private projects on the environment [2014]; and
- The Protection of Badgers Act 1992.

11.3 Methodology

11.3.1 Approach to the Assessment

The approach to this assessment is based on the guidance provided in:

- the Chartered Institute for Ecology and Environmental Management's Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition (CIEEM, 2016);
- Scottish Government's Planning for Natural Heritage: Planning Advice Note 60 (Scottish Executive, 2000);
- Scottish Government's Planning Advice Note 1/2013: Environmental Impact Assessment (Scottish Government, 2013a); and,
- Scottish Natural Heritage's (SNH), a handbook on environmental impact assessment (SNH, 2013).

Scoping advice from SNH (**Chapter 3: Development Design and Alternative**s) which referred to the Kyleakin Quarry ES (Johnson, Poole and Bloomer Consultants (JPB), 2009) and requested that updates to surveys for that ES be carried out to inform this current assessment. In particular, SNH highlighted the presence of otter (*Lutra lutra*), and noted that the 2009 ES (JPB, 2009) discussed: feeding bats (species of the order Chiroptera); adder (*Vipera berus*), slow worm (*Anguis fragilis*); and sand martin (*Riparia riparia*) recorded on the site during 2007, when the Kyleakin Quarry ES surveys were conducted. Further to this SNH noted the presence of pine marten (*Martes martes*) in the vicinity of Kyleakin.

Scoping advice from The Highland Council (THC) (**Chapter 3: Development Design and Alternatives**) made reference to the previous ES carried out in respect to quarry operations and noted the presence of protected species. Further to this THC stated that "the highly modified nature of the site offered limited habitat."

Scoping advice from Scottish Environment Protection Agency (**Chapter 3: Development Design and Alternatives**) highlighted the need to de-culvert and improve the ecological value of the Allt Anavig Burn. They further noted that any Japanese knotweed (Fallopia japonica) should be "dealt with using current guidance".

11.3.2 Study Area

The study area comprised an area up to 500m from the edge of the Proposed Development Area. Variations were made to this study area for specific ecological features depending on sensitivity, mobility and habitat range (see below).

11.3.3 Baseline Conditions

11.3.3.1 Desk Study

A desk study was undertaken to review existing relevant literature and to obtain ecological information within the study area and a surrounding 2km buffer zone, this included the following EIA previously undertaken on the site (JPB, 2009).

Further information for the desk study was obtained from the following online resources:

- Joint Nature Conservation Committee (JNCC) website (JNCC, 2016a);

- Scotland's Environment website (Scotland's Environment Web Partnership, 2016); and
- SNH Information Service (SNH, 2016b).

Data was also collated from direct consultation with:

- The Highland Biological Recording Centre (HBRC); and
- The Royal Society for the Protection of Birds (RSPB).

Consultation was not undertaken with Scottish Badgers as previous surveys of the site (JPB, 2009), desk study and subsequent field surveys in 2016 by both Dr Mary Elliot and Jacobs staff, did not find any evidence of the presence of badgers within the study area.

11.3.3.2 Field Surveys

A Phase 1 habitat survey and a targeted otter survey of the study area were undertaken by Dr Mary Elliot in June 2016 (**Appendix 11.2** and **11.3** respectively). It is assumed that these have been undertaken in accordance with current relevant guidance and to a suitable standard to support the planning and marine licence applications for the Proposed Development.

An ecology walkover survey was conducted by Jacobs in July 2016 and focused on:

- otter survey within 500m buffer of the Proposed Development (Chanin, 2003);
- ground truthing Phase 1 habitat areas within Dr Mary Elliot's survey and collection of target note species data (JNCC, 2010);
- assessment of potential bat roosting trees within 50m buffer of the Proposed Development as identified by Dr Mary Elliot (**Appendix 11.3**). Assessment of trees was undertaken in accordance with the Bat Conservation Trust's (BCT) best practice guidelines (Collins, 2016);
- presence of suitable pine marten denning habitat within 50m buffer of the Proposed Development Area;
- presence of suitable reptile habitat within the Proposed Development Area (Sewell et al., 2013); and
- confirmation of location of existing sand martin colony identified by JPB in 2009.

11.3.4 Assessment Criteria

11.3.4.1 Evaluation of Ecological Features

Ecological features have been evaluated broadly in accordance with the guidelines for Ecological Impact Assessment set out by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2016). Each feature is assigned an importance using a geographic frame of reference:

- International – for example sites designated under the Conservation (Natural habitats &c.) Regulations 1994 (as amended in Scotland);
- National – for example species protected under the WCA and whose populations in the study area comprise a key component of Scottish populations;
- Regional – features important within the Highlands and Islands (e.g., species noted on the Highland Biodiversity Action Plan (Highland Environment Forum, 2015)); and
- Authority Area – features important within Skye and Lochalsh (e.g., species noted on the Skye and Lochalsh Biodiversity Action Plan (Skye and Lochalsh Biodiversity Group, 2003)).

Broadly following the CIEEM (2016) guidelines, a range of criteria has been considered in assigning ecological importance, as follows:

- presence of sites or features designated for their nature conservation interest;
- biodiversity importance; for example: habitats or species which are rare or uncommon, species rich assemblages, species which are endemic or on the edge of their range, large populations or

concentrations of uncommon or threatened species, and/or plant communities that are typical of valued natural/semi-natural vegetation types;

- presence of legally protected sites or species;
- presence of Scottish Biodiversity Strategy (SBS) (Scottish Government, 2015) and Highlands or Skye and Lochalsh ecosystems, habitats and species; and
- secondary and supporting value; for example: habitats or features which provide a buffer to valued features, or which link isolated areas.

For the purposes of this assessment, only features of authority area importance or greater are taken forward for detailed impact assessment. Features of less than authority area importance are not considered to be important ecological features.

11.3.4.2 Impact Assessment

Once a feature's importance has been determined, the effects of construction and operational activities on important ecological features are characterised. The following factors are used to determine whether or not those effects and their consequent impacts on ecological features are significant:

- adverse or beneficial;
- extent;
- magnitude;
- severity;
- duration;
- reversibility;
- timing (e.g. if they occur in a breeding season); and
- frequency of impacts on the feature(s).

11.4 Baseline Conditions

This section summarises the existing ecological conditions that have been determined through a combination of desk study, consultation and field surveys shown in **Table 11.1**. Detailed information can be found in **Appendix 11.1, 11.2** and **11.3** as well as on **Figures 11.1, 11.2** and **11.3**.

The legal and conservation status of these ecological features is provided in **Table 11.1** along with a short justification for the assigned conservation importance of each feature. As part of this species identified on the Scottish Biodiversity List (SBL) are highlighted where relevant. The SBL forms part of the Scottish Biodiversity Strategy (SBS) as revised by the "2020 Challenge for Scotland's Biodiversity".

11.4.1 Biodiversity Action Plans

The study area is covered by the regional Highland BAP (Highland Environment Forum, 2015) and is further covered by the Local BAP for Skye and Lochalsh (Skye and Lochalsh Biodiversity Group, 2003). This is currently being revised as of February 2015 (Skye and Lochalsh Environment Forum, 2016).

11.4.2 Designated Sites

Two designated sites were recorded within 2km of the Proposed Development (**Table 11.1, Figure 11.1**):

- Kinloch and Kyleakin Hills Special Area of Conservation (SAC) (JNCC, 2016b); and
- Kinloch and Kyleakin Hills Site of Special Scientific Interest (SSSI) (SNH, 2016c).

Sites designated for geological reasons are not covered within this chapter. Marine designated sites are dealt with in **Chapter 19: Marine Ecology**.

Table 11.1 : Summary of Ecological Features Recorded in the Study Area

Ecological Feature	Data Source	Baseline	Legal/BAP Status	Justification	Importance
Designated Sites					
Kinloch and Kyleakin Hills SAC UK0030176 NG 749 201 5,275ha	• JNCC, 2016b	**Desk based:** The presence of the Annex I habitat Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles are the primary reason for selection of this site as a SAC. The following Annex I habitats and Annex II species are other qualifying features of the site • Alpine and Boreal heaths • Blanket bogs (priority habitat if active) • European dry heaths • Northern Atlantic wet heaths with *Erica tetralix* • Tilio-Acerion forests of slopes, screes and ravines (priority habitat) • Otter Located approximately 1.3km to the south of the study area.	European site under Conservation (Natural habitats &c) Regulations 1994 (as amended in Scotland)	Designated for the presence of Annex I habitats and Annex II species.	International
Kinloch and Kyleakin Hills SSSI SNH Site Code 8173 NG 750 701 5,266ha	• SNH, 2016c	**Desk based:** An extensive area of upland habitats that extend from sea level to over 700 metres. Around the coast there is ancient semi-natural woodland with relatively intact transitions from marine to woodland to upland habitats, an uncommon feature in Britain. The site also supports nationally important assemblages of mosses, liverworts and lichens, and hosts a nationally recognised otter population. Located approximately 1.3km to the south of the study area and overlaps with the Kinloch and Kyleakin Hills SAC.	Designated under the Nature Conservation (Scotland) Act 2004	Designated due to the presence of woodland and upland habitats which further support nationally important assemblages of mosses, liverworts and lichens. Supports nationally recognised otter population.	National

Ecological Feature	Data Source	Baseline	Legal/BAP Status	Justification	Importance
Habitats					
Ancient Woodland Inventory (AWI) woodland	• SNH, 2008	**Desk based:** One area listed as AWI woodland is present within the study area. This is category 2a Ancient (of semi-natural origin since at least 1860).	AWI is regarded as an important and irreplaceable national resource (SNH, undated). Actions for ancient woodland have also been identified in the Highland BAP to protect relict areas.	SBS includes woodland as a priority habitat on its associated SBL (including a variety of semi-natural broadleaved woodland types). The Scottish Government's policy on control of woodland removal states that there is a strong presumption against removing ancient semi-natural woodland or plantations on ancient woodland sites.	National
Non-AWI woodland	• Dr M Elliot, 2016 • Jacobs surveys, 2016 • Scottish Government, 2013b • Skye and Lochalsh Biodiversity Group, 2003	**Desk based (confirmed by site survey):** Semi-natural broadleaved woodland occurs around the margins of the study area. Sessile oak (*Quercus petraea*) and downy birch (*Betula pubescens*) trees predominate in the canopy, with frequent young willow (*Salix* spp.) and rowan (*Sorbus aucuparia*) also present (**Appendix 11.2, Figure 11.2**).	Lowland mixed deciduous woodlands are priorities on the SBS. Woodland is identified as a local priority habitat within the Skye and Lochalsh BAP.	These woodland areas are not listed on the AWI and are not of a standard to be classed as a BAP or SBS habitat.	Less than Authority Area
Scrub	• Dr M Elliot, 2016 • Jacobs surveys, 2016	**Desk based (confirmed by site survey):** This is a highly modified habitat. It contains common gorse (*Ulex europaeus*), with a mixture of self-seeded native trees including downy birch, willow and rowan. Some conifers such as spruce (*Picea* sp.) and Scots Pine (*Pinus sylvestris*) are also present (**Appendix 11.2, Figure 11.2**).	None	This habitat is common and widespread and rapidly develops on derelict sites. Often has low species diversity.	Less than Authority Area
Waterbody	• Dr M Elliot, 2016 • Jacobs surveys,	**Desk based (confirmed by site survey):** A steep-sided quarry pond forms an open standing freshwater habitat	None	The habitat at this location is not of high quality being an artificial settlement pond with very	Less than Authority Area

Ecological Feature	Data Source	Baseline	Legal/BAP Status	Justification	Importance
	2016 • SEPA, 2016b	within the study area (**Appendix 11.2**). A second waterbody is located within the study area to the south of the Proposed Development however this was not surveyed as it was unsafe to access. Viewing from a distance it appeared to have significantly less sediment loaded runoff entering it.		steep sides and lacking vegetated banks. It was not possible to fully assess the importance of the second waterbody due to access issues. This waterbody is not classified by SEPA. It is unlikely that this would be of a higher importance than that assigned to the quarry pond.	
Marginal Vegetation	• Dr M Elliot, 2016 • Jacobs surveys, 2016	**Desk based (confirmed by site survey):** A small patch of marginal vegetation was recorded at the east end of the quarry pond. This comprises sedge spp. (*Carex* spp.) with some bogbean (*Menyanthes trifoliata*) (**Appendix 11.2, Figure 11.2**). The initial survey by Dr Mary Elliot suggested that this may be a Groundwater Dependant Terrestrial Ecosystem (GWDTE), however following subsequent survey by Jacobs it was determined that the settlement pond is only partially groundwater fed with the remaining water coming from surface water run-off, this is further strengthened by the presence of a drainage pipe entering the pond (Chapter 5 Hydrogeology and Geology) (Photograph 11.1).	None	The habitat at this location is not of high quality being species-poor (mostly sedge spp.).	Less than Authority Area
Bare ground	• Dr M Elliot, 2016 • Jacobs surveys, 2016	**Desk based (confirmed by site survey):** The majority of the study area comprises bare ground with little to no vegetation cover (**Appendix 11.2, Photograph 11.2**).	None	This habitat has little potential to support protected species and has no inherent ecological importance.	Less than Authority Area
Intertidal rocky and shingle areas	• Dr M Elliot, 2016 • Jacobs surveys, 2016	**Desk based (confirmed by site survey):** the inter-tidal beach consists of seaweed-coated cobbles and naturally-placed boulders. Quarried rocks, referred to as rip-rap, have been placed to protect the inter-tidal and coastal ground on both sides of the existing pier (**Appendix 11.2**).	None	For terrestrial ecology, this habitat is only of note in relation to its use by otter (see below).	Less than Authority Area

Ecological Feature	Data Source	Baseline	Legal/BAP Status	Justification	Importance
Protected Species					
Otter	• JPB, 2009 • HBRC, 2016 • Dr M Elliot, 2016 • Jacobs surveys, 2016 • Highland Environment Forum, 2015 • Skye and Lochalsh Biodiversity Group, 2003	**Desk based:** HBRC provided 269 records of otter within the 2km study area, the most recent from 2015 and many of these were recorded within the Kyleakin area. Extensive evidence of otter including the presence of a holt in the harbour wall at the east end of the site was recorded in 2007. **Site survey:** Otter were recorded using the shoreline as well as the freshwater quarry pond within the study area. Surveys by Dr Mary Elliot in June 2016 identified one holt and three couches (only one of which showed signs of use) within the study area (**Appendix 11.3**). Survey by Jacobs in July 2016 identified a further holt and couch within the study area. Further to this Jacobs confirmed one of the previously identified couches determining this was in fact two interconnected couches.	European Protected Species (EPS) under the Conservation (Natural habitats &c) Regulations1994 (as amended in Scotland). Listed in the Highland BAP and Skye and Lochalsh BAP.	Recent publications by SNH indicate that otter populations are increasing and that they are now widespread within Scotland, (Findlay et al., 2015). SNH site condition monitoring for otters (Findlay et al., 2015) states that otters are in favourable status at the Kinloch and Kyleakin SAC (nearest monitored site to the study area).	Regional
Bats	• JPB, 2009 • Dr M Elliot, 2016 • Jacobs surveys, 2016 • Scottish Government, 2013b • Highland Environment Forum, 2015 • Skye and Lochalsh Biodiversity Group, 2003	**Desk based:** Pipistrelle (*Pipistrellus* sp.) bats were observed on site in 2007. Timing of observations suggested they had come from a roost a "significant distance from the site". **Site survey:** The majority of the trees within the study area are young and lacking typical bat-roost features. Surveys by Dr Mary Elliot and subsequently by Jacobs did not find any trees capable of supporting bat roosts.	All UK bat species are EPS under the Conservation (Natural habitats &c) Regulations 1994 (as amended in Scotland). There are nine species of bat known to occur in Scotland and all are listed on the SBS/SBL. Soprano pipistrelle and brown long-eared bat are listed as a priority species on the Highland BAP. 'Bat species' are also identified as a local	No potential roost sites were identified on the site. Desk based data does suggest possible use by foraging pipistrelles. Both Pipistrelle species are widespread and found throughout Scotland.	Less than Authority Area

Ecological Feature	Data Source	Baseline	Legal/BAP Status	Justification	Importance
			priority in the Skye and Lochalsh BAP.		
Pine marten (*Martes martes*)	• HBRC, 2016 • NBN, 2016 • Scottish Government, 2013b • Highland Environment Forum, 2015 • Skye and Lochalsh Biodiversity Group, 2003	**Desk based:** HBRC provided 15 records of pine marten within the 2km study area one of which was located near the entrance to the site. **Site survey**: Suitable habitat for supporting pine marten occurs around the periphery of the study area; however, no areas suitable for supporting denning activity were identified during the surveys.	Schedule 5 of the WCA. Listed on the SBS/SBL. Listed in the Highland BAP and Skye and Lochalsh BAP.	This species is widespread throughout Scotland and well established in the Highlands (Croose et al., 2014). However, the species is still rare in the UK with population estimates ranging from 2,600 to around 3,500 adult martens in Scotland (SNH, 2016j).	Authority Area
Reptiles	• JPB, 2009 • Scottish Government, 2013b • Skye and Lochalsh Biodiversity Group, 2003	**Desk based:** Limited evidence of the presence of adder and slow worm were recorded in the east of the quarry site in 2007, and outwith the current study area. HBRC returned a record of common lizard (*Zootoca vivipara*) within the current 2km study area. **Site survey:** Suitable habitat for reptiles was recorded in the study area; specifically within heathland to the west of the Proposed Development.	Adder, common lizard and slow worm are listed on Schedule 5 of the WCA, the SBL and as priority species within the Skye and Lochalsh BAP.	Suitable habitat for these species is abundant within the land surrounding the study area.	Authority Area
Breeding birds	• JPB, 2009 • RSPB, 2016	**Desk based**: RSPB consultation data identified 33 bird species recorded within 2km of grid reference NG736263. The most recent records dated from 2012. **Site Survey:** No breeding bird surveys were undertaken within the study area (due to seasonal constraints and also due to not being required under the agreed scope) however the scrub and woodland areas within the study	Protected whilst breeding under WCA. Species are also listed on the SBS/SBL and Skye and Lochalsh BAP.	Of data gathered during the desk study and site incidentals, with reference to Birds of Conservation Concern: 14 species are Red listed; 11 species Amber listed; 9 species Green listed; and one species of No Status (Canada Goose). Fifteen of these species are on the SBL, and 20 are listed as priority	Regional

Ecological Feature	Data Source	Baseline	Legal/BAP Status	Justification	Importance
		area provide suitable habitat to support a typical assemblage of breeding passerines. Juvenile oystercatcher (*Haematopus ostralegus*) and ringed plover (*Charadrius hiaticula*) were recorded along the shoreline during the Jacobs surveys.		species on the local BAP.	
Sand martin	• JPB, 2009 • Jacobs surveys, 2016 • Skye and Lochalsh Biodiversity Group, 2003	**Desk based:** This species was recorded within the western quarry void in 2007. **Site survey:** The presence of an existing sand martin colony was confirmed within the western quarry site (**Figure 11.3**).	Protected whilst breeding under WCA. Priority species within the Skye and Lochalsh BAP.	Sand martin are listed as Green on the list of Birds of Conservation Concern (BOCC), meaning that the species is widespread throughout the UK and does not fit with Amber or Red list criteria, notably it is not experiencing severe or moderate declines.	Authority Area

Photograph 11.1 : Settlement pond showing drainage pipe and marginal vegetation.

Photograph 11.2 : Quarry floor showing dominance of bare ground habitat.

11.4.3 Invasive Non-Native Species (INNS)

Two invasive non-native plant species, monkey flower (*Mimulus guttatus*) (TN6) and rhododendron (*Rhododendron* sp.) (TN10), were recorded within the study area (**Figure 11.2**, **Appendix 11.1**).

11.5 Predicted Impacts

Predicted impacts on important ecological features for the Proposed Development are described below in **Table 11.2**.

Impacts on features of less than authority area importance are not discussed.

Where an impact is initiated in construction but also occurs throughout operation (e.g. permanent habitat removal), it is discussed only within operational impacts.

No impacts are predicted for the following features either during the construction or operational phases of the Proposed Development as no effects pathways were identified. Therefore these ecological features are not discussed further in the impact assessment:

- Kinloch and Kyleakin Hills SAC and SSSI; these sites are located approximately 1.3km from the Proposed Development Area;
- Bats; only foraging bats have been noted within the study area (JPB, 2009) and the site does not support any potential roosts;
- Sand martin; the colony is located approximately 1km from the Proposed Development site and will therefore not be disturbed during the works. Foraging habitat is also widespread outwith the study area and therefore feeding resources are not anticipated to be affected; and,
- Reptiles; recorded in 2007 within the extreme south west of the western quarry site which is located approximately 1km from the Proposed Development. It is not anticipated that the Proposed Development will impact on reptile populations. However appropriate mitigation will be required during vegetation clearance works to reduce the risks of mortality or injury in compliance with the WCA.

11.5.1 Construction

Construction will take place over a 17 month period from February 2017 until June 2018 (including enabling and construction works). Impacts may include:

- injury or mortality of protected species due to vegetation removal, vehicle movements or becoming trapped in uncovered holes and pipes;
- temporary habitat fragmentation due to disturbance;
- temporary disturbance to protected species from noise, lighting and movement of vehicles and increased human activity;
- sediment release and run-off from construction works; and
- generation of dust from use of haul routes, earth movement and soil storage.

11.5.2 Operation

Operational impacts may include:

- permanent loss of habitats under footprint of the Proposed Development;
- fragmentation and severance of habitats; and
- disturbance to protected species from operation of factory and vehicle movements.

Table 11.2 : Description of Potential Impacts (without Mitigation)

Ecological Feature	Impact	Effect	Significance
Construction			
AWI woodland	Generation of dust during construction activities is likely given the nature of the site as a previous sand and gravel quarry.	Pollution of habitat leading to changes in health of plants and community compositions. This is likely to be a short-term and reversible adverse effect during the construction period over approximately 50% of the AWI area.	Non-significant
Otter	Construction related activities, including vehicle movements.	Direct mortality of individuals from collisions or entrapment in pits, pipes or machinery within the	Non-significant

Ecological Feature	Impact	Effect	Significance
		works boundary. Possible damage to or destruction of an otter holt due to temporary jetty works including dredging. These effects are unlikely to occur in sufficient scale or numbers to affect the wider population, but mortality of otter and holt destruction both pose risks of breaching the Conservation (Natural habitats &c.) Regulations 1994 (as amended in Scotland) if not mitigated. Although these effects will only occur over the duration of the construction period, they would be permanent and negative.	
	Noise, vibration and light spill associated with construction related operations including earth movement.	Disturbance of an EPS leading to its avoidance of foraging habitat and places of shelter and rest. Confirmed resting sites are situated more than 30m from the Proposed Development. It is not therefore considered that any disturbance would cause declines in population, although disturbance of otter poses risks of breaching the Conservation (Natural habitats &c.) Regulations 1994 (as amended in Scotland) if not mitigated. This effect would be short-term over the duration of the construction period, reversible and negative.	Non-significant
Pine marten	Construction related activities, including vehicle movements.	Direct mortality of individuals from collisions or entrapment in pits, pipes or machinery. This would be unlikely to occur in sufficient numbers to affect the wider population. but mortality of pine marten poses risks of breaching the WCA if not mitigated. Although the effect will only occur over the duration of the construction period, the effect would be permanent and negative.	Non-significant
	Noise, vibration and light spill associated with construction related operations including earth movement.	Disturbance leading to avoidance of key habitats for foraging leading to some displacement of population. This effect would be short-term over the duration of the construction period, reversible and negative.	Non-significant
Breeding birds	Construction related activities, including vehicle movement and vegetation clearance throughout the Proposed Development.	Direct mortality and disturbance due to vegetation and site clearance/preparation works if carried out during the breeding season. Short-term but significant effect due to habitat loss and disturbance caused by construction.	Significant
INNS	Transfer of INNS during construction	Reduction in biodiversity through loss of habitat, reduction in species-richness and a loss of	Significant

Ecological Feature	Impact	Effect	Significance
		species which the habitat(s) support. Long-term, irreversible (without management) and likely. With the potential for the effects to spread beyond the scope of the initial impact area.	
Operation			
AWI	Loss of AWI under the footprint of the Proposed Development.	A small area of AWI will be lost under the water treatment facility and a very small amount under the south eastern corner of the Proposed Development. The highly modified nature of the site has resulted in the habitat in these areas being previously impacted with no woodland cover now remaining. The habitat is now dominated by bare ground and gorse scrub (Photograph 11.3).	Non-significant
Otter	Increase in vehicle movements on site.	Direct mortality of individuals from vehicle collisions. This effect would be permanent and negative. Given that the majority of otter activity occurs along the shoreline away from access routes within the site this is unlikely to occur in sufficient numbers to affect the wider population. However, mortality of otter poses risks of breaching the Conservation (Natural habitats &c.) Regulations 1994 (as amended in Scotland) if not mitigated.	Non-significant
	Increase in vehicle movements and human activity.	Disturbance of an EPS leading to its avoidance of foraging habitat. This would be permanent, however it is not considered that any disturbance to foraging habitats would occur at a level to cause declines in population. Known resting sites are situated more than 30m from the Proposed Development. It is not therefore considered that any disturbance would occur to these.	Non-significant
	Loss of habitat due to placement of excavated material at the western end of the existing settlement pond.	Loss of an area of freshwater habitat (western end of existing settlement pond) used by otter most likely as a feeding and cleaning resource. Only a small proportion of the pond will be lost and a large area of the settlement pond will remain available to use by otter. This would be a permanent and negative impact.	Non-significant
	Severance of habitat between the shore and freshwater pond by the Proposed Development.	Fragmentation of connecting terrestrial freshwater habitats leading to increase in barriers to movement and reduced access to	Significant

Ecological Feature	Impact	Effect	Significance
		resources for the species within the catchment. This effect would be permanent and negative.	
INNS	Construction impacts only		

Photograph 11.3 : Location of proposed water treatment facility showing dominance of bare ground and gorse habitat.

11.6 Mitigation Measures

As noted in **Section 11.3** (Methodology), mitigation will follow a hierarchical approach to mitigation design, in the following order (CIEEM, 2016; SNH, 2013; Scottish Government, 2013a):

- avoid adverse impacts in the first instance;
- where avoidance is not possible, reduce the adverse impacts through mitigation; and
- where significant adverse residual impacts remain, measures to offset the adverse impacts at a site-specific level may be required (compensation).

This section outlines mitigation measures proposed to avoid, reduce or offset the potential adverse effects of the Proposed Development on biodiversity and nature conservation in accordance with best practice guidance and UK, Scottish and local government environmental impact, planning and sustainability policies.

The proposed mitigation is designed to produce a net gain for biodiversity where practicable in line with policy and guidelines (CIEEM, 2016). It has also been designed to deliver biodiversity objectives including, but not limited to:

- Highland BAP (Highland Environmental Forum 2015);
- Skye and Lochalsh BAP (Skye and Lochalsh Biodiversity Group 2004); and
- Highland-wide Local Development Plan Strategic Environmental Assessment (THC, 2015).

It is expected that all non-significant impacts would be mitigated through the application of best working practice (e.g. mitigation of potential dust pollution impacts through adherence to standard best practice and guidelines, such as dust suppression methods on site as set out in **Table 11.3**). Significant ecological impacts are expected to be mitigated through a combination of best practice/typical mitigation methods **Table 11.3**.

Mitigation measures listed in this ES will be specified as environmental commitments in the contract documents to ensure implementation by the appointed Contractor.

11.6.1 Ecological Clerk of Works (ECoW)

A suitably qualified (or team of suitably qualified) Ecological Clerk of Works (ECoW) will be employed by the Contractor to supervise the construction works, undertake pre-construction surveys for protected species in the areas affected by the Proposed Development and ensure mitigation measures are implemented to avoid and reduce impacts on ecological features.

11.6.2 Construction Environmental Management Plan (CEMP)

A Construction Environmental Management Plan (CEMP) will be produced by the construction contractor. The CEMP will set out the intended methods of effectively managing potential environmental impacts resulting from construction of the Proposed Development. It will contain specific environmental objectives, environmental risks and the proposed mitigation such as dust and soil management, storage of chemicals and use of SEPA PPG's (SEPA, 2003). It will also contain, where relevant, method statements as a means of controlling environmental risks including biosecurity maintenance.

11.6.3 Species Protection Plans

Species Protection Plans will be prepared for EPS (and other species as determined by the ECoW) by the contractor as part of the CEMP developed from the environmental commitments identified in this ES (**Table 11.3**). The Species Protection Plans will be prepared to ensure that essential mitigation strategies required for safeguarding protected species are implemented as part of the contract, and will be updated as appropriate if any derogation licences are identified as being required following further surveys.

Some Species Protection Plans and derogation licences, may be required to avoid potential breaches of conservation legislation arising from mortality, destruction of resting sites, or disturbance, even if these effects are not of a magnitude to be ecologically significant.

11.6.4 Mitigation Items

Mitigation is described below in **Table 11.3**. Construction based impacts and associated mitigation are left clear with operational impacts and mitigation highlighted in grey.

It will be the contractual responsibility of the appointed Contractor to ensure that mitigation is implemented during the works and that all relevant licences, should they be required, are in place prior to commencement of works.

It should be noted that SNH consider ecological data acquired on EPS to have a limited time frame of up to eighteen months before becoming outdated.

Should the presence of any protected species within the study area change, additional mitigation may be required.

Although not taken forward through the impact assessment as waterbodies were assessed as of less than authority area importance, the pollution of waterbodies during construction should be taken in to consideration. This will be mitigated for with the implementation of best practice and standard guidelines such as the SEPA Pollution Prevention Guidelines (PPGs) (SEPA, 2003) (**Table 11.3**). The use of excavated material onsite has the potential to contribute to this pollution of watercourses during the construction phase. However, seeding and establishing a vegetated cover over the surface will mitigate the potential for this to continue on into the operational phase of the works by stabilising the substrate and preventing sediment loaded runoff.

Table 11.3 : Ecological Mitigation for Habitats and Species

Ecological Feature	Impact	Mitigation	Phase	Residual Impact
Construction				
AWI woodland	Pollution due to generation of dust during construction activities.	Dust management procedures will be detailed within the CEMP to prevent adverse effects such as the build-up of dust on trees and scrub vegetation. Measures will include: • minimising the size and duration of exposed ground and soil stockpiles; • dampening down construction areas and material stockpiles (especially when weather conditions are dry and windy); • use of cutting equipment that utilises water dust suppression (e.g. abrasive disc cutters); • significant material stockpiles to be enclosed as far as practicable; • concrete batching to be only carried out in enclosed or shielded areas; • enforcement of appropriate speed limits on haul roads; • implementing regular dampening down of unsurfaced site and access roads using water bowsers, particularly during dry, windy conditions; and • provision of wheel washing facilities at site exits.	Construction	Non-significant
Otter	Mortality or injury of individuals from construction related activities, including entrapment and vehicle movements.	• All trenches, holes and pits will be kept covered at night or provide a means of escape for mammals that may become entrapped. • Temporary mammal resistant fencing will be provided around construction compounds following a specification agreed through consultation with SNH. • Compound gates will be sensitively designed to prevent mammals from gaining access to compounds and will be closed at night.	Construction	Non-significant
	Disturbance due to noise, vibration and light spill associated with construction related operations including earth movement. Loss of potential holt due to temporary jetty works, including dredging.	• Species Protection Plans for EPS and other species of conservation interest will be created by the Contractor in consultation with SNH; plans will be updated and amended as required during the construction programme. • Pre-construction surveys for protected species under the footprint of the Proposed Development plus a buffer of at least 50m (or as determined in the Species Protection	Pre-construction Construction	Non-significant

Ecological Feature	Impact	Mitigation	Phase	Residual Impact
		Plans) will be undertaken: ○ surveys will inform the need for any protected species licences required and/or any additional measures to be undertaken by the Contractor to obtain the necessary licences; and ○ locations of protected species will be communicated to construction staff in strict confidence to ensure no direct mortality of protected species during site clearance, and allow for the Proposed Development of additional mitigation should it be required. • A lighting plan will be developed for low light conditions and during the hours of darkness. The use of construction lighting will be in accordance with BS 5489 requirements and applicable guidance on lighting (e.g. Institute of Lighting Engineers (2011)). This will include, but is not limited to: ○ avoidance of working during the hours of darkness where possible; ○ the use of directional lighting; and ○ preventative measures (e.g. installation of shields, hoods or limiting the height of lighting columns).		
Pine marten	Mortality or injury of individuals from construction related activities, including entrapment and vehicle movements.	See for otter above.	Construction	Non-significant
	Noise, vibration and light spill associated with construction related operations including earth movement.	See for otter above.	Construction	Non-significant
Breeding birds	Mortality and disturbance due to construction related activities, including vehicle movement and vegetation clearance throughout the Proposed Development.	• Vegetation clearance will be undertaken outwith the bird breeding season (typically March to August inclusive) where applicable and practicable. • Where clearance must be undertaken during these times, pre-works checks will be undertaken to identify active nests no more than two days prior to tree felling works. If found, clearance must be postponed until chicks have left the nest. • Checks will be made for the presence of ground nesting birds prior to commencement of works (including the movement of excavated material along the shore). • Any methods required to exclude and deter birds from breeding in working areas will be	Construction	Non-significant

Ecological Feature	Impact	Mitigation	Phase	Residual Impact
		developed in consultation with SNH and implemented ahead of the breeding bird season. • All cleared material will be rendered unsuitable for nesting birds or removed from the works area.		
INNS	Transfer of INNS during construction	An Invasive Species Plan will be incorporated into the CEMP. This will include measures to prevent the spread of invasive species that will be implemented during construction.	Construction	Non-significant
Waterbodies	Pollution from sediment loaded run off during construction	The Contractor will be required to abide by SEPA Pollution Prevention Guidance notes (PPGs): • during construction, the contractor will abide by SEPA PPG 1, 3, 5, 6, 21 and 22 (SEPA, 2003); • surface and foul water will be appropriately drained and stored. These control measures must be in place before earthworks commence; • chemicals, oils and fuels will be kept safely stored and away from drainage systems and waste will be appropriately managed; • plant and machinery must not be fuelled in the vicinity of drainage systems; and, • emergency procedures and spillage kits must be available and construction staff must be familiar with emergency procedures.	Construction	N/A
Reptiles	Animal welfare issues during vegetation clearance.	Habitat clearance in areas where reptile presence has been confirmed during pre-construction surveys will be conducted in stages under the direction and supervision of an ECoW.	Construction	N/A
Operation				
AWI Woodland	Loss of AWI under the footprint of the Proposed Development.	No mitigation is proposed as this habitat has already been significantly modified due to previous works on the site.	Operation	Non-significant
Otter	Mortality of individuals due to increase in vehicle movements on site during operation.	Use of signage and site speed limits will raise awareness of otter within the area and minimise the potential for collisions with vehicles.	Operation	Non-significant
	Loss of habitat due to placement of excavated	The quality of the retained area of settlement pond as a feeding and cleaning resource for otter	Operation	Non-significant

Ecological Feature	Impact	Mitigation	Phase	Residual Impact
	material at the western end of the existing settlement pond.	should be maintained.		
	Severance of habitat between the shore and freshwater pond by the Proposed Development during operation.	Retention of an appropriate access route between the shore line and the freshwater pond should be retained to allow access by otter. The design and creation of new culverts will take into account the relevant guidelines in relation to otter connectivity.	Construction Operation	Non-significant

11.7 Residual Impacts

Potentially significant construction impacts on breeding birds and spread of INNS are anticipated to be fully mitigated through the proposed vegetation clearance/management and breeding bird checks, and by implementation of an Invasive Species Plan as set out above and in **Table 11.3**. Non-significant construction impacts on otter, pine marten, reptiles and AWI will also be further reduced through implementation of measures to avoid: entrapment in excavations; disturbance due to lighting; avoidance of mortality; and dust management procedures. Where identified as necessary in pre-construction surveys, the loss of an otter holt may require appropriate compensation, as defined in consultation with SNH through the EPS derogation licensing process. No significant operational impacts are predicted, but best practice mitigation will help retain safe access routes for otter across the site.

There are no significant long-term residual impacts on ecological features predicted, provided that there is successful implementation of proposed mitigation measures which include adherence to environmental plans such as the CEMP and Species Protection Plans.

11.8 Difficulties Encountered in Compiling Information

It is assumed that the Phase 1 habitat survey and targeted otter survey undertaken by Dr Mary Elliot were undertaken in accordance with current relevant guidance and to a suitable standard to support this planning and marine licence application. The Phase 1 survey was only undertaken around the Proposed Development and does not include a survey buffer zone surrounding it. However the only likely effects pathway which may affect habitats within the vicinity of the Proposed Development would be through the deposition of dust pollution and this is currently mitigated for (**Tables 11.2 and 11.3**).

11.9 Cumulative Impacts and Impact Interrelations

No cumulative impacts are anticipated between the Proposed Development and any other proposed or consented schemes within the surrounding area.

11.10 References

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