Volume 5: Appendix 3.2 General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs)

VOLUME 5, APPENDIX 3.2: GENERAL ENVIRONMENTAL MANAGEMENT PLANS (GEMPS) AND SPECIES PROTECTION PLANS (SPPS)

VOLUME 5, APPENDIX 3.2: GEMPS AND SPPS

General Environmental Management Plans

Species Protection Plans

Other

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-510

Environmental

General Environmental Management Plan (GEMP) – Oil Storage and Refuelling

TG-NET-ENV-510	General Environmental Management Plan (GEMP) – Oil Storage and Refuelling		Applies to Transmission ✓
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Approved by	[redacted]	Head of Consents and Environment

Contents

1 Introduction

1.1 Oil and fuel, inappropriately used, stored or disposed of, can give rise to pollution of the environment.

1.2 Oil and fuel can be released into the environment through:

- Spillages during delivery or use
- Spillages during refuelling operations
- Loss during attempted theft or vandalism
- Spillages from hose bursts
- Spillages from mechanical failure of plant and their components
- Inadequate or damaged storage facilities, or
- Being poured directly to drains or gullies or being burned.

1.3 Petrol, diesel and oil are all highly harmful to plants, animals and humans. If pollution is caused, prosecution may follow. The resultant cost of clean-up and legal proceedings following an incident is likely to far exceed the cost of putting proper control measures in place.

2 References

The documents detailed in Table 2.1 – Miscellaneous Documents, should be used in conjunction with this document.

Table 2.1 – Miscellaneous Documents

Reference	Title
https://www.sepa.org.uk/media/dw5de0kh/car-a-practical-guide.pdf	SEPA The Water Environment (Controlled Activities) (Scotland) Regulations 2011
CIRIA (2006) C648 - Control of water pollution from linear construction sites – Technical Guidance	Control of Water Pollution from Linear Construction Sites
https://www.hse.gov.uk/cdg/commonproblems/bowsers.htm	Bowser Regulations
https://www.gov.uk/government/publications/carriage-of dangerous-goods-guidance-note-23	Transporting Diesel, Petrol or Kerosene by Road
Ciria C741	Environmental Good Practice on Site Guide (fourth Edition)

3 Legislation

3.1 The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) apply to any kind of oil including petrol, diesel, mineral oil, heating oil, lubricating oil, waste oil, vegetable and plant oil (except uncut bitumen) stored above ground at premises such as construction sites.

3.2 The relevant provisions of Waste Management Licensing Regulations 1994 (as amended) also apply to handling and storage of waste oil.

3.3 The carriage of diesel, kerosene and petrol by road is regulated by The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG 2009), as amended.

3.4 Petrol, diesel and oils are also covered under the Control of Substances Hazardous to Health Regulations 2002 (COSHH Regs) and need to be stored and used in compliance with these also.

4 General Compliance Requirements

4.1 General

4.1.1 Compile a protocol for oil and fuel storage & operations on site, including but not limited to, bulk fuel delivery procedure, refuelling procedure, fuel storage inspections (including spill kit & plant nappy provision and condition) & emergency response procedures.

4.1.2 All those undertaking, or involved in, refuelling operations should be nominated on the project as Refuelling Marshals and trained in the approved refuelling procedure.

4.1.3 Suitably sized and fully stocked spill kits of the appropriate type are to be located and maintained at all oil & fuel storage locations, refuelling locations and in all site vehicles. Consider the nature of surrounding area when specifying and checking spill kit contents to ensure they provide suitable materials and modify contents accordingly e.g. include floatation bunds if works are near watercourses or, consider inclusion of absorbent granules, shovel and impermeable sheet if the ground is very free draining. Provide suitably labelled plastic sacks for disposal of contaminated wastes arising from used spill kits.

4.1.4 Used spill kit materials should be removed as Special Waste. Stocks of spare material are required to be held on site to ensure restocking and replacement can occur in a timely manner.

4.1.5 Plant nappies must be available at all refuelling locations for use during refuelling procedure.

4.1.6 Where a plant nappy is of two part design the use of plant nappy liners without plant nappy base, or plant nappy base without liner, is not acceptable as their performance will be compromised.

4.1.7 All oil loss events such as spillages, hose bursts etc must be reported in line with Scottish and Southern Electricity Networks (SSEN) reporting procedures.

4.2 Deliveries & Storage

4.2.1 Oil and fuel storage areas should be clearly designated and shown on site layout and drainage plans, clearly presented on site and briefed during site inductions. Tool Box Talks are to be used to communicate changes and periodically remind operatives on oil and fuel storage, refuelling procedures and emergency response requirements.

4.2.2 The following will be considered as a minimum when identifying the location for fuel storage:

- Maintaining a minimum of 30m from sensitive environmental receptors such as surface waters, surface drainage systems, wetlands, Groundwater Dependent Terrestrial Ecosystems (GWDTEs), drinking water or private water supply catchments.
- Fuel stores must be sited away from where they could be hit by moving vehicles and plant whilst ensuring ease of access to proposed storage area for oil deliveries / refuelling.
- Ensuring suitability of ground conditions e.g. can the area be protected against flood damage / inundation / subsidence.
- Use existing oil interceptor facilities, bunded storage areas or suitable areas of hardstanding, and
- Locate areas to prevent risk of theft or vandalism.

4.2.3 Clear signage should be provided at oil storage areas and designated fuelling areas.

4.2.4 Clearly identify any areas where fuelling or fuel storage is not permitted on site plans (e.g. within close proximity to watercourses). Where appropriate, consider additional signage highlighting and defining exclusion zones.

4.2.5 During delivery of fuel or oils by a supplier to site, the delivery vehicle must be supervised by a suitably trained Refuelling Marshal when on site. Volume and type of fuels delivered and stored on site should be recorded along with dates of delivery.

4.3 Fuel and Oil Storage Containers

4.3.1 All fuel or oil storage containers must:

- Adhere to all and any conditions of the Controlled Activities Regulations (CAR)
- Be of suitable type for that fuel or oil
- Be appropriately labelled identifying the contents
- Be of enough strength and structural integrity to ensure that it is unlikely to burst or leak in its ordinary use

- Be maintained in good condition
- Not filled beyond design capacity
- Be impermeable to oil or water, and
- Positioned, or other steps taken, to minimise any risk of damage by impact so far as reasonably practicable.

4.3.2 Storage of fuel or oils within 50 gallon / 200 litre drums is not permitted on site. Where waste oil is stored in this equipment it should be for minimal duration and the drum should be placed within a suitably sized bund.

4.3.3 For fuel storage containers of 200 litres or greater these must be checked for compliance with General Binding Rule 28 of the Controlled Activity Regulations, and locked when not in use to prevent unauthorised use and potential spillages arising from such use.

4.3.4 Secondary containment or bunds are required where storage of oil or fuel is within containers over 200 litres. This secondary containment must be checked and maintained regularly, with any liquid or materials within emptied / removed and suitably disposed of to retain required volume.

4.3.5 The storage of oil or fuel in a portable container with a capacity of less than 200 litres must:

- Be securely sealed when not in use so as to contain the fuel in event of tipping of the container
- Be secured during transit within a vehicle so as not to slide, tip or otherwise be put at risk of damage
- Where being stored for any period longer than a day between use, be placed within suitable bunded Control of Substances Hazardous to Health (COSHH) containment when not in use, and
- When not stored within a bunded COSHH container, the container should be stored securely on a plant nappy, away from any sensitive receptors such as watercourses.

4.4 Refuelling

4.4.1 The following must be adhered to for refuelling operations:

- Refuelling operations are to be included within the preparation of a protocol for oil and fuel storage & operations on site
- Undertake refuelling at appropriately sited and set up designated refuelling bays
- Where this is not possible for operational reasons, refuelling should not be undertaken within 30m of surface waters and should follow the above guidance regarding location of any fuel related activities
- Suitably sized spill kits must be easily accessible for all re-fuelling operations and drip trays / plant nappies used during refuelling operations to catch drips and splashes.

4.5 Construction Plant

4.5.1 Plant nappies should be placed under stationary plant and equipment such as oil powered pumps, generators, winches, hydraulic presses, compressors, lighting rigs (where these items are not "integrally bunded"). Hydraulic powered plant such as presses, winches or tensioners may require additional mitigation such as further plant nappies or impervious drip trays.

4.5.2 Whilst plant nappies do not provide significant containment capacity, they are easier to manage than impervious drip trays which require increased maintenance to ensure rain water is not contaminated and require to be regularly emptied of rainwater to ensure effectiveness.

4.5.3 Static plant should be located at least 30m from any watercourse (or other identified sensitive receptor). Where it is not possible, mitigation should be put in place to reduce the risk or impacts of a pollution incident occurring (including additional capture methods for losses, increased inspection visits of the plant or placement of oil booms).

4.5.4 Plant nappies are to be placed under mobile plant on site when parked up and operative is not within plant, for example during breaks, overnight or longer periods. A plant nappy will be assigned to each piece of plant and placed under the area of the plant considered the greatest risk, for example this may be under the engine bay (if unbunded) or under the hydraulic pumps or flexi hoses. Stones maybe placed on the plant nappy to prevent it being blown away in strong winds.

4.5.5 Plant nappies should be regularly inspected as part of plant pre-use checks and during other site inspections and should be replaced (or their liners replaced) when deterioration and/ or contamination is evident.

5 Revision History

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01	New Document Created	N/A	1.00	[redacted]
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Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-511

Environmental

General Environmental Management Plan (GEMP) – Soil Management

TG-NET-ENV-511	General Environmental Management Plan (GEMP) – Soil Management		Applies to
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Approved by	[redacted]	Head of Consents and Environment

Contents

1 Introduction

1.1 Soil is a precious resource and can provide the following functions:

- Supports a diverse ecological system and provide the growing medium for habitats, crops and timber;
- Provides a carbon sink and plays an important role in carbon sequestration;
- Absorbs rainfall, delaying its movement into watercourses; and
- Filters or transforms chemicals that pass through it, preventing them from ending up in water or air.

1.2 Any damage to soil quality affects the long-term functioning of the soils and has an impact not only on ecological diversity, performance and visual amenity, but can have impacts off-site such as on flooding, aquifer recharge and water quality.

1.3 It is therefore essential that impacts to the resource are reduced to the minimum necessary for the works and that all work is undertaken in accordance with best practice. The methods of stripping, storage, reuse and disposal of soil can have significant impacts on both the soil resource and other environmental receptors.

2 General Compliance Requirements

2.1 General Principles of Soil Management Process

2.1.1 All stripping should follow this process, except in agricultural fields whereby the method should be informed by landowner requirements, or where archaeological concerns exist and smooth buckets maybe preferable:

- Turves stripped to 300mm using large toothed bucket;
- Turves to be stored vegetation side up and watered if drying out;
- Any remaining topsoil and all subsoil layers to be removed and stored separately;
- Label stored soils with source of origin and material type if to be left for periods more than a month;
- If soil storage bunds to be left for duration of 6 months or more, consider placing top soil layer on subsoil bunds;
- Subsoil, topsoil and turves are to be replaced in same order as removed;
- Turves to be reinstated vegetation side up, and spread in a mosaic pattern if there is a shortfall;
- The toothed bucket should not be used to smooth over the excavation as it results in greater initial damage and slower recovery of the vegetation in the long run.

2.2 Stripping

2.2.1 Plan soil stripping carefully in advance.

2.2.2 Check whether the project archaeologist should be on site during the soil stripping.

2.2.3 Check all necessary pre-construction surveys have been completed prior to stripping (e.g. preconstruction protected species surveys in line with Species Protection Plans).

2.2.4 Follow all identified mitigation requirements for the location and method of stripping.

2.2.5 Where possible, strip soil during drier periods. Do not strip soil during periods of very heavy rainfall.

2.2.6 Soil stripping should only be undertaken in manageable sections, to minimise open excavations, maximise chance of effective reinstatement and allow the installation of suitable silt mitigation (where necessary) for the area being stripped.

2.3 Storage

2.3.1 Topsoil should be stripped and stored within the pre-identified and agreed areas to ensure safe storage and swift and successful reinstatement.

2.3.2 If soil storage is being carried out on sensitive habitats, consideration should be given to storage on top of a geotextile mat with duration of storage minimised.

2.3.3 Topsoil must not be mixed with subsoil or other layers with a requirement for separate storage areas for each.

2.3.4 Record and 'signpost' where all removed soils are stored including the different subsoil layers (this is important as individual subsoil layers should be reinstated in the order in which they were removed).

2.3.5 If the storage is likely to be for an extended period (for example >6 months) it may be appropriate to store topsoil layered on top of subsoil bunds. Underlying turves (and topsoil) at the storage location should be removed in advance with turves stored on surface of the bund.

2.3.6 Soil storage areas should be located away from watercourses (minimum 10m) and protected from run-off from adjacent areas.

2.3.7 Storage bunds should be designed so the material is stable and unlikely to slip, slide or slump. Consider the risk of any adjoining topography, (e.g. avoiding storing soils near steep slopes or banks, or in areas at high risk of flooding).

2.3.8 Best practice should be applied in order to minimise the amount of compaction or other disturbance of the general structure of the superficial deposits.

2.3.9 Other site works should not impact on stored soil (e.g. Construction traffic must not track over stored soils).

2.3.10 Careful planning of storage areas and required works must be undertaken to avoid multiple handling of stored material and moving of stockpiles.

2.3.11 The surface of material storage bunds (not turfed as detailed above) can be smoothed with bucket to aid surface water run off to reduce potential for erosion. If significant soil erosion is occurring from storage piles during periods of heavy rain, consideration should be given to covering the stockpiles with terram or other suitable material.

2.3.12 Seeding of soil storage bunds should not be undertaken in areas of sensitive habitats and should only be undertaken with agreement of landowner, but may help stabilise bunds if required to be in place for extended period. Consider an enhanced seed mix (with native wildflower for example) to give a temporary biodiversity benefit.

2.3.13 Noxious weed growth or Non-native invasive species on soil storage bunds must be treated/ controlled or otherwise removed. Seeding bunds may help hinder noxious weed establishment.

2.3.14 In periods of dry weather check the need for dampening down to reduce dust and potential nuisance.

2.3.15 If any stored soil is contaminated it should be managed in accordance with the Contaminated Land GEMP.

2.3.16 After removal of stored material, storage areas should be reinstated to the pre-existing condition.

2.4 Reinstatement

2.4.1 Reduce risk of soil storage being constrained by nesting birds through implementation of nesting bird deterrents/ programming reinstatement works outwith nesting bird season. Ensure soil stores are surveyed for nesting birds/ protected species in line with Species Protection Plans (SPPs).

2.4.2 Stripped soil should be reinstated as close to where it was removed as possible. This will help to maintain a local seed base and the local geological/ hydrological characteristics.

2.4.3 Unless otherwise agreed, turves should be reinstated following the works and orientated vegetation side up.

2.4.4 Where turves are not available, areas would be left to revegetate naturally unless circumstances dictate otherwise, e.g. where vegetation is unlikely to establish within a reasonable timescale, or where a Habitat Management Plan/ BNG commitment specifies. Any seeding or replanting must be agreed in advance, including details of seed mixes and management regimes. Other techniques maybe more appropriate depending on the habitat to be reinstated.

2.4.5 The reinstatement of the construction area is to be undertaken to a high standard, using the existing soil and vegetation material wherever possible, in accordance with best practice.

3 Revision History

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01	New Document Created	N/A	1.00	[redacted]
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Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-512

Environmental

General Environmental Management Plan (GEMP) – Working in or Near Water

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Contents

Scottish & Southern Electricity Networks
TRANSMISSION

1 Introduction

1.1 Construction activities in or near water have the potential to cause serious pollution or impact on the bed and banks of a watercourse and on the quality and quantity of the water.

1.2 Engineering works can cause damage to the habitat within rivers, lochs and wetlands, with associated impacts on invertebrates, plants, birds and mammals. Engineering works can also block the passage of migrating fish and damage spawning habitats during sensitive times.

1.3 Major causes of environmental harm associated with working in or near watercourses include:

- Silt e.g. disturbance of river bed or bank, dewatering and pumping of excavations, run-off from exposed ground, plant washing, roads and river crossings;
- Cement and concrete – which is very alkaline and corrosive and can cause serious pollution;
- Chemicals and solvents – oil storage, refuelling, trade materials etc;
- Herbicides – aerial and non-aerial applications; and
- Waste materials (including special waste) e.g. oily wastes, spent acids and solvents.

2 References

The document detailed below in Table 2.1 - Scottish and Southern Electricity Networks Documents, should be used in conjunction with this document.

Table 2.1 - Scottish and Southern Electricity Networks Documents

Reference	Title
SM-NET-ENV-500	Consents and Environment Manual

3 Legislation

3.1 There are a number of activities which pose a risk to the water environment including:

- Discharges to the water environment;
- Abstractions; and
- Physical works within, and in proximity to, controlled waters.

3.2 The Water Environment (Controlled Activities) (Scotland) Regulations 2011 – more commonly known as the Controlled Activity Regulations (CAR) sets out authorisations that are required for different activities in or near the water environments (including rivers, lochs, estuaries and groundwater).

3.3 Levels of CAR authorisation include General Binding Rules (GBR), Registrations and Licences.

3.4 A Construction run-off licence is required for any project that:

- Exceeds 4 hectares in area;
- Contains a road or track length in excess of 5km;
- Includes any area of more than 1 hectare that has a slope more than 25 degrees; or
- Includes any road (or track) with a length greater than 500 metres that has a slope more than 25 degrees.

3.5 Large and complex construction project run-off licence may be required for project that undertake one or more controlled activities(including the discharge of water run-off from a construction site to the water environment) and are:

- A project (or part of a project) that is a National Development, as identified in the National Planning Framework; and/ or
- A linear project greater than 25km in length.

4 General Compliance Requirements

4.1 General

4.1.1 Plan all works in accordance with best practice.

4.1.2 Ensure all necessary authorisations under the Controlled Activities Regulations (CAR) are in place.

4.1.3 Identify all activities that will be undertaken in or near watercourses (including all identifiable drainage paths).

4.1.4 Avoid works within 10m of a watercourse unless no other practical options exist and leave a vegetated buffer strip.

4.1.5 Where works are undertaken within 10 m of any watercourse or drain, ensure specific pollution prevention controls are in place.

4.1.6 Communicate risks associated with working in or near watercourses to all personnel and include control measures in the site-specific construction method statements.

4.1.7 Keep site tidy and do not store materials too close to watercourses or surface water features.

4.1.8 Ensure that all watercourses are routinely monitored for changes in water quality and keep a written record of monitoring. If water quality deteriorates, stop works, identify the source of the problem and implement appropriate mitigation measures. Ensure any potential pollution incident is reported in line with procedures, including to SSEN Transmission.

4.2 Watercourse Engineering

4.2.1 Seek to avoid or minimise watercourse engineering works wherever possible.

4.2.2 Vehicles should not work within the water unless no other reasonable options exist.

4.2.3 All construction machinery operating in-stream should be mechanically sound to avoid leaks of oils, hydraulic fluid, etc.

4.2.4 Machinery should be thoroughly cleaned and checked prior to commencement of in-stream works.

4.2.5 All reasonable steps shall be taken to prevent the transport of sediments or other matter disturbed by the works.

4.2.6 Ensure all required pre-construction surveys have been completed before starting works (these will include, where appropriate, fresh water pearl mussels, otter, water vole).

4.2.7 Check if there are any timing restrictions to works because of protected species (e.g. spawning salmonids, otter, water vole etc) or landowner commitments.

4.2.8 Any temporary dams used should be designed to accommodate periods of high watercourse discharge and dried out sections of bed should be check for stranded fish. Any stranded fish or other wildlife must be immediately translocated to suitable nearby habitat.

4.2.9 Pumps should also be fitted with screens to prevent fish mortalities and ingress of debris, and the outfall to pumps be designed to prevent erosion of the receiving waters (i.e. by dissipating the flow). Back up pumps should be available.

4.2.10 Where stock has access to the works fencing may be necessary to allow the regeneration of native riparian and aquatic marginal vegetation.

4.3 Surface Water Control

4.3.1 Locate areas of high-risk activities away from watercourses and drainage paths. Areas of high risk include:

- Fuel and chemical storage;
- Refuelling areas;
- Material stockpiles;
- Vehicle and equipment washing areas;
- Site compounds / parking areas.

4.3.2 Minimise the volume of contaminated run-off being created by:

- Diverting clean surface water away from areas using cut-off drains, catch pits and bunds (where necessary these can be lined);
- Do not allow water to drain down the length of a haul road. Roads should have adequate cambers to shed water quickly and if necessary cut-off drains installed across the road;
- Minimise erosion of exposed soils and working areas;
- Reduce the exposed working area through phased construction;
- Reinstate exposed soil as soon as practical;
- Roughen exposed surfaces to reduce rate of water run off;
- Prevent water from leaving site prior to treatment;
- Ensure adequate buffer zones are identified between working areas and surface waters;
- Diversion drains should be used to catch sediment laden run-off and direct it to treatment facilities such as settlement ponds (where necessary these can be lined), silt fences (not to be installed in watercourse), settlement tanks etc (see CIRIA C6848);
- Maintain all mitigation measures regularly to ensure their effectiveness;
- Depending on the level of contamination, silty water can be pumped over land to filter through vegetation and infiltrate into the ground provided it is carried out in line with the CAR regulations. An appropriate buffer distance must be maintained to allow sufficient distance for the vegetation to filter the silty water prior to reaching a watercourse;
- Ensure construction works minimise disturbance to the current run-off regimes.

4.4 Vegetation Removal

4.4.1 Trees and shrubs should not be removed without agreement.

4.4.2 Avoid un-necessary vegetation removal.

4.4.3 Where necessary leave a vegetated buffer distance of 10m between works and a watercourse.

4.4.4 Only break the ground surface when works are required and initiate a phased approach.

4.4.5 Comply with agreed buffer zones of vegetation as this will allow further treatment of surface water.

4.4.6 Do not dispose of cleared vegetation into the watercourse and avoid debris from clearance.

4.4.7 Vegetation removal can impact on bank stability and increase erosion. Ensure that all banks are restored to a condition prior to works commencing and assess what further protection may be required.

5 Revision History

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Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-513

Environmental

General Environmental Management Plan (GEMP) – Working in Sensitive Habitats

	Name	Title
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Contents

1 Working in Peatland and Sensitive Habitats

1.1 Introduction

1.1.1 This General Environmental Management Plan concentrates on sensitive habitats associated with Peat, Blanket Bog, Wet Heath and Dry Heath habitats.

1.1.2 Section 3 of this General Environmental Management Plan includes guidance specific to peat management and the preparation of Peat Management Plans where on-site activities impact on peat. Site specific measures should be developed before construction begins at any location where working in peat is a constraint.

1.2 Legislation

1.2.1 Sensitive habitats may include those Scheduled under Annex 1 of the Habitats Directive. The Habitats Directive is more formally known as Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, a European Union Directive adopted in 1992. Sensitive habitats may more widely be defined as habitats where additional care is required to avoid permanent damage or to reinstate to the previous condition.

2 General Compliance Requirements

2.1 General

2.1.1 Whilst working within sensitive habitats or peatlands follow best practice from NatureScot and SEPA.

2.1.2 When working in areas with sensitive habitats, the hierarchy of avoid, minimise, mitigate, and manage must be applied.

2.1.3 Where possible areas of development such as cable routes, access tracks and tower positions, as well as permanent/ temporary compounds or laydown areas, should be micro-sited within permissible limits to avoid and minimise impacts on areas of sensitive habitat and areas of deep peat.

2.1.4 Stripping areas of sensitive habitat and peatland should be kept to an absolute minimum and done in consultation with the environmental representative.

2.1.5 During planning and implementation consider how the site will be restored or reinstated on completion of the works.

2.1.6 Ensure adequate corridors / areas are allowed for water management and reinstatement works which may include sourcing donor material from adjoining areas in some instances.

2.1.7 Consider effects of local hydrology factors (drainage, watercourses, flushes, bog pools, peatlands, etc.) on established habitats and seek to maintain hydrology regimes during the works.

2.1.8 If hydrological impacts cannot be avoided, or significantly mitigated through design and implementation, ensure hydrological connectivity is re-stablished as soon as possible. Ensure developed or reinstated areas do not form preferential drainage.

2.1.9 Areas where rain water has been flowing over the ground surface should be identified in advance of works.

2.1.10 Design drainage channels or pipe systems to conduct water across cable trenches (or areas where tracks have been removed and ground reinstated). This will minimise post-construction damage and to allow better opportunities for re-vegetation and successful reinstatement. Any drainage pipes should be removed once vegetation and stabilisation of original drainage has been established. All temporary materials used for mitigation / drainage purposes during development must be removed on completion.

2.1.11 Undertake post-installation / restoration inspections to identify any areas where surface water flow is causing soil erosion.

2.2 Access

2.2.1 Access across sensitive habitats must be done as efficiently as possible, avoiding unnecessary movements back and forth.

2.2.2 Agree an Access Strategy and details of all access routes with the environmental representative ahead of works, avoiding impacts on peatland or sensitive habitats as far as possible. Where All Terrain Vehicles (ATVs) are used for multiple trips where there is no formally constructed access track, consider changing access route if ground shows evidence of becoming damaged (avoiding sensitive habitats), rather than repeated use of one route that subsequently requires more significant reinstatement / restoration. Any alternative route must be agreed with the environmental representative/ ECoW in advance of being used.

2.2.3 Where no existing access tracks exist, seek to use temporary trackway solutions including trackway panels (e.g. Terrafirma Dura-Base or Trackway), timber log mats or bog mats when transiting sensitive habitats or peatlands. Where plant and terrain do not suit the use of temporary access panels type solutions, temporary floating stone roads may be needed.

2.2.4 Access across unprotected peatland, or other sensitive habitats, should be restricted to low ground pressure vehicles and plant only (i.e. suitable ATV, Argocat or Softrack, or wide spread tracked machines), and should avoid rutting. Any damage caused must be reinstated to a high standard on cessation of the works.

2.3 Access Track Construction

2.3.1 Design of works should avoid the potential for concentrated discharges of water onto the hill slopes. In particularly susceptible areas, the use of drainage ditches may be necessary upstream of the construction corridor (e.g. above access tracks). These should be installed following advice from hydrological specialists and in agreement with project environmental representative.

2.3.2 Ensure adequate cross track drainage is installed (temporary or permanent access tracks) through use of culverts at regular intervals, connecting track side ditches, minor watercourses and flow paths (where there may not be obvious watercourses) above the track to habitats beneath, ensuring hydrology is maintained as close to natural as possible. Increase frequency of cross track drainage where wetter habitats are transected by tracks, i.e. through peatlands, wet heath, flushes, etc. Avoid discharging track drainage ditch flow into watercourse crossings (maintain separate to cross track drainage).

2.3.3 Working in areas of peatland should be avoided, as far as practicable, during times of the year with the highest rainfall. Stripping of peat and reinstatement works should stop during periods of sustained heavy rainfall.

2.3.4 During the reinstatement of sensitive habitats, it may be necessary to utilise living donor turfs from land either side of the development and to rework acrotelm from land adjoining the works corridor to prevent formation of preferential drainage.

2.3.5 Across areas of deep peat, and other sensitive habitats, floating roads are generally preferable, especially where temporary. The formation of temporary access tracks should be underlaid with geotextile and geogrids. This should exceed the width of the track formation to avoid overspill of stone onto adjoining habitat and to assist in separation of the track construction materials from the underlying soils.

2.3.6 Where excavation is required, a tracked excavator should first remove turfs to a depth of 300 mm using as large a toothed bucket wherever possible. (This may not be appropriate where archaeological interest exists, and smooth buckets are specified).

2.3.7 Turfs, peat and subsoil should be stored separately in line with Soil Removal, Storage and Reinstatement General Environment Management Plan. Peat should be handled in line with any Peat Management Plan in place.

2.3.8 Turfs and soil should be stored to the side of the excavation. Where this is on good quality blanket bog, or other sensitive habitat, storage should be on top of a geotextile membrane.

2.3.9 Turfs should be stored root side down and should remain in the storage location until required for reinstatement (this is to avoid multiple handling and reduce the potential for turfs becoming unstable). If stored for longer drier periods, turfs may require watering to give vegetation the best chance of survival and improve eventual reinstatement chance of success. (Any water abstraction associated with this activity needs to be compliant with the Controlled Activities Regulations (CAR)).

2.3.10 Subsoil layers and peat layers should be reinstated in the order they were removed, and the turfs should be reinstated root side down, vegetative side up.

3 Peat Management

3.1 General Peat Management Requirements

3.1.1 In addition to the unique habitats provided by peatlands, areas of deep peat have a significant global role in carbon sequestration. Disturbing peat can release CO_2 to the atmosphere as the peat is oxidised when exposed to air or dried out. Through proper management of peat these impacts can be reduced.

3.1.2 It is important to ensure the hydrological regime of peatland is maintained and that peat is not left unprotected to avoid erosion and degradation. Avoid unnecessary drainage of peatlands. Any temporary cut off ditches should be back filled as soon as practical on completion of works.

3.1.3 Ensure that large loads do not compress peat and create a barrier to water movement which could cause ponding at one side of the corridor and drying out at the other, or cause peat slump by displacement.

3.1.4 A Peat Landslide Hazard and Risk Assessment (PLHRA) may be required by the project, and should be agreed prior to the construction phase. The PLHRA should be undertaken, and updated to reflect any changes, in line with Scottish Government best practice. Mitigations identified within the PLHRA must be followed.

3.1.5 Existing degraded peatland can often be stabilised or re-established to active peatland with minimal effort, and opportunities to undertake such works should be investigated where possible. For example, reprofiling of peat hags and blocking of drainage channels within peatlands.

3.2 Peat Management Plans

3.2.1 Where significant impacts on peat are identified, or where peat depth is greater than 0.5 metres, a site or project specific Peat Management Plan (PMP) may be required and should be agreed prior to the construction phase. The PMP must be developed with input from the environmental representative and may require stakeholder input.

3.2.2 In certain circumstances a PMP may be required as a condition of consent or as specified as a contract deliverable. In these circumstances the content must reflect that required by the consent or contract.

3.2.3 The Peat Management Plan, as a minimum, should:

- Include and adhere to principles set out in best practice and guidance notes from NatureScot and SEPA, including SEPA's guidance note WST-G-052 -Developments on Peat and Off-Site Uses of Waste Peat.
- Include detailed 1:25k/ 1:10k OS background-based plans with site location insets (1:50k OS mapping), detailing peat depth maps, highlighting areas of deep peat, storage areas and any areas suitable for restoration / reinstatement.

- Reference peat depth maps, identify how impacts on peat have been minimised and quantify types and volumes of peat anticipated to be disturbed by the project.
- Identify appropriate storage of peat for reuse (during reinstatement for example). In line with the Soil Removal, Storage and Reinstatement GEMP.
- Identify suitable areas for separate storage of excavated strata, including for example, turfs, peat and subsoil. It may also be appropriate to implement different management and storage strategies for the various strata of deep peat, including top vegetative layer and acrotelm, where fibrous living organic matter is still evident, separate to the catotelm, where the structure of the peat is more homogenous and loses its structure more easily
- Detail how the works have been planned to ensure minimal handling of peat. (In moving and reworking peat, the structure can easily be lost making storage and reuse more challenging). Turfs and other peat materials should be stored as close to origin as possible.
- Detail inspection regime to ensure peat is regularly checked for signs of drying out and detail planned measures to prevent this occurrence. (If drying out is occurring the storage areas may require to be sprayed with water. Any water abstraction associated with this activity needs to be compliant with the Controlled Activities Regulations (CAR)).
- Identify opportunities for reuse on and off site if required (in peatland restoration for example). Transport of peat significant distances must be avoided. Detail plans for reinstatement of stored material, including potential peatland restoration works. During implementation ensure that no bare (unvegetated) peat is exposed as this may take a long time to re-establish, and will be a high risk of degradation and erosion; and
- Include a water management strategy for minimising impacts of construction activities on the peatland.

3.2.4 The Peat Management Plan must be followed during the construction phase, with any required changes agreed as the project progresses. Changes may be required to be agreed with stakeholder such as local planning authority / SEPA.

4 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New Document Created	N/A	1.00	[redacted]
02	Reviewed and updated.	TG-NET-ENV-513 (Rev 1.00)	2.00	[redacted]
03				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-514

Environmental

General Environmental Management Plan (GEMP) – Working with Concrete

TG-NET-ENV-514	General Environmental Management Plan (GEMP)-Working with Concrete		Applies to Transmission ✓
Revision: 2.00	**Classification:** Internal	**Issue Date:** March 2024	**Review Date:** March 2026

	Name	Title
Author	[redacted]	Consents and Environment Manager
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Approved by	[redacted]	Head of Consents and Environment

Contents

1 Working with Concrete

1.1 Background

1.1.1 The chemical reactions that enable fresh concrete to cure are complex. A by-product of these reactions is the production of calcium hydroxide, a highly alkaline chemical that has a pH in excess of 12.

1.1.2 There are a number of sources of alkaline water on construction sites, which include:

- Concrete wash water from cleaning of machinery and tools used with fresh concrete – e.g. chutes, drums, pumps, hand tools
- Cutting or coring of concrete structures
- Hydro-demolition (high pressure water cutting)
- Surface water runoff from newly concreted areas
- The storage or use of Cement Bound Sand (CBS) in backfilling of cable works
- Leaching form installed cabling works utilising CBS backfill
- Crushed demolition materials, and
- Concrete installed below groundwater level (e.g. piled foundations)

1.1.3 The release of untreated highly alkaline water into the environment from any of the sources described above can have a significant environmental impact, including on the ecology of receiving waters. The following are potential impacts of concrete and cement born contamination if not properly treated:

- Increase in pH of the water environment to toxic levels
- Kill invertebrate and other aquatic life including plants
- Adversely impact on surrounding habitats
- Particles can impact the turbidity of receiving waters
- Smother the bed and kill aquatic life
- Block gills of fish
- Impact directly and indirectly protected species which may be present e.g. otters, freshwater pearl mussels, or salmon
- Increase flood risk or agricultural drainage by blocking of drains and other structures

1.2 Legislation

1.2.1 Under the Controlled Activities Regulations, it is on offence to discharge polluting substances to controlled waters (surface water and groundwater) without prior approval from the Regulator (SEPA). This includes any discharge of concrete/ cementitious materials or contaminated water.

2 General Compliance Requirements

2.1 General use

2.1.1 Concrete shall not be used within 10m of any watercourse or loch. Should there be the requirement to use concrete and cement within 10m of a waterbody, this should be fully risk assessed and agreed in advance of the works.

2.1.2 Store bulk and bagged cement and concrete additives at least 30 metres away from watercourses, gullies and drains in properly secured, covered and bunded areas.

2.1.3 Ensure dust from storage areas is controlled. Securely cover stockpiles of cementitious materials such as CBS with a tarpaulin, or non-permeable sheeting.

2.1.4 Ensure all staff are briefed on the potential environmental risks of working with concrete.

2.1.5 Ensure that any residue from cutting/ coring/ hydro-demolition activities is correctly contained and treated where necessary.

2.1.6 Consider the materials being used e.g. recycled concrete aggregate may cause elevated pH levels as a result of run-off.

2.1.7 Recirculating systems should be used where possible to minimise the use of water resources and reduce volume of high pH waters produced requiring treatment.

2.2 Washout

2.2.1 Areas should be established for concrete washout which avoid important habitats and species.

2.2.2 Surplus concrete should be removed from equipment by scraping before washing down in order to minimise the volume of water required.

2.2.3 All concrete wash water should be contained for treatment on site or disposal off site. None shall be allowed to enter any drains, ditches or watercourses or land.

2.2.4 Concrete wash waters should be returned to batching plant as a first option (suitable temporary storage in IBCs or similar would be acceptable.) Where this is not an option, special wash water treatment units should be used, such as Roadside Concrete Washouts (RCWs) or similar. These units should filter/ separate solids from the wash water, and allow for pH treatment through CO_2 diffuser, using citric acid or similar to achieve a more neutral pH.

2.2.5 Discharge of treated wash waters to ground or other receiving environment should only be permitted when agreed with SEPA. The SSEN Environmental Representative is to be copied into all correspondence with the regulator in this regard, and consulted in the first instance of the intent to contact SEPA.

2.2.6 Lined pits or lined skips are not acceptable, unless these can be fully demonstrated to be impermeable and a treatment/ removal procedure agreed. No overlapping plastic sheets can be relied on in their construction. Where more than one width of sheet is required these should be welded and tested to demonstrate sealing. Additionally, regular monitoring is required to ensure ongoing effectiveness and to ensure they do not become overloaded, resulting in the escape of wash water and cementitious fines. Written record of inspections must be maintained.

2.2.7 Discharge of small volumes to land should only take place where there is no connectivity to surface and ground waters and can be demonstrated to be fully compliant with legislative requirements.

2.3 Treatment Options on site

2.3.1 The pH scale is a logarithmic scale which means that each unit change in pH, for example pH 7 to 8, represents a tenfold increase in alkalinity. Because of this, attempting to treat concrete washout by dilution alone has the potential to increase the risk of a serious pollution incident.

2.3.2 Dilution of high pH water is ineffective due to the logarithmic scale of pH. For example, to dilute one IBC of concrete wash water at pH 12, the equivalent of four Olympic swimming pools of fresh water would be needed to bring it back to neutral (pH 7).

2.3.3 In order to adjust high pH wash water in line with acceptable levels, a process of neutralisation using controlled amounts of reagent may be required. Typical reagents include mineral acid (either sulphuric or hydrochloric acid), citric acid, carbon dioxide (CO_2) and self-buffering solutions. Propriety units for treatment of high pH water on site are available, some of which use CO_2 diffusers to neutralise the high pH water.

3 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New document created	N/A	1.00	[redacted]
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03				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-515

Environmental

General Environmental Management Plan (GEMP) – Watercourse Crossings

TG-NET-ENV-515	General Environmental Management Plan (GEMP) – Watercourse Crossings		Applies to Transmission ✓
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	Name	Title
Author	[redacted]	Consents and Environment Manager
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Approved by	[redacted]	Head of Consents and Environment

Contents

1 Introduction

1.1 The installation of structures for the purpose of crossing watercourses presents potential risks to the environment. These include:

- Obstruction to fish migration and spawning;
- Obstruction to mammal access;
- Impacts on aquatic flora and fauna;
- Loss or degrading of aquatic and riparian habitats;
- Alteration of the hydrological regime with associated impacts on habitats;
- Releases of substances to the water environment during construction and operation e.g. suspended solids, oils etc; and
- Impacts altering the natural geomorphological balance of the watercourse, leading to erosion and bank stability issues.

2 Legislation

2.1 All watercourse crossings will require some level of authorisation under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR). Levels of authorisation include General Binding Rules (GBR), Registrations and Licences.

2.2 It is essential that these legislative requirements are considered in the early stages of the planning and design process of a project.

3 General Compliance Requirements

3.1 General

3.1.1 Seek to avoid watercourse engineering works wherever possible.

3.1.2 Where this is not possible, seek to use existing crossings, upgrading as required (e.g. installation of a bridge at a fording point). Note that replacement of watercourse crossings (bridges & culverts) are subject to CAR and may require CAR Registration/ Licence to undertake.

3.1.3 Plan all works in accordance with best practice, referring to SEPA guidance document 'WAT-SG-25 Engineering in the water environment: Good Practice Guide, River crossings'.

3.1.4 Design crossing to account for maximum flow conditions, in line with SEPA best practice and guidance documents.

3.1.5 Culverts should be dug into bed of watercourse, allowing for natural strata in the watercourse to form the new bed of the culverted watercourse (Note: This may reduce the hydraulic capacity of the culvert and should be allowed for when specifying diameter of culvert).

3.1.6 Ensure crossing or associated works do not impede fish passage through the system.

3.1.7 Do not use multi-piped culverts.

3.1.8 If the watercourse is wider than 1.5 m (measured top of bank to top of bank) use a clear span bridge as opposed to a culvert.

3.1.9 Ensure all necessary authorisations under the Controlled Activities Regulations (CAR) are in place and conditions (including GBR) are adhered to.

3.1.10 Ensure all required pre-construction protected species surveys have been completed before starting works (these will include, where appropriate, fresh water pearl mussel (FWPM), otter, water vole and beaver).

3.1.11 Do not undertake works during fish are likely to be spawning nor in the period between spawning and the subsequent emergence of juvenile fish.

3.1.12 Consult with local Fishery Board/ Fishery Trust and NatureScot for advice on the presence of fish in the catchment. However, such advice does not override conditions of CAR. Any works within a watercourse during fish spawning season (or period between spawning and the subsequent emergence of juvenile fish) should be agreed in writing with SEPA (with SSEN Environmental Representative copied into correspondence). Consider upper reaches of watercourse, potential habitats down stream of crossing as well as immediate habitats impacted.

3.1.13 Pump intakes must be fitted with screens to prevent fish mortalities and ingress of debris.

3.1.14 Where possible, flume pipes should be used for temporary works in areas where migratory fish are present, as an alternative to pumps.

3.2 Construction

3.2.1 Where possible, works should be undertaken during drier periods (subject to other ecological timing conditions and constraints) and avoid periods of high rainfall. The weather forecast should be consulted 3 days in advance of works commencing the water crossing.

3.2.2 Vehicles should not work within the water unless no other reasonable options exist. If working within the watercourse, then plant must be thoroughly cleaned prior to use and vegetable based hydraulic oils specified in the plant.

3.2.3 During construction and use of the crossing, measures must be taken to prevent the transport of sediments or other materials into the watercourse, for example using correctly installed silt fencing.

3.2.4 Access across the watercourse crossing should be constructed of suitable material and in a manner that will not give rise to rutting, ponding or silt run-off (use of silt fencing along edges may be appropriate).

3.2.5 Vegetation removal should be minimised wherever possible. Any vegetation removed shall not be disposed of into any inland surface water.

3.2.6 Any length of bank with bare earth shall be re-established with an appropriate and agreed mix of riparian vegetation or with a fully biodegradable geotextile.

3.2.7 Where the channel, bed or banks immediately adjacent to the engineering works have been adversely impacted by the works, they must be restored to at least their previous condition as soon as reasonably practicable.

3.2.8 Any storage of material should be far enough away from the watercourse so as to prevent wash off entering the watercourse.

3.2.9 Any temporary dams used should be designed to accommodate periods of high flows.

3.2.10 Where pumps are used, back-up pumps should be available.

3.2.11 Any engine used to drive a pump must be located as far away from a watercourse as possible, in a location not susceptible to water inundation and placed on a plant nappy.

3.2.12 Any stranded fish or other wildlife should be immediately removed from de-watered sections of bed and translocated to suitable habitat.

3.2.13 All temporary crossings must be reinstated to a condition that existed prior to the works as soon as possible.

3.3 Fording of Watercourses

3.3.1 Fording of watercourses is generally not acceptable and should be avoided if possible. However, depending on the activity it may be appropriate for limited access.

3.3.2 If fording is required, access should be restricted to one crossing point, using an existing / previous crossing point if available.

3.3.3 Scottish Environment Protection Agency (SEPA) must be consulted in order to obtain the relevant agreement or authorisations (as required).

3.3.4 A method statement for the use of the ford should be agreed ahead of works, identifying the crossing point, surveys undertaken ahead of crossing, frequency of use, and any required mitigation measures (e.g. wheel washing prior to entry into the watercourse).

3.3.5 If the crossing point is not an established ford, measures to protect the bed and bank should be implemented as appropriate.

3.3.6 After use, the watercourse must be reinstated to a condition that existed prior to the works as soon as possible.

4 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New Document Created	N/A	1.00	[redacted]
02	Document Reviewed and Updated	TG-NET-ENV-515 General Environmental Management Plan (GEMP) – Watercourse Crossings Rev 1.00	1.01	[redacted]
03				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-516

Environmental

General Environmental Management Plan (GEMP) – Waste Management

TG-NET-ENV-516	General Environmental Management Plan (GEMP) – Waste Management		Applies to Transmission ✓
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	Name	Title
Author	[redacted]	Consents and Environment Manager
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Approved by	[redacted]	Head of Consents and Environment

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Scottish & Southern Electricity Networks
TRANSMISSION

1 Introduction

1.1 Waste is defined in the in the Waste Framework Directive (75/442/EEC) as "any substance or object which the holder discards, intends to discard or is required to discard". This includes materials that other people want, or for which they can find a beneficial use i.e. material that is to be recovered / recycled.

1.2 In any construction project, there may be a variety of different wastes, from office and canteen waste to construction materials, waste aggregate from temporary tracks, waste oils, asbestos and clinical waste that will require management.

2 Legislation

2.1 Waste legislation and guidance is extensive, complex and works must comply with all the obligations they impose. Key guidance from the Scottish Environment Protection Agency (SEPA) can be found on their waste website (www.sepa.org.uk/regulations/waste). This includes information on core legislation including:

- Environmental Protection Act 1990 (as amended)
- Waste Management Licensing (Scotland) Regulations 2011 (as amended)
- The Waste (Scotland) Regulations 2012 (as amended)

3 General Compliance Requirements

3.1 Principles of Waste Management

3.1.1 Waste management priorities and practical actions that can be undertaken on site should follow the principles of the waste hierarchy as illustrated below:

- Eliminate - Design out waste
- Reduce - Minimise waste generation
- Reuse - Reuse materials on site if possible
- Recycle - Reprocess materials for off-site use
- Recover - Recovery of energy from waste sent off site
- Dispose - Least desirable option – last resort

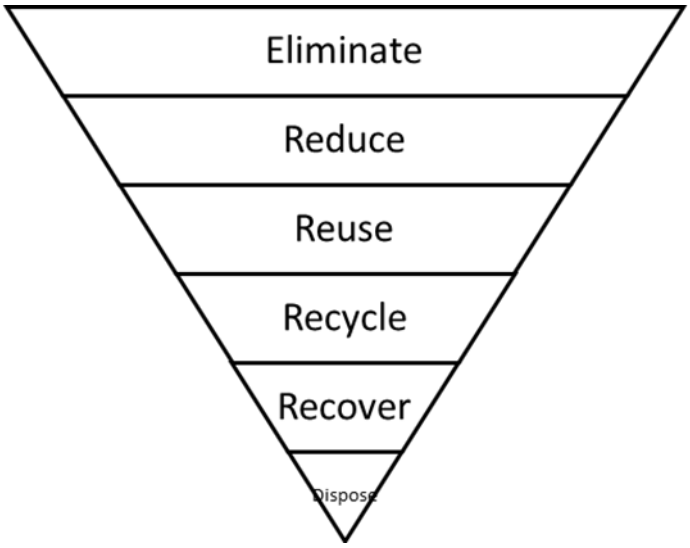

Figure 3.1 - Waste Hierarchy

3.1.2 A Site Waste Management Plan (SWMP) is required to be prepared and agreed prior to construction works starting. The SWMP should be kept up to date as the project progresses. This plan should be based on the above principles and include the following minimum requirements:

- Waste minimisation;
- Allocate a waste champion – who is responsible for the SWMP;
- Record types and quantities of waste that will be produced during the project;
- Decide how waste arising will be managed in line with the waste hierarchy;
- Plan for efficient materials and waste handling and set reduction targets (KPIs);
- Measure quantities and types of waste produced and compare against targets;
- Monitor the implementation of the SWMP and update as necessary; and
- Compile a waste budget.

3.1.3 The SWMP can be in electronic form provided the requisite information can be collated and reviewed, and that the data is readily available as required.

3.1.4 For further guidance on preparing and updating a SWMP, please refer to:

A simple guide to Site Waste Management Plans (netregs.org.uk)

3.2 Duty of Care

3.2.1 All those who produce or handle waste have legal responsibilities, a 'Duty of Care', for its safe keeping, transport and subsequent recovery or disposal.

3.2.2 Failure to comply the 'Duty of Care' is an offence as it is a legal requirement under Section 34 of the Environmental Protection Act 1990 (as amended).

3.2.3 'Duty of Care' requires the producer to:

- Ensure those transporting waste are registered with SEPA;
- Ensure the waste is being treated, re-used or disposed of at a suitably licensed site in line with current legislation;
- Keep a Waste Transfer Note for all waste being transported off site;
- Ensure that all waste on site is properly stored and secured;
- Take all reasonable steps to prevent unauthorised handling or disposal by others;
- If you are dealing with hazardous / special wastes, such as asbestos, chemicals, oils or contaminated soils, you have extra legal responsibilities and are required to complete detailed 'Special Waste Consignment Notes'; and
- Should there be uncertainty over whether a waste is hazardous or special, advice should be sought.

3.3 Storage

3.3.1 The site should be kept tidy and free from litter at all times.

3.3.2 Segregation of waste (including metal, plastic, glass, paper and card) at the point of generation should be provided for site offices / welfare facilities and for construction activities by the use of designated storage areas / containers to ensure cross-contamination is reduced.

3.3.3 All storage areas / containers should be clearly labelled to identify the waste type and properties.

3.3.4 Waste storage areas should be appropriately secured to ensure to prevent pollution.

3.3.5 Controls should be in place to prevent wind blow (e.g. covered skips).

3.3.6 All wastes that could leach or be entrained in water should be stored in a sealed container or on an impervious surface with barriers to lateral flow.

3.3.7 Storage of liquid wastes should be stored in a sealed container within a secondary containment system (bund) with 110% capacity of the container.

3.3.8 Keep the duration of storage to the minimum required.

3.4 Special Waste Storage

3.4.1 Containers used for storage of special waste should be inspected weekly for leaks and corrosion. A written record of inspections is be retained.

3.4.2 Take care to separate different types of special waste, e.g. different chemicals that, if mixed, could react.

3.4.3 Written instructions must be available on site for storing and disposing of each type of special waste.

3.4.4 An inventory must be maintained of all special wastes stored on site, detailing quantities and locations.

3.5 Movement

3.5.1 All movement of waste must be undertaken in line with the relevant waste regulations.

3.5.2 Any waste being transported off site must be done so by a registered waste carrier.

3.5.3 A Waste Transfer Note / Special Waste Consignment Note must be completed and retained prior to waste leaving the site.

3.5.4 Before waste is allowed to leave site, the producer must ensure that the site it is being transported to is appropriately licensed.

3.5.5 Vehicles transporting waste must be suitably secured so as not to allow waste to escape.

3.6 Reuse, Treatment, Disposal

3.6.1 All re-use, treatment and disposal of waste must be undertaken in line with an appropriate Waste Management Licence (WML) or an exemption to require a waste management licence (WMX), under the Waste Management Licensing (Scotland) Regulations 2011 (as amended).

3.6.2 If it can be proven that the material is not waste, it will not fall within these requirements.

3.6.3 A WML and WMX must be obtained from SEPA prior to undertaking the activity.

3.6.4 No burning of waste is permitted on site.

3.6.5 No fly-tipping is permitted.

4 Further Information

Some useful sites on waste management are:

- www.sepa.org.uk
- www.zerowastescotland.org.uk
- www.wrap.org.uk
- www.bre.co.uk
- www.smartwaste.co.uk
- www.ciria.org.uk
- www.netregs.org.uk

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03				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-517

Environmental

General Environmental Management Plan (GEMP) – Contaminated Land

TG-NET-ENV-517	General Environmental Management Plan (GEMP) – Contaminated Land		Applies to Transmission ✓
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	Name	Title
Author	[redacted]	Consents and Environment Manager
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Approved by	[redacted]	Head of Consents and Environment

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Scottish & Southern Electricity Networks
TRANSMISSION

1 Introduction

1.1 Previous land use can lead to ground becoming contaminated with substances which may be hazardous to health or the environment. During construction works there is potential for these materials to be exposed, disturbed and mobilised. It may be possible to identify this as a risk during appropriate assessments at the planning stage, or it may be encountered unexpectedly during site works.

1.2 Works in vicinity of existing or decommissioned substation sites may be at increased risk of contamination, depending on the age and history of the site. Linear developments have the potential to encounter old tips, gralloch pits, or other areas of discrete contamination which may be not have been recorded.

2 Legislation

2.1 Investigation and management of any potentially contaminated land must be undertaken in compliance with relevant Environmental and Health and Safety Legislation.

3 General Compliance Requirements

3.1 Planning the works

3.1.1 Plan works taking account of recognised best practice and all relevant waste regulations.

3.1.2 Key stakeholders for contaminated land issues often include landowners / tenants, the local authority, and the Scottish Environment Protection Agency (SEPA).

3.1.3 Assess the risk of contaminated land issues at a site using historical land use checks and information from site walkovers, hydrological and geological mapping and other relevant data sources (sometimes referred to as Phase 1 Contaminated land assessments).

3.1.4 Check with the landowner whether they are aware of any historical land use which may give risk to contamination (e.g. old tips, middens, gralloch or stink pits).

3.1.5 Where a risk of contamination is identified, further site investigations may be appropriate, including analysis of soil and water samples for specific suites of potential contaminants and more detailed contaminated land assessments (which may consider source, pathway, receptor models).

3.1.6 Identified, high risk or known areas of contaminated land should be recorded and identified clearly in project documentation, including clear scaled plans with inset showing location context of plan.

3.1.7 Contamination could however be encountered in areas where it has not been expected and checks must be undertaken to ensure that any risks to the environment are identified and controlled.

3.2 During works

3.2.1 During works (including site investigation) keep a careful lookout for any signs of contamination during boring, excavating, soil stripping and similar operations.

3.2.2 Signs of potential contamination may include discoloured soil, unexpected odours, a fibrous texture to the soils (e.g. asbestos), or presence of foreign objects (e.g. chemical/oil, containers/waste).

3.2.3 Increased risks of contamination may exist if there is any evidence of previous soil workings, underground structures or waste pits, evidence of made ground, or old drain runs.

3.3 If contamination is encountered

3.3.1 Stop work immediately.

3.3.2 Report the discovery to the site manager and project environmental representative within 30 minutes. An EcoOnline report should be raised to track the occurrence. Expert advice and guidance on required measures / mitigation should be implemented. Ensure the landowner / occupier is informed.

3.3.3 Seal off the area to contain spread of contaminants.

3.3.4 Undertake risk assessment to minimise the risk to health and safety of site workers. This should identify acceptable working methods, PPE, contact, and other required procedures.

3.3.5 Clear site to ensure there is nothing that could cause fire or explosion.

3.3.6 Ensure that the suspected contamination is tested and characterised, including any Waste Acceptance Criteria required if waste is to be disposed offsite and agree changes to the existing site proposals and method statements.

3.3.7 Avoid causing or spreading contamination.

3.3.8 Do not stockpile contaminated soil unless it cannot be avoided. If it is necessary, stockpile only on an area of hard standing to prevent contamination of the underlying area. If possible, place material on non-permeable geotextile or membrane.

3.3.9 Cover the stockpile with plastic sheeting to prevent infiltration of precipitation and spread of soluble contaminants and to prevent potentially contaminated wind-blown dust.

3.3.10 Control surface drainage from stockpiled area. Remember water draining from a stockpile may be contaminated and require controlled off-site disposal.

3.3.11 Where disposal of contaminated land is required, this should be done in accordance with current waste legislation.

4 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New Document Created	N/A	1.00	[redacted]
02	Review of existing document	TG-NET-ENV-517 General Environmental Management Plan (GEMP) – Contaminated Land Rev 1.01	1.01	[redacted]
03				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-518

Environmental

General Environmental Management Plan (GEMP) – Private Water Supplies

TG-NET-ENV-518	General Environmental Management Plan (GEMP) – Private Water Supplies		Applies to Transmission ✓
Revision: 1.01	**Classification:** Internal	**Issue Date:** March 2024	**Review Date:** March 2027

	Name	Title
Author	[redacted]	Consents and Environment Manager
Checked by	[redacted]	Lead Consents and Environment Manager
Approved by	[redacted]	Head Of Consents and Environment

Contents

1 Introduction

1.1 Many construction works, including site investigation works, have the potential to impact on private water supplies (PWS). This can be through either disturbing drainage patterns (horizontally or vertically) or impacting on the quality of the water source. There is also the potential to impact on infrastructure of PWS, with pipes and tanks possibly omitted from service plans.

1.2 Damaging a PWS can have impacts on the health of the users, as well as severe financial and reputational impacts.

1.3 It is required to comply with the following in addition to any specific measures identified associated with the site.

2 General Compliance Requirements

2.1 Pre-construction

2.1.1 Review any consent requirement for delivering the works and undertake all required actions in relation to PWS.

2.1.2 All PWS located within 250 m of the proposed works must be identified prior to commencement of any works.

2.1.3 A risk assessment should be undertaken to identify those PWS that have the potential to be affected by the works including consideration of:

- Type and depth of water supply source (e.g. borehole, spring or surface water abstraction);
- Catchment area;
- Nature of proposed works (e.g. depth and extent of any proposed excavations, potential for pollution incidents / spillage, etc.); and
- Proximity of works to PWS and related topography of area

2.1.4 Should the results of this assessment indicate a risk to the PWS, then mitigation shall be developed for inclusion in a site specific PWS Protection Plan that is discussed and agreed with the PWS owner.

2.1.5 In certain circumstances it may be appropriate to undertake water quality testing of the source or supply, to establish a baseline of current water levels and quality. It may be required to collect baseline water quality monitoring throughout the year to establish any seasonal fluctuations in existing quality and production of the source. Baseline water quality (and potentially production capacity) monitoring should be agreed as part of the PWS protection plan.

2.1.6 Prepare a contingency plan to deliver an alternative water supply (on a temporary or permanent basis) in the event of an unforeseen problem with the existing supply. This may include ensuring provisions of bottled water, IBCs of potable water, fresh water bowers, replacement lengths of suitable piping and fittings to match existing infrastructure area available on site.

2.2 Construction

2.2.1 PWS requiring protection will have specific mitigation developed. Mitigation may include some / all of the following:

- Fence off the PWS intake (to avoid accidental damage and to deter animals) and identify relevant buffer distances;
- Installation of silt mitigation to prevent runoff from works areas entering the PWS. Use a precautionary approach as not all flow pathways may be immediately obvious;
- Avoid undertaking works within PWS catchments during wet weather or when wet weather is forecast as there will be increased surface water flows into the PWS which will be harder to control;
- Use low impact access methodologies including the use of track panels where access to works are within the PWS catchment;
- Survey and peg out the route of the distribution main in the vicinity of the construction works and avoid / minimise activity within this area; and
- Ensure all site operatives working in the area are made aware of the location of the PWS and catchment area, and mitigation measures required through toolbox talks or similar
- Signage should be considered to remind workers when works take place in these areas

2.2.2 Put in place measures to protect PWS distribution mains where they cross beneath roads / access tracks. These might include:

- Setting the existing pipe work within mass concrete;
- Upgrading or rerouting the existing pipe work;
- Ensuring that there are adequate pollution control and emergency response measures in place to deal with any accidents that could affect a water supply (e.g. spill response or sediment control);
- Implementation of regular, recorded checks on any pipework (visible signs of cracking or other damage); and
- Provision of an alternative supply (temporary / permanent), e.g. taking a surface water abstraction to a point above the works to prevent potential downstream contamination from works impacting upon the supply. (Ensure appropriate landowner agreement and CAR consent is in place.)

2.2.3 Undertake regular health, safety and environment briefings to construction staff. Include information on:

- Presence and importance of water supply intake and distribution main nearby;
- Need to protect these from accidental damage;
- Need to act promptly if an accidental spill or pollution incident poses a threat; and
- Reporting requirements

2.2.4 Regularly monitor works and their impact on the PWS, ensuring appropriate mitigation is in place. Keep records of inspections and mitigation maintenance/ improvements. If the PWS is being impacted or has the potential to be impacted, stop those activities and seek specialist advice.

2.3 Unidentified Water Supplies

2.3.1 It is possible that previously unidentified PWS may be found during works.

2.3.2 If this happens, stop work in that location and seek specialist advice.

2.3.3 Necessary protection measures will need to be identified in consultation with the PWS owner, landowner, specialists and relevant authorities and implemented before work should resume in that location.

3 Revision History

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01	New Document Created	N/A	1.00	[redacted]
02	Document reviewed and updated	TG-NET-ENV-518 General Environmental Management Plan (GEMP) – Private Water Supplies (Rev 1.00)	1.01	[redacted]
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Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-519

Environmental

General Environmental Management Plan (GEMP)

- Forestry

TG-NET-ENV-519	General Environment Management Plan (GEMP) - Forestry		Applies to Transmission ✓
Revision: 2.00	**Classification:** Internal	**Issue Date:** May 2024	**Review Date:** May 2027

	Name	Title
Author	[redacted]	Consents and Environment Manager
Checked by	[redacted]	Forestry Project Manager Team Lead
Approved by	[redacted]	Head of Consent and Environment

Contents

1 Introduction

1.1 Forestry and woodland is an important resource in Scotland. It can contribute biodiversity, climate resilience, flood regulation as well as be an important product for materials. Overall there is a large societal importance on healthy, sustainable forestry management and works to tree's needs to be carefully considered so impact is minimised and the appropriate management regime is put in place. This GEMP is to be followed by anyone working undertaking forestry works, other tree felling or arboricultural works on behalf of Scottish and Southern Electricity Networks (SSEN).

2 Legislation

2.1 All felling works must be authorised under an appropriate Planning Permission, Section 37 consent, Felling Licence, or permitted under The Forestry (Exemptions) (Scotland) Regulations 2019. The requirements of any consent must be adhered to at all times.

2.2 Landowner agreement must be in place prior to felling or other tree works taking place.

3 General Compliance Requirements

3.1 Felling/Tree Removal

3.1.1 No tree felling/vegetation removal should take place during the bird breeding season unless pre-felling surveys have been undertaken.

3.1.2 Mulching should only be used where there is a need to clear the site of tree residue or where trees or areas are too small to fell commercially (typically, a minimum top diameter of 7 cm will be commercially recovered). The resultant mulch is to be partially incorporated with the vegetation layer, or separated and made available for alternative reuse, preferably within the project.

3.2 Other Tree Works

3.2.1 Avoid all recognised injurious practices such as:

- Topping or lopping to an arbitrary height or branch length;
- Pruning flush cuts;
- Unbalancing a tree crown by excessive one-sided pruning;
- Inappropriate use of flailing; and
- Climbing damage – Care shall be taken to avoid injuring thin and weak barked species by inappropriate use of rope access techniques on trees (such as use of climbing irons) on trees to be retained.

3.2.2 Vegetation should be left well balanced with natural crown shapes.

3.2.3 If the only pruning option is to severely reduce or unbalance a tree, then coppicing, or felling and replacement planting are often better options and shall be agreed with the landowner.

3.2.4 Pruning must also take into account the vegetation re-growth expected in the interval between cuts. This will vary widely between plant species and sites.

3.3 Protection of Retained Trees

3.3.1 Avoid damaging those standing trees which are to be retained.

3.3.2 A root protection zone should be identified and enforced around all trees to remain on site that are within close proximity to the works area to ensure that no accidental damage is caused to the tree roots. Root protection zones should be defined in line with the British Standard 5837.

3.3.3 No material arising from site works are to be stored within the root protection zone or stacked against trees.

3.4 Access

3.4.1 Utilise brash to assist with the access requirements for felling and construction machinery and give consideration to rights-of-way by transient wildlife. In agreement with environmental specialists and landowners, small piles of brash and timber may be left on site at specific, identified locations in the interest of habitat creation and increasing biodiversity.

3.4.2 Access damage – Vehicle access and treatment of arisings shall avoid injury to low branches, stems, root buttresses and feeder roots. Branches should be removed by saw prior to access being taken. Breaking of limbs is not acceptable during access.

3.5 Storage of Marketable Timber

3.5.1 Forest roadside timber stacks should be built in a safe and stable condition and generally of a height that does not exceed product length. All timber stacking should be undertaken and managed in-line with 'FISA Safety Guide 503' and other industry best practice including 'Forestry and Land Scotland (FLS) Guidance on the safe management of timber stacks'.

3.5.2 Forest felling sites shall be left tidy, with all marketable timber extracted to forest roadside, brash and stumps left in a condition that meets industry best practice and stumps cut low and neatly, with any torn hinges or jagged spikes removed, to prevent them becoming a danger to site visitors as a trip hazard or an obstacle to vehicles. Remove all litter from site.

3.6 Forestry Waste

3.6.1 Note that forest wastes are controlled under SEPA Waste Regulations which must be adhered to.

3.7 General Forestry Practice

3.7.1 Forestry best practice as specified by the Health and Safety Executive (HSE), Scottish Forestry, Forest Industry Safety Accord (FISA) and other Government and Non-Government Organisations should be implemented at all times. The following is provided as a guide (but not a definitive list) to the standards that should be followed during forestry works:

- The UK Forestry Standard (UKFS)
- BS3998 (2010) Recommendations for Tree Work
- BS5837 (2012) Trees in Relation to Design, Demolition and Construction
- FISA Safety Guides
- HSE Guidance and Regulations
- SEPA Guidance and Regulations
- Scottish Water Guidance

3.7.2 Spreading Disease - Appropriate regard shall be given to avoiding spreading fungal diseases. Forest Research biosecurity guidance should be followed. Consideration should be given to landowners' requirements for treating stumps.

3.7.3 Leave watercourses, culverts and ditches undamaged and clear of arisings. No felling into watercourses is allowed.

3.7.4 Local drainage systems to be maintained and not damaged or interrupted by the felling works.

3.7.5 No fires should be lit on site. Fire risk in and near wooded areas should be considered and risk assessed with additional mitigations imposed during prolonged dry periods (e.g. implementation of wider non-smoking zones).

3.7.6 No dogs permitted on active worksites.

4 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New document created	N/A	1.00	[redacted]
02	New branded template Expansion of 3.5.1 & 3.5.2, expansion of 3.7.1, addition of 3.7.6	TG-NET-ENV-519 Rev 1.00	2.00	[redacted]
03				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-520

Environmental

General Environmental Management Plan (GEMP) – Dust Management

TG-NET-ENV-520	General Environmental Management Plan (GEMP) – Dust Management		Applies to Transmission ✓
Revision: 1.01	**Classification:** Internal	**Issue Date:** March 2024	**Review Date:** March 2027

	Name	Title
Author	[redacted]	Consents and Environment Manager
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Approved by	[redacted]	Head of Consents and Environment

Contents

Scottish & Southern Electricity Networks
TRANSMISSION

1 Introduction

1.1 There are many potential sources of dust from a construction site which need to be closely managed on an ongoing basis to ensure it is adequately controlled on site. Likely sources of dust include:

- Haul roads and access tracks;
- Yards and storage areas;
- Soil storage areas;
- Construction corridor (exposed areas following stripping);
- Material transportation;
- Transport of mud onto the public highway;
- Loading and unloading materials;
- Quarrying or blasting activities;
- Crushing / screening activities;
- Stone breaking;
- Concrete or stone cutting

1.2 Once dust particles are airborne, it is very difficult to prevent them from dispersing into the surrounding area. The most effective technique is to control dust at source and prevent it from becoming airborne.

2 Legislation

2.1 In the event of dust becoming an issue there is potential for enforcement action from the Scottish Environment Protection Agency (SEPA) or the local authority. There is also the potential for legal action, which will have cost, programme and reputation implications.

2.2 Likely actions and implications include:

- Health and & Safety implications for operatives on site and wider public;
- Nuisance to neighbours and bad publicity for the site;
- Abatement notice or enforcement action from regulators;
- Impact on project programme and budget (e.g. compliance with statutory notices relating to dust levels / abatement notices);
- Under the Clean Air Act 1993 and Part 3 of the Environmental Protection Act 1990, local authorities can impose limits on dust generated from a site;
- Impacts on ecology (e.g. impacting on plant growth, smothering of habitats, watercourse pollution, local pH changes etc)

3 General Compliance Requirements

3.1 Planning the Works

3.1.1 Where Dust has the potential to become an issue, a protection plan should be developed.

3.1.2 A Dust Management Plan should be incorporated into the CEMP under the Air Quality Management section.

3.1.3 Likely sources of dust should be identified ahead of works and appropriate mitigation measures put in place to minimise the risk of dust become an issue.

3.1.4 Nearby potential receptors such as residential dwellings or sensitive habitats should be identified, and the works planned minimise the risk of dust impacting on these, with the adoption of up-front appropriate mitigation measures.

3.2 Avoiding Dust Generating Activities

3.2.1 Plan activities to ensure that, as far as practical, particularly dusty activities are not carried out in unsuitable weather conditions (i.e. very dry / windy conditions) unless suppression is in place.

3.2.2 Store materials away from the site boundary.

3.2.3 Limit vehicle speeds along stone access tracks.

3.2.4 Vehicles carrying bulk materials should be sheeted if could give rise to dust.

3.2.5 Keep height of soil stockpiles to a minimum and gently grade the side slopes.

3.2.6 Minimise the height of fall of materials.

3.2.7 Reduce the height that materials are unloaded from.

3.2.8 Do not use drills that are powered by compressed air unless appropriate control measures are in place.

3.2.9 Ensure any tools or plant which have facilities for dust suppression utilise this function.

3.3 Management and Mitigation

3.3.1 Inspect high risk areas daily, especially during dry weather. Keep a record of inspections and any actions identified required.

3.3.2 Mud should not be deposited on roads. Where applicable, wheel cleaning facilities will be provided prior to vehicles leaving site.

3.3.3 Keep all public roads well swept and bowse if required. Ensure a road sweeper can be commissioned locally to the site in the event of an issue arising.

3.3.4 Suppress dust from soil stockpiles, haul roads, stripped working corridors and material storage areas, by bowsing with water, where required.

3.3.5 Ensure the relevant permissions and consents have been obtained for water used for suppression activities (e.g. CAR authorisation from SEPA or Standpipe Licence from Scottish Water).

3.3.6 Ensure efficient use of water to dampen down dust (e.g. use of diffusers to suppress wide areas with a spray/mist rather than a standard hosepipe arrangement).

3.3.7 Any run-off from dust suppression activities shall be controlled in line with best practice to avoid creating sediment contaminated run off.

3.3.8 Communicate dust management procedures to all relevant personnel and provide suitable training if required. Keep a record of appropriate training and issue of tool box talks.

3.3.9 Follow-up any complaints immediately and take action to avoid a repeat complaint.

3.3.10 Further information available in:

- BRE (2003) Control of dust from construction and demolition activities;
- DETR (2000) Environmental handbook for building and civil engineering projects;
- CIRIA (2005) Environmental Good Practice – site guide

4 Revision History

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01	New Document Created	N/A	1.00	[redacted]
02	Review and update existing document	TG-NET-ENV-520 General Environmental Management Plan (GEMP) – Dust Management Rev 1.00	1.01	[redacted]
03				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-521

Environmental

General Environmental Management Plan (GEMP) – Biosecurity (On Land)

	Name	Title
Author	[redacted]	Consents and Environment Manager
Checked by	[redacted]	Lead Land Manager
Approved by	[redacted]	Head of Land

Contents

1 References

The documents detailed in Table 1.1 – Scottish and Southern Electricity Networks Documents below, should be used in conjunction with this document.

Table 1.1 - Scottish and Southern Electricity Networks Documents

Reference	Title
PR-NET-OPS-025	Foot and Mouth Disease

2 GEMP – Biosecurity (On Land)

2.1 General Principles of Soil Management Process

2.1.1 Biosecurity is important when any agricultural land, hill ground and moorland that carries stock, farm steadings, forestry and woodland, rivers and lochs and aquaculture units is entered where there is a risk of spreading pest or disease.

2.1.2 Biosecurity good practice will minimise the risk of contamination and the spread of animal and plant diseases, parasites and non-native species. You cannot always see disease causing agents, plant pests, parasites and non-native species and they can be picked up and carried on clothing, footwear, on vehicles and equipment to other locations.

2.1.3 The main risk identified for our work has been identified as the transfer of potato cyst nematode and clubroot (a brassica disease) in arable land. These are predominately spread by contaminated soil, plant matter or dung.

2.1.4 There is also the risk of spreading insect pests, or bacterial, viral and fungal tree pathogens in woodland areas, or causing the spread of non-native invasive species or injurious weeds.

2.1.5 Additionally, there are several diseases capable of being transmitted from animals to humans including Lyme Disease, Leptospirosis, E. coli O157 and Salmonella. Good hygiene practice will significantly reduce the risk of contracting or spreading a disease.

2.2 Biosecurity Control Stages

2.2.1 The stage of biosecurity control that should be practiced will vary according to:

- Type of work you are carrying out
- Use of land you are entering e.g. is it used to grow crops such as brassicas or potatoes
- Livestock movement, some sites are governed by stricter disease control measures
- Landowner / occupier as well as project specific requirements
- The known presence of current pests and diseases or restrictions applied to land or premises

2.2.2 The stages (Stage 1 and Stage 2) described below are based on Scottish Government guidelines but have been tailored to the type of works normally undertaken by us or our contractors.

2.2.3 Unless there is a specific risk or requirement Stage 1 should suffice (see below). The control measures are only the minimum recommended and the implementation of any reasonable biosecurity procedures that may go beyond this, due to the nature of the property, must be considered.

2.3 Biosecurity Control – Stage 1

2.3.1 For non-intrusive works e.g. site visits, walkover surveys and intrusive works in low risk areas i.e. where there is no know reasonable risk of the transmission of disease or pests.

- Ensure the landowner has been notified and is aware of the works/surveys to be undertaken
- Ensure all personnel have been briefed and understand what is required of them and the possible consequences of not adhering to the measures explained
- Ensure footwear is clean (visually free from soil and debris) before entering site. If necessary, brush and wash with water
- Enquire with landowner whether Stage 2 Biosecurity Control must be adopted, i.e. clean and disinfect footwear using appropriate disinfectants (please refer to Farmland Biosecurity Policy for further guidance). If request then implement Stage 2 Biosecurity Control.
- Ensure vehicles, plant and tools (including temporary access materials such as 'bog mats' and track way panels) to be used on the site is cleaned at the commencement of the works and thereafter is kept clean and, in particular, remove any accumulated mud, especially when moving between holdings
- Make use of any facilities provided at the premises to clean footwear if required by the contractor or land manager
- Keep access to a minimum, do not access areas unnecessarily and if practical do not take vehicles onto premises and keep to established tracks
- Respect any notices or instructions
- Food, Litter and packaging must be removed from site to prevent animals from eating or getting tangled up in material, litter etc
- Ensure that gates are left as they are found, as per the Scottish Government's Biosecurity Code. For more information on specific diseases refer to Scottish Government web pages

2.3.2 The minimum equipment to be carried in the vehicle should include a stiff brush, water sprayer with sufficient water to clean equipment and footwear/clothing, a hoof pick to remove mud between boot treads and suitable container.

2.4 Biosecurity Control – Stage 2

2.4.1 Ensure landowner has been contacted well in advance of any works taking place. Establish whether there are any control measures needed which relate specifically to the area you are working. For intrusive works i.e. ground-breaking operations in areas which have been deemed to be high risk. Also, for all non-intrusive work e.g. site walkovers where there are specific landowner or project requirements for this level of biosecurity non-intrusive works e.g. site visits, walkover surveys and intrusive works in low risk areas i.e. where there is no know reasonable risk of the transmission of disease or pests.

2.4.2 High risk areas are those fields which have been either identified as having the potential to be used to grow brassicas (oil seed rape, cabbage, turnips, swede, etc) or potatoes, or any other areas deemed to be high risk by the contractor.

- Mitigations as per Stage 1
- Clean and disinfect footwear using appropriate disinfectants (please refer to Farmland Biosecurity Policy for further guidance)
- Ensure vehicles, plant and tools (including temporary access materials such as 'bog mats' and track way panels) are adequately cleaned and disinfected using appropriate methods. Pay particular attention to the tyres and wheel arches. This is doubly important when moving from one farm to another to reduce the risk of spreading disease
- Contractor machinery and footwear must be cleaned between various areas within an individual holding, where it is reasonably required and there is evidence of definitive disparities in disease risk between different areas of the holding.

2.4.3 If the stages 1 and 2 are not anticipated to be sufficient e.g. there is a known outbreak of a contagious pest or disease, please refer to PR-NET-OPS-025 Foot and Mouth Disease, and up to date industry or Government guidance for enhanced biosecurity control.

2.4.4 In all cases, reference should be made to the most up to date and relevant industry or Government recognised guidance on suitable biosecurity measures. Advice on the type of disinfectant to used can be obtained from the Department for Environment, Food and Rural Affairs (DEFRA) website: http://disinfectants.defra.gov.uk/

3 Revision History

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01	New Document Created	N/A	1.00	[redacted]
02	Review of existing document	TG-NET-ENV-521 (Rev 1.00)	1.01	[redacted]
03	Review of existing document: - Amend requirements under 2.2.3 for reasonable additional biosecurity measures - Add in further provision re contractor machinery and footwear at 2.4.2 - Update industry and Government guidance reference at 2.4.3 and 2.4.4	TG-NET-ENV-521 (Rev 1.01)	1.02	[redacted]
04				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-522

Environmental

General Environmental Management Plan (GEMP) - Restoration

TG-NET-ENV-522	General Environmental Management Plan (GEMP) - Restoration		Applies to
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	Name	Title
Author	[redacted]	Consents and Environment Manager
Checked by	[redacted]	Lead Consents and Environment Manager
Approved by	[redacted]	Head of Consents and Environment

Contents

1 Introduction

1.1 The way in which stripping, storage and replacement of soils / turfs is undertaken can significantly increase the successfulness of any reinstatement. The following guidance should form a basis of the restoration plan for the project.

1.2 Important guidance on soil management principles is contained in the Soil Removal, Storage and Reinstatement General Environmental Management Plan (GEMP) and should be followed in conjunction with this GEMP.

1.3 Reinstatement is the replacement of soils and vegetation set aside during works post construction, to a condition which can recover to the previous habitat present prior to works in a timely manner. Restoration is the enhancement of the ground to make good any failed reinstatement, or to enhance recovery of the habitat, or establishment of desired habitat, post construction and may include seeding / planting or other means to establish specific habitat, as may be required.

2 Legislation

2.1 Reinstatement and restoration obligations will be imposed on the works through the core consenting regimes, including:

- Planning permission under the Town and Country Planning (Scotland) Act 1997 (as amended);
- The Town and Country Planning (General Permitted Development) (Scotland) Order 1992;
- S37 consent under the Electricity Act 1998 (as amended);
- SSSI consent under Nature Conservation (Scotland) Act 2004 (as amended);
- Natura Consent under Conservation (Natural Habitats, &c.) Regulations 1994 (as amended); and
- CAR authorisations under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended).

2.2 Any obligations imposed under these consents must be complied with.

3 General Compliance requirements

3.1 Planning Construction Works

3.1.1 In planning construction works seek to avoid intrusive work wherever possible. As a result there will be less reinstatement and restoration required once construction is finished.

3.1.2 Seek to:

- Avoid major earthworks wherever possible;
- Retain natural features such as rocky outcrops;
- Avoid loss of mature trees; for example, remove young regenerating birch in preference to mature trees which may have biodiversity and landscape value and will give structure to the finished works;
- Site tracks and micro-site route around groups of trees to leave natural features rather than dissecting groups/copses;
- When crossing hedges, walls or watercourses plan to use existing gaps/ wayleaves;
- Design any permanent drainage ditches to be as natural as possible (sinuous with varied banks and alignments, etc.). Ensure Controlled Activity Regulations (CAR) compliance and that any CAR authorisations required are in place;
- Design drainage measures carefully to avoid unnecessary long-term effects on adjacent habitats which could be difficult to restore; and
- Plan all site activities to reduce the need for vehicle movements. This will help in final restoration by minimising compression etc.

3.2 Planning Restoration

3.2.1 Restoration at the end of the works will always be more successful if planned in advance. A soil management and restoration plan should be developed in advance of the works.

3.2.2 Always:

- Plan restoration in advance of working on-site. This will save time and money at a later stage and will ensure that opportunities are not lost, and a more successful outcome is achieved;
- Ensure that detailed restoration plans take account of specific habitat types and locations, including those which may be identified within any Landscape & Habitat Management Plan, or BNG report, for the project;
- Identify where soils and peat and turfs will be stored;
- Take account of all agreements made during consenting process and with landowners;
- Take account of all environmental interests, for example, seek to enhance local biodiversity (avoiding planting on sensitive archaeological or geological sites);
- Plan how monitoring of restoration will be undertaken identifying when, how frequently and by whom;
- Consider how deer pressures (grazing and wallowing) or other grazing may affect the success of planting and plan restoration works accordingly; and
- Plan restoration taking account of run-off erosion risks on steep slopes in poor conditions; be aware of the potential for sediment rich run-off to smother sensitive or newly established vegetation in poor weather conditions and seek to minimise this.

3.3 Early Works

3.3.1 Early works will help in achieving more successful final restoration. These include the following:

- Always take photographs of the site before works start to guide later restoration including of any drainage that will be disturbed;
- Strip turfs and vegetation carefully and use in temporary works to prevent erosion;
- Turfs can be stored successfully in temporary cut-off ditches in some locations which can aid water attenuation and prevent turfs / vegetation from drying out;
- Store top soil and subsoil separately according to best practice;
- Store stripped materials in the immediate vicinity (or as close as feasible) for future re-use in site restoration;
- Keep a record of where all soils and turfs are stored. Consider signage on storage areas to help identifying source and type of material storage, to assist in subsequent reinstatement;
- Remove large boulders (rather than cover) to replace in restoration works;
- Remove/ treat noxious weeds in accordance with best practice and legal requirements. Do not allow unnecessary spread or this will compromise the success of final restoration works;
- Seek to avoid compression of soils as much as possible on restoration. Drainage may be impeded and may result in extensive areas of rush being created; and
- During construction seek to avoid creating eroded areas which can be difficult to restore successfully.

3.4 Final Restoration

3.4.1 At the end of construction in any area the land and vegetation must be restored to pre-construction conditions, or as otherwise specified in any Landscape and Habitat Management Plan or BNG report. This should be done carefully and sympathetically taking account of all required mitigation and of the conditions. The following principles should also be adopted where appropriate:

- Undertake restoration works in suitable weather conditions - wet ground conditions can be difficult as can hot dry and windy spells;
- Restoration should ensure the successful integration of the site with surrounding land uses and habitats;
- All field, roadside or other boundaries disturbed during construction operations would be reinstated using the original materials (in the case of stone dykes, this having been carefully set aside for re-use) or to the original specification, and to at least the pre-existing condition, or better;
- Natural regeneration of habitats should be promoted in all appropriate areas, or as otherwise specified in any Landscape and Habitat Management Plan or BNG report;
- Where hedgerow field boundaries are removed, they are to be replanted with the same species and at the same spacing intervals, or as otherwise specified in any Landscape and Habitat Management Plan or BNG report;
- Any required replanting and / or reseeding should be undertaken at appropriate times of the year and with the agreement of landowners / occupiers (and NatureScot if within designated sites);
- Identify the most appropriate machinery to use for restoration in any area (small digger or large machine, etc.) according to the sensitivity of the habitats and the extent of areas to be restored (take advice from the site ecologist);
- Undertake small sections of the site for restoration and monitor success with input from the site environmental representative(s) before restoring large areas;
- All temporary accesses are to be restored to original condition;
- A pro-active approach to restoration i.e. use of temporary access materials such as Trackway panels and appropriate low pressure construction vehicles, particularly in areas of wet ground, is encouraged; and
- Unless otherwise specified (e.g. in landowner commitments), all decommissioned tower foundations are to be removed to 1.5 m below ground level.

4 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New Document Created	N/A	1.00	[redacted]
02	Review and Updated	TG-NET-ENV-522 General Environmental Management Plan (GEMP) – Restoration (Rev 1.00)	1.01	[redacted]
03				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-523

Environmental

General Environmental Management Plan (GEMP) – Bad Weather

TG-NET-ENV-523	General Environmental management Plan (GEMP) – Bad Weather		Applies to Transmission ✓
Revision: 1.01	**Classification:** Internal	**Issue Date:** March 2024	**Review Date:** March 2026

	Name	Title
Author	[redacted]	Environmental Manager
Checked by	[redacted]	Lead Consents and Environment Manager
Approved by	[redacted]	Head of Consents and Environment

Contents

1 Introduction

1.1 It is important to consider the implications of poor weather conditions and associated environmental risks.

1.2 Bad weather, particularly heavy rain, can increase the risk of significant environmental impacts during construction (for example, on sensitive habitats and increased risk of sediment laden run-off into surface waters).

1.3 Storm events can also impact oil storage areas and increase the risk of a loss of oil to the environment.

2 General Compliance Requirements

2.1 General

2.1.1 This action plan can sit within the Emergency Response Plan section of the CEMP and should allow for occurrence of heavy rain, high winds, heavy snow, prolonged freezing condition and periods of dry weather.

2.1.2 The weather forecast should be checked daily and changes to work activities or mitigation requirements implemented on an ongoing basis.

2.1.3 Identify and communicate any areas of flood risk. SEPA flood mapping can assist in this but should not be the sole information used in any risk assessment.

2.1.4 Ground conditions should be checked regularly, and assessment made as to whether they are suitable for the proposed site activities.

2.1.5 Check whether plant is causing damage on site because of poor ground conditions exacerbated by bad weather.

2.1.6 Plan for high run-off in advance and Identify protection measures (silt traps, straw bales and booms, etc.).

2.1.7 Check for any materials stored close to watercourses during construction activities which could be washed into the water in times of storm.

2.1.8 During times of excessive rainfall and ground saturation, stripping and reinstatement works should not be undertaken.

2.1.9 Check any containment bunds (oil storage, concrete washout etc) have the appropriate capacity and empty if necessary, to prevent any un-controlled discharge.

2.1.10 Ensure all skips and waste containers are covered / closed to minimise water ingress.

2.1.11 Emergency response plans should take account of bad weather. Identify an action plan before construction starts that identifies measures to implement in times of extreme weather.

2.1.12 Consider the use of a visual display board which can be used to alert site staff to the expected weather and the necessary preparations that are required.

2.1.13 Keep site records of weather experienced through site diary, including through installation of weather station at site compound (or use of local nearby weather stations), to record such detail as temperature, wind speed and rainfall. Data should be made available to SSEN, along with any variation to planned activities due to weather/ forecast.

3 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New Document Created	N/A	1.00	[redacted]
02	Reviewed	TG-NET-ENV-523 General Environmental management Plan (GEMP) – Bad Weather Rev 1.00	1.01	[redacted]
03				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-507

Safety, Health and Environment

Wildcat Species Protection Plan

TG-NET-ENV-507	Wildcat Species Protection Plan		Applies to Transmission ✓
Revision: 1.03	**Classification:** Internal	**Issue Date:** December 2022	**Review Date:** December 2030

	Name	Title
Author	[redacted]	Environmental Net Gain Manager
Checked by	[redacted]	Consents & Environment Manager
Approved by	[redacted]	Head Of Environment

Contents

1 Introduction

Wildcat is a European Protected Species and is afforded a high level of protection in Scotland. This Protection Plan provides guidance and agreed procedures for the protection of wildcats and their shelters during construction works on Scottish Hydro Electric (SHE) Transmission projects.

2 References

The documents detailed in Table 2.1 - Miscellaneous Documents, should be used in conjunction with this document

Table 2.1 - Miscellaneous Documents

Title
The Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland)
EC Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive)
The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007
The Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019
NatureScot Licensing

3 General Protection Plan

3.1 Introduction

This Species Protection Plan applies to all projects where wildcat may be present. It outlines the responsibilities of SHE Transmission and the Contractor regarding protection of wildcat. It also details relevant legislation, survey requirements, general mitigation measures and the requirement for licensing and mitigation.

3.2 Background

Wildcats are a member of the Felidae family with a population restricted to marginal areas predominantly in northern Scotland, in essence north of the Highland Boundary Fault. In the 19th century wildcats were heavily hunted and persecuted, this combined with habitat loss reduced their numbers dramatically. It is now estimated that approximately 400 wildcats remain in Scotland, although estimates do vary.

Domestic tabby cat strongly resemble wildcat; however, they are smaller and less robust. Wildcats can easily hybridise with feral and domestic cats making it difficult to confidently identify wildcats. One diagnostic feature of a wildcat is the thick, bushy tail with black rings and a black blunt tip.

Wildcats also have distinct stripes on their flanks that are less broken or spotty than on tabby cats and hybrid cats (see Kitchener *et al.* 2005 for details[1]). They also do not have white paws.

Wildcats are solitary animals that occupy their own exclusive home range, however the exclusive home range of a male wildcat my overlap with the territories of one or a number of female wildcats. These home ranges can be very large, up to 18 km^2, but can also be much smaller depending on the density of their prey - primarily rabbits and other small mammals. Male home ranges are usually larger than female home ranges.

Wildcats are an exclusively carnivorous species. They usually inhabit woodland areas but due to the lack of suitable habitat in the UK can also be found using more open habitats such as moorland or rough grazing. Wildcats have a number of dens throughout their home range that they have access to. These dens are usually among rocks and boulders and rocky cairns on hillsides and can also be in abandoned fox earths, badger setts and rabbit burrows as well as among tree roots. Females use different dens to give birth and rear kittens than they do to shelter in.

Wildcats breed predominantly between January and March and give birth to their young between April and May, however they can breed at any time during the year. The female is the sole provider for the kittens bringing live prey to the den from when they are 3 weeks old, and she will stop producing milk at 6-7 weeks. The young usually leave their mothers and become independent at around 5-6 months old. Signs of wildcat include (although these can be indistinguishable from feral and hybrid cats);

- Feeding signs – prey remains may be left inside or outside of dens
- Wildcat tracks and scats – wildcats may mark their home range on prominent features such as trees and boulders on tracks by spraying urine or leaving scats
- Claw marks – wildcats scratch the bark of trees to mark their home range
- Places of shelter – dens are usually marked my urine sprays or scats

Due to their nocturnal activity, it can be difficult to confirm the presence of wildcats at suspected dens, and to be sure that the individual is a pure wildcat, therefore camera traps may be required to positively identify a wildcat and confirm its presence in the area.

3.3 Responsibilities

It is the *Contractor's* responsibility to comply with all the requirements of this Species Protection Plan where wildcat may be present, and it is both the *Contractor's* and SHE Transmission's responsibility to monitor compliance with this Species Protection Plan. The responsibility for applying for any licence, may vary from project to project, but all applications and mitigation works will adhere to this plan.

1.1

[1] Kitchener AC, Yamaguchi N, Ward J and Macdonald DW. 2005. A diagnosis for the Scottish wildcat (Felis silvestris): a tool for conservation for a critically endangered felid. Animal Conservation (8): 223-237.

3.4 Legislation

Wildcat is a European Protected Species (EPS) protected under Annex II and IV of EC Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive). The Habitats Directive is transposed into Scottish law by The Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland). The protection has remained operable in Scotland following amendments of the Regulations by The Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019. Wildcat is listed on Schedule 2 of The Conservation (Natural Habitats &c.) Regulations 1994. The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007 enhanced this protection. Current Legislation means that wildcat and their shelters are fully protected in Scotland. Guidance on the protection given to wildcat and their shelters is available on the NatureScot website

https://www.nature.scot/plants-animals-and-fungi/mammals/land-mammals/wildcats

In summary, it is illegal to:

- Deliberately or recklessly1 kill, injure or take (capture) a wildcat;
- Deliberately or recklessly disturb or harass a wildcat; and
- Damage, destroy or obstruct access to a breeding site or resting place of a wildcat (i.e., a wildcat shelter).

Licences may be granted for certain purposes that would otherwise be illegal / cause an offence; such licences for development work must be applied for from NatureScot, licences may be granted for imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment. Further information on licensing and wildcats can be found on the NatureScot website https://www.nature.scot/professional-advice/protected-areas-and-species/licensing/species-licensing-z-guide/wildcats-and-licensing.

3.5 Surveying for Wildcat

1. Surveys for wildcat must be undertaken in all works areas containing suitable wildcat habitat, a maximum of 12 months[2] prior to works commencing, (this includes site investigations).
2. Surveys must extend for a minimum of 200 m beyond working areas, including access tracks.

1.1

[1] Reckless acts would include not having or disregarding a mitigation plan aimed at protecting wildcat resulting in killing, injury, and/or disturbance of any wildcat or wildcat place of shelter, or carrying out an activity which would result in an offence where the presence of wildcat was foreknown.

[2] Note: Information from any previous surveys (e.g., surveys carried out to provide data for Environmental Impact Assessment (EIA) or other Assessments) can be a useful guide to wildcat activity in an area, particularly if dens were recorded. However, surveys will always require to be updated if carried out more than 12 months prior to works commencing. surveys a maximum of 3 weeks prior to works are recommended.

3. Surveys must be carried out by suitably qualified and experienced ecologists and must identify whether any wildcat and/or their places of shelter are likely to be affected by the works.
4. If wildcats are known to be in the area or evidence of wildcat is found during the initial survey this should alert surveyors and staff to the need for general mitigation measures. Where mammal dens or places of shelter are found during protected mammal surveys, unless the area can be avoided more detailed survey will likely be required to identify which species are using the den. This will usually involve the use of trail cameras at possible dens for a minimum of 1 month and / or DNA testing of scat or hairs found at the possible den site. If evidence of use by wildcat is established the structure must be assumed to be a den. Paired camera traps are normally required to adequately capture images of the pelage, which are crucial for correct identification of wildcats. The ecologist or EcoW should consult NatureScot Licensing Team regarding appropriate camera trapping methodology and a licence for disturbance will be required for any camera trapping. If possible wildcat scats or tracks are found away from possible den sites, use of trail camera could be useful to establish which species left them, but the priority should be on identification of potential wildcat dens.
5. It is important to note that some intrusive surveys may require a Licence from NatureScot.

3.6 Review of Wildcat Survey

Once a wildcat survey has been carried out, the ecologist / ECoW must review the survey results, apply the mitigation hierarchy outlined below and decide if a licence is required from NatureScot for the works. If required, a licence must be obtained from NatureScot prior to any works commencing. Construction teams should be advised of existing / new constraints, together with mitigation / compensation, and licensing requirements by the ecologist / ECoW. Relevant site documentation and project information sources should be updated with new and amended information on wildcat constraints as it is produced, with changes communicated to appropriate staff immediately.

3.7 Mitigation Hierarchy

There should be a general presumption against works being carried out which will disturb wildcat in their den, or which will require the destruction of any wildcat den. A hierarchical approach to minimise the impact on wildcat should be established as follows:

Avoidance

This is the preferred option. Appropriately sized protection zones must be marked and signed on the ground by the ecologist / EcoW, with appropriate material, around all wildcat dens identified during the pre-works surveys. A 200 m radius protection zone must be established around all wildcat dens at any time of year.

All works personnel, machinery, vehicles and storage of materials must be restricted from entering

protection zones. Protection zones must be maintained until all works are completed. Site staff must be briefed of their purpose through a Toolbox Talk by the ecologist / EcoW. If wildcat disturbance can be avoided in this way, there is no need to obtain a licence from NatureScot for the works.

Disturbance

If works within protection zones cannot be avoided, a Licence for disturbance from NatureScot will always be required.

Individual licence applications for disturbance must be accompanied by a Mitigation Plan which outlines how the disturbance will be minimised, and dens protected from damage, for example through screening of works and modifying protection zones.

Wildcat are currently in unfavourable conservation status in Scotland therefore it is unlikely that a licence will be issued by NatureScot for wildcat den destruction.

3.8 Mitigation Measures

3.8.1 General Mitigation – in all wildcat areas (i.e., where no specific signs found during surveys but known to be locally present).

1. Any temporarily exposed pipe system should be capped when staff are off site to prevent wildcats from gaining access and becoming trapped.
2. All exposed trenches and holes should be provided with mammal exit ramps e.g., wooden planks or earth ramps when Contractors are off site.
3. An emergency procedure will be implemented by site workers if wildcat dens are encountered. All work within 200 m will cease, and the ECoW will inspect the site and define mitigation (if required) in line with this SPP.
4. An exceptional circumstance procedure will be implemented should mitigation options not prove satisfactory in a particular case. Works will be halted whilst mitigation is determined (with consultation with NatureScot Licensing Team if required).

3.8.2 Mitigation where a wildcat den is subject to disturbance (under license)

Site specific conditions will be required but may include, protection zones, timing, limits on hours of operation, lighting, noise.

Monitoring and Reporting

1. The Ecologist / Ecological Clerk of Works (EcoW) will attend site on a regular basis throughout the construction period to ensure all environmental mitigation relevant to wildcats is delivered.
2. Reports will be submitted to NatureScot as required by the relevant Licence.

3.9 Licensing Requirements

Licence applications must be sent into NatureScot Licensing Team sufficiently in advance of the project start date (approximately 30 days) to ensure the licence is in place prior to any work commencing.

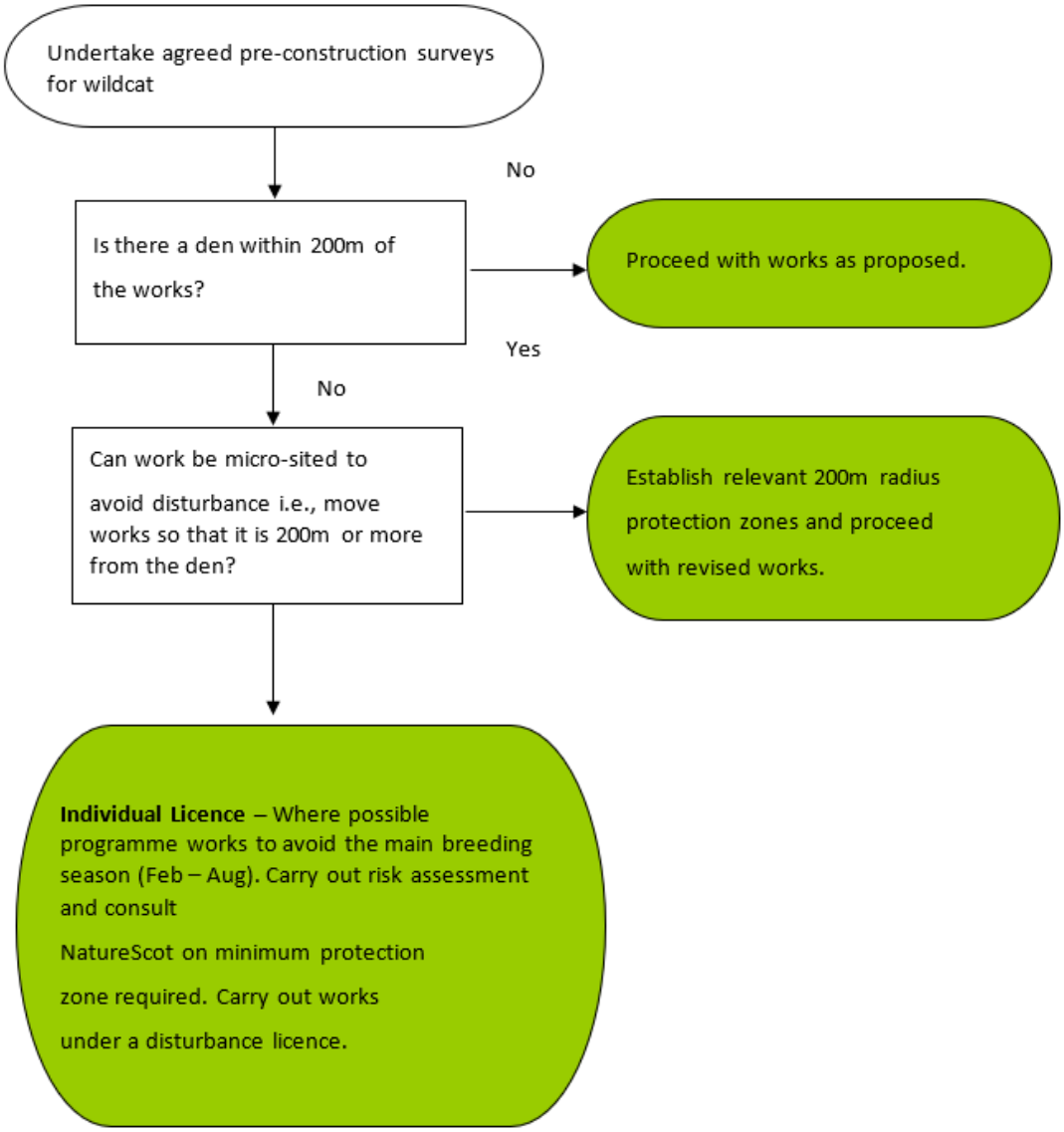


Figure 3.1 - Wildcat Mitigation Decision Tree

4 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	Transfer to new template and Nomenclature	TG-PS-LT-720 (Rev 1.00)	1.00	[redacted]
02	Update to wildcat signs section	TG-NET-ENV-507 (Rev 1.00)	1.01	[redacted]
03	Reworded introduction. Update to weblinks and typo changes. Changes to decision tree.	TG-NET-ENV-507 (Rev 1.01)	1.02	[redacted]

No	Overview of Amendments	Previous Document	Revision	Authorisation
04	Transfer to New Template. Updates relating to NatureScot and simplification of legislation.	TG-NET-ENV-507 (REV 1.02)	1.03	[redacted]
05				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-508

Safety Health and Environment

Pine Marten Species Protection Plan

TG-NET-ENV-508	Pine Marten Species Protection Plan		Applies to Transmission ✓
Revision: 1.01	**Classification:** Internal	**Issue Date:** October 2022	**Review Date:** October 2030

	Name	Title
Author	[redacted]	Environmental Net Gain Manager
Checked by	[redacted]	Consents & Environment Manager
Approved by	[redacted]	Head Of Environment

Contents

1 Introduction

Pine marten (Martes martes) is listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is afforded a high level of protection in Scotland. This Species Protection Plan provides guidance and agreed procedures, for the protection of pine marten and their shelters, during construction works on Scottish Hydro Electric (SHE) Transmission projects. The Plan contains two parts and details the procedures that must be followed where there is potential for pine marten to be present (Part 1), and where a Project Licence for pine marten has been issued by NatureScot Licensing Team to cover the project (Part 2).

1.1 Part 1: General Protection Plan

This Part applies to all projects where pine marten may be present. Part 1 outlines the responsibilities of SHE Transmission and the Contractor regarding protection of pine marten. It also details relevant legislation, survey requirements, general mitigation measures and the requirement for licensing and mitigation.

1.2 Part 2: Project Licence Protection Plan

This Part is provided to Contractors in addition to Part 1, for large projects where a Project Licence has been issued by NatureScot to cover the work, and identifies those activities and protection / mitigation measures which are permitted under the Project Licence and those activities which require an additional Method Statement to be submitted to NatureScot Licensing Team for written approval before works can commence. This Part should be followed in conjunction with Part 1 and the relevant Project Licence, to provide approved guidance and methodologies for carrying out work.

2 References

The documents detailed in Table 2.1 below, should be used in conjunction with this document.

Table 2.1 - Miscellaneous Documents

Title
Wildlife and Countryside Act 1981 (as amended in Scotland)
NatureScot Licensing

3 Part 1: General Protection Plan

3.1 Background

Pine martens are a member of the mustelid family with a population distributed throughout northern Scotland extending down to the northern boundary of the central belt and including a number of the islands including Mull and Skye. There is also a population in Dumfries and Galloway. Following the dramatic reduction in numbers of pine martens in the 19th century they are currently undergoing resurgence due in part to the legal protection they are afforded under the Wildlife and Countryside Act 1981.

Pine martens are solitary territorial animals. Although the edges of territories may overlap slightly, separate individuals are rarely found in close proximity to each other. They generally inhabit woodland or scrubby areas as they require a large amount of cover, and spend much of their time in the canopy. Pine martens are omnivorous, consuming a diet consisting of a wide variety of animals (predominantly small mammals) as well as berries and nuts allowing them to be active all year round. Both male and female pine martens have large territories of up to 8 km2 for females and 20 km2 for males. Due to the size of their territories pine martens have a number of dens (resting places) throughout their territory. They also make breeding nests, which can either be within rocks, in hollowed out trees or in bird nests / squirrel dreys. Increasing pine martens use human habitation such as attics, sheds and other farm buildings for both places of shelter and breeding dens.

Pine marten have two stages to their breeding behaviour with mating taking place in July – August but with the implantation of the fertilised egg delayed until February - March. The young are then born 1 month later and remain with the mother for approximately 12 weeks. Pine martens are mainly active at night and dawn/dusk times, although can also be seen during the day.

Signs of Pine marten:

- Pine marten prints and tracks – five toed slightly cat like footprints only of significant use in areas with snow cover. Tracks on the edge of territories are often marked with scat which can vary considerably in size and shape depending on contents
- Pine marten shelters or dens can be either on the ground in rocky crevices or in elevated tree cavities, abandoned bird nests or owl boxes
- Pine marten scat – is 4 – 12 cm long and 0.8 – 1.8 cm in diameter with often a narrow and twisted appearance. The scats may have a musky smell likened to Parma Violets, although this can vary, and DNA analysis can be required to confirm identification

Due to their nocturnal activity, it can be difficult to confirm the presence of pine martens at suspected dens, therefore camera traps may be required to positively identify a pine marten and confirm its presence in the area.

3.2 Responsibilities

It is the *Contractor's* responsibility to comply with all the requirements of this Species Protection Plan where Pine marten may be present, and it is both the *Contractor's* and SHE Transmission's responsibility to monitor compliance with this Species Protection Plan. The responsibility for applying for any licence, may vary from project to project, but all applications and mitigation works will adhere to this plan.

3.3 Legislation

Pine marten is afforded full protection under Schedule 5 of the Wildlife and Countryside Act 1981,(as amended in Scotland). This makes it an offence to kill, injure or take a pine marten or to intentionally or recklessly[1] damage, destroy or obstruct access to any place used for shelter or for breeding. Disturbance to this species in any place used for shelter or breeding also constitutes an offence.

NatureScot can grant licences to enable certain activities that would otherwise be an offence, to be carried out in relation to pine martens and their places of shelter, subject to the following:

- That undertaking the conduct authorised by the licence will give rise to, or contribute towards the achievement of, a significant social, economic or environmental benefit; and
- That there is no other satisfactory solution.

In granting a licence NatureScot has to take into account the consequences for pine martens at a local population level, to assist this assessment NatureScot will need to see maps of the area of operations and also surrounding areas of suitable pine marten habitat.

3.4 Surveying for Pine Marten

- Surveys for pine marten must be undertaken in all works areas containing suitable pine marten habitat, a maximum of 12 months[2] prior to works commencing, (this includes site investigations), to ensure availability of up to date information on place of shelter locations
- Surveys must extend for a minimum of 100 m beyond working areas, including access tracks

1.1

[1]Reckless acts would include disregard of mitigation aimed at protecting pine martens, resulting in killing, injuring and/or disturbance of any pine marten or pine marten resting place. Reckless acts would include disregard of mitigation aimed at protecting pine martens, resulting in killing, injuring and/or disturbance of any pine marten or pine marten resting place.

[2] Note: Information from any previous surveys (e.g., surveys carried out to provide data for Environmental Impact Assessment (EIA or other Assessments) can be a useful guide to pine marten activity in an area, particularly if dens were recorded. However, surveys will always require to be updated if carried out more than 12 months prior to works commencing. Pre-felling surveys a maximum of 3 weeks prior to works are recommended.

- All dens must be marked to permit easy identification.
- Surveys must be carried out by suitably qualified and experienced ecologists and must identify whether any pine martens and/or their places of shelter are likely to be affected by the works.

If works during the breeding season (March to August inclusive) cannot be avoided, and breeding dens may be disturbed by works, it may also be important to establish if these dens are being used for breeding. The non- invasive method as follows must be used in the first instance: Visual observation and camera surveillance from the ground, for a period of a minimum of 14 consecutive days prior to works commencing, used to establish if the breeding den is in regular use. If regular use is established the den must be assumed to be being used for breeding purposes.

3.5 Review of Pine Marten Survey

Once a pine marten survey has been carried out, the ecologist / Ecological Clerk of Works (EcoW) must review the survey results, apply the mitigation hierarchy outlined below and decide if a licence is required from NatureScot (either Individual or Project) for the works.

If required, licences (individual or project), must be obtained by NatureScot prior to any works commencing.

Construction teams should be advised of existing / new constraints, together with mitigation / compensation, and licensing requirements by the ecologist / ECoW.

Relevant site documentation and project information sources should be updated with new and amended information on pine marten constraints as it is produced, with changes communicated to appropriate staff immediately.

3.6 Mitigation Hierarchy

There should be a general presumption against works being carried out which will disturb pine martens in their den, or which will require the destruction of any pine marten den. A hierarchical approach to minimise the works impact on pine marten should be established as follows:

Avoidance

This is the preferred option. Appropriately sized protection zones must be marked and signed on the ground by the ecologist / EcoW, with appropriate material, around all pine marten dens identified during the pre-works surveys. The breeding season (March to June inclusive) is the most sensitive time for disturbance, during this time a 100m radius protection zone must be established around all pine marten dens. Out with the breeding season, a protection zone of 30 metres radius must be established. For high noise / vibration activities (pile driving or blasting) a 100m radius protection zone around pine marten dens must be established at any time of year.

All works personnel, machinery, vehicles and storage of materials must be restricted from entering protection zones. Protection zones must be maintained until all works are completed. Site staff must be briefed of their purpose through a Toolbox Talk by the ecologist / EcoW. If pine marten disturbance can be avoided in this way, there is no need to obtain a licence from NatureScot for the works.

Disturbance

If works within protection zones boundaries cannot be avoided, a Licence for disturbance from NatureScot will be required. For small scale projects the licence may be specific to the site, for larger scale works a Project Licence may be appropriate.

Individual licence applications for disturbance must be accompanied by a Mitigation Plan which outlines how the disturbance will be minimised, and dens protected from damage, for example through screening of works and modifying protection zones.

If a Project Licence is in place, and a den being used in the breeding season will be disturbed, a Method Statement must be submitted to NatureScot for written approval in accordance with Part 2 of this document, prior to any works commencing. The Method Statement must state how works will be carried out in a way which ensures no abandonment of young.

Destruction

Destruction of dens must only be undertaken as a last resort and requires a Licence from NatureScot. Individual Licence applications to NatureScot must be accompanied by a Mitigation / Compensation Plan which outlines how disturbance will be minimised and individual pine martens protected from injury, and may include provision for the creation of an artificial den if appropriate. If destruction of a den during the breeding season is required, the plan should include details of non-invasive monitoring which will take place to ensure breeding is not taking place prior to any den destruction. Any den subject to works under Licence must be monitored during and after those works.

3.7 Mitigation Measures

3.7.1 General Mitigation

- An emergency procedure will be implemented by site workers if pine marten dens are encountered. All work within 30 m (non-breeding season) or 100 m (breeding season) will cease, and the ECoW will inspect the site and define mitigation (if required) in line with this SPP
- Any temporarily exposed pipe system to be capped when contractors are off site to prevent pine marten from gaining access. Similarly, all exposed trenches and holes must be provided with mammal exit ramps when contractors are off site (i.e., at night time)
- An exceptional circumstance procedure will be implemented should mitigation options not prove satisfactory in a particular case. Works will be halted whilst mitigation is determined (under consultation with NatureScot Licensing Team if required)

3.7.2 Monitoring and Reporting

- The Ecologist / ECoW will attend site on a regular basis throughout the construction period to ensure all environmental mitigation relevant to Pine martens is delivered
- Reports will be submitted to NatureScot as required by the relevant Licence

3.8 Licensing Requirements

Licence applications must be sent into NatureScot Licensing Team sufficiently in advance of the project start date (approximately 30 days) to ensure the licence is in place prior to any work commencing.

3.9 Project Licence

A NatureScot Project Licence is likely to be the most appropriate form of licence for any large scale and / or long running project, in pine marten areas. For example, where multiple instances of disturbance to a number of pine marten resting places is anticipated over several months / years. A Project Licence can be used to standardise protected species mitigation / compensation, creating consistency across the project area and throughout the Project's lifespan. Project Licences do not negate the need for thorough pre-construction survey within 12 months and three weeks of the planned project start date.

Any Project Licence application will need to be accompanied by a Mitigation / Compensation Plan, and procedures for pine marten included in Parts 1 and 2 of this SPP.

3.10 Individual Licence

For small scale projects expected to be completed over relatively short timescales, which will result in a low number of unavoidable pine marten offences an Individual NatureScot Licence is most likely to be appropriate. Licence applications should be accompanied by a Mitigation Plan and should be sent sufficiently in advance of the project start date to ensure the licence is in place prior to work commencing. Further guidance and details of how to apply for a pine marten Licence can be found on the NatureScot website https://www.nature.scot/professional-advice/protected-areas-and-species/licensing/species-licensing-z-guide/pine-martens-and-licensing

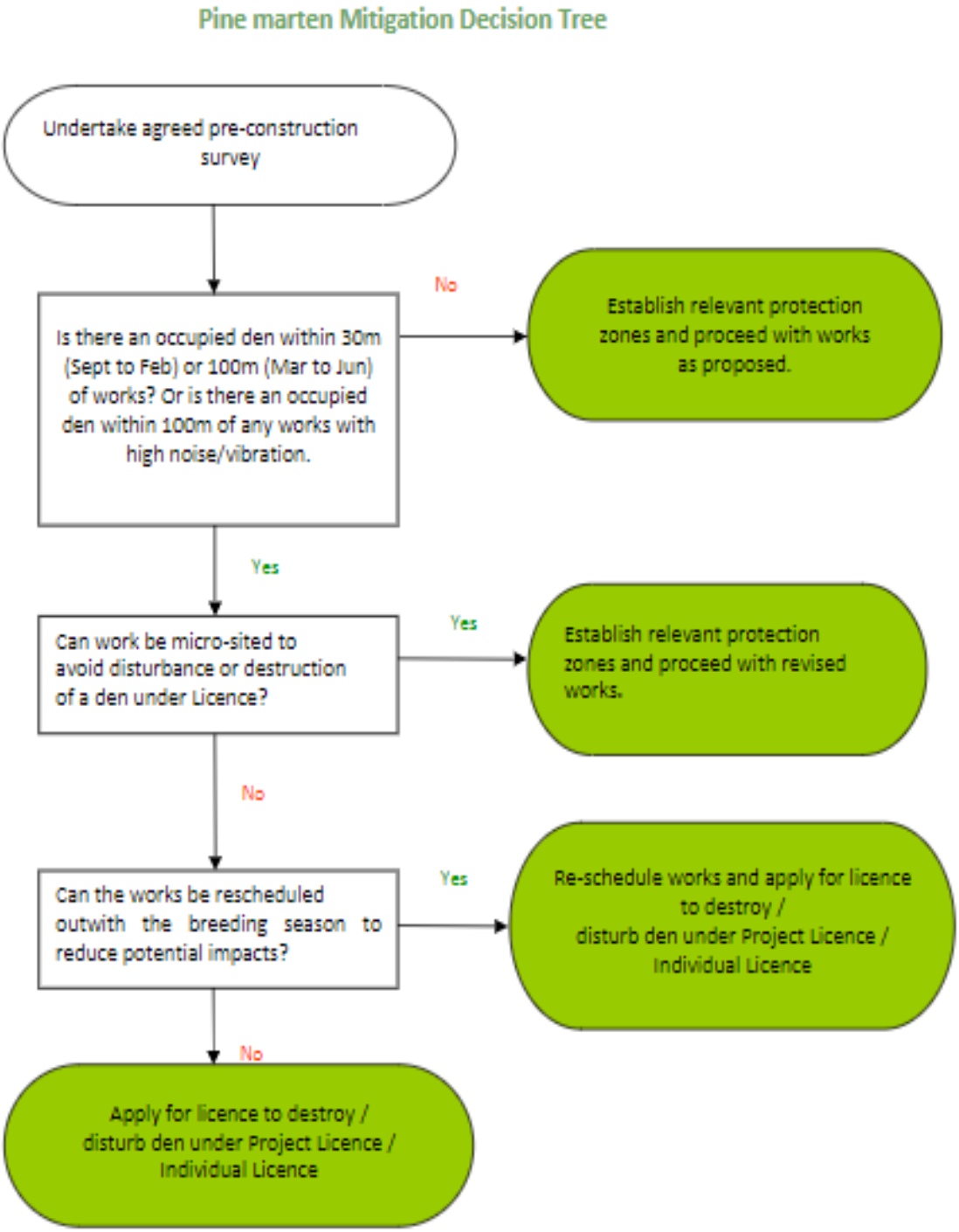


Figure 3.1 - Pine Marten Mitigation Decision Tree

4 Part 2: Project Licence Protection Plan

The following sections of this plan are to be read in conjunction with Part 1 of this document, the Project Licence (insert Licence number) and its conditions.

Mitigation activities permitted under Project Licence are included in this Part of the SPP (section A). More disruptive activities, listed in Section B below, will require a specific Method Statement to be submitted to NatureScot Licensing Team for approval, prior to works commencing (see Appendix A). It is the *Contractor*'s responsibility to submit these Method Statements to both SHE Transmission and NatureScot for written approval. No works shall proceed without this written approval.

Sufficient time should be allowed for in the programme to carry out any consultation work and obtain necessary approvals.

The Project Licence will specify reporting requirements detailing all disturbance and destruction works carried out.

In advance of, and during construction at any location where there is the potential for pine marten to be present, it is **essential** that this plan is followed:

A. Works allowed under the project licence without further approval from NatureScot Licensing Team

The following works may be carried out under this SPP without further approval from NatureScot, using the prescribed methodologies:

1. Disturbance to a den or place of shelter out with the breeding season. This includes ground and aerial dens, whether occupied, or unoccupied and located within known pine marten territory.

Methodology:

Pine marten dens must not be damaged or destroyed, but protected from potential damage by setting up a modified protection zone (size determined by the site ecologist / EcoW). Protection zones must be clearly marked on the ground and signed, and must exclude all works personnel, machinery, vehicle and storage. The protection zone must be maintained until all works are finished. Works will be undertaken in as short a period as possible to minimise the level of disturbance. A project licence return must be sent to NatureScot Licensing Team detailing all disturbance works under the Project Licence.

a. Before works commence, the ECoW will:

- Attend the site in order to check whether pine marten is present or not. If pine marten is present, then works may need to be delayed until the ECoW is satisfied suitable access / egress away from the place of shelter is safeguarded. If no pine marten is present, works can proceed
- Brief the site personnel, including contractors and subcontractors, regarding the presence of the pine marten dens and the protected status of pine marten, their dens and the conditions of this Species Protection Plan, which allows for felling and construction within 30 m of the den

- Describe the actual den and state that no machinery must drive over it or if it is in a tree the den tree must not be cut down

b. The den should be clearly marked with a blue tipped stick adjacent to the hole. For an aerial den the tree will be marked with a thick band of blue tape around the trunk.
c. For felling operations, the whole area within the 30 m protection zone, excepting the den tree itself, may be felled using a harvester.
d. Works within 30 m of the den will be undertaken within 1 day wherever possible. Where works take longer, the ECoW will carry out a pre-works check each morning for pine marten presence.

B. Activities requiring an NatureScot Approved Method Statement Prior to Works Commencing

The following activities require a formal Method Statement to be submitted and approved in writing by NatureScot Licensing Team prior to any works commencing:

a. Temporary or permanent exclusion or destruction of a den.

b. Any works within 100m of a breeding den during the breeding season.

c. Any exceptional circumstances not covered in this SPP.

The Method Statement template in Appendix A has been developed in conjunction with NatureScot and should be used by the *Contractor / Named Agent* for all submissions.

5 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	Transfer to New Template and Nomenclature	TG-PS-LT-721 (Rev 1.00)	1.00	[redacted]
02	Typos, formatting and reference to other species removed.	TG-NET-ENV-508 (Rev1.00)	1.01	[redacted]
03	Transfer to New Template. Updates relating to NatureScot and simplification of legislation.	TG-NET-ENG-508 (Rev1.01)	2.00	[redacted]
04				

Appendix A Project Licence Method Statement Template

<PROJECT TITLE>

METHOD STATEMENT FOR WORKS UNDER (insert licence details)

<insert species record reference>

<insert date>

Introduction

This document, prepared on behalf of SHE Transmission provides a Method Statement for **<**insert details of works**>** to be completed under **<**insert licence details**>.** These works are required in order to facilitate the delivery of the <insert Project details> (the Project).

Condition **<**insert No.**>** of the above Licence states that a **<**insert species**>** Protection Method Statement be submitted to NatureScot Licensing Team for written approval, under specific circumstances, prior to commencement of works which could affect **<**insert species**>.** Therefore, no works which would <insert licensed activity> **<**insert species**>** shall take place without written confirmation of NatureScot approval of this method statement.

This Method Statement makes reference to the following documents:

<insert licence details**>,** NatureScot

Species Protection Plan (SPP): **<**insert SPP No. and title**>** Rev. X **<**insert date**>**

Further information is provided in Table 1: Summary of Data.

Licensable Works

Introduction

<Insert details**>**

Baseline Description

<Insert description, including photographs / location plan>

Appendix A, Table 1

Reference	Easting	Northing	Date recorded	Description	Date works exclusion zone demarcated & distance

Survey Summary

<Insert details>

Description of the Proposed Licensable Works

<Insert details>

Works Duration

<Insert details>

Consideration of Alternatives

<Insert details>

Impact Assessment

<Insert details>

Method Statement Site Briefing (to be delivered to relevant staff prior to works)

Site: <insert description>

Reference number: <insert species record reference>

Client: SHE Transmission

Task: <insert description of works>

Prepared by: <insert individual or Company name>

Licensed Agent: <insert name>

Method statement for <insert works description>

Before works commence:

All relevant personnel will be made aware of the presence and location of the constraint and mitigation.

<insert details of methodology>

During works:

<insert details of methodology>

<Insert Contractor's name>

I, the undersigned, confirm receipt of this method statement and fully understand and agree to work to the conditions therein.

Signature of Contractor's Representative:…… Date ..../ /

Print name in full: ……

Scottish & Southern Electricity Networks
TRANSMISSION

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-527

Safety, Health and Environment

Wood Ant Species Protection Plan

TG-NET-ENV-527	Wood Ant Species Protection Plan		Applies to Transmission ✓
Revision: 1.00	**Classification:** Internal	**Issue Date:** March 2022	**Review Date:** March 2030

	Name	Title
Author	[redacted]	Consents and Environment Manager
Checked by	[redacted]	Consents and Environment Manager
Approved by	[redacted]	Head of Environment

Contents

1 General Protection Plan Introduction

This Protection Plan provides guidance and agreed procedures for the protection of wood ants during construction works on SSEN Transmission projects. The plan details the procedures that must be followed where wood ants have been observed within the construction area.

2 Background

2.1 There are three key species of wood ant, which are as follows:

Formica aquilonia (Scottish wood ant) This species has a fringe of hairs at the rear of the head which does not extend down to the compound eyes. Viewed from the side, it does not appear hairy. It builds very large mound nests, up to two metres in diameter and up to 1.5 m high. These nests are rarely isolated and are often linked by long trails to neighbouring mounds, effectively forming one huge colony.	 ©Gabor Pozsgai	 ©Jenni Stockan
Formica lugubris (Hairy or Northern wood ant) In *F. lugubris* the fringe of hairs at the rear of the head extends down to the compound eyes. There are also long hairs on the thorax and when viewed from the side, the top of the thorax looks very hairy. They build large mound nests about two metres in diameter and one metre high. Some nests exist in isolation, but large groups of interconnecting nests often occur, and may contain many hundreds of queens.	 ©Hayley Wiswell	 ©Hayley Wiswell
Formica exsecta (Narrow-headed ant)[1] The distinctive feature of this ant is the notch in the top of the head and the narrow appearance of the head. It is smaller in size compared to the other wood ants, with workers around seven millimetres long. Their nests are dome-shaped mounds, smaller in size than the other two species, about 30 cm in diameter. Note: Narrow-headed ant has a very restricted distribution: Abernethy, Glenmore, Carrbridge, Mar Lodge (all in the Cairngorms National Park), and Camghouran alongside Loch Rannoch. It's not known elsewhere in Scotland.	 © Alex Hyde	 ©Jenni Stockan

[1]*Formica exsecta is not strictly speaking a wood ant however they share a common ancestor. Therefore, F. exsecta is being considered as a wood ant for the purposes of this plan.*

2.2 The nests of all three species offer opportunities for shining guest ant (Formicoxenus nitidulus) which is about 2.8 to 3.6 mm long and lives in the colonies of the much larger species. It is difficult to detect; therefore, all wood ant nests should be considered to be potential habitat.

2.3 Further information on wood ants can be found in a 'Guide to the Wood Ants of the UK and related species', published by the Cairngorms National Park Authority in 2021. A digital copy of this guide and further guidance on relocation of wood ant nests can be found at www.woodants.org.uk.

3 Responsibilities

It is the Contractor's responsibility to comply with all the requirements of this Protection Plan where wood ants may be present, and it is both the Contractor's and SHE Transmission's responsibility to monitor compliance with the Protection Plan.

4 Legislation

4.1 Narrow-headed ant and shining guest ant are both included on the Scottish Biodiversity List.

4.2 Section 1(2)(a) of the Nature Conservation (Scotland) Act 2004 requires every public body and office-holder to have regard to the Scottish Biodiversity List as a requirement of their biodiversity duty under section 1(1) of the Act. This requirement includes SSEN Transmission as the holder of a licence under section 6(1) of the Electricity Act 1989.

5 Surveying for Wood Ants

5.1 In advance of construction a walkover will be undertaken by a qualified and experienced ecologist to check construction areas for wood ants. Once the survey has been carried out, the ecologist / Environmental Clerk of Works (ECoW) shall review the survey results and apply the mitigation hierarchy outlined below.

5.2 Ongoing checks will be undertaken throughout construction by the project ecologist. Construction teams should be advised of existing / new constraints, together with mitigation requirements by the ecologist / ECoW.

5.3 Relevant site documentation and project information sources should be updated with new and amended information on constraints as it is produced, with changes communicated to appropriate staff immediately.

6 Mitigation Hierarchy

There is a general presumption against works being carried out which could destroy wood ants. A hierarchical approach to mitigation of Avoidance – Relocation will be applied nest that may be affected (See Figure 2.1):

6.1 Avoidance

6.1.1 This is the preferred option for nests identified within construction areas. A protection zone of at least five metres around the nest should be marked and signed on the ground with appropriate material to restrict work access. This protection zone may need to be larger depending on size of nest and activity of workers around the nest. The protection zone should ideally take into consideration significant foraging routes, and 'foraged' trees if these are present to avoid a large number of workers being harmed.

6.1.2 Protection zones must be maintained until works are completed. Site staff should be briefed of their purpose through a Toolbox Talk and works micro-sited out with the protection zone.

6.2 Relocation

6.2.1 Where avoidance is not possible, the following wood ant relocation protocol shall be followed.

6.2.2 Wood ant species have different habitat requirements. The microhabitat of the affected site must be surveyed to include aspect, slope, elevation, hill-shading, canopy, location and size of trees etc. Potential receptor sites that match these requirements must be identified.

6.2.3 Wood ants are territorial and will compete with the same and other ant species. Territory differs between species but may be up to 100m from the nest. As such a survey for other ant nests within 100m of potential receptor sites will also be undertaken.

6.2.4 Wood ants are active throughout the summer, while queens hibernate during winter. These are sensitive times for the colony and relocation should not be undertaken at these times.

6.2.5 The relocation of narrow-headed ants should be avoided where at all possible as current evidence suggests a high risk or probability the nest will fail if it is relocated. Relocation should only be considered as an emergency last resort when a nest is threatened with likely imminent extinction if there is no intervention.

6.2.6 The optimum time for relocation of F. aquilonia and F. lugrubis is Spring, however it is possible in Autumn. The optimum time for relocation of F. exsecta is late summer (after August) to late autumn. The optimum temperature for relocations is between 5 to 10ºC.

6.2.7 Relocation must be carried out in fine weather and be followed by at least several days of similar weather, so that the ants can organise themselves and set about nest building. It is crucial therefore to watch for weather forecasts during the relocation season, so that optimum conditions prevail.

6.2.8 All relocations must be supervised by the ecologist / ECoW to tackle any issues arising.

6.2.9 Prior to relocation preparations are essential and include:

- The ecologist / ECoW undertaking a site survey to identify a suitable resettlement location away from construction activities. The potential resettlement site(s) should be visited in advance at different times of the year. A site which appears suitable in winter may have a completely unsuitable state in summer, and vice versa. Unsuitable factors principally include excessive shading and/or potential water-logging due to poor drainage, lack of food-source trees etc
- When deciding on a new location the following factors should be considered:
  - It should preferably have an open southerly aspect, free from shading overgrowth and with good drainage. If necessary, any shading vegetation should be cleared or thinned. A focal point for nest building, such as an old stump or decaying tree trunk or boughs, should be present, or artificially added if not. Twiggy 'brash' added over the stump or boughs will serve to provide a framework for nest building
  - It should be as similar as possible to the source site
  - It should be in a location that facilitates monitoring for as long as possible
  - Suitable tree and shrub species must be present to provide enough food in the form of honeydew from aphids and other plant-lice
  - Prepare the resettlement site by excavating a hole to at least the same size (nests can extend one metre below ground depending on the size of the nest, and underground components usually mirror those above ground)
- The ecologist / ECoW undertaking a detailed Toolbox Talk in advance of the relocation works to all personnel involved

6.2.10 When planning for relocation there are two possible methods, as outlined in Table 6.1 and below.

Table 6.1 - Planning for Relocation Methods

Method	Strengths	Weaknesses
Hand Tool Method	Less reliance on retaining nest architecture. Can allow nests to be moved in a vehicle to a distance resettlement site. Can work for any size of nest and particularly useful for large nests where digging whole nest is not feasible. Can be done using hand tools and at sites when access for machinery is not possible	Results in total loss of nest architecture, though the "layers" of material are still retained. Relies on the ability of the ants to rebuild the nest structure and thatch which they can do surprisingly quickly depending on size of colony and time of year. Best timed to seasons when the ants are active and able to recover (i.e., not immediately before hibernation and cold spells of weather).

Method	Strengths	Weaknesses
Excavator Method	Can retain nest architecture if done carefully Can make use of machinery that may already be on site.	Should only be used when nests are being moved very short distances, to avoid loss and damage to nest whilst being carried in excavator bucket. Best suited to small-medium sized nests.

6.3 Hand Tool Method

6.3.1 Tools to be used include spades, shovels, and possibly saws or axes (if roots etc are a problem). Nest transfer into the sack should preferably be done using wide, flat coal-type shovels, which are less potentially damaging than sharp digging spades. Organic Hessian-type potato sacks make the best containers, and the use of plastic sacks must be avoided. String or similar cord is necessary to tie up each sack as it is filled. Sixty litre plastic barrels with lids have also proven successful, and could be considered for this method.

6.3.2 When using hand tools shovel up as much of the massed ants and material as possible, in as few scoops as possible, in order to minimise the time taken and the disturbance to the ants. Work down as far as the soil structure will allow. Do not over-fill each hessian sack, which could lead to some crushing at the bottom, and try to include some small branches etc to alleviate pressure. Tie up each sack as quickly as possible after filling.

6.3.3 Keep the time between removal of the ants from the old location and their release at the new location as short as possible.

6.3.4 Untie the sack(s) and carefully tip the ants and nest material over the prepared nest site. After the bulk material is emptied, there will still be many ants clinging to the inside (and outside) surfaces of the sack, which should be shaken vigorously to dislodge as many as possible. The sack should be turned inside out, and then cut into two or three sections which can be placed and left on and around the nest heap. This will enable all the ants to keep together, and also ensure that any other small creatures, such as myrmecophilous beetles etc, which might be clinging to the sack, will be able to remain with the ants. The Hessian sack material will add to the overall nest framework and will eventually rot away.

6.4 Excavator Method

6.4.1 Prepare the route between the old location and resettlement site. A trial run should be undertaken to identify and remove hazards when not using existing roads or tracks prior to relocation.

6.4.2 Ensure the excavator slowly moves to the ant nest and excavates the entire nest using the bucket (ensuring minimal damage to the nests architecture occurs).

6.4.3 Care needs to be taken to ensure the nest is kept as intact as possible and where possible move the nest as one complete unit to maintain nest architecture.

6.4.4 Once the nest has been excavated ensure the bucket is covered in thermal breathable fabric coverings to help retain heat within the nest, should the transport take longer than 30 minutes. This covering will assist in preventing any ant's falling out of the bucket during transit. The excavator shall move the nest as slowly and steadily as possible (around 2.5 miles per hour).

6.4.5 Ensure the excavator places the bucket containing the ant nest into the resettlement site, ensuring retention of the nest aspect. The bucket is to be retracted slowly, ensuring the nest is gently placed into the resettlement site and limits damage of the internal structure of the nest.

6.5 Post Excavation (either method)

6.5.1 After the nest has been excavated, the excavation site should be checked by the ecologist / ECoW for any significant number of ants, ant queens or signs of nest architecture (nests can extend one metre below ground depending on the size of the nest, and underground components of the nest usually mirror those above ground). These should be gathered and taken to the resettlement site.

6.5.2 If the relocation site is in proximity to construction activities a protection zone of at least five metres around the nest should be marked and signed on the ground with appropriate material to restrict work access. This protection zone may need to be larger depending on size of nest and activity of workers around the nest. The protection zone should ideally take into consideration significant foraging routes, and 'foraged' trees if these are present to avoid a large number of workers being harmed.. If the nest is out with the construction area it should be clearly marked so it can easily be located for monitoring.

6.5.3 Where badgers are known to be present physical barriers may be required for the first year after relocation to prevent the nest being damaged or destroyed.

6.5.4 Provide supplementary sugary food (e.g. bee food dough, honey-breadwater mash, or jam) at the receptor site daily for first two weeks post-move to ensure long term success in the new site.

6.5.5 During the initial days after the relocation the old location should be checked if possible, and if necessary, remaining ants should be collected and moved to the resettlement site.

7 Monitoring

The ecologist / ECoW will attend site on a regular basis throughout the construction period to ensure all environmental mitigation relevant to wood ants are delivered, including:

- food supply – have the ants set up foraging routes to a foraged tree(s), which may harbour an aphid colony?
- If not, then further supplementary feeding may be required
- are the ants active and remained where they were relocated with evidence of thatch repair and/or growth in the size of the nest?

- have the ants moved to a new site of their own choosing? This often happens, sometimes after an initial period (lasting a few days to perhaps a week or so) of stability and is not a problem unless the uncertainty becomes prolonged
- where protection measures around the relocated nest have been installed, as described above, does this require to be modified and/or repaired?
- It is not unusual for the population to appear to be significantly reduced in the next season after relocation. This is due to losses during the previous year and over the winter, caused by physical injury, predators and/or 'shock' – older workers in particular may not adjust to their new surroundings. If all is well, however, losses are made up during the succeeding months and years. To ascertain success / failure, the nest shall be monitored through the first season and in the April of the following season. For the purposes of monitoring the following process is recommended as a minimum:
    - following relocation supplementary feeding should be undertaken daily for the first two weeks
    - in the third week following relocation check whether the ants have established foraging routes and decide whether to continue supplementary feeding or not
    - a month later check whether the nest has been damaged or had major disturbances
        - If so, protection measures to prevent further damage or disturbance should be considered
    - where protection measures to prevent damage by badgers are installed they can be removed after one year
    - in April of the season following relocation determine short-term success / failure to ascertain if there is any learning that can be used to update / amend the relocation process. If so, this should be reported to the SSEN Transmission Consents and Environmental Manager for the project

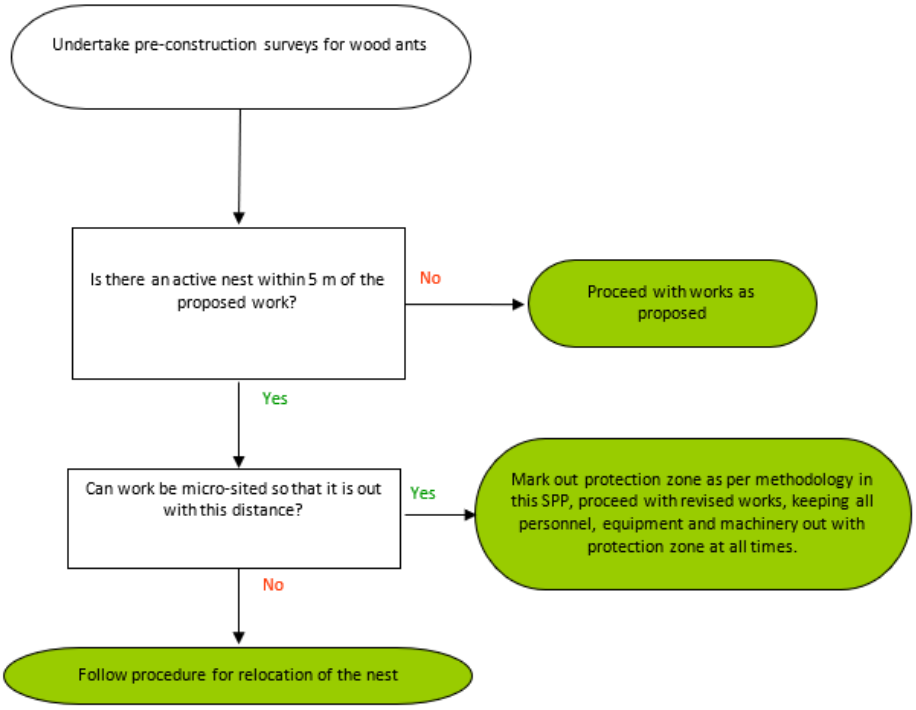


Figure 7.1 - Wood Ant Mitigation Decision Tree

8 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	Created after review by Hayley Wiswell (Cairngorms National Park), Athayde Tonhasca (NatureScot) and Jenni Stockan (James Hutton Institute)	n/a	1.00	[redacted]
02				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-529

Environmental

Beaver Species Protection Plan

Inveralmond House, 200 Dunkeld Road, Perth PH1 3AQ ssen.co.uk

TG-NET-ENV-529	Beaver Species Protection Plan		Applies to Transmission ✓
Revision: 1.00	**Classification:** Public	**Issue Date:** August 2023	**Review Date:** August 2031

	Name	Title
Author	[redacted]	Biodiversity Enhancement Implementation Manager
Checked by	[redacted]	Consents & Environment Manager
Approved by	[redacted]	Head of Consents & Environment

Contents

Inveralmond House, 200 Dunkeld Road, Perth PH1 3AQ ssen.co.uk

1 Introduction

Beaver (Eurasian or European) is a European Protected Species and is afforded a high level of protection in Scotland. This Species Protection Plan (SPP) provides guidance and agreed procedures for the protection of beavers and their shelters during construction works on SSEN Transmission projects.

This SPP applies to all projects where beaver may be present. It outlines the responsibilities of SSEN Transmission and the *Contractor* regarding protection of beaver. It also details relevant legislation, survey requirements, general mitigation measures and the requirement for licensing and mitigation.

2 References

The documents detailed in

Table 2.1 - Scottish and Southern Electricity Networks Documents and Table 2.2 - Miscellaneous Documents, should be used in conjunction with this document.

Table 2.1 - Scottish and Southern Electricity Networks Documents

Reference	Title
TG-NET-ENV-512	General Environmental Management Plan (GEMP) - Working in or Near Water
TG-NET-ENV-515	General Environmental Management Plan (GEMP) - Watercourse Crossings
TG-NET-ENV-519	General Environmental Management Plan (GEMP) - Forestry

Table 2.2 - Miscellaneous Documents

Title
Campbell-Palmer, R. et al. (2016) The Eurasian Beaver Handbook: Ecology and Management of *Castor fiber*. Exeter: Pelagic Publishing, UK
The Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland)
The Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019
Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
NatureScot Standing advice for planning consultations - Beavers
NatureScot Management Framework for Beavers in Scotland
NatureScot Ecological and practical interpretation of legal definitions: disturbance, breeding sites and resting places of beavers (Updated: 7 March 2019)
NatureScot Managing the impacts of beavers in Scotland. Guidance for land, property and infrastructure managers
NatureScot Beaver Mitigation Practical Guides: Protecting trees using wire mesh
NatureScot Licensing
SEPA WAT-PS-14-01: (The Controlled Activities Regulations) CAR and the Management of Beaver Structures
SEPA Water levels

Inveralmond House, 200 Dunkeld Road, Perth PH1 3AQ ssen.co.uk

3 General Protection Plan

3.1 Background

Beaver (*Castor fiber*) are mainly nocturnal, large, semi-aquatic rodents with a characteristic large, flattened, scale-covered tail. Although they occurred across Scotland in the past before being hunted to extinction, they now have a limited distribution in Scotland with known populations primarily in Tayside, as a result of probable escapes or unofficial releases and through a Scottish Government approved trial reintroduction project in Knapdale. Other populations may exist outwith these areas.

The most sensitive period for beavers is during the kit dependency period normally between the 1st April and 16th August. They form territorial family groups (typically a monogamous pair with a number of yearlings and kits) and are largely restricted to freshwater and associated riparian broadleaved woodland habitats. Territories are related to food resources and will change over time in relation to availability of suitable food sources. They are considered to be 'ecosystem engineers' - altering their environment to create ponds and wetlands, altering sediment transport, importing woody debris into aquatic environments, creating standing dead wood and coppiced stands. Whilst overall beavers may have a positive impact on biodiversity, there can be negative impacts on certain species and habitats. It can also lead to conflicts with other land uses such as forestry, agriculture and infrastructure. Beavers form lodge and chambered burrow structures for breeding and will also form simple burrow structures for shelter and protection. The majority of beaver activity is found within 20 m of the water's edge. Aspen and willow appear to be preferred food choice for beaver, whilst conifers are generally avoided. In Scotland ash, rowan and birch are also browsed or felled. Additionally, a wide variety of herbaceous materials are also foraged including arable crops and bracken.

Beaver activity has been recorded across large parts of Tayside, spreading from the catchments of the River Tay and the River Earn. More recently, beavers have expanded their range naturally from Tayside into the Forth catchment and the Loch Lomond / Leven catchment. Further expansion is likely, with a single animal known to be in the Clyde catchment. The Scottish Government announced on the 24th November 2021 that it will actively support the expansion of the beaver population, promoting translocation, helping beavers to establish beyond where natural expansion would be expected to reach in the short term

Signs of beaver:

- Feeding remains – chiselled stumps of felled/gnawed trees which may include relatively large trees (sometimes in excess of 1 m diameter), ring barked trees and wood chips are often the most obvious signs of beaver activity. Other feeding signs include closely 'grazed lawn' areas of vascular plants, cleared areas of root or cereal crops adjacent to watercourses and feeding stations where beavers return repeatedly, evidenced by piles of peeled sticks or other feeding remains
- Beaver shelters – burrows are preferred to 'true' free-standing lodges. Burrows may extend up to 20 m from the water's edge (usually starting with an underwater entrance); however, most burrows only extend to within 10 m of a watercourse. Each beaver family will have several shelters within their territory:

- Free-standing lodges have the majority of their chambers within a woody stick pile, with below ground burrowing limited due to unsuitable ground conditions for digging or water level. A free-standing lodge will have underwater entrance(s). Free-standing lodges can be breeding sites or resting places
- Bank lodges are formed where beavers pile branches and other material on top of the bank where the depth of the bank is not great enough. The majority of chambers are within the chambered burrow below ground. Bank lodges will have underwater entrance(s). Bank lodges can be breeding sites or resting places
- Chambered burrows have multiple entrances (below the waterline) with multiple chambers dug into the riverbank. Those with a woody material roof or branches and other material piled on to top of the bank where the depth of the bank is not deep enough are bank lodges (see description above). Chambered burrows can be breeding sites or resting places
- Simple burrows are usually short (less than 5 m in length) and lack multiple chambers. They can have multiple entrances above or below the waterline (typically 2-3). NatureScot's published interpretation does not consider simple burrows to be breeding sites or resting places. However, beavers are protected from disturbance when using simple burrows for shelter and protection. In practical terms, a non-intrusive survey of a burrow that appears to have an end chamber is unlikely to be able to distinguish between burrows with a single end chamber (simple burrow) or multiple end chambers (chambered burrow). Furthermore, a burrow with a single end chamber could feasibly be used as a resting place. This Species Protection Plan proposes a precautionary approach of initially classifying any burrow that appears to have an end chamber as a chambered burrow and, where necessary, monitoring to establish if the burrow is being used a breeding site or resting place
- Short burrows with no end chamber are a type of simple burrow which may be identified if the whole burrow can be viewed (there are no bends) or if the top of the burrow collapses and the burrow can be viewed down to the water line. Short burrows with no end chamber are not considered to be breeding sites or resting places but beavers are protected from disturbance when using them for shelter and protection. They do not require a licence to destroy if monitoring establishes that a beaver is not in occupation so would not be disturbed
- Temporary nest (or couch) - temporary loose structure consisting of a small area of gathered vegetation and shredded woody material on land, used as a 'day rest' or bed or used by family group or individuals when lodge or permanent burrow is temporarily uninhabitable (e.g., as a result of flooding). Temporary nests or couches are not considered to be breeding sites or resting places but beavers are protected from disturbance when using them for shelter and protection. They do not require a licence to destroy if monitoring establishes that a beaver is not in occupation so would not be disturbed

- Dams – built from logs, branches, grass mud and stones. These are built in mainly narrow or shallow watercourses to raise water levels to protect lodges or burrows.

Dams are largely unknown on larger watercourses (>10 m wide). They are often built at pinch-points in the flow, such as at culverts or where the channel narrows around an obstruction such as a boulder or tree. *Dams over two weeks old are considered part of a breeding site or resting place where they regulate the water level*

- Beaver prints and trails – beaver paws have five clawed toes and are of a typical rodent shape although the hind feet are webbed. Tracks can appear to be three or four toed and hind paw prints are often obscured by the dragging tail
- Foraging trails (sometimes referred to as slides) – well-worn trails and pathways connecting to areas where beavers repeatedly forage on land. These have a semi-excavated appearance and can develop into canals from digging
- Canals – actively excavated channels of around 30 – 60 cm width, radiating from a waterbody, used as navigation channels for food and materials for construction. These can also form from foraging trails filling with water
- Scent-mounds or marks – used to delineate territories and communicate within territories but may not always be present if unrelated beavers are not encountered regularly. These mounds are constructed of mud, sticks and stones can be detected from a camphor-like smell. Lots of scent marking at the borders of a territory will only be found if there is another beaver territory adjacent
- Food caches – winter food stores associated with overwintering resting places, collected in the autumn. Cut branches are secured in the substrate, often just outside the entrance of the main lodge or chambered burrow in a territory being used for overwintering, and may have other branches woven through or piled on to them. Not all beaver families will make caches every winter, therefore absence of this field sign is not evidence that a lodge/burrow is not active. *A food cache is considered to be an integral part of the overwintering resting place so interference with or prevention of access to a food cache during winter months (from November to March) is likely to cause disturbance and require a licence*

3.2 Responsibilities

It is the *Contractor's* responsibility to comply with all the requirements of this Protection Plan where beaver may be present, and it is both the *Contractor's* and SSEN Transmission's responsibility to monitor compliance with the Protection Plan.

3.3 Legislation

Beaver is a European Protected Species (EPS) protected under Annexes II and IV of EC Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive). The Habitats Directive is transposed into Scottish law by the Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland). The protection has remained operable in Scotland following amendments of the Regulations by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019.

Beaver, Eurasian or European, is listed on Schedule 2 of the Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland). Current legislation means that beaver and their breeding sites and resting places are fully protected in Scotland.

In summary it is illegal to:

- Deliberately or recklessly kill, injure, take (capture) a beaver
- Deliberately or recklessly harass a beaver or a group of beavers
- Deliberately or recklessly disturb a beaver whilst it is occupying a lodge, burrow or other place it uses for shelter or protection
- Deliberately or recklessly disturb a beaver while it is rearing or otherwise caring for its young
- Deliberately or recklessly obstruct access to a beaver breeding site or resting place, or otherwise prevent their use
- Deliberately or recklessly disturb a beaver in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species
- Deliberately or recklessly disturb a beaver in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young

It is also an offence (of strict liability) to:

- Damage or destroy a breeding site or resting place of a beaver

NatureScot considers the breeding sites and resting places of beavers to be lodges, and chambered burrows and they are protected whilst a territory is active, regardless of whether or not they are physically occupied at that point in time.

Reckless acts would include not having or disregarding a mitigation plan aimed at protecting beaver resulting in killing, injury, and/or disturbance of any beaver, or protection of a beaver shelter; or carrying out an activity which would result in an offence where the potential to cause damage or disturbance could have reasonably been expected to have been foreseen but no action was taken to assess the risk.

Removing, notching or installing flow devices to established dams (more than two weeks old at the time that the action is taken) should be presumed to require a licence from NatureScot. This is due to the difficulty in ascertaining whether those dams protect breeding sites or resting places, particularly as burrow entrances may be concealed below water level.

NatureScot's Management Framework for Beavers in Scotland guidance on 'Managing the impacts of beavers in Scotland Guidance for land, property and infrastructure managers' lists actions that do not require a licence (subject to the protections above) which includes:

- Destroying short burrows with no end chamber
- Bank protection from burrowing activity
- Filling in canals created by beavers
- Fencing off areas to keep beavers out and use of protectors for vulnerable trees

- Removing, notching, or installing flow-devices to new dams less than two weeks old (at the time that the action affecting the dam is undertaken)

NatureScot advises that in most cases of development works a licence is unlikely to be required provided that the works will not damage lodges, breeding burrows or affect beaver dams; affect their access or access to associated foraging habitats, or otherwise interrupt normal ecological behaviour beyond a short-term temporary period.

3.4 Surveying for Beaver

1. Surveys for beaver must be undertaken in all works areas containing suitable beaver habitat within or with connectivity to recorded ranges. Initial surveys will be considered valid for a maximum of 12 months prior to the works commencing (this includes site investigations). Information from any previous surveys (e.g., surveys carried out to provide data for Environmental Impact Assessment (EIA) or other assessments) can be a useful guide to beaver activity in an area, particularly if lodges were recorded. Where beavers are a consideration, a preconstruction check must also be made of work areas a maximum of two weeks prior to the start of works, to check for new lodges, burrows or associated dams or changes in occupation of previously recorded shelters.
2. Surveys must include all suitable habitat within 50 m of working areas, including access tracks. This is increased to all suitable habitat within 100 m of when works have potential for high noise and/or vibration (piling, blasting etc.). If the works involve significant changes to hydrology (water levels or flow rates) then the survey should be extended to suitable habitat across all affected areas.
3. Surveys must be carried out by suitably qualified and experienced ecologists and will identify whether any beaver shelters or dams are likely to be affected by the works.
4. Where evidence of beavers is detected, the ecologist will provide a map showing beaver habitat and the location of beaver shelters, dams, food caches, feeding signs, beaver prints and trails, foraging trails (slides), canals and scent-mounds or marks in relation to the works.
5. Shelters will be classified as the following and will note the number of entrances identified, evidence of activity and any food caches:
    - **Lodge (free-standing / bank)**
    - **Chambered burrow**
    - **Short burrow with no end chamber**
    - **Temporary nest (or couch)**
6. Dams will each be classified as one of the following:
    - **Newly built dam:** This classification may only be used if the dam was not reported during a survey of the same extent less than two weeks before it was first detected. The survey report must specify the date and survey details of the prior survey which did not detect the dam for the avoidance of doubt and to

inform implications of delays to any works impacting that dam. Newly built dams are not considered likely to protect water levels at associated natal lodges or chambered burrows. *This will need to be reassessed if works will commence more than two weeks after any survey has classified the dam as newly built.*

- **Established dam:** Interpreted as more than two weeks old or where no prior survey has taken place in the two weeks prior to demonstrate that the dam is less than two weeks old. The record can be supported by a surveyor opinion on the potential for maintaining water levels at a lodge or chambered burrow used either for birth and rearing kits (a 'natal dam') or as a resting place outside of the kit dependency period (such as an overwintering resting place).

7. Appropriate monitoring should be undertaken where required to determine if any beaver shelter is being used for breeding or otherwise in use. Camera trap monitoring may require a licence from NatureScot. In certain circumstances an evening watch of the entrance location(s) may be more effective. The potential that a well-insulated beaver may not trigger a Passive Infrared (PIR) sensor camera trap immediately after emerging from water should be considered if relying solely on camera trap monitoring.

- **Camera trap monitoring of lodge or burrow with underwater entrances:** movement in and out of the lodges and burrows will be very difficult to establish where the entrance is underwater, therefore use should be presumed if a beaver is detected nearby. Beavers may not be active on the banks close to these structures, therefore a bait (e.g., carrots or castoreum) will be required to attract beavers to the camera over a deployment which should be no less than 2 weeks.
- Camera trap monitoring of lodge or burrow with entrances above water or temporary nest (or couch): camera trap deployment should take place over 2 weeks.
- **Evening watch of the entrance location(s):** Watches should take place over at least two nights, each for four hours beginning in the evening and ending at nightfall (the start time in Scotland can vary from 18:30 to 21:00 depending on the time of year). The two visits should be spaced sufficiently far apart so that factors arising from river or weather conditions are negated. A one-week gap should be reasonable in most circumstances but should be extended to two weeks if river or weather conditions are unfavourable. Lodge/burrow watches should not be undertaken when:
- water levels are high relative to normal levels (because the beavers may have temporarily moved)
- during heavy rain (which may mask the view of beavers in the water)
- when visibility is restricted (e.g., fog, heavy rain or snow)
- when the water in front of the lodge/burrow is iced over
- when the air temperature is below about -5°C (due to the potential that beavers will not be very active)

If a lodge or burrow shows signs of recent maintenance (fresh sticks placed on top, or mud plaster on it) then an evening watch will not be necessary to establish use since the shelter is clearly in-use. A food-cache located in front of a lodge or burrow during the winter is also evidence that the shelter is in-use.

3.5 Review of Beaver Survey

Once a beaver survey has been carried out, the ecologist / Ecological Clerk of Works (ECoW) should review the survey results, apply the mitigation hierarchy outlined below and decide if a licence is required for the works.

Construction teams should be advised of existing / new constraints, together with mitigation and licensing requirements by the ecologist / ECoW.

Relevant site documentation and project information sources should be updated with new and amended information on beaver constraints as it is produced, with changes communicated to appropriate staff immediately.

All records of beaver activity are required to be submitted to SSEN Transmission in a format compatible with SSEN Transmission's GIS and must comply with the current data standard.

3.6 Mitigation Hierarchy

There is a general presumption against works being carried out which could disturb beavers in their place of shelter or requiring the destruction or exclusion of any lodge or chambered burrow. A hierarchical approach to mitigation of Avoidance - Disturbance - Destruction will be applied to any lodge / place of shelter that may be affected (see Appendix A Beaver Mitigation Decision Tree).

Beavers demonstrate a particular tolerance to human activities and appear to be undisturbed by the presence of people, road traffic or land management activities. NatureScot are of the opinion that land-use practices and other activities that avoid damage to lodges and chambered burrows, or dams that protect them, are unlikely to result in an offence and that specifying disturbance-free protection zones is not necessary. This SPP considers high noise and vibration activities and other construction activities that may impact on the integrity of structures and shelters used by beavers so proposes the use of protection zones which are subject to Risk Assessment.

Avoidance

This is the preferred option for all lodges, burrows and temporary nest (or couch) identified. The default protection zone will be 50 m from the closest part of a lodge, the nearest detected entrance of a burrow or nearest part of a temporary nest (or couch); or 100 m from the closest part to high noise and vibration (piling, blasting etc.) activities. This larger protection zone considers not only the potential for disturbance, but also burrow collapse from vibration.

The default protection zones may be reduced if in the opinion of a suitably qualified ecologist it can be demonstrated that it will not result in damage or destruction of lodges or chambered burrows or dams protecting them; will not obstruct or otherwise deny access to the lodge or chambered burrow; and will not result in disturbance of a beaver occupying a lodge, burrow or temporary nest (or couch) or a beaver while it is rearing or otherwise caring for its young.

- Default protection zones will not be reduced around lodges or chambered burrows during the young dependency period which is normally between 1st April and 16th August without monitoring in accordance with this Species Protection Plan (for no less than two weeks) prior to the works to demonstrate that the structure is not relied upon for breeding or dependent young and those findings being considered as part of the Risk Assessment. Monitoring will continue until works within the protection zone have been completed
- Default protection zones should not be reduced overnight or within two hours of sunset / sunrise
- Free-standing lodges and bank lodges are more likely to be resilient to collapse from high vibration activities due to their woody structure

If a reduction in the protection zone is proposed, the ecologist / ECoW must complete a Risk Assessment using the form in Appendix B 'Beaver Protection Zone Reduction Risk Assessment' to support the reduction and detail why it is considered that offences will be avoided and will specify any mitigations (which could include the consideration of low ground pressure vehicles, ground protection panels, bog mats etc.) to minimise the risk to structures. Although disturbance is unlikely, care should be taken if operating near the water's edge at night where beavers are active. Although beavers are quite resilient to disturbance, changes in noise and activity levels may solicit a change in behaviour (i.e., urban beavers are used to human disturbance but other groups may not be). They are also likely to be intolerant of people at close-proximity when outside of the lodge or burrow.

The Risk Assessment must be made available for inspection by SSEN Transmission if requested.

Protection zones should be visibly marked and signed on the ground with appropriate material to restrict work access and must be maintained until works are completed. Site staff should be briefed of the purpose of the protection zone via a Toolbox Talk. Works will be micro-sited outwith the protection zone.

Activities impacting on any beaver dams shall be avoided in the first instance. Where impacts on, or manipulation, of a dam (whether newly built or established) cannot be avoided then Appendix C 'Beaver Dam Risk Assessment' must be completed to assess the risks of works to the ecological functionality of lodges or chambered burrows. Work on any established dam i.e., those older than two weeks old at the time that the action will be taken or cannot otherwise be demonstrated to be less than two weeks old at that time, will be presumed to require a licence from NatureScot unless it can be demonstrated beyond reasonable doubt that the dam does not protect a breeding site or resting place. Where surveys have identified the beaver dam is less than two weeks old it will be important to understand the programme of works. A licence will be required if there are any delays to this programme resulting in manipulation of a dam which is more than two weeks old.

There is no need to obtain a licence from NatureScot if the following can be **avoided**:

- damage to or destruction of lodges or chambered burrows and dams protecting them;
- disturbance of beavers occupying a lodge, burrow or temporary nest (or couch);
- disturbance of beavers rearing or otherwise caring for young;
- obstruction or otherwise denial of use of lodges or chambered burrows

Destruction, removal or preventing access to food caches should be avoided generally and **must be avoided** during the winter months (from November to March) when they are integral to an overwintering resting place as this could impair beaver ability to survive, breed or reproduce, or rear or otherwise care for its young.

Disturbance

If, following the advice of a suitably qualified ecologist, it is not possible to establish a protection zone which eliminates the potential for disturbance then a licence application to NatureScot will be required.

Manipulation of established dams (more than two weeks old when works commence) will be considered as capable of damaging the ecological integrity of lodges and chambered burrows (this extends to negative impacts on any food cache which is integral to an overwintering resting place between November and March inclusive) and therefore could disturb beavers so will be presumed to require a licence application to NatureScot, unless it can be demonstrated beyond reasonable doubt that the dam does not protect a breeding site or resting place (also see comments under Destruction about impacts on dams capable of resulting in the destruction of the ecological integrity of these sites in case that is also applicable).

There is a presumption against licensing disturbance to beaver lodges, natal burrows and associated dams while beavers have dependent young. The young dependency period is normally between 1st April and 16th August. Licensed activity in this situation would have to wait until the beavers had finished breeding and the young are fully mobile.

Licence applications to NatureScot should be accompanied by a Protection Plan which outlines how disturbance will be minimised and how lodges and chambered burrows and associated dams regulating their water levels will be protected. This could include screening of works and modifying protection zones.

Destruction

Destruction of lodges and chambered burrows or destruction of dams associated with these structures should only be undertaken as a last resort.

- A licence will be required from NatureScot for destruction of lodges or chambered burrows or for manipulation of a dam which is capable in resulting in the destruction of the ecological integrity of lodges or chambered burrows
- A short burrow with no end chamber or a temporary nest (or couch) will not require a licence to destroy, if monitoring demonstrates that the structure is not currently occupied by a beaver (or another protected species such as otter)

There is a presumption against licensing damage to beaver lodges, natal burrows and associated dams while beavers have dependent young. The young dependency period is normally between 1st April and 16th August. Licensed activity in this situation would have to wait until the beavers had finished breeding and the young are fully mobile.

Licence applications to NatureScot should be accompanied by a Protection Plan which outlines how impacts will be minimised and individuals protected (see NatureScot Standing advice for planning consultations – Beavers).

The plan should include monitoring to ensure breeding is not taking place in the feature and that the group has more than one lodge/chambered burrow in the immediate vicinity to switch to. It is unlikely that surveys will be able to establish the extent of a beaver territory. Seek advice from NatureScot if no alternative lodge/chambered burrow is identified or if more than one lodge/chambered burrow would need to be destroyed. Any lodge or chambered burrow subject to works under licence will be monitored during and after those works. Techniques for exclusion of lodges/chambered burrows or the provision of artificial lodges have not yet been established.

3.7 Mitigation Measures

3.7.1 General mitigation

1. All works close to waterbodies and watercourses showing signs of regular use by beavers should not take place at night or within two hours of sunset / sunrise, if possible.
2. Where works close to waterbodies and watercourses are required at night, lighting should be directed away from riparian areas. Works of a prolonged nature should consider visual screening such as a solid ply fence around 2 m tall.
3. All works close to watercourses and waterbodies must follow best practice measures outlined in the GEMPs, Scottish Environment Protection Agency (SEPA) guidance and *Contractor's* EMP to ensure their protection against pollution, silt and erosion.
4. Any temporarily exposed pipes or ducts should be capped when staff are off site to prevent beavers from gaining access.
5. All exposed trenches and holes should be provided with mammal exit ramps e.g., wooden planks or earth ramps when *Contractor*s are off site.
6. An emergency procedure should be implemented by site workers if a beaver, beaver shelter or beaver dam is unexpectedly encountered. All work within 50 m (100 m for high noise/vibration activities) should cease until a suitably qualified and experienced ecologist has inspected the site and determined the appropriate course of action. *Burrows are easy to miss because the entrances are usually underwater. Therefore, vigilance is needed by all workers.*
7. An exceptional circumstance procedure will be implemented should mitigation options not prove satisfactory in a particular case. Works will be halted whilst mitigation is determined (under consultation with NatureScot if required).
8. Beavers can be excluded from stands of trees using specification C.8 Permanent exclusion fencing described in Campbell-Palmer *et al.* (2016) using galvanised high-tensile mesh (locked-joint or weldmesh) with mesh dimension of 10 cm or less, erecting a fence of a minimum of 120 cm above ground, pegging out a skirt of around 40 cm into the ground from the direction that beavers are likely to approach from and burying a section of fence vertically. Fences within 5 m of a watercourses with steep sides underwater may be burrowed under from the bank so would need the fencing to extend vertically 0.5-1 m below normal water level and not as a horizontal skirt (so not rocky channels or those with shallow margins). NatureScot has published 'Beaver

Mitigation Practical Guides: Protecting trees using wire mesh' concerning protection of individual trees as part of their Management Framework for Beavers in Scotland.

9. Where dams are required to be removed, notched or a flow control device installed the Appendix C 'Beaver Dam Risk Assessment' must be completed and a record kept with site documents. Reducing water levels to depths of less than 70 cm at burrow or lodge entrances is likely to make the feature unsuitable for beavers. It should be presumed that this should be done in compliance with the relevant CAR guidance and strict adherence to GBRs. SEPA has published the position statement WAT-PS-14-01: (The Controlled Activities Regulations) CAR and the Management of Beaver Structures.
10. Hard bank reinforcement options may be suitable where flood defences have been compromised by burrowing. Discussion with SEPA would be required.
11. Design and locate culverts for future beaver resilience. This could include using square profiles, widths greater than 5.5 m and consideration of siting to avoid pooling of water at the inlet. Culverts should be of a specification which allows safe passage by beavers. These must also comply with CAR requirements.

3.7.2 Monitoring and Reporting

1. The Ecologist / ECoW will attend site on a regular basis throughout the construction period to ensure all environmental mitigation relevant to beaver is delivered.
2. Reports will be submitted to NatureScot as required by the relevant licence.

3.8 Licensing Requirements

Licence applications must be sent into NatureScot Licensing Team sufficiently in advance of the works start date (approximately 6 weeks) to ensure that the licence is in place prior to any work commencing. There is a presumption against licensing during the kit dependency period between 1st April and 16th August. Licensed activity in this situation would have to wait until the beavers had finished breeding and the young are fully mobile.

Licence applications should be accompanied by a Method Statement.

Further guidance and details of how to apply for a beaver licence can be found on the NatureScot website (https://www.nature.scot/professional-advice/protected-areas-and-species/licensing/species-licensing-z-guide/beavers-and-licensing).

4 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New document created	N/A	1.00	[redacted]
02				

Appendix A Beaver Mitigation Decision Tree

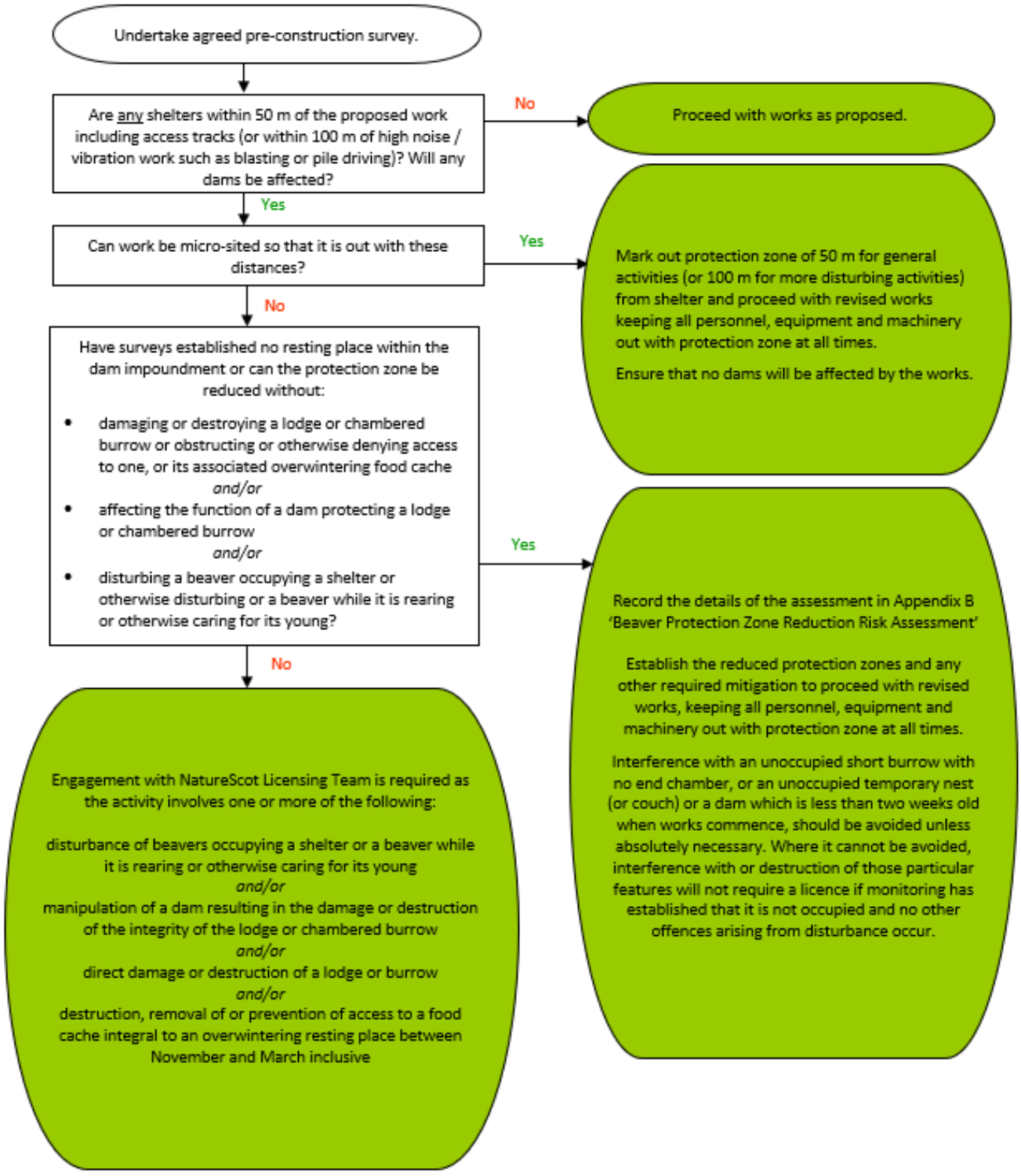


Figure A.1

Appendix B Beaver Protection Zone Reduction Risk Assessment

<*Project name*>: Beaver Protection Zone Reduction Risk Assessment

<Title including record ID and location>

Scope of Work

This method statement is applicable for <*insert details of works to be undertaken*>. The work comprises of:

Location and Access/Egress

<*Insert details including map / plan showing beaver habitat and the location of signs, shelters and dams in relation to the works and access*>

Description of beaver shelter and relationship to works (including access routes)

Table B.1

Beaver shelter name	Type of shelter *Free-standing lodge / Bank lodge / Chambered burrow / Short burrow with no end chamber / Temporary nest (or couch)*	Photo reference	Shelter location and grid reference	Description of beaver shelter and justification for category assigned	Relationship with project works *Provide the distance in metres from works (including access routes) to closest visible part of beaver shelter (this may for example be an entrance on a bank)*

Programme of Works

The following works are planned within <*50 m, or 100 m for areas of potential high noise and vibration (piling, blasting etc.)*> of the beaver shelter:

<*Insert details including timing and duration*>

Planned Equipment and Labour

The operation will be carried out by the following personnel and using the following equipment

<*Insert details*>

Inveralmond House, 200 Dunkeld Road, Perth PH1 3AQ ssen.co.uk

Risk Assessment / Mitigation / Supervision of Work

<Include:

- the details of the assessment (including the qualifications and experience of the Ecologist/ECoW undertaking the Risk Assessment);
- existing disturbance of the features (such as agricultural or forestry traffic, including any correspondence of their typical access routes with the proposed working area);
- detail the reduced protection zone extent (including distance from the nearest visible part of the beaver shelter);
- state why it has been assessed that damage to a lodge or chambered burrow will be avoided when the protection zone is reduced;
- state why it has been assessed that disturbance to a beaver occupying a shelter will be avoided when the protection zone is reduced (consideration should be given to avoiding activities with the potential to cause disturbance within a reduced protection zone overnight or within two hours of sunset / sunrise);
- state why it has been assessed that disturbance of a beaver rearing or otherwise caring for its young will be avoided when the protection zone is reduced (this should reference timing of potential disturbances with regards to any increased sensitivity to the proposed activities during the kit dependency period of 1st April to 16th August);
- explain why it has been assessed that the works will not obstruct or otherwise deny use of a lodge or chambered burrow;
- if the works are proposed to take place between November and March inclusive if a food cache is integral to the overwintering resting place and how it has been taken into account; and
- detail mitigation required to avoid offences.>

Summary of reduced protection zone distance and controls relating to beaver shelter

Table B.2

Beaver shelter name	Shelter location and grid reference	Proposed reduced protection zone distance (metres)	Mitigation measures	Proposed monitoring of shelter and controls

Appendix C Beaver Dam Risk Assessment

<*Project name*>: Beaver Dam Risk Assessment

<Title including record ID and location>

Scope of Work

This method statement is applicable for <*insert details of works to be undertaken*>. The work comprises of:

Location and Access/Egress

<*Insert details including map / plan showing beaver habitat and the location of signs, lodges or burrows and dams in relation to the works and access*>

Description of beaver dam

Table C.1

Beaver dam name	Photo reference	Feature location and grid reference	Details of any beaver shelters with the potential of having water levels maintained by the dam	Dam manipulation works proposed and anticipated implications on water levels at associated beaver lodge or chambered burrow

Evidence that dam is newly built

Date that dam was first detected and details of surveyor: <*Include details of the surveyor*>

Description of dam and approximate water depth at any associated beaver lodge or chambered burrow: <*Include details of any associated overwintering food cache if the works are proposed to take place between November and March inclusive* >

Date and details any recent prior survey during which the dam had not been detected: <*Include details of the surveyor*>

Programme of Works

The following works are planned which will impact on the dam:

<*Insert details including timing and duration*>

Planned Equipment and Labour

The operation will be carried out by the following personnel and using the following equipment

<*Insert details*>

Risk Assessment / Mitigation / Supervision of Work

Removing, notching or installing flow devices to established dams (those more than two weeks old) is presumed to require a licence from NatureScot unless it can be demonstrated beyond reasonable doubt that the dam does not protect a breeding site or resting place. This is due to the

difficulty in ascertaining whether those dams protect breeding sites or resting places particularly as burrow entrances may be concealed below water level.

<Include:

- the details of the assessment (including the qualifications and experience of the Ecologist/ECoW undertaking the Risk Assessment);
- an assessment of the relationship of the dam to any beaver lodge or chambered burrow (and any food cache integral to an overwintering resting place if the works are proposed to take place between November and March inclusive);
- if it has been assessed that manipulation of the dam will not affect water levels at an associated lodge or chambered burrow and damage or destroy the ecological functionality of the site then detail why, making reference to previous survey details if it is classified as a 'newly built dam' less than two weeks old;
- if a dam is more than two weeks old then the risk assessment should detail the assessment undertaken under appropriate field conditions (which avoids periods following prolonged heavy rainfall and/or high water levels) which detected no evidence of recent field signs and/or camera trap monitoring over a minimum of two weeks demonstrating that there is no occupancy of associated lodges or chambered burrows (taking into account that although beavers are active all year that they may be confined to lodges and burrows under ice during extreme winter conditions);
- reference to SEPA water level data (*www.sepa.org.uk/environment/water/water-levels*); and
- mitigation required to ensure that water levels at associated lodges and chambered burrows are not compromised.

Scottish & Southern Electricity Networks

TG-NET-ENV-501

Safety, Health and Environment

Badger Species Protection Plan

	Name	Title
Author	[redacted]	Environmental Project Manager
Checked by	[redacted]	Environmental Advisor
Approved by	[redacted]	Head of Environment

Contents

1 Introduction

Badger is a protected species under the Badger Protection Act and is afforded a high level of protection in Scotland. This Protection Plan provides guidance and agreed procedures for the protection of badgers and their shelters during construction works on SHE Transmission projects. The Plan contains two parts and details the procedures that must be followed where there is potential for badger to be present (Part 1), and where a Project Licence for badger has been issued by SNH to cover the project (Part 2):

1.1 Part 1: General Protection Plan

This Part applies to all projects where badger may be present). Part 1 outlines the responsibilities of SHE Transmission and the *Contractor* regarding protection of badger. It also details relevant legislation, survey requirements, general mitigation measures and the requirement for licensing and mitigation.

1.2 Part 2: Project Licence Protection Plan

This is provided to *Contractors* in addition to Part 1 for large projects where a Project Licence has been issued by SNH to cover the work and identifies those activities and protection / mitigation measures which are permitted under the Project Licence and those activities which require a Method Statement to be submitted to SNH for written approval before works can commence. This Part should be followed in conjunction with Part 1 and the relevant Project Licence to provide approved guidance and methodologies for carrying out work.

2 References

The documents detailed in **Error! Reference source not found.**, below should be used in conjunction with this document

Table 2.1- Miscellaneous Documents

Title
The Protection of Badgers Act 1992
https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/licensing
SNH's "Scotland's Wildlife: Badgers and Development (2001)"

3 Part 1: General Protection Plan

3.2 Background

Badgers (*Meles meles*) are members of the weasel family with a very widespread distribution in Scotland. They normally live in small family groups (clans) in sometimes large underground structures called setts. Setts

are closely associated with woodland and sloping ground, but badgers can exploit many diverse types of habitat including upland moorland. Although they typically consume large numbers of earthworms, they are omnivorous and will forage on a wide variety of foods including grains and carrion. The distance from the sett which they travel varies widely, with those in upland areas having to exploit large areas. Four kinds of setts are recognised – main, annexe, subsidiary and outlier although badgers are also known to use above ground nests and rock crevices.

The badger breeding season is generally acknowledged to run between 1st December and 30th June with cubs born in February.

Signs of badger:

- Dung heaps or latrines – small pits are dug and large faeces of variable consistency are deposited. Dung tends to have an inoffensive odour.
- Badger prints and tracks – badger paths are often well worn and lead from setts to and along boundaries such as fences. They may be marked at strategic points with dung heaps where they constitute the edge of a home range. Badger prints are about 4.5 – 6.5 cm wide and have five toes with very prominent claws.
- Guard hairs – stiff, long, elliptical, hairs with black and white bands.
- Setts – typically large D-shaped burrows with large spoil heaps of excavated soil often with discarded bedding mixed in.
- Snuffle holes – indentations in the ground where badgers have been rooting for food such as bulbs and invertebrates.

3.3 Responsibilities

It is the *Contractor's* responsibility to comply with all the requirements of this Protection Plan where badger may be present, and it is both the *Contractor's* and SHE Transmission's responsibility to monitor compliance with the Protection Plan. The responsibility for applying for any Licence, including a Project Licence, may vary from project to project, but all applications and mitigation works will adhere to this plan.

3.4 Legislation

Badger is protected under The Protection of Badgers Act 1992. Under this Act it is illegal to intentionally or recklessly[1] damage a badger sett or cause a dog to enter a sett, to obstruct access to a sett and to disturb a badger while occupying a sett, or for any person to kill, injure or take a badger. It is also an offence to cruelly ill-treat a badger, to dig for or to snare a badger.

[1] Reckless acts would include not having or disregarding a mitigation plan aimed at protecting badgers resulting in killing, injury, and/or disturbance of any badger or badger resting place, or carrying out an activity which would result in an offence where the presence of badger was foreknown.

This legislation means that badgers are fully protected in Scotland. Under Section 10 (1) of The Protection of Badgers Act 1992, Licences may be granted to interfere with a badger sett within an area specified in the Licence by any means so specified.

3.5 Surveying for Badger

Surveys for badger must be undertaken in all works areas containing suitable badger habitat, a maximum of 12 months prior to the works commencing, (this includes site investigations), to ensure the availability of up-to-date information on shelter locations. A preconstruction check should also be made of works areas a maximum of three weeks prior to the start of works, to check for any changes to sett location / status.

Surveys must extend for a minimum of 30 m beyond working areas, including access tracks increasing to 100 m in areas of potential high noise and vibration (piling, blasting, etc.) for high noise activities.

The preconstruction surveys will be carried out by suitably qualified and experienced ecologists who will identify whether the setts are Active, Inactive or Defunct.

- Active - the presumption in Scotland is any suitable site that could be used for shelter in active badger territory is considered an active sett unless proven otherwise, through a lack of supporting evidence of current use, and by appropriate monitoring.

- Inactive - these can be characterised by tunnels looking disused (e.g. cobwebs and overgrown vegetation / leaves in the entrance) and no presence of signs of current use by badger (e.g. hairs, footprints, snuffle holes etc.). Appropriate monitoring is required to provide absolute certainty that the sett is not in current use by badger.

- Defunct - these are characterised by a loss of the structural integrity of the tunnel entrance (such as when they have been trampled by cattle) and/or roots growing through the tunnel, (i.e. the hole could not be used for shelter by a badger in its current state), and no other signs of current use by badger being present

Appropriate monitoring (e.g. the use of suitable camera traps) should be undertaken where required to determine if any sett is being used for breeding. Camera trap monitoring may also require a Licence from SNH.

3.6 Review of Badger Survey

Once a badger survey has been carried out, the ecologist / ECoW should review the survey results, apply the mitigation hierarchy outlined below and decide if a Licence is required (either Individual or Project) for the works.

Construction teams should be advised of existing / new constraints, together with mitigation and licensing requirements by the ecologist / ECoW.

Relevant site documentation and project information sources should be updated with new and amended information on badger constraints as it is produced, with changes communicated to appropriate staff immediately.

3.7 Mitigation Hierarchy

There is a general presumption against works being carried out which could disturb badgers in their setts or to destroy / exclude any sett. A hierarchical approach to mitigation of Avoidance - Disturbance - Destruction will be applied to any sett that may be affected (See Figure 1):

Avoidance

This is the preferred option for active / inactive setts identified within 30 m of works (or 100 m for high noise / vibration activities), an initial protection zone of either 30 m (or 100 m) will be marked on the ground and appropriately signed to restrict work access.

Protection zones must be maintained until works are completed. Site staff should be briefed of their purpose through a Toolbox Talk and works micro-sited outwith the protection zone. If badger disturbance can be avoided in this way, there is no need to obtain a Licence from SNH for the works.

Disturbance

For any works required within 30 m of active setts, and for high noise / vibration activities such as pile driving or blasting within 100 m of setts, a Licence from SNH will be required (either Individual or Project).

Individual Licence applications to SNH should be accompanied by a Species Protection Plan which outlines how disturbance will be minimised and setts protected, for example through screening of works and modifying protection zones.

If a Project Licence is in place, and a breeding sett will be disturbed during the breeding season (1st December – 1st July), a Method Statement must be submitted to SNH licensing team for written approval in accordance with Part 2 of this document, prior to any works commencing.

Destruction

Destruction of setts should only be undertaken as a last resort. For destruction of active setts a Licence will be required from SNH (either Individual or Project) Individual Licence applications to SNH should be accompanied by a Species Protection Plan which outlines how disturbance will be minimised and individuals protected.

The plan should include appropriate monitoring to ensure breeding is not taking place and provision for the creation of an artificial sett if required. Any sett subject to works under Licence will be monitored during and after those works. If a Project Licence is in place, a Method Statement must be submitted to SNH licensing team in accordance with Part 2 of this document for written approval prior to any works commencing.

3.8 Mitigation Measures

3.8.1 General Mitigation

- Any temporarily exposed pipe system should be capped when staff are off site to prevent badgers from gaining access.
- All exposed trenches and holes should be provided with mammal exit ramps e.g. wooden planks or earth ramps when Contractors are off site.
- An emergency procedure should be implemented by site workers if badger / badger setts are unexpectedly encountered. All work within 30 m (100 m for high noise/vibration activities) should cease until a suitably qualified and experienced ecologist has inspected the site and determined the appropriate course of action.
- An exceptional circumstance procedure will be implemented should mitigation options not prove satisfactory in a particular case. Works will be halted whilst mitigation is determined (under consultation with SNH licensing team if required).

3.8.2 Monitoring and Reporting

- The Environmental Representative will attend site on a regular basis throughout the construction period to ensure all environmental mitigation relevant to badger is delivered.
- Reports will be submitted to SNH as required by the relevant Licence.

3.8.3 Exclusion / Destruction of Inactive Setts at any time of year

Where there is a structure that requires to be excluded or destroyed which may be used by badger, a survey to determine whether the feature is in active use is required to determine whether a licence. For guidance see the SNH website (https://www.nature.scot/sites/default/files/2017-07/A1391121%20-%20Badgers%20-%20Current%20use%20-%20Guidance%20-%204%20September%202014.pdf).

Should the structure be deemed to be inactive the following methodology will be incorporated into a Site Specific Method Statement and issued prior to work commencing. A licence from SNH is not required.

Monitoring

a. Any potentially inactive sett must be monitored for a minimum of 14 days where weather conditions are favourable (up to 28 days if unfavourable) to check for current use by badger.

b. A combination of the following methods will be used, as appropriate:

- An appropriately positioned camera trap to monitor badger activity at the sett.
- Small pencil-sized sticks placed in the floor of the tunnel just inside the entrance(s), pointing upright.
- Checks for other badger sign (*e.g.* hair, snuffle holes, latrines and fresh scuff marks).
- Sand placed at the sett entrance(s).

Exclusion

c. Following adequate monitoring, and where the named Agent is confident that there is no sign of use by badger, the sett will be excluded for 7 days using a gate[2] set in the one-way position.

d. Exclusions must be overseen by a named Agent on the Project Licence.

Monitoring Exclusion

e. The sett will be visited regularly through the exclusion process to check activity and to check on the integrity of the exclusion materials and make good any damage. If it is apparent that badger(s), or other animals, have breached the exclusion any necessary repairs will be made and exclusion period will be restarted.

Exclusion / Destruction of the Sett

f. Following exclusion, temporary blocking by wiring the gate shut, or destruction of the sett will be undertaken, where required, under the supervision of the Agent.

g. Where the sett is not required to be destroyed the exclusion gate / sheeting may be left whilst works proceed around the sett and removed once works have finished.

h. Where the inactive sett is required to be destroyed, this will be carried out using appropriate plant or hand tools.

i. For setts on distinct slopes, the excavation will start at least 1 m away from the entrance spoil heap on the down-slope side (up to 4-5 m in front of the entrance itself). For setts on flat ground the excavation will start in front of the entrance hole and hand digging will be utilised to assess the direction and number of tunnels in all directions. Once this has been established a appropriate plant can be used to further progress the excavation. A trench will be dug under direction of the Agent. In the unlikely event that badgers are found during this process all excavation will cease and the badger(s) will be allowed to freely move away from the area. The Agent / ECoW will decide on when the excavation can re-commence.

j. The excavation will continue slowly, working forwards into the tunnels and chambers until the Agent is satisfied the entire sett has been excavated. Once fully excavated the soil will then be backfilled and compressed to deter animals from excavating further holes.

k. Construction works will be programmed to commence as soon after this process as possible to reduce the probability of animals returning to the area.

3.9 Licensing Requirements

Licence applications must be sent into SNH licensing team sufficiently in advance of the project start date (approximately 40 days) to ensure the licence is in place prior to any work commencing.

[2] The specification of gates, fencing and materials would be in accordance with DMRB and the Natural England Technical Information Note 25 (Appendix 2). The badger mesh fence specification is as described in SNH's "Scotland's Wildlife: Badgers and Development (2001)".

3.10 Project Licence

An SNH Project Licence is likely to be the most appropriate form of Licence for any large scale and / or long running Project, which may result in a large number of minor unavoidable badger offences.

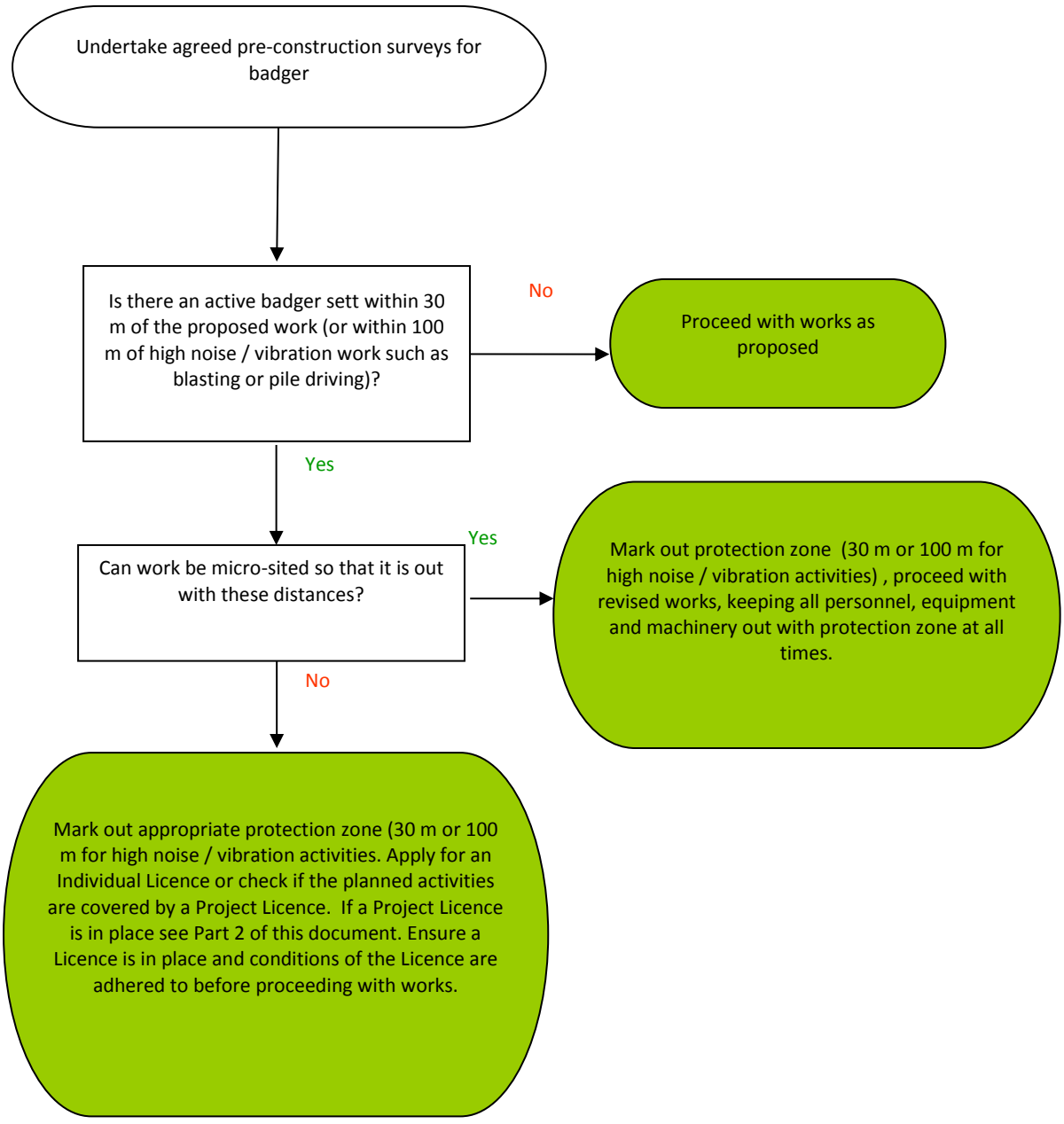
For example, multiple instances of disturbance to a number of badger setts over several years. A Project Licence can be used to standardise protected species mitigation / compensation, creating consistency across the project area and throughout the Project's lifespan. Project Licences do not negate the need for thorough pre-development surveys within 12 months of the planned project start date, and pre-construction surveys within 3 weeks of works commencing. Any Project Licence application will need to be accompanied by the Mitigation Plan and procedures for badger included in Parts 1 and 2 of this SPP

3.11 Individual Licence

For small scale Projects expected to be completed over relatively short timescales, which will result in a low number of unavoidable badger offences an Individual SNH Licence is most likely to be appropriate. Licence applications should be accompanied by a Method Statement and should be sent sufficiently in advance of the Project start date to ensure the licence is in place prior to work commencing.

Further guidance and details of how to apply for a badger Licence can be found on the SNH website (https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/licensing).

Badger Mitigation Decision Tree



4 Part 2: Project Licence Protection Plan

The following sections of this plan are to be read in conjunction with the Project Licence (insert Licence number) and its conditions.

As stated in the Project Licence, methodologies for certain mitigation activities permitted under the Licence are included in this Part of the SPP. More disruptive activities, listed in Section 1 below, will also require a specific Method Statement to be submitted to SNH licensing team for written approval (see Appendix A). It is the *Contractor*'s responsibility to submit these Method Statements to both SHE Transmission and SNH for written approval. No works shall proceed without this written approval.

Sufficient time should be allowed for in the programme to carry out any consultation work and obtain necessary approvals.

The Project Licence will specify reporting requirements detailing all disturbance and destruction works carried out.

4.1 Works Allowed under the Project Licence

Under the Project Licence there is a general presumption against works being carried out which could disturb badgers in their setts, or to destroy / exclude any sett unless it can clearly be demonstrated that either it is inactive (*i.e.* through monitoring) or that there is no alternative solution against Project timescales and requirements.

4.2 Activities requiring an SNH Approved Method Statement

The following activities require a formal Method Statement to be submitted and approved by SNH prior to any works commencing:

a. Destruction of any active setts within the breeding season (1st December – 30th June inclusive).
b. Destruction of a breeding sett, or a sett which cannot be discounted as a breeding sett, at any time of year.
c. Disturbance (*i.e.* works within 30 m, or 100 m for high noise / vibration works) to a breeding sett, or a sett which cannot be discounted as a breeding sett, during the breeding season.
d. Where it is proposed to exclude (even temporarily) such a proportion of setts in a given clan's territory as to cause a significant impact on the clan.
e. Any exceptional circumstances not covered in this SPP.

The Method Statement template in Appendix A has been developed in conjunction with SNH and should be used by the *Contractor / Named Agent* for all submissions.

Proposed mitigation works should be agreed with SNH.

4.3 Activities not requiring additional SNH approval

The following works may be carried out under this SPP and / or specific Method Statements without the prior approval of SNH when a Project Licence is in place, using the prescribed methodologies:

4.3.1 Exclusion / Destruction of a non-breeding active sett from July – November inclusive

The following methodology will be incorporated into a Site Specific Method Statement and issued prior to work commencing:

Pre-works Assessment

a. In advance of any ground-breaking or use of construction machinery within 30 m of a sett entrance (or 100 m for blasting operations) an Agent on the Project badger licence will consider in detail the scope of the proposed works, type of sett and topographical location to determine if exclusions can be avoided without placing badgers at risk.

Exclusion

b. As agreed with SNH, badger gates and appropriate materials[4] will be used for the exclusion of setts, unless in rare circumstances, in which case SNH licensing team will be consulted beforehand. Exclusions must be overseen by a named agent on the Project badger licence.

c. The gate would be set to the two-way position for at least 7 days and then set to one-way for 14 days.

Monitoring Exclusion

d. To monitor use of the sett the a combination of the following methods may be used.

- An appropriately positioned camera trap to monitor badger activity at the sett.
- Small pencil-sized sticks placed in the floor of the tunnel just inside the entrance, pointing upright.
- Threads pinned to the gate and gate frame to confirm if the gate has been opened.
- Sand placed at the sett entrance (inside and outside the gate).

e. The sett will be visited regularly through the exclusion process to check activity and to check on the integrity of the exclusion materials and make good any damage. If it is apparent that badger(s) have breached the exclusion any necessary repairs will be made and exclusion period will be restarted.

Destruction of the Sett

f. Destruction will proceed as per the method outlined for destruction of inactive setts.

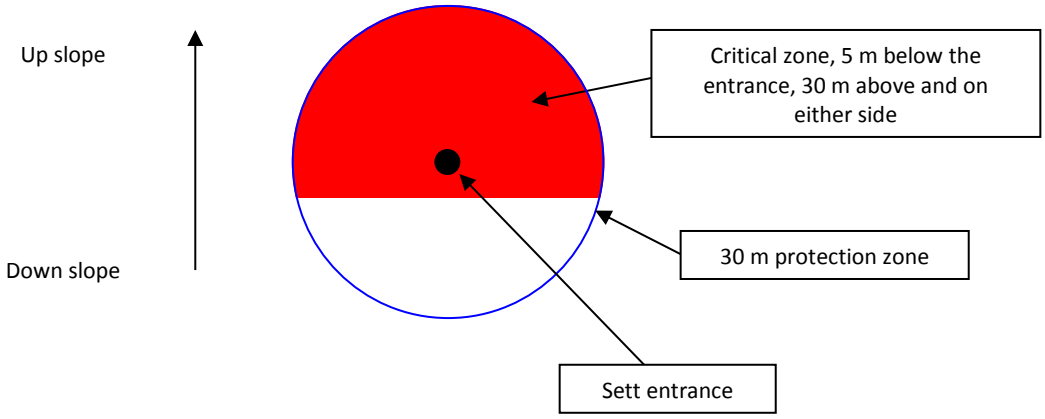
4.3.2 Disturbance to a non-breeding active sett from July – November inclusive

The following methodology will be incorporated into a Site Specific Method Statement and issued prior to work commencing:

Tree Felling and Scrub clearance

All tree and scrub clearance will be undertaken in accordance with the conditions of a Standard Forestry Operations Licence (see https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/licensing/species-licensing-z-guide/badgers-and-licensing/badgers-licences-land).

Track Construction



a. Track construction can be carried out within the 30 m protection zone under the Project Licence providing it does not impact on the "Critical Zone", as shown in the diagram above, and lie within 5 m of the sett entrance. An Agent / ECoW on the Project badger licence will carry out a risk assessment and mark out the maximum protection zone to ensure the integrity of the sett is protected. If works are proposed in the critical zone between 20 and 30m from an entrance, careful hand-digging of a cross trench at the edge of proposed access track route or tower compound will be performed to confirm the tunnels do not extend under the works.

b. The Agent / ECoW will be present immediately before construction starts to re-check for any ecological constraints including newly dug badger setts. Details of any ecological constraints, and associated mitigation, not related to badger will be communicated separately to this plan to all site workers.

Tower Compound Establishment

c. A tower compound can intrude within the 30 m protection zone under the Project licence, where there is no alternative, providing it does not impact on the "Critical Zone" and the sett entrance is a minimum of 5 m out with the compound boundary. The An Agent / ECoW on the Project badger licence will carry out a risk assessment and mark out the maximum protection zone to ensure the integrity of the sett is protected.

d. Badger proof fencing / gates will be used for the compound to reduce the risk of badgers entering the works area. One-way badger gates will be installed at the nearest corner of the compounds to allow animals to escape.

e. The Agent / ECoW will be present immediately before construction starts to re-check for any ecological constraints including newly dug badger setts. Details of any ecological constraints, and associated mitigation, not related to badger will be communicated separately to this plan to all site workers.

5 Revision History

No	Overview of Amendment and Text affected	Previous Document	Revision	Authorisation
01	Transfer to new template and Nomenclature	TG-PS-LT-707 (Rev 1.00)	1.00	[redacted]
02	Hyperlink to "Current use" guidance 'What is a badger sett?' has been added under newly created paragraph 3.8.3. 4.3.1 'Exclusion / Destruction of Inactive Setts at any time of year' (Rev 1.00) has been moved under 3.8.3 to represent Licensing Team changes in accordance with legislation.	TG-NET-ENV-501 (Rev 1.00)	1.01	[redacted]

Appendix A Project Licence Method Statement Template

<PROJECT TITLE>

METHOD STATEMENT FOR WORKS UNDER *(insert licence details)*

<insert species record reference>

<insert date>

Introduction

This document, prepared on behalf of SHE Transmission provides a Method Statement for ***<insert details of works>*** to be completed under ***<insert licence details>***. These works are required in order to facilitate the delivery of the *<insert Project details>* (the Project).

Condition ***<insert No.>*** of the above Licence states that a ***<insert species>*** Protection Method Statement be submitted to Scottish Natural Heritage (SNH) licensing team for written approval, under specific circumstances, prior to commencement of works which could affect ***<insert species>***. Therefore, no works which would *<insert licensed activity>* ***<insert species>*** shall take place without written confirmation of SNH approval of this method statement.

This Method Statement makes reference to the following documents:

- ***<insert licence details>***, SNH
- Species Protection Plan (SPP): ***<insert SPP No. and title>*** Rev. X *<insert date>*

Further information is provided in Table 1: Summary of Data.

Licensable Works

Introduction

<Insert details>

Baseline Description

<Insert description, including photographs / location plan>

Table 1: Summary of Data

Reference	Easting	Northing	Date recorded	Description	Date works exclusion zone demarcated & distance

Survey Summary

<Insert details>

Description of the Proposed Licensable Works

<Insert details>

Works Duration

<Insert details>

Consideration of Alternatives

<Insert details>

Impact Assessment

<Insert details>

Method Statement Site Briefing (to be delivered to relevant staff prior to works)

Site: *<insert description>*

Reference number: *<insert species record reference>*

Client: SHE Transmission

Task: *<insert description of works>*

Prepared by: *<insert individual or Company name>*

Licensed Agent: *<insert name>*

Method statement for *<insert works description>*

Before works commence:

All relevant personnel will be made aware of the presence and location of the constraint and mitigation.

<insert details of methodology>

During works:

<insert details of methodology>

<Insert Contractor's name>

I, the undersigned, confirm receipt of this method statement and fully understand and agree to work to the conditions therein.

Signature of *Contractor's* Representative:..... Date ..../ /

Print name in full: .....

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-500

Safety, Health and Environment

Freshwater Pearl Mussel Species Protection Plan

Inveralmond House, 200 Dunkeld Road, Perth PH1 3AQ ssen.co.uk

TG-NET-ENV-500	Freshwater Pearl Mussel Species Protection Plan		Applies to Transmission ✓
Revision: 2.00	**Classification:** Public	**Issue Date:** August 2023	**Review Date:** August 2031

	Name	Title
Author	[redacted]	Consents & Environment Manager
Checked by	[redacted]	Environment Net Gain Manager
Approved by	[redacted]	Head of Consents & Environment

Contents

1 Introduction

Freshwater pearl mussel (FWPM) is one of the most endangered molluscs in the world. Scotland holds some of the largest remaining populations in the world. This Species Protection Plan (SPP) provides guidance and agreed procedures for the protection of FWPM and their habitat during construction works on Scottish & Southern Electricity Networks Transmission (SSEN Transmission) projects. It applies to all projects where FWPM may be present and is issued to *Contractors* as part of the Works Information. It outlines the responsibilities of SSEN Transmission (the *Employer*) and the *Contractor* regarding protection of FWPM. It also details relevant legislation, survey requirements and mitigation measures to protect the species and its environment.

2 References

The documents detailed in Table 2.1 - Scottish and Southern Electricity Networks Documents and Table 2.2 - Miscellaneous Documents should be used in conjunction with this document.

Table 2.1 - Scottish and Southern Electricity Networks Documents

Reference	Title
TG-NET-ENV-511	General Environmental Management Plan (GEMP) - Soil Management
TG-NET-ENV-512	General Environmental Management Plan (GEMP) - Working in or Near Water
TG-NET-ENV-514	General Environmental Management Plan (GEMP) - Working with Concrete
TG-NET-ENV-515	General Environmental Management Plan (GEMP) - Watercourse Crossings
TG-NET-ENV-519	General Environmental Management Plan (GEMP) - Forestry
TG-NET-ENV-523	General Environmental Management Plan (GEMP) - Bad Weather

Table 2.2 - Miscellaneous Documents

Title
Wildlife and Countryside Act 1981 (as amended in Scotland)
NatureScot - Freshwater pearl mussel
NatureScot - SiteLink
NatureScot Licensing
NetRegs - Guidance for Pollution Prevention (GPP) documents
SEPA - The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide

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3 Background

3.1 Freshwater pearl mussels (*Margaritifera margaritifera*) are freshwater bivalves (a type of mollusc) which filter feed in clean, fast flowing waters.

3.2 Fertilised adult females eject millions of tiny larvae in the summer which must successfully attach to the gills of young salmon or trout, which they live on harmlessly, before dropping off onto the riverbed substrate the following spring. The juveniles usually establish themselves in coarse sand or fine gravel, though they are known to be found in finer substrates. It takes around 10-12 years for the young mussels to reach sexual maturity. Adults can live to over 100 years and grow to over 15 cm in length.

3.3 They are extremely vulnerable to changes in their environment, such as water pollution (including silt and sediment) and engineering works affecting mussel beds. Populations in Scotland are still illegally fished for pearls; therefore the precise locations of known populations are kept confidential.

3.4 Due to the dependency of its larval stages on fish hosts, activities which impact on local salmon and trout populations can potentially also have an impact on FWPM populations.

4 Responsibilities

4.1 It is the *Contractor's* responsibility to comply with all the requirements of this Protection Plan where FWPM may be present, and it is both the *Contractor's* and SSEN Transmission's responsibility to monitor compliance with the Protection Plan.

4.2 It is **essential** that this plan is followed in advance of any works which could impact on FWPM or their habitat. Any river within the SSEN Transmission licence area that is not ephemeral (short duration after precipitation or flooding), and which is not entirely bedrock should be treated as having potential for FWPM, unless this has been discounted through other assessments which may include FWPM surveys. Rivers without the presence of salmonids (salmon and trout), due to barriers obstructing the movement of the fish, will not have recruitment of juvenile FWPM due to the dependency the larval stage on attaching to the gills of the fish. This may not rule out the potential for adults which may have established before barriers became established.

5 Legislation

5.1 FWPM is afforded full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended in Scotland). This makes it an offence to intentionally or recklessly kill, injure, take or disturb FWMP when it is occupying a structure or place used for shelter or protection, or to damage, destroy or obstruct access to any structure or place it uses for shelter or protection. Reckless acts would include disregard of mitigation aimed at protecting FWPM, resulting in killing or injuring FWPM. Knowingly causing or permitting any of the above acts to be carried out is also an offence. The protection of FWPM is a priority in the fight against wildlife crime.

5.2 NatureScot can grant licences to enable certain activities that would otherwise be an offence, to be carried out in relation to FWPM and their places of shelter, subject to the following:

a) the activity authorised by the licence will contribute to significant social, economic or environmental benefit; and,

b) there is no other satisfactory solution

5.3 The critically endangered status of FWPM in Europe means that robust justifications and high burdens of proof should be expected to be provided by the applicant for both tests and that there should be no presumption that a licence would be forthcoming. Licences for this purpose will only be issued in *exceptional* circumstance *and* where the activities will not compromise the local population viability.

5.4 This Plan outlines the planning, assessments and mitigation expected to avoid the need for an application for a licence to undertake development activities.

6 Planning Works Close to or Crossing Freshwater

6.1 Activities which have the potential to affect FWPM where they are found include, but are not limited to, crossing watercourses, in watercourse engineering and bank works. The potential for harmful pollutants (including silt from site run off) to travel long distances downstream along water courses means that FWPM populations may be impacted far downstream from the sources of those pollutants.

6.2 The approach to FWPM protection will always be based on the 'avoidance' of impacts. Unlike other species covered in this SPP series, **'disturbance' is not a legal option** due to the sedentary lifestyle of adults and juveniles as this could result in them being killed or injured.

6.3 Avoidance of potential impacts on FWMP may be achieved through consideration of location, timing, methods or technology of the proposed works which could avoid impacts on FWPM completely, or at least minimise the likelihood of an offence occurring. Please note that this document presumes that the 'do nothing' option has already been eliminated from valid options through the Governance processes and that the need for undertaking works can be robustly defended and withstand scrutiny if required.

7 General Mitigation

7.1 All Works

- Strict adherence to SEPA's 'The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide' (which is mandatory to ensure legal compliance), the Guidance for Pollution Prevention documents and any additional best practice in SSEN Transmission's General Environmental Management Plans should ensure that pollution pathways are eliminated.

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- It should be remembered that water pollution incidents, whether they arise on land (such as site run off) or from works in the water or from directional drill frac-out, can have severe consequences long distances downstream in receiving waters which may contain FWPM.

7.2 Works Within Watercourses

- Any activities proposed in the water course (e.g. vehicular crossings and isolated open-cut trenches) must not be undertaken without an assessment being completed by the *Ecologist / Ecological Clerk of Works* of the potential of that watercourse to support FWPM. If this assessment determines that there is a potential for FWPM to be present at the location of works or within 0.1 km upstream or 0.5 km downstream then a survey must be undertaken which meets the requirements set out in this SPP. The *Ecologist / Ecological Clerk of Works* should also consider activities which may reduce water flow in suitable water courses.

7.3 Works Outwith Watercourses

- Where there are no pathways for pollution or works affecting the beds of watercourses and/or no reductions to water flow and/or no reductions in tree shading of watercourses there is need no need for further assessments.

8 Freshwater Pearl Mussel Surveys

8.1 Field surveys will be required in the following circumstances:

- When working within a watercourse within a designated site for FWPM (Special Area of Conservation or Site of Special Scientific Interest) or otherwise identified as having FWPM populations (candidate Special Area of Conservation or Site of Community Importance) or the catchment of such sites. Such sites can be identified using the NatureScot SiteLink service (https://sitelink.nature.scot/)
- Where FWPM have previously identified through desk study or from prior surveys as being 0.1 km upstream or 0.5 km downstream and there is still a potential for a water pollution event even after adhering to the Pollution Prevention Guidelines and any additional best practice in SSEN Transmission's General Environmental Management Plans.
- Where works will take place within a watercourse that is - i) not ephemeral (of short duration after precipitation or flooding), ii) which is not entirely bedrock and iii) where an assessment by an *Ecologist / Ecological Clerk of Works* cannot robustly discount the possibility of their presence. Assessment of suitability may be undertaken as part of the surveys and assessments undertaken for Environmental Impact Assessment or other relevant environmental assessments.

8.2 Detailed guidance on a survey methods to inform development and deep water survey methods can be found on the NatureScot website and require a licensed FWPM surveyor to undertake them, so are not repeated.

1) Survey work must be undertaken in periods of low water flow. **This generally limits the survey season to between April and September.** Planning of works should allow sufficient time for a FWPM survey to be carried out and a report prepared.

2) The length of watercourse requiring to be surveyed will be dependent on the nature of the works and their potential impacts. The surveyor will adhere to the published survey guidance on the NatureScot website to identify extent of river to be surveyed and the techniques used.

9 Review of Survey

9.1 The locations of any FWPM detected should be treated with the strictest confidentiality and only be released to the relevant competent authorities (SEPA, NatureScot and local planning authority) in reports or annexes clearly marked as sensitive.

9.2 The *Ecologist / Ecological Clerk of Works* will review the survey report to determine whether the proposed activities are likely to have a significant impact on any FWPM identified through the assessments.

9.3 If it is determined that there is a potential for negative impacts on FWPM then the *Contractor* should work with the *Ecologist / Ecological Clerk of Works* to identify any changes which can be made to the proposed works which will mitigate the risks to FWPM.

9.4 The approach to resolving any potential conflicts with FWPM protection identified will always begin with identifying options for 'avoidance'. Avoidance solutions may be identified through consideration of alternatives with regards to location of the activity, timing (which may relate to water levels), materials, methods or technology used. This SPP presumes that detailed consideration will already have been given to the necessity of delivering a particular outcome and that the 'do nothing' option will no longer be available.

9.5 If the *Ecologist / Ecological Clerk of Works* is not able to agree sufficient mitigation with the *Contractor*, or there is reasonable doubt about the sufficiency of the proposed mitigation, then the *Employer* should be informed before the *Ecologist / Ecological Clerk of Works* contacts NatureScot Licensing Team for further guidance.

10 Emergency Procedure

10.1 The following procedure will be followed if FWPM are encountered unexpectedly:

1) An emergency procedure will be implemented by site workers if FWPM are encountered. All work within 0.1 km upstream and 0.5 km downstream on the water course will cease, and the *Ecologist / Ecological Clerk of Works* will inspect the site and define mitigation (if required) in line with this SPP.

2) Works within the area halted will not recommence until the *Ecologist / Ecological Clerk of Works* has agreed the mitigation with the *Contractor* and provided written approval.

3) An exceptional circumstance procedure will be implemented should mitigation not prove satisfactory in a particular case. Works will be halted whilst an appropriate course of action is determined (under consultation with NatureScot Licensing Team if required). If the *Ecologist / Ecological Clerk of Works* determine that FWPM are at risk then the *Contractor* and the *Employer* should be informed immediately and this should be prior to SEPA and the local wildlife crime officer being contacted.

11 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New document created	n/a	1.00	R Baldwin
02	1.1: Replaced reference to CEMD with 'Works Information'. 9: Shortened title to 'Emergency Procedure'. Footnotes 3 and 5: Update of Scottish Natural Heritage hyperlinks.	TG-NET-ENV-500 (Rev 1.00)	1.01	R Baldwin
03	Rev 1.01 migrated into TEM-NET-GOV-505, which inserted new section 2 References, Footnote text from 1.01 has now be integrated into the main text following the sentence which contained the footnote in 1.01. References to SNH have been replaced by references to NatureScot 'Generic Environmental Management Plan' corrected to 'General Environmental Management Plan'. References to SHE Transmission have been replaced by Scottish & Southern Electricity Networks Transmission/ SSEN Transmission. 1 Introduction: SSEN Transmission defined as the *Employer*. 2 References: New references added which were not otherwise contained in text of 1.01, relating to specific GEMP documents, Guidance for Pollution Prevention, Wildlife & Countryside Act 1981 and NatureScot Licensing.7.1 reference to *Pollution Prevention Guidelines (which are currently under review)* has been replaced with *Guidance for Pollution Prevention*	TG-NET-ENV-500 (Rev 1.01)	2.00	R Baldwin

Appendix A Freshwater Pearl Mussel Decision Flowchart

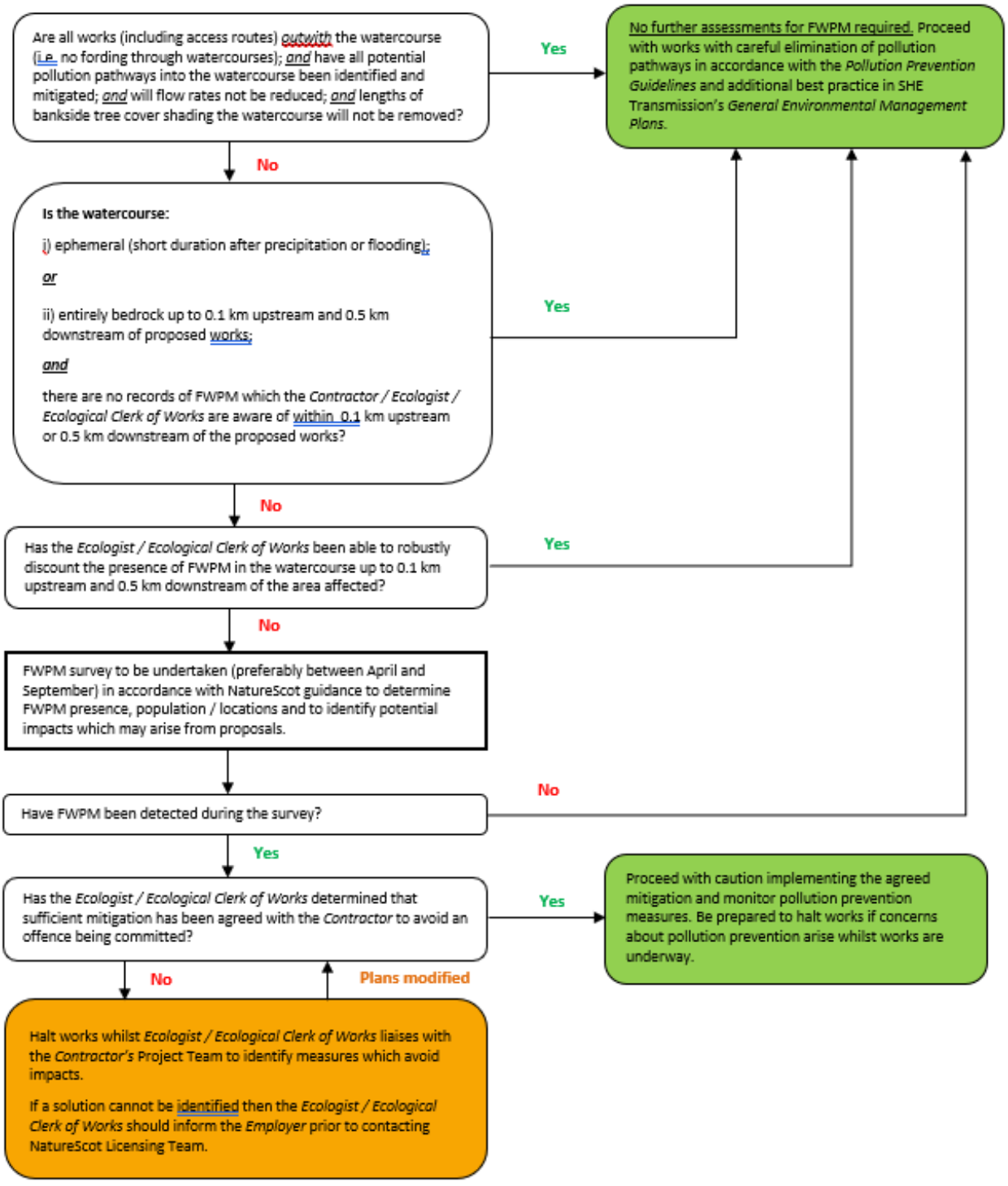

Figure A-1

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-502

Safety, Health and Environment

Bat Species Protection Plan

TG-NET-ENV-502	Bat Species Protection Plan		Applies to Transmission ✓
Revision: 2.00	**Classification:** Internal	**Issue Date:** March 2025	**Review Date:** March 2030

	Name	Title
Author	[redacted]	Consents and Environment Manager
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Approved by	[redacted]	Head of Environment

Contents

1 Introduction

All bat species occurring in Britain are European Protected Species (EPS), protected under Annex II and IV of EC Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) and are afforded a high level of protection in Scotland. Licences from NatureScot can be acquired for disturbance of a roost, or destruction / exclusion of a bat roost, assuming specific list of conditions are met. Licensed bat workers may be required to implement these licences. Some licensed bat workers may also hold a BLIMP licence (Bat Low Impact licensing) which will, providing the situation meets clear criteria, enable them to deal directly with mainland Scotland roosts which are not used for breeding or hibernation for two of the more common species without the need to submit individual licence applications to NatureScot for each development site (as BLIMP licence is held by bat worker and required to be reflected in an update licence return schedule submitted to NatureScot).

Bats in need of rescue or assistance can be aided without the need for Species Licensing as the bat's welfare is prioritised, exempting these activities from the legislation. This is covered in further detail in Section 3.5.

This Protection Plan provides guidance and agreed procedures for the protection of bats and their shelters (roosts) during construction works on SSEN Transmission projects. The Plan contains two parts and details the procedures that must be followed where there is potential for bats to be present (Part 1), and where a Project Licence for bats has been issued by NatureScot to cover the project (Part 2):

1.1 Part 1: General Protection Plan

This section applies to all projects where bats may be present and is issued to Contractors. Part 1 outlines the responsibilities of SSEN Transmission and Contractors regarding protection of bats. It also details relevant legislation, survey requirements, general mitigation measures, guidance on compensation / enhancement and the requirement for licensing and mitigation.

1.2 Part 2: Project Licence Protection Plan

This section is provided to Contractors, in addition to Part 1, for large projects where a Project Licence has been issued by NatureScot to cover the work and identifies those activities and protection / mitigation measures which are permitted under the Project Licence and those activities which require a Method Statement to be submitted to NatureScot for written approval before works can commence. Part 2 should be followed in conjunction with Part 1 and the relevant Project Licence to provide approved guidance and methodologies for carrying out work.

2 References

The documents detailed in Table 2.1 – Miscellaneous Documents, should be used in conjunction with this document.

Table 2.1 – Miscellaneous Documents

Title
EC Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive)
The Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland)
The Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019
https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/licensing
https://www.nature.scot/professional-advice/protected-areas-and-species/licensing/species-licensing-z-guide/bats-and-licensing
https://www.nature.scot/guidance-bat-low-impact-licensing-blimp-ecologists-guide
https://www.bats.org.uk/resources/guidance-for-professionals/bat-surveys-for-professional-ecologists-good-practice-guidelines-4th-edition
https://www.bats.org.uk/advice/help-ive-found-a-bat/bats-in-need-of-rescue/assess-the-situation

3 Part 1: General Protection Plan

3.1 Ecology

Bats are a diverse group of mostly nocturnal flying mammals of which there are generally recognised to be 10 different species in Scotland. There are four more common or widespread species; common pipistrelle (Pipistrellus pipistrellus), soprano pipestrelle (Pipistellus pygmaeus), Daubenton's bat (Myotis daubentonii), and brown long-eared bat (Plectotus auritus). The two pipistrelle species mentioned above are most likely to be encountered.

The other less common species are Natterer's bat (Myotis nattereri), Nathusius' pipistrelle (Pipistellus nathusii), Leisler's bat (Nyctalus leisleri), Noctule bat (Nyctalus noctula) and whiskered bat (Myotis mystacinus). The Brandt's bat (Myotis brandtii) is considered rarest and suspected to have a small range in southern Scotland, if at all.

Identification can be made by using bat detectors and recording devices to differentiate the characteristic echolocation signals (used to navigate and catch prey) as well as flight patterns, morphology and DNA analysis of droppings. The use of night vision aids (NVAs) including night vision/ infrared / thermal imaging cameras, can be used to record roosting or emerging bats, including the use of further infrared illumination.

Bats exploit a wide variety of natural and semi-natural habitats such as woodlands, pasture, water and hedges in pursuit of insect prey such moths and midges. They use a variety of strategies to catch their prey. For example, brown long-eared bats glean insects from foliage, whereas Daubenton's bats gaffe insects from near the surface of water.

Bats rest during the day in roosts within sheltered voids or cavities. Although all bat species in Scotland rely heavily on man-made structures, roosts can be found in; buildings and ruins, trees (woodpecker holes, cracks, flaky bark and callused flush cuts), bridges, caves and tunnels. Signs of an active roost may include urine staining, scratch marks, sound (rustling or high pitch squeaking/ chattering, especially near twilight), strong odour and droppings, however not all roosts have such features. Many roosts can be particularly difficult to identify, and usually require dusk and/ or dawn activity surveys at appropriate time of year to confirm.

Roosts are often communal structures which are in use at different times and many different types of roosts exist varying from temporary day roosts to more permanent maternity and hibernation roosts. The most sensitive periods for maternity roosts are from early May to September and hibernation roosts can in use from October until March. Bats are particularly vulnerable to disturbance during hibernation which could result in mortality due to cold temperatures and lack of food resource, or during maternity period when disturbance could result in the newly born bats being abandoned. Bats have a slow reproductive rate, usually with one pup per female each year which makes their colonies susceptible to disturbance and direct impacts, such as habitat loss. Males can sometimes be found singular, in small 'bachelor' groups, or within maternity roosts.

3.2 Responsibilities

It is the Contractor's responsibility to comply with all the requirements of this Protection Plan where bats are or may be present, and it is both the Contractor's and SSEN Transmission's responsibility to monitor compliance with the Protection Plan. The Contractor is required to appoint a suitably qualified and competent Ecologist, where licensable activities need to be overseen, and in some cases, undertaken by a licensed bat worker (e.g. roost exclusion). Not all bat surveys require the ecologist to be licensed, but they should be suitably trained and competent in the bat survey type being used. Independent ECoWs may be appointed on a project to undertake compliance monitoring. The responsibility for applying for any Licence, including a Project Licence, usually sits with the Contractor, but may vary from project to project, but all applications and mitigation works must adhere to this plan.

3.3 Legislation

All bat species (Chiroptera) in Britain are European Protected Species (EPS), protected under Annex II and IV of EC Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive). The Habitats Directive is transposed in Scottish law by The Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland). The protection has remained operable in Scotland following amendments of the Regulations by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019.

As EPS, it is an offence to deliberately or recklessly[1] kill, injure or take (capture) bats, deliberately or recklessly disturb or harass bats, and damage, destroy or obstruct access to a breeding site or resting place of any bat. It is important to note that bat roosts are protected even at times of year when not in use.

To summarise, for any wild bat species it is an offence to deliberately or recklessly:

- capture, injure or kill a bat;
- harass a bat or group of bats;
- disturb a bat in a roost (any structure or place it uses for shelter or protection);
- disturb a bat while it is rearing or otherwise caring for its young;
- obstruct access to a bat roost or otherwise deny an animal use of a roost;
- disturb a bat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species;
- disturb a bat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; and
- disturb a bat while it is migrating or hibernating.

[1] Reckless acts would include not having or disregarding a mitigation plan aimed at protecting Bats resulting in killing, injury, and/or disturbance of any Bat or Bat Roost, or carrying out an activity which would result in an offence where the presence of Bats was foreknown.

It is also an offence to:

- damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly); and
- keep, transport, sell or exchange, or offer for sale or exchange any wild bat (or any part or derivative of one) obtained after 10 June 1994.

3.4 Bat Care (Rescue)

Occasionally bats find themselves in situations or locations where they become trapped in buildings. If bats are mobile and flying around, opening the door and windows may be sufficient for the bat to make an escape unharmed. However, if they have been trapped for a period or are otherwise in need of care (exhaustion / injury etc.), they should be taken into care. Often bats in need of care are found grounded and unable to sustain flight. Sometimes bats can appear to be dead, therefore should be carefully assessed, and advice sought from a trained and competent person (e.g. the Environmental Advisor or ecologist).

Whilst handling bats is usually an offence without a licence, injured or grounded bats can be legally handled or dispatched where severe injury is clearly evident (e.g. broken wing) for the purposes of care. Although bats are protected by law, handling a bat in trouble in order to assist it is permitted. Ideally this would be undertaken by a suitably trained and rabies vaccinated individual, or ecologist. There is a small risk of rabies transmission from bat bites and scratches in the UK, but you can protect yourself by limited handling (required to contain the bat to take into rehabilitation) and wearing long sleeves and gloves. An FFP2 face mask should also be worn to prevent any potential infection of the bat from human born viruses such as COVID (SARS-CoV-2). Please refer to referenced Bat Conservation Trust (BCT) guidance on containment of a grounded bat and precure beneath.

https://www.bats.org.uk/advice/help-ive-found-a-bat/bats-in-need-of-rescue/assess-the-situation

The finding of the bat must be reported to site management and an SSEN Transmission environmental representative. Further investigations maybe required to establish the entry point of the bat and check for any nearby roosts. Should a dead bat or bats be found, this should also be reported. Always wear gloves when handling a bat, alive or dead, and seek medical advise immediately if bitten, licked, or scratched, even if you have been vaccinated for rabies.

3.5 Surveying for Bats

Surveys should be undertaken in line with the BCT Bat Surveys for Professional Ecologists: Good Practice Guidelines (current edition).

Bat surveys (or consideration of their requirement) are often undertaken during the development stage of a project, such as during EIA or Environmental Appraisal. The assessment and findings of these reports must be reviewed by the Contractor engaged for delivery to ensure adequate time for further bat surveys where required. Should proposals change, then the Contractor must reassess the potential to impact on bats and their roost, including requirement for further surveys as appropriate. Consideration for bats should also be considered for any changes, or additional development not included in the main application, such as enabling works, public road improvements or the formation of construction compounds. Other factors such as lighting, or noise from generators, including temporary elements, must also be considered, and follow best practice guidance.

1. Bat surveys must be undertaken in all works areas containing suitable habitat, at a suitable time of year a maximum of 12 months[2] prior to the works commencing, (this includes site investigations), to ensure the availability of up-to-date information on shelter locations.
2. Surveys must extend for a minimum of 30 m beyond working areas.
3. Pre-construction surveys will be undertaken for all potential roosting features likely to be affected (i.e. built structures and trees). If evidence of roosting bats is encountered, further surveys may be required to confirm species, roost type and usage, which are required to support any licence application.

3.6 Review of Bat Survey

Once survey(s) have been completed, the ecologist must review the survey results, apply the mitigation hierarchy outlined below and decide whether a Licence is required (either Individual or Project) for the works. A specific bat protection plan may be required in support of a licence application, applying the mitigation hierarchy with reference to this plan.

NatureScot state that a species protection plan should:

- build on the results of surveys to look at the potential impacts of the development on protected species;
- describe how those impacts will be mitigated or compensated;
- identify whether or not a licence is necessary; and
- include a good method statement – i.e. a description of how all work in relation to protected species (including licensed work) will be done.

[2] Note: Information from any previous surveys (e.g. surveys carried out to provide data for EIA or other Assessments) can be a useful guide to bats activity in an area, particularly if roosts were recorded. However, surveys will always require to be updated if carried out more than 12 months prior to works commencing.

A species protection plan will also allow the planning authority to state that adherence to the plan is a condition of any consent.

Construction teams must be advised of existing / new constraints, together with mitigation and licensing requirements by the ecologist.

Relevant site documentation and project information sources must be updated with new and amended information on bat constraints as it is produced, with changes communicated to appropriate staff immediately.

3.7 Mitigation Hierarchy

There is a general presumption against works being carried out which could disturb bats or to destroy / exclude or obstruct access to any bat roost. A hierarchical approach to mitigation of Avoidance - Disturbance - Destruction will be applied to any roost that may be affected:

Avoidance

This is the preferred option for roosts identified within 30 m of works, an initial protection zone of 30 m will be demarcated and appropriately signed to restrict work access.

Protection zones must be maintained until works are completed. Site staff must be briefed of their purpose through a Toolbox Talk and works micro-sited out with the protection zone. If bat disturbance can be avoided in this way, there is no need to obtain a Licence from NatureScot.

Disturbance

Works required within 30 m of an active roost may constitute disturbance and therefore may require a Licence from NatureScot, to be assessed case-by-case. In these circumstances the ecologist must be tasked to determine the likelihood of disturbance to bats and need for a licence (in consultation with the NatureScot licensing team if required). Individual Licence applications to NatureScot are to be accompanied by a Protection Plan outlining how disturbance will be minimised and roosts protected; for example, through timing works for when bats are least likely to be present, screening of works and modifying protection zones. In some circumstances works may be allowed under a Bat Low Impact Licence (BLIMP).

Some disturbance licensing requirements may include compensation, such as installation of bat box(es) away from the proposed works. Installation of boxes should be within 100 m of the roost or as close as reasonably practicable, where they are less likely to become a future constraint, whether this is during operation of the asset or another development. Placement must therefore be agreed with SSEN Transmission and landowner(s) in addition to NatureScot as appropriate.

If a Project Licence is in place, part 2 of this document should be used to ascertain whether a formal Method Statement is required to be submitted for approval to NatureScot prior to works commencing which could disturb bats.

Roost Destruction

Destruction of roosts should only be undertaken as a last resort. For destruction of roosts a Licence will be required from NatureScot. Destruction of maternity roosts and hibernation roosts will only be licensed outside of the seasons when they are in use.

Individual Licence applications to NatureScot should be accompanied by a Protection Plan which outlines how disturbance of bats will be minimised, roosts compensated for, and individual bats protected. Roost destruction may not always be permitted; this will depend on roost type and rarity of species (see species matrix in part 2 of this document). In some circumstances works may be allowed under a Bat Low Impact Licence (BLIMP).

If a Project Licence is in place the following activities require a formal Method Statement to be submitted and approved by NatureScot in accordance with Part 2 of this document, prior to any works commencing:

- Destruction of a breeding / hibernation roost of a brown long-eared or Daubenton's bat.
- Destruction of any roost of an uncommon species (Natterer's, Leisler's, Whiskered, Noctule, Nathusius' pipistrelle, and Brandt's bat) at any time of year.

For all other scenarios (such a destruction of a non-breeding roost of a more common species outside of the active season) works should be carried out in accordance with part 2 of this document. Any roost subject to works under Licence will be monitored during and after those works.

Similarly to disturbance, some destruction licensing requirements may include compensation, such as installation of bat box(es) away from the proposed works. Installation of boxes should be within 100 m of the roost or as close as reasonably practicable, where they are less likely to become a future constraint, whether this is during operation of the asset or another development. Placement must therefore be agreed with SSEN Transmission and landowner(s) in addition to NatureScot as appropriate.

3.8 Mitigation Measures

3.8.1 General Mitigation

The following mitigation is to be incorporated, but not necessarily limited to:

1. Where possible, timing or works which have the potential to impact bats and / or their roosts should be avoided during the most sensitive times of year. Maternity roosts and hibernation roosts are particularly sensitive to disturbance. Weather conditions should also be considered (e.g. warmer winters may lead to bats hibernating later). Advice from the ecologist should be sought.
2. Where works are in areas where bat roosts may be encountered, toolbox talks should be used to brief workers on bats and their protected status, including findings of surveys undertaken, and exclusion buffers, and emergency measures to be undertaken on bat encounter or identification of a suspected roost.
3. Any artificial lighting to be directed away from known shelters/suitable habitat as far as reasonably practical.
4. Tree felling to be directed away from known roosts. Remnants such as branching must not block / obstruct roosts. Retain surrounding vegetation as far as possible.
5. Habitat connectivity to be maintained with obstruction and fragmentation avoided.
6. Any considerably noisy static machinery to be stored outside of sensitive areas / exclusion zones and switched off overnight where practical.
7. Avoid activity between dusk and dawn when bats are most active as far as reasonably practical.

8. Emergency procedures must be implemented inclusive of the following:

- Should bats or field signs be identified unexpectedly and measures not already in place, all work within 30 m must cease until the ecologist and SSEN Transmission environmental representative has been consulted, the site inspected where required, and determined the appropriate course of action.
- Any suspected sick or injured bats to be reported to the ecologist and taken into care as appropriate, following the procedure outlined by the Bat Conservation Trust[3]. Further guidance is provided in Section 3.5. Ensure the bat is contained within a secure box with breathable holes, a towel / similar, and **shallow** dish of water (milk lid appropriate). Where there is not a bat carer associated with the project, contact the National Bat Helpline on **0345 1300 228**.
- The Scottish Society for the Prevention of Cruelty to Animals (SSPCA) can be contacted where bat carers are not available. The SSPCA will only attend site if the animal has been contained (within a box or cover placed over) and / or someone is monitoring consistently-frequently. The SSPCA require 'What 3 Words' of location, contact number and postcode. Incidents can be reported to the SSPCA[4] on **03000 999 999**.
- Site personnel safety must never be compromised in attempt to rescue wildlife. Any animal can be unpredictable, particularly when they are in pain or feel threatened by humans. There is a small risk that bats can carry rabies, a fatal virus. Avoid direct handling if you can, always wear gloves and long sleeves, and wash hands after. An FFP2 mask should be worn to protect bats from potential virus transmission.
- Where injury or death to a bat is a result of site activities and / **or licensing conditions have been breached**, activities in the area must cease and the site made safe immediately. SSEN Transmission Environmental representative must be notified and a suitably qualified ecologist contacted and arrangement made for to attend site. The incident must be reported to SSEN on **0800 107 2307** within 30 minutes and reported to the NatureScot licensing team as soon as possible. Details must also be recorded on EcoOnline.

9. Where injury or death to a bat is not a result of site activities and no licensing conditions have been breached, activities in the area must cease and the site made safe immediately. The SSEN Transmission Environmental representative is to be contacted and should attend site. The incident should be recorded on EcoOnline and within weekly-monthly reports (e.g. dead bat found in building and suspected to be a 'one off' incident).
10. An exceptional circumstance procedure will be implemented should mitigation options not prove satisfactory in a particular case. Works will be halted whilst mitigation is determined (under consultation with NatureScot if required).

[3] Help! I've found a bat - Advice - Bat Conservation Trust

[4] The SSPCA is the animal welfare charity operating in Scotland and should not be confused with the RSPCA operating only in England and Wales.

3.8.2 Monitoring and Reporting

1. The Ecologist will attend site on a regular basis throughout the construction period to ensure all environmental mitigation relevant to bats is delivered.
2. Reports to follow guidance within the BCT Bat Surveys for Professional Ecologists: Good Practice Guidelines (current edition).
3. Reports will be submitted to NatureScot as required by the relevant Licence. These should also be shared with SSEN Transmission.
4. Any commitments to monitor effectiveness of compensation measures must be followed, and findings reported back to SSEN Transmission.

3.9 Compensation

Some activities that impact on bat roosts may require compensation to offset remaining impacts, for example after destruction / exclusion of a roost. Compensation measures may be included within licence applications made to NatureScot. These compensation measures are usually in the form of installation of a suitable bat roost box(es) with following points adhered to/ considered:

- They should be installed as close to the affected roost as possible (usually within 100 m).
- Of suitable type for the roost being compensated. Woodcrete boxes such as Schwegler are preferred as known to be successful.
- Consideration of the fixing of the proposed bat roost box type to location should be considered, with flat backed boxes being easier to hang on walls, and cylindrical types easily affixed to trees.
- Bat boxes should be placed at a suitable height to encourage uptake by bats, and to limit the potential of predation (3-5 m).
- Preferred orientation is south facing; however, offset from south may allow bats to move to warmer / cooler temperatures as required.
- Consideration as to the location of the proposed installation of bat roost compensation measures must be made to ensure they are installed in a suitable location for likely uptake by bats, but also an area which would not be disturbed or constrain future works, and
- Location(s) of proposed boxes or other mitigation must be agreed with the Land Assembly/ SSEN Transmission Operations (ensure land agreements are in place for placement on any area not under SSEN Transmission's control).

Larger more bespoke mitigation measures may be required for destruction / exclusion or more significant roosts; however, consideration of such can become complex, especially if heating elements are deemed required. Formation of bat roosting features within trees to be retained may also be considered, including cutting of new features or retention of roost feature, secured to a retained tree in suitable location.

Monitoring success of the compensation measures may be included within licence applications, but would form part of the conditions of the licence and therefore must be met where commitment is made. Once a bat box becomes occupied it is considered a roost and offered the same legal protection as any other roost.

3.10 Enhancement

Enhancement refers to providing net benefits for biodiversity, over and above the requirements for avoidance, mitigation or compensation, for example, placement of bat roost box associated with licensable roost disturbance. While SSEN Transmission seeks and welcomes opportunities for enhancement on projects / assets, measures installed for enhancement must follow the same principles as Compensation, set out above.

3.11 Licensing Requirements

Licence applications must be sent into NatureScot species licensing team sufficiently in advance of the project start date (approximately 30 days) to ensure the licence is in place prior to any work commencing.

3.12 Bat Low Impact Licence

In certain circumstances works on mainland Scotland affecting soprano pipistrelle or common pipistrelle bat roosts, which are not used for breeding or as hibernacula, can be undertaken utilising a BLIMP licence. BLIMPs may only be used by Licenced BLIMP holder and works must be undertaken following the most up to date NatureScot guidance; Guidance - Bat Low Impact Licensing (BLIMP) - An ecologist's guide | NatureScot.

For the avoidance of doubt the BLIMP licence will not cover activities affecting other bat species or other types of roost. However, this will not preclude working under the BLIMP licence at a site where other species or roost types are present providing that the works will not affect them.

3.13 Project Licence

A NatureScot Project Licence is likely to be the most appropriate form of Licence for any large scale and / or long running Project, which may result in a large number of minor unavoidable bat offences.

For example, multiple instances of disturbance to a number of bat roosts over several years. A Project Licence can be used to standardise protected species mitigation / compensation, creating consistency across the project area and throughout the Project's lifespan. Project Licences do not negate the need for thorough pre-development surveys within 12 months of the planned project start date, and pre-construction surveys within 3 weeks of works commencing. Any Project Licence application will need to be accompanied by the Mitigation Plan and procedures for bats included in Parts 1 and 2 of this SPP.

3.14 Individual Licence

For small scale Projects expected to be completed over relatively short timescales, which will result in a low number of unavoidable bats offences, an Individual NatureScot Licence is most likely to be appropriate. Licence applications should be accompanied by a Method Statement and should be sent sufficiently in advance of the Project start date to ensure the licence is in place prior to work commencing.

Further guidance and details of how to apply for a bat Licence can be found on the NatureScot website (https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/licensing).

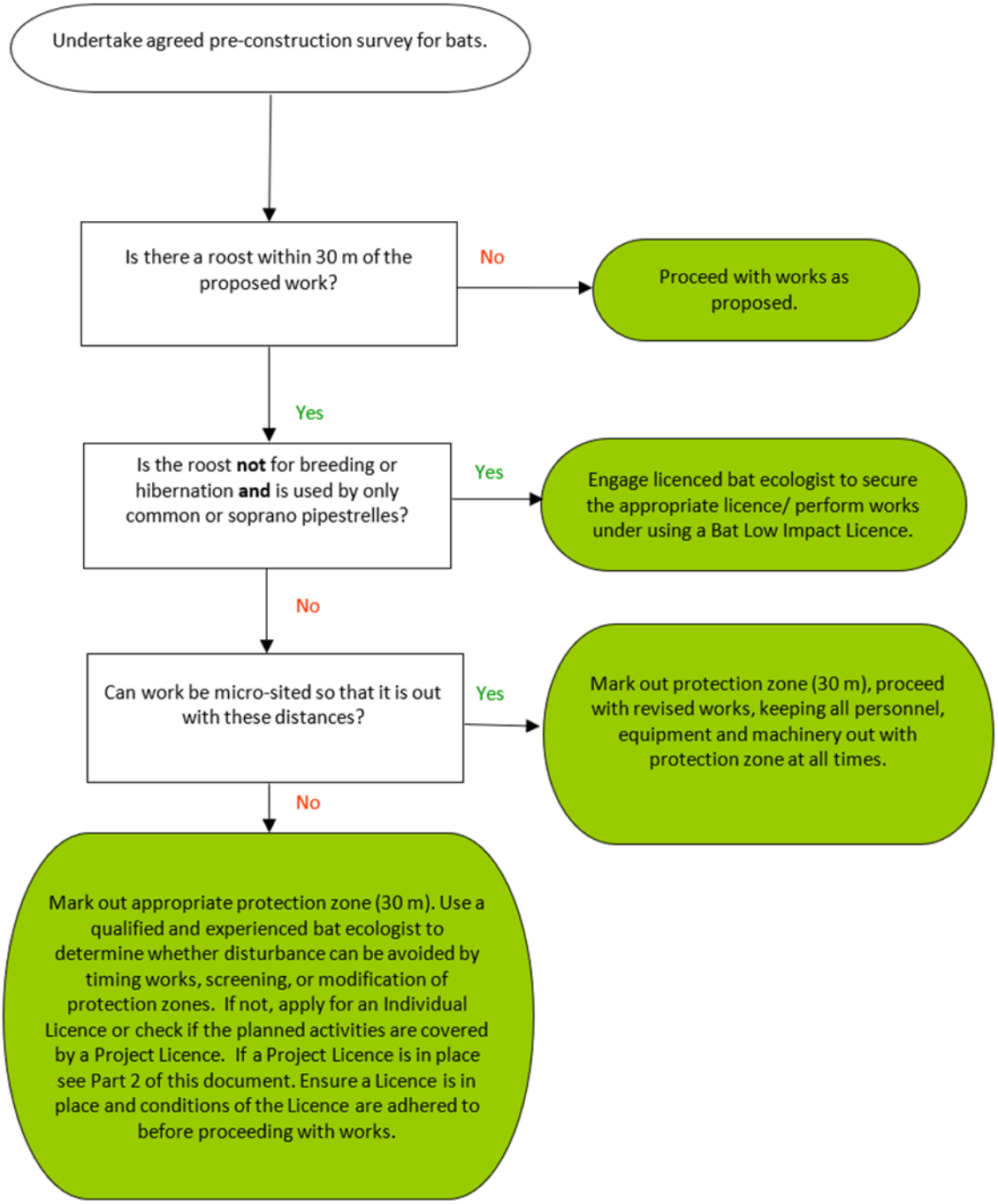

Figure 3.1 - Bat Mitigation Decision Tree

4 Part 2: Project Licence Protection Plan

The following sections of this plan are to be read in conjunction with the Project Licence (insert Licence number) and its conditions.

As stated in the Project Licence, methodologies for certain mitigation activities permitted under the Licence are included in this Part of the SPP. More disruptive activities, listed in Section 1 below, will also require a specific Method Statement to be submitted to NatureScot licensing team for written approval (see Appendix A). It is the Contractor's responsibility to submit these Method Statements to both SHE Transmission and NatureScot for written approval. No works shall proceed without this written approval.

Sufficient time should be allowed for in the programme to carry out any consultation work and obtain necessary approvals.

The Project Licence will specify reporting requirements detailing all disturbance and destruction works carried out.

4.1 Works Allowed under the Project Licence

Under the Project Licence there is a general presumption against works being carried out which could disturb bats, or to destroy / exclude or obstruct access to any bat roost unless it can clearly be demonstrated that either it is inactive (i.e. through monitoring) or that there is no alternative solution against Project timescales and requirements.

4.2 Activities requiring a NatureScot Approved Method Statement

The following activities require a formal Method Statement to be submitted and approved by NatureScot prior to any works commencing:

a. Disturbance of breeding or hibernation roosts of Common Pipistrelle, Soprano pipistrelle, Brown long-eared, and Daubenton's bat during the seasons when they are likely to be in use;

b. Disturbance of breeding or hibernation roosts of all non-common bat species (i.e. Natterer's, Leisler's, Whiskered, Noctule, Nathusius', and any other species not normally found in Scotland) at any time;

c. Disturbance of non-breeding and non-hibernation roosts for all non-common bat species (i.e. Natterer's, Leisler's, Whiskered, Noctule, Nathusius', and any other species not normally found in Scotland);

d. Destruction of a Brown Long-eared or Daubenton's breeding or hibernation roost;

e. Destruction of any roosts for all non-common bat species (i.e. Natterer's, Leisler's, Whiskered, Noctule, Nathusius', and any other species not normally found in Scotland)); and

f. Any exceptional circumstances not covered in this SPP or Points a to e above.

The Method Statement template in Appendix A has been developed in conjunction with NatureScot and should be used by the *Contractor / Named Agent* for all submissions.

Proposed mitigation works should be agreed with NatureScot.

Species Matrix

This matrix summarises which activities at which time of year can be carried out under this SPP or require an approved method statement. For explanation see text of this SPP.

Table 4.1 - Species Matrix

	Breeding / Hibernation Roosts		Non-breeding / non-hibernation Roosts	
Species	**Disturbance**	**Destruction**	**Disturbance**	**Destruction**
Common Pipistrelle	SPP (outwith seasons)	SPP (outwith seasons)	BLIMP	BLIMP
Soprano Pipistrelle	SPP (outwith seasons)	SPP (outwith seasons)	BLIMP	BLIMP
Brown Long Eared	SPP (outwith seasons)	Approved MS	SPP	SPP
Daubenton's	SPP (outwith seasons)	Approved MS	SPP	SPP
Natterer's	Approved MS	Approved MS	Approved MS	Approved MS
Nathusius' Pipistrelle	Approved MS	Unlikely to be allowed	Approved MS	Approved MS
Leisler's	Approved MS	Approved MS	Approved MS	Approved MS
Whiskered	Approved MS	Unlikely to be allowed	Approved MS	Approved MS
Noctule	Approved MS	Approved MS	Approved MS	Approved MS
Other species not normally found in Scotland	Approved MS	Approved MS	Approved MS	Approved MS

4.3 Activities not requiring additional NatureScot approval

The following works may be carried out under this SPP and / or specific Method Statements without the prior approval of NatureScot, using the prescribed methodologies:

a. Disturbance to non-breeding (note according to European guidance mating roosts are considered to be breeding roosts) and non-hibernation roosts, and disturbance to maternity / hibernation roosts (outwith the seasons they are in use), for the more common species (i.e. brown long-eared, and Daubenton's bats). Destruction of any common or soprano pipistrelle breeding and hibernation roosts at an appropriate time of year for the type of roost (i.e. when bats are not likely to be present and avoiding sensitive seasons).

b. Destruction of non-breeding and non-hibernation roosts for brown long-eared and Daubenton's bats, at an appropriate time of year for the type of roost when bats are not present, or avoiding sensitive seasons.

4.3.1 Disturbance to non-breeding and non-hibernation roosts at any time of year, and disturbance to maternity and hibernation roosts outwith the seasons they are in use.

a. This methodology applies to the following:

- Disturbance to non-breeding and non-hibernation roosts of common pipistrelle, soprano pipistrelle, brown long-eared and Daubenton's bats.

b. If works are to be completed within the protection zone when bats are present the following measures will be adopted in order to minimise potential disturbance to the roost:

- Works will be completed in a manner to reduce and ensure minimal disturbance;
- No use of directional lighting; and
- No site compounds and/or vehicle parking areas will be permitted within 30 m of the roost.

c. Prior to the commencement of Project works, a protection zone will be established to retain the maximum possible distance between Project works and the roost in order to prevent damage. In most cases this protection zone will be no less than 1 m from the drip line of the tree or 5 m for buildings or cave entrances, and will be set up by the Ecologist / ECoW who is an Agent on the Project bat Licence, or a suitably qualified bat worker under their supervision. No construction works will be completed within this zone.

d. All site construction staff will be made aware of the presence of the roost and the requirement to remain outwith the protection zone at all times through a Toolbox Talk and the site EMP.

e. A watching brief would be undertaken by the ECoW as required to ensure that the protection zone has not been breached and that the roost/ roost feature has not been inadvertently damaged.

f. No specific ecological mitigation is considered to be required for the disturbance to non-breeding and non-hibernation sites.

4.3.2 Destruction of roosts at an appropriate time of year.

a. This methodology applies to the following:

- Destruction of roosts of common and soprano pipistrelle bats; and
- Destruction of non-breeding and non-hibernation roosts of common pipistrelle, soprano pipistrelle, brown long-eared and Daubenton's bats.

b. Destruction of these roosts will only be completed at an appropriate time of year (dependent on roost status, avoiding sensitive seasons and if presence/ absence of bats can be confirmed).

c. Prior to the commencement of Project works within 30 m of non-breeding and non-hibernation roosts, a protection zone will be set up by the ECoW. No works will be completed within this area until the roost has been destroyed in a controlled manner.

d. All site construction staff will be made aware of the presence of the roost and the requirement to remain out with the protection zone at all times through a Toolbox Talk and the site EMP.

e. Prior to licensed destruction of the roost, appropriate mitigation / compensation shall be provided on a like-for-like replacement basis (e.g. provision of roost features that would match the roost to be destroyed). Replacement roost features would be sited as close as possible to the roost to be destroyed but out with any potential disturbance distances. Compensatory roost provision would be agreed with NatureScot.

f. The destruction of the roost will be completed in a controlled manner under the supervision of the ECoW (who is an Agent on the Project Licence, or a suitably qualified bat worker under their supervision), in order to ensure that no bats are injured and/or killed. The following measures will be adopted during the controlled destruction of the roost:

- Prior to any works being completed that will result in the destruction of non-breeding and non-hibernation roosts, a survey will be completed to determine whether bats are present or absent, the status of the roost and the species involved (through visual or lab analysis of droppings).
- Where a roost is to be destroyed during the active period, and the presence of bats is confirmed or cannot be discounted, bats will be excluded from the roost using an appropriate exclusion device. (e.g. a cotton sleeve) which will be fitted to the observed entrance/exit point by the ECoW.
- A dawn survey will be undertaken on the day of the exclusion to confirm the absence of bats returning to the roost. These surveys will be undertaken when the dawn temperature is > 8o C. Should bats be seen entering the roost the exclusion will be postponed for 3 days and the process repeated.
- The exclusion device will remain in place for 7 days, unless this corresponds to a period of cold or adverse weather (where the temperature at dusk is < 8o C or heavy rain), then the excluder must stay in place for a further 7 days.
- In the event of bats being identified within the roost during destruction, the ECoW is responsible for determining the best course of action with respect to the welfare of the animals.

5 Revision History

No	Overview of Amendment and Text affected	Previous Document	Revision	Authorisation
01	Transfer to new template and Nomenclature	TG-PS-LT-708 (Rev 1.00)	1.00	[redacted]
02	Sentence 3.8.2 (1) has been replaced by the equivalent sentence of precursor TG-PS-LT-708. Paragraph 3.10 has been replaced by the equivalent paragraph of precursor TG-PS-LT-708. Paragraph 3.11 has been replaced by the equivalent paragraph of precursor TG-PS-LT-708 (with exception of update to SNH hyperlink).	TG-NET-ENV-502 (Rev 1.00)	1.01	[redacted]
03	SPP updated to incorporate introduction of Bat Low Impact Licence.	TG-NET-ENV-502 (Rev 1.01)	1.02	[redacted]
04	Updated in line with DMS requirement. Clarification on bat care added. SNH references updated to NatureScot. Survey requirements updated to align with current BCT guidance.	TG-NET-ENV-502 (Rev 1.02)	2.00	[redacted]

Appendix A Project Licence Method Statement Template

<PROJECT TITLE>

METHOD STATEMENT FOR WORKS UNDER (insert licence details)

<insert species record reference>

<insert date>

Introduction

This document, prepared on behalf of SHE Transmission provides a Method Statement for <insert details of works> to be completed under <insert licence details>. These works are required in order to facilitate the delivery of the <insert Project details> (the Project).

Condition <insert No.> of the above Licence states that a <insert species> Protection Method Statement be submitted to NatureScot licensing team for written approval, under specific circumstances, prior to commencement of works which could affect <insert species>. Therefore, no works which would <insert licensed activity> <insert species> shall take place without written confirmation of NatureScot approval of this method statement.

This Method Statement makes reference to the following documents:

- <insert licence details>, NatureScot
- Species Protection Plan (SPP): <insert SPP No. and title> Rev. X <insert date>

Further information is provided in Table A.1 - Summary of Data.

Licensable Works

Introduction

<Insert details>

Baseline Description

<Insert description, including photographs / location plan>

Table A.1 - Summary of Data

Reference	Easting	Northing	Date recorded	Description	Date works exclusion zone demarcated & distance

Survey Summary

<Insert details>

Description of the Proposed Licensable Works

<Insert details>

Works Duration

<Insert details>

Consideration of Alternatives

<Insert details>

Impact Assessment

<Insert details>

Method Statement Site Briefing (to be delivered to relevant staff prior to works)

Site: <insert description>

Reference number: <insert species record reference>

Client: SHE Transmission

Task: <insert description of works>

Prepared by: <insert individual or Company name>

Licensed Agent: <insert name>

Method statement for <insert works description>

Before works commence:

All relevant personnel will be made aware of the presence and location of the constraint and mitigation.

<insert details of methodology>

During works:

<insert details of methodology>

<Insert Contractor's name>

I, the undersigned, confirm receipt of this method statement and fully understand and agree to work to the conditions therein.

Signature of Contractor's Representative:..... Date / /

Print name in full: .....

Scottish & Southern Electricity Networks
TRANSMISSION

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-503

Safety, Health and Environment

Otter Species Protection Plan

TG-NET-ENV-503	Otter Species Protection Plan		Applies to Transmission ✓
Revision: 1.02	**Classification:** Internal	**Issue Date:** December 2022	**Review Date:** December 2030

	Name	Title
Author	[redacted]	Environmental Net Gain Manager
Checked by	[redacted]	Consents & Environment Manager
Approved by	[redacted]	Head of Consents & Environment

Contents

1 Introduction

Otter is a European Protected Species and is afforded a high level of protection in Scotland. This Protection Plan provides guidance and agreed procedures for the protection of otters and their shelters during construction works on Scottish Hydro Electric (SHE) Transmission projects. The Plan contains two parts and details the procedures that must be followed where there is potential for otter to be present (Part 1), and where a Project Licence for otter has been issued by NatureScot to cover the project (Part 2).

Part 1: General Protection Plan

This Part applies to all projects where otter may be present. Part 1 outlines the responsibilities of SHE Transmission and the Contractor regarding protection of otter. It also details relevant legislation, survey requirements, general mitigation measures and the requirement for licensing and mitigation.

Part 2: Project Licence Protection Plan

This is provided to Contractors in addition to Part 1 for large projects where a Project Licence has been issued by NatureScot to cover the work and identifies those activities and protection / mitigation measures which are permitted under the Project Licence and those activities which require a Method Statement to be submitted to NatureScot for written approval before works can commence. This Part should be followed in conjunction with Part 1 and the relevant Project Licence to provide approved guidance and methodologies for carrying out work.

2 References

The documents detailed in Table 2.1 - Miscellaneous Documents, should be used in conjunction with this document.

Table 2.1 - Miscellaneous Documents

Title
The Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland)
EC Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive)
The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007
The Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019
NatureScot Licensing

3 Part 1: General Protection Plan

3.1 Background

Otters (*Lutra lutra*) are members of the weasel family with a widespread distribution in Scotland. They are largely solitary, semi-aquatic and obtain most of their food from rivers or the sea. Otters living on rivers may travel distances of 16 km or more at night. They use two kinds of shelter – underground holts and above ground couches. Otters may dig their own holts but they often enlarge existing structures such as rabbit holes so identification can be difficult. Couches may be nest-like structures or simply a depression in a stick pile or under a windblown tree. Each individual will use multiple shelters and holts can be located up to 500 m from watercourses. Otters may have cubs at any time of year.

Breeding sites are generally found in areas with the following characteristics:

- Relatively undisturbed by humans / ungrazed by stock
- Close (<50 m) to water but rarely flooded or just above the floodplain level
- Containing patches of dense cover (e.g., scrub thickets, deciduous woodland, young conifer plantation, heather, log piles, tree roots, rock piles, stands of tussocky tall fen vegetation, or reed beds)

Signs of Otter:

- Spraints (droppings) which have a high mucus content and are often formless, generally black or greenish–black in colour and may contain obvious fish bones or scales
- Otter prints and tracks – otter paths are 12-15 cm wide and normally connect with water and holts they are marked with spraints. Otter prints are about 6 cm wide and have five toes
- Feeding remains – hard parts of crustaceans, unpalatable bits of amphibians and bony parts of fish
- Otter shelters - holts or couches

3.2 Responsibilities

It is the *Contractor's* responsibility to comply with all the requirements of this Protection Plan where otter may be present, and it is both the *Contractor's* and SHE Transmission's responsibility to monitor compliance with the Protection Plan. The responsibility for applying for any Licence, including a Project Licence, may vary from project to project, but all applications and mitigation works will adhere to this plan.

3.3 Legislation

Otter is a **European Protected Species (EPS)** protected under Annex II and IV of EC Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats

Directive). The Habitats Directive is transposed in Scottish law by The Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland). The protection has remained operable in Scotland following amendments of the Regulations by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019.

Otter is listed on Schedule 2 of the Conservation (Natural Habitats &c.) Regulations 1994. The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007 enhanced this protection. Current Legislation means that otters and their shelters are fully protected in Scotland. In summary it is illegal to:

- Deliberately or recklessly kill, injure or take (capture) an otter
- Deliberately or recklessly disturb or harass an otter
- Damage, destroy or obstruct access to a breeding site or resting place of an otter

3.4 Surveying for Otter

- Surveys for otter must be undertaken in all works areas containing suitable otter habitat, a maximum of 12 months[1] prior to the works commencing, (this includes site investigations), to ensure the availability of up-to-date information on shelter locations
- Surveys must extend for a minimum of 200 m beyond working areas, including access tracks
- Surveys must be carried out by suitably qualified and experienced ecologists and will identify whether any active holts or places of shelter are likely to be affected by the works. Normally work within 30 m of a non-breeding shelter is regarded as likely to cause otter disturbance and will therefore require to be covered by a licence from NatureScot. However, works generating high noise / vibration levels (such as pile driving or blasting) can cause disturbance to non-breeding sites up to 100 m. Any work within 200 m of a breeding otter holt / shelter should also be regarded as capable of causing disturbance
- Appropriate monitoring (e.g., the use of suitable camera traps) should be undertaken where required to determine if any holt / place of shelter is being used for breeding. Camera trap monitoring may also require a Licence from NatureScot
- Active shelters will be classified as:
- Holt: Underground or other fully enclosed structure (can range from enlarged rabbit holes and cavities amongst tree roots to rock piles and man-made structures)
- Place of Shelter: Can be either a Couch / Lie-up - an above ground semi-enclosed resting place (e.g., under overhanging river banks / tree root plates); or Hover – a

1.1

[1] Note: Information from any previous surveys (e.g., surveys carried out to provide data for Environmental Impact Assessment (EIA) or other Assessments) can be a useful guide to otter activity in an area, particularly if holts were recorded. However, surveys will always require to be updated if carried out more than 12 months prior to works commencing.

nest-like structures (0.3 -1 m in diameter) constructed from nearby vegetation or a depression in a stick pile or under a windblown tree

3.5 Review of Otter Survey

Once an otter survey has been carried out, the ecologist /Ecological Clerk of Works (EcoW) should review the survey results, apply the mitigation hierarchy outlined below and decide if a Licence is required (either Individual or Project) for the works.

Construction teams should be advised of existing / new constraints, together with mitigation and licensing requirements by the ecologist / ECoW.

Relevant site documentation and project information sources should be updated with new and amended information on otter constraints as it is produced, with changes communicated to appropriate staff immediately.

3.6 Mitigation Hierarchy

There is a general presumption against works being carried out which could disturb otters in their place of shelter or to destroy / exclude any holt. A hierarchical approach to mitigation of Avoidance - Disturbance - Destruction will be applied to any holt / place of shelter that may be affected (See Figure 3.1):

Avoidance

This is the preferred option for active holts / places of shelter identified within 30 m of works (100 m for high noise / vibration activities) or 200 m for confirmed breeding sites or. Protection zones of either 30 m, 100 m or 200 m should be marked and signed on the ground with appropriate material to restrict work access.

Protection zones must be maintained until works are completed. Site staff should be briefed of their purpose through a Toolbox Talk and works micro-sited outwith the protection zone. If otter disturbance can be avoided in this way, there is no need to obtain a Licence from NatureScot for the works.

Disturbance

For any works required within 30 m of active holts / places of shelter (or 200 m for confirmed breeding sites), and for high noise / vibration activities such as pile driving or blasting within 100 m of holts / places of shelter, a Licence from NatureScot will be required (either Individual or Project).

Individual Licence applications to NatureScot should be accompanied by a Protection Plan which outlines how disturbance will be minimised and holts protected, for example through screening of works and modifying protection zones.

If a Project Licence is in place, and a breeding holt will be disturbed, a Method Statement must be submitted to NatureScot for written approval in accordance with Part 2 of this document, prior to any works commencing.

Destruction

Destruction of holts / other places of shelter should only be undertaken as a last resort. For destruction of active holts / places of shelter a Licence will be required from NatureScot (either Individual or Project) Individual Licence applications to NatureScot should be accompanied by a Protection Plan which outlines how disturbance will be minimised and individuals protected.

The plan should include monitoring to ensure breeding is not taking place and provision for the creation of an artificial holt if required. Any holt / place of shelter subject to works under Licence will be monitored during and after those works. If a Project Licence is in place, a Method Statement must be submitted to NatureScot in accordance with Part 2 of this document for written approval prior to any works commencing.

3.7 Mitigation Measures

3.7.1 General Mitigation

1. All works close to waterbodies and watercourses showing signs of regular use by otters should not take place at night or within 2 hours of sunset / sunrise, if possible.
2. Where works close to waterbodies and watercourses are required at night, lighting should be directed away from riparian areas.
3. All works close to water courses and waterbodies must follow best practice measures to ensure their protection against pollution, silting and erosion.
4. Any temporarily exposed pipe system should be capped when staff are off site to prevent otters from gaining access.
5. All exposed trenches and holes should be provided with mammal exit ramps e.g., wooden planks or earth ramps when Contractors are off site.
6. An emergency procedure should be implemented by site workers if otter / otter shelters are unexpectedly encountered. All work within 30 m (100 m for high noise/vibration activities) or 200 m for breeding sites should cease until a suitably qualified and experienced ecologist has inspected the site and determined the appropriate course of action.
7. An exceptional circumstance procedure will be implemented should mitigation options not prove satisfactory in a particular case. Works will be halted whilst mitigation is determined (under consultation with NatureScot if required).

3.7.2 Monitoring and Reporting

1. The Environmental Representative will attend site on a regular basis throughout the construction period to ensure all environmental mitigation relevant to otter is delivered.
2. Reports will be submitted to NatureScot as required by the relevant Licence.

3.8 Licensing Requirements

Licence applications must be sent into NatureScot Licensing Team sufficiently in advance of the project start date (approximately 40 days) to ensure the licence is in place prior to any work commencing.

3.9 Project Licence

A NatureScot Project Licence is likely to be the most appropriate form of Licence for any large scale and / or long running Project, which may result in a large number of minor unavoidable otter offences. For example, multiple instances of disturbance to a number of otter places of shelter over several years.

A Project Licence can be used to standardise protected species mitigation / compensation, creating consistency across the project area and throughout the Project's lifespan. Project Licences do not negate the need for thorough pre-development surveys within 12 months of the planned project start date, and pre-construction surveys within 3 weeks of works commencing. Any Project Licence application will need to be accompanied by the Mitigation Plan and procedures for otter included in Parts 1 and 2 of this SPP

3.10 Individual Licence

For small scale Projects expected to be completed over relatively short timescales, which will result in a low number of unavoidable otter offences an Individual NatureScot Licence is most likely to be appropriate. Licence applications should be accompanied by a Method Statement and should be sent sufficiently in advance of the Project start date to ensure the licence is in place prior to work commencing.

Further guidance and details of how to apply for an otter Licence can be found on the NatureScot website https://www.nature.scot/professional-advice/protected-areas-and-species/licensing/species-licensing-z-guide/otters-and-licensing

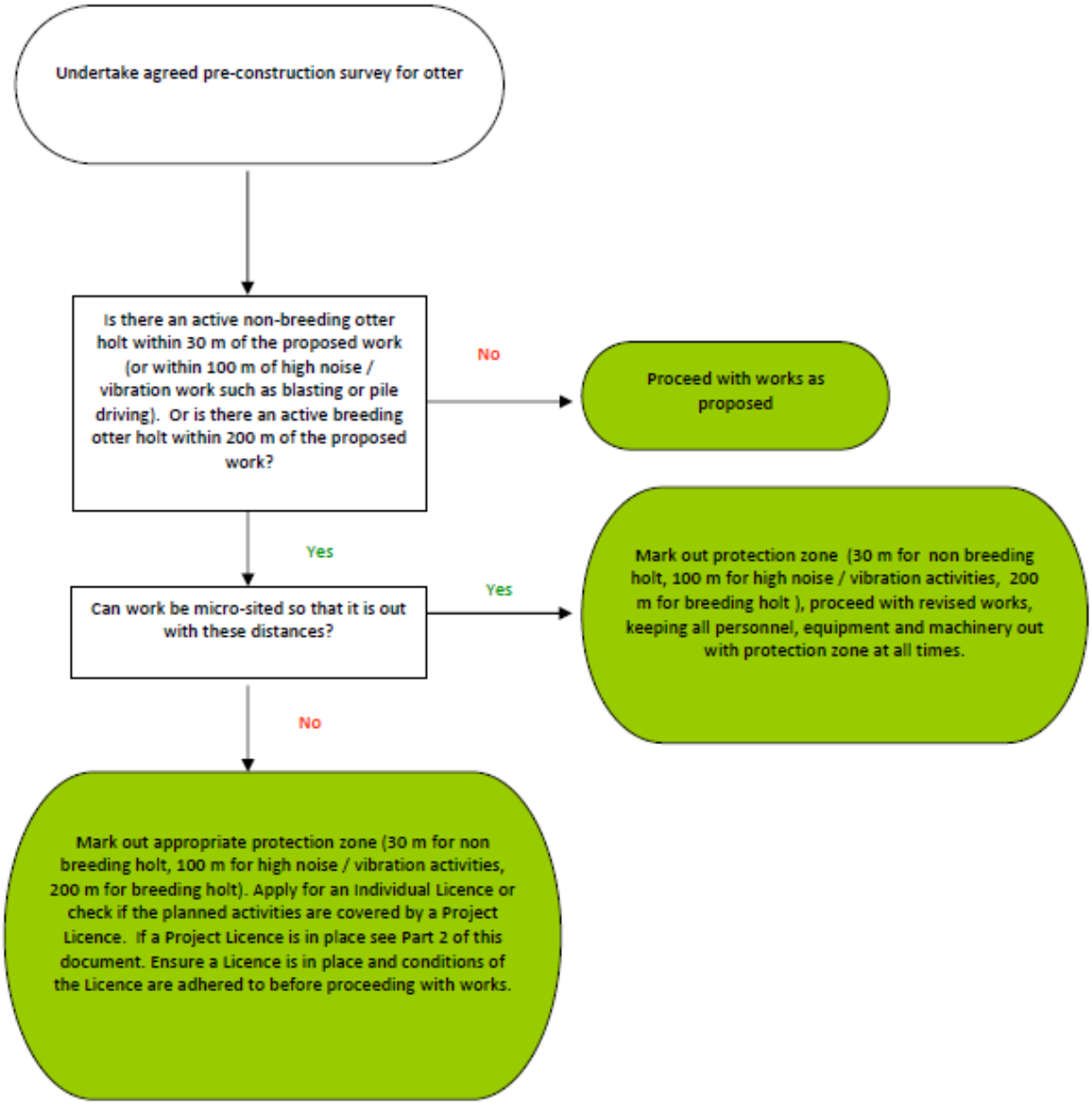

Figure 3.1 - Otter Migration Decision Tree

4 Part 2: Project Licence Protection Plan

The following sections of this plan are to be read in conjunction with the Project Licence (insert Licence number) and its conditions.

As stated in the Project Licence, methodologies for certain mitigation activities permitted under the Licence are included in this Part of the SPP. More disruptive activities, listed in Section 1 below, will also require a specific Method Statement to be submitted to NatureScot Licensing Team for written approval (see Appendix A). It is the *Contractor's* responsibility to submit these Method Statements to both SHE Transmission and NatureScot for written approval. No works shall proceed without this written approval.

Sufficient time should be allowed for in the programme to carry out any consultation work and obtain necessary approvals.

The Project Licence will specify reporting requirements detailing all disturbance and destruction works carried out.

4.1 Works allowed under the Project Licence

Under the Project Licence there is a general presumption against works being carried out which could disturb otters in their place of shelter, or to destroy / exclude any holt unless it can clearly be demonstrated that either it is inactive (i.e., through monitoring) or that there is no alternative solution against Project timescales and requirements.

4.2 Activities requiring a NatureScot approved Method Statement

The following activities require a formal Method Statement to be submitted and approved by NatureScot prior to any works commencing:

a. Destruction of a holt at any time of year

b. Disturbance to a breeding holt at any time of year

c. Any exceptional circumstances not covered in this SPP

The Method Statement template in Appendix A has been developed in conjunction with NatureScot and should be used by the Contractor / Named Agent for all submissions.

Proposed mitigation works should be agreed with NatureScot.

4.3 Activities not requiring additional NatureScot approval

The following works may be carried out under this SPP and / or specific Method Statements without the prior approval of NatureScot, using the prescribed methodologies:

4.3.1 Disturbance / Destruction of places of shelter at any time of year

The following methodology will be incorporated into a Site Specific Method Statement and issued prior to work commencing:

Disturbance to a non-breeding holt / place of shelter at any time of year

i. Appropriate monitoring will be undertaken to ensure the place of shelter is not being used for breeding.

ii. The Agent or their representative will check, prior to works each morning, that suitable access / egress between the holt / place of shelter and a watercourse is maintained. A check will also be made of the works area to check no otter is present within construction plant / materials.

iii. Works can commence once the Agent or their representative is satisfied that no otter is present within the works area.

iv. The Agent or their representative will set up a suitable protection zone as far from the holt/place of shelter as is reasonably practicable to prevent damage and minimise disturbance.

v. The Agent or their representative will monitor the works to ensure compliance with the licence conditions.

vi. The emergency procedure detailed will be implemented if an otter is found during works.

Destruction of a place of shelter at any time of year

i. Appropriate monitoring will be undertaken to ensure the place of shelter is not being used for breeding.

ii. The Agent or their representative will check to ensure that the place of shelter is not being used immediately prior to its destruction.

iii. If it can be determined that the place of shelter has not been used recently, no exclusion will be required prior to destruction.

iv. The Agent or their representative will monitor the destruction works to ensure compliance with the licence.

v. The emergency procedure will be implemented if an otter is found during the works.

vi. A report will be sent to NatureScot detailing the destruction works undertaken (in line with the reporting process outlined above).

5 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	Transfer to New Template and Nomenclature	TG-PS-LT-709 (Rev.1.00)	1.00	[redacted]

No	Overview of Amendments	Previous Document	Revision	Authorisation
02	Updated links and replaced references to badger with otter, Other minor formatting issues corrected	TG-NET-ENV-503 (Rev 1.00)	1.01	[redacted]
03	Transfer to New Template. Updates relating to NatureScot and simplification of legislation.	TG-NET-ENV-503 (Rev 1.01)	1.02	[redacted]
04				

Appendix A Project Licence Method Statement Template

<PROJECT TITLE>

METHOD STATEMENT FOR WORKS UNDER (insert licence details)

<insert species record reference>

<insert date>

Introduction

This document, prepared on behalf of SHE Transmission provides a Method Statement for <insert details of works> to be completed under <insert licence details>. These works are required in order to facilitate the delivery of the <insert Project details> (the Project).

Condition <insert No.> of the above Licence states that a <insert species> Protection Method Statement be submitted to NatureScot Licensing Team for written approval, under specific circumstances, prior to commencement of works which could affect <insert species>. Therefore, no works which would <insert licensed activity> <insert species> shall take place without written confirmation of NatureScot approval of this method statement.

This Method Statement makes reference to the following documents:

<insert licence details>, NatureScot

Species Protection Plan (SPP): <insert SPP No. and title> Rev. X <insert date>

Further information is provided in Table 1: Summary of Data.

Licensable Works

Introduction

<Insert details>

Baseline Description

<Insert description, including photographs / location plan>

Table 1: Summary of Data

Appendix A, Table 1

Reference	Easting	Northing	Date recorded	Description	Date works exclusion zone demarcated & distance

Survey Summary

<Insert details>

Description of the Proposed Licensable Works

<Insert details>

Works Duration

<Insert details>

Consideration of Alternatives

<Insert details>

Impact Assessment

<Insert details>

Method Statement Site Briefing (to be delivered to relevant staff prior to works)

Site: <insert description>

Reference number: <insert species record reference>

Client: SHE Transmission

Task: <insert description of works>

Prepared by: <insert individual or Company name>

Licensed Agent: <insert name>

Method statement for <insert works description>

Before works commence:

All relevant personnel will be made aware of the presence and location of the constraint and mitigation.

<insert details of methodology>

During works:

<insert details of methodology>

<Insert Contractor's name>

I, the undersigned, confirm receipt of this method statement and fully understand and agree to work to the conditions therein.

Signature of Contractor's Representative:..... Date / /

Print name in full: .....

Scottish & Southern Electricity Networks
TRANSMISSION

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-504

Safety, Health and Environment

Red Squirrel Species Protection Plan

TG-NET-ENV-504	Red Squirrel Species Protection Plan		Applies to Transmission ✓
Revision: 2.00	**Classification:** Internal	**Issue Date:** October 2022	**Review Date:** October 2030

	Name	Title
Author	[redacted]	Environmental Net Gain Manager
Checked by	[redacted]	Consents and Environment Manager
Approved by	[redacted]	Head of Environment

Contents

1 Introduction

Red squirrel (*Scirius vulgaris*) is afforded a high level of protection in Scotland. This Protection Plan provides guidance and agreed procedures, for the protection of red squirrels and their shelters, during construction works on Scottish Hydro Electric Transmission (SHE Transmission) projects. The Plan contains two parts and details the procedures that must be followed where there is potential for red squirrel to be present (Part 1), and where a Project Licence for red squirrel has been issued by NatureScot Licensing Team to cover the project (Part 2).

1.1 Part 1: General Protection Plan

This Part applies to all projects where red squirrel may be present. Part 1 outlines the responsibilities of SHE Transmission and the Contractor regarding protection of red squirrel. It also details relevant legislation, survey requirements, general mitigation measures and the requirement for licensing.

1.2 Part 2: Project Licence Protection Plan

This Part applies to all projects where red squirrel may be present. Part 1 outlines the responsibilities of SHE Transmission and the Contractor regarding protection of red squirrel. It also details relevant legislation, survey requirements, general mitigation measures and the requirement for licensing.

2 References

The documents detailed in Table 2.1 – Miscellaneous Documents, should be used in conjunction with this document.

Table 2.1 – Miscellaneous Documents

Title
Wildlife and Countryside Act 1981 (legislation.gov.uk)
NatureScot Licensing

3 Part 1: General Protection Plan

3.1 Background

Red squirrels are rodents with a widespread distribution in Scotland, although as they are predominately woodland animals they are largely absent from the Scottish islands (with the exception of Arran) and the far North West. They are currently under pressure, particularly in southern areas, due to a number of factors including competition from the non-native grey squirrel (*Scirius carolinensis*), disease (squirrel pox virus – SQPV), and habitat loss and fragmentation. Grey squirrels are not protected by law, and it is an offence to release them into the wild if caught.

Red squirrels are largely solitary, not strictly territorial, and generally arboreal, spending up to 70% of the time in the tree canopy. Densities generally vary from 1 per hectare, to 1 per 10 hectares of suitable habitat. They obtain most of their food from seeds or fruits from trees, although they are opportunistic. They build dense spherical nest structures called dreys, which are generally about 30cm in diameter and consist of an outer layer of twigs often with leaves still attached with an inner layer of softer materials such as moss and/or leaves. Dreys tend to be in the forks or against the trunks of trees such as spruce (*Picea abies*), Scots pine (*Pinus sylvestris*) or oak (*Quercus* spp.). Squirrels can also use holes in trees, nest boxes and other cavities as dreys. Several dreys may be in used at the same time, and it can take less than a day for a new drey to be built.

Red squirrels have two peak breeding seasons, the first litters being born between February and April with a second litter from May to August. The exact timing is however dependent on food availability and weather. In winter red squirrels do not hibernate, but are less active particularly in bad weather (high winds, heavy rain and cold). In summer they have two periods of peak activity; one in the early morning and one in the evening, whereas in winter this shifts to one main activity peak earlier in the day.

Signs of red squirrel:

- Feeding signs – stripped cones or cleanly split nuts often in piles on tree stumps
- Squirrel prints and tracks – characteristic squirrel tracks show the hind feet (with five toes) in front of the forefeet (four toes), in hops of less than 1 meter. Hind feet are 35mm wide and 40mm long
- Squirrel shelters - dreys

It is not possible to distinguish between field signs of red and grey squirrels in the field therefore visual surveys, cameras and/or hair tubes (with appropriate biosecurity measures in place), may be required in areas where the two species are present. Red squirrels can vary in colour and there can be confusion with grey squirrels; adult grey squirrels are much larger and lack ear tufts.

3.2 Responsibilities

It is the *Contractor's* responsibility to comply with all the requirements of this Species Protection Plan where red squirrel may be present, and it is both the *Contractor's* and SHE Transmission's responsibility to monitor compliance with this Species Protection Plan. The responsibility for applying for any licence, including a project wide licence, may vary from project to project, but all applications and mitigation works will adhere to this plan.

3.3 Legislation

Red squirrel is afforded full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended in Scotland). This makes it an offence to kill, injure or take a red squirrel or to intentionally

or recklessly[1] damage, destroy or obstruct access to any place used for shelter or for breeding. Disturbance to this species in its drey also constitutes an offence.

NatureScot can grant licences to enable certain activities that would otherwise be an offence, to be carried out in relation to red squirrels and their dreys, subject to the following:

A. That undertaking the conduct authorised by the licence will give rise to, or contribute towards the achievement of, a significant social, economic or environmental benefit; and;

B. That there is no other satisfactory solution.

In granting a licence NatureScot has to take into account the consequences for red squirrels at a local population level, to assist this assessment NatureScot will need to see maps of the area of operations and also surrounding areas of suitable red squirrel habitat.

3.4 Surveying for Red Squirrel

1. Surveys for red squirrel must be undertaken in all works areas containing suitable red squirrel habitat, a maximum of 12 months[2] prior to works commencing, (this includes site investigations). As squirrels can rapidly build new dreys, pre-felling surveys a maximum of 3 weeks prior to works commencing, must also be undertaken to ensure the availability of up-to-date information on squirrel drey locations.
2. Surveys must extend for a minimum of 50 m beyond working areas, including access tracks.
3. All drey trees must be marked to permit easy identification.
4. All dreys found must be assumed to be red squirrel, unless definitive evidence exists that they are grey squirrel only.
5. Surveys must be carried out by suitably qualified and experienced Ecologists and must identify whether any squirrel dreys are likely to be affected by the works.

If works during the breeding season (February to September inclusive) cannot be avoided, and dreys may be disturbed by works, it may also be important to establish if dreys are being used for breeding. The non- invasive method must be used in the first instance: Visual observation and camera surveillance from the ground, for a period of three days used to establish if the drey is in regular use. If regular use is established the drey must be assumed to be being used for breeding purposes. Where this type of drey monitoring is not practical for example in situations of poor visibility it is recognised that more invasive methods may be required, if this situation arises NatureScot Licensing Team must be contacted for advice on whether a survey licence will be required: licensing@naturescot.gov.uk.

1.1

[1] Reckless acts would include disregard of mitigation aimed at protecting red squirrels, resulting in killing, injuring and/or disturbance of any red squirrel or red squirrel resting place.
[2] Note: Information from any previous surveys (e.g., surveys carried out to provide data for EIA or other Assessments) can be a useful guide to red squirrel activity in an area, particularly if dreys were recorded. However, surveys will always require to be updated if carried out more than 12 months prior to works commencing. Pre-felling surveys a maximum of 3 weeks prior to works are recommended.

3.5 Review of Red Squirrel Survey

Once a red squirrel survey has been carried out, the Ecologist / ECoW must review the survey results, apply the mitigation hierarchy outlined below and decide if a licence is required from NatureScot (either Individual or Project) for the works.

If required, licences (individual or project), must be obtained by NatureScot prior to any works commencing.

Construction teams should be advised of existing / new constraints, together with mitigation / compensation, and licensing requirements by the Ecologist / ECoW.

Relevant site documentation and project information sources should be updated with new and amended information on red squirrel constraints as it is produced, with changes communicated to appropriate staff immediately.

3.6 Mitigation Hierarchy

There should be a general presumption against works being carried out which will disturb red squirrels in their drey, or which will require the destruction of any red squirrel drey. A hierarchical approach to minimise the works impact on red squirrel should be established as follows:

Avoidance

This is the preferred option. Appropriately sized protection zones must be marked and signed on the ground by the Ecologist / ECoW, with appropriate material, around all squirrel dreys identified during the pre-works surveys. The breeding season (February to September inclusive) is the most sensitive time for disturbance, during this time a 50m radius protection zone must be established around all squirrel dreys. Out with the breeding season, a protection zone of one tree from the drey tree (or 5 metres radius - whichever is lesser) must be established. For high noise / vibration activities (pile driving or blasting) a 100m radius protection zone around drey trees must be established at any time of year.

All works personnel, machinery, vehicles and storage of materials must be restricted from entering protection zones. Protection zones must be maintained until all works are completed. Site staff must be briefed of their purpose through a Toolbox Talk by the Ecologist / ECoW. If red squirrel disturbance can be avoided in this way, there is no need to obtain a licence from NatureScot for the works.

Disturbance

If works within protection zones boundaries cannot be avoided, a licence for disturbance from NatureScot will be required. For small scale projects the licence may be specific to the site, for larger scale works a Project Licence may be appropriate.

Individual licence applications for disturbance must be accompanied by a Mitigation Plan which outlines how the disturbance will be minimised, and dreys protected from damage, for example through screening of works and modifying protection zones.

If a Project Licence is in place, and a drey being used in the breeding season will be disturbed, a Method Statement must be submitted to NatureScot for written approval in accordance with Part 2

of this document, prior to any works commencing. The Method Statement must state how works will be carried out in a way which ensures no abandonment of young.

Destruction

Destruction of dreys must only be undertaken as a last resort and requires a Licence from NatureScot. Individual Licence applications to NatureScot must be accompanied by a Mitigation / Compensation Plan which outlines how disturbance will be minimised and individual squirrels protected from injury, and may include provision for the creation of an artificial drey if appropriate. If destruction of a drey during the breeding season is required, the plan should include details of non-invasive monitoring which will take place to ensure breeding is not taking place prior to any drey destruction.

Any drey subject to works under Licence must be monitored during and after those works.

3.7 Mitigation Measures

3.7.1 General Mitigation

1. An emergency procedure will be implemented by site workers if squirrel dreys are encountered. All work within 5 m (non-breeding season) or 50 m (breeding season) will cease, and the ECoW will inspect the site and define mitigation (if required) in line with this SPP.
2. An exceptional circumstance procedure will be implemented should mitigation options not prove satisfactory in a particular case. Works will be halted whilst mitigation is determined (under consultation with NatureScot Licensing Team if required).

3.7.2 Monitoring and Reporting

1. The Ecologist / ECoW will attend site on a regular basis throughout the construction period to ensure all environmental mitigation relevant to red squirrel is delivered.
2. Reports will be submitted to NatureScot as required by the relevant Licence

3.8 Licensing requirements

Licence applications must be sent into NatureScot Licensing Team sufficiently in advance of the project start date (approximately 40 days) to ensure the licence is in place prior to any work commencing.

3.9 Project Licence

A NatureScot Project Licence is likely to be the most appropriate form of licence for any large scale and / or long running project, in red squirrel areas. For example, where multiple instances of disturbance to a number of red squirrel dreys is anticipated over several months / years. A Project Licence can be used to standardise protected species mitigation / compensation, creating consistency across the project area and throughout the Project's lifespan. Project Licences do not negate the need for thorough pre-construction survey within 12 months and three weeks of the planned project start date.

Any Project Licence application will need to be accompanied by a red squirrel survey carried out within 12 months of the proposed works start date, and procedures for red squirrel included in Parts 1 and 2 of this SPP.

3.10 Individual Licence

For small scale projects expected to be completed over relatively short timescales, which will result in a low number of unavoidable red squirrel offences an Individual NatureScot Licence is most likely to be appropriate. All licence applications must be accompanied by a red squirrel survey carried out within 12 months of the proposed works start date, and a mitigation / compensation plan.

Further guidance and details of how to apply for a red squirrel Licence can be found on the NatureScot website https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/licensing/species-licensing-z-guide/red-squirrels-and-licensing.

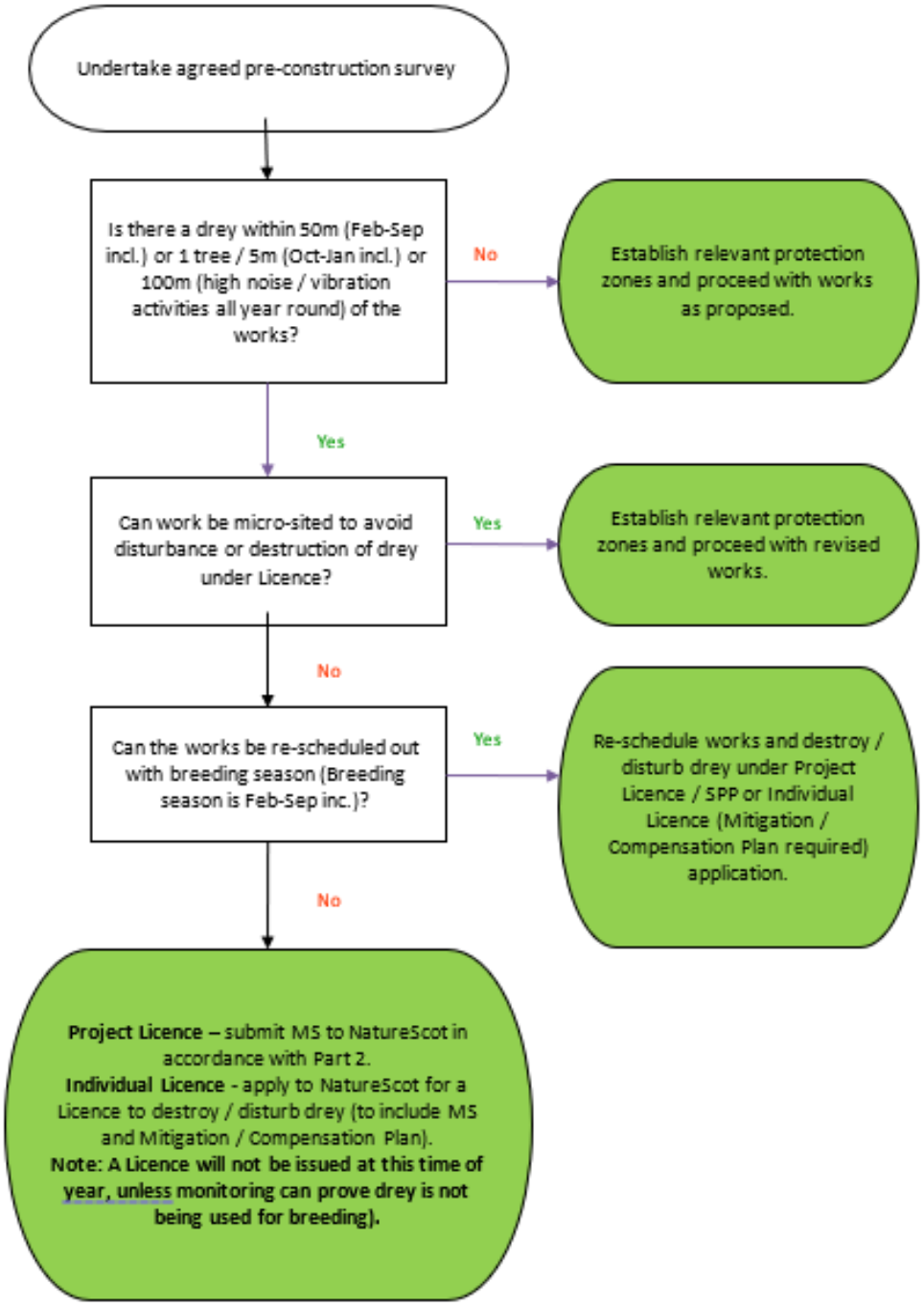

Figure 3.1 - Project Licence

4 Part 2 Project Licence Protection Plan

The following sections of this plan are to be read in conjunction with the Project Licence (insert Licence number) and its conditions.

Mitigation activities permitted under Project Licence are included in this Part of the SPP (section A). More disruptive activities, listed in Section B below, will require a specific Method Statement to be submitted to NatureScot Licensing Team for approval, prior to works commencing (see Appendix A). It is the *Contractor*'s responsibility to submit these Method Statements to both SHE Transmission and NatureScot for written approval. No works shall proceed without this written approval.

Sufficient time should be allowed for in the programme to carry out any consultation work and obtain necessary approvals.

The Project Licence will specify reporting requirements detailing all disturbance and destruction works carried out.

In advance of, and during construction at any location where there is the potential for red squirrel to be present, it is **essential** that this plan is followed.

4.1 Works Allowed under this SSP

The following works may be carried out under this SPP without further approval from NatureScot, using the prescribed methodologies:

1. Disturbance to red squirrel dreys out with the breeding season (October to January inclusive)

   Red squirrel dreys must not be damaged or destroyed, but protected from potential damage by setting up a modified protection zone (size determined by the site Ecologist / ECoW). Protection zones must be clearly marked on the ground and signed, and must exclude all works personnel, machinery, vehicle and storage. The protection zone must be maintained until all works are finished.

   A licence return must be sent to NatureScot Licensing Team detailing all disturbance works under the Project Licence.

2. Destruction of red squirrel dreys out with the breeding season (October to January inclusive

   Destruction of squirrel dreys must only be undertaken as a last resort. Prior to a drey being destroyed, the Ecologist / ECoW must satisfy themselves that no squirrel is present within the structure. Dreys must be destroyed in a controlled manner to ensure no injury or killing of animals. All works must be overseen by an experienced Ecologist / ECoW.

   A licence return must be sent to NatureScot Licensing team detailing all drey destruction works carried out under the Survey Licence.

4.2 Activities requiring a NatureScot approved Method Statement

The following activities require a formal Method Statement to be submitted and approved in writing by NatureScot Licensing Team prior to any works commencing:

a. Disturbance or destruction of a drey during the breeding season.

b. Any exceptional circumstances not covered in this SPP.

The Method Statement template in Appendix A has been developed in conjunction with NatureScot and should be used by the *Contractor / Named Agent* for all submissions. The methodology used should be based on the following:

A. Destruction or disturbance to a drey within the breeding season (February to September inclusive)

A. There must be a presumption against disturbance or destruction of a squirrel drey during the breeding season, if unavoidable this work requires that a detailed Method Statement is agreed in writing with NatureScot Licensing Team prior to works commencing.

B. Non-invasive survey methods must be used to establish if the drey is in regular use. An experienced and qualified Ecologist / ECoW must use visual observation and video surveillance from the ground for a period of three days of daytime observations, to establish if the squirrel drey is in regular use. If the drey is in regular use it must be assumed that it is being used for breeding purposes.

C. If the survey establishes that there is no regular use by squirrel, destruction of the shelter can be carried out as for during the non-breeding season.

D. Dreys being used for breeding must not be destroyed or disturbed and no works carried out within 50 m of the structure, until the site Ecologist / ECoW has confirmed that dependent young are no longer present. The young begin leaving the drey at *c*. 7 weeks and are weaned at 8-10 weeks old.

E. Once completion of breeding has been confirmed through monitoring, and the site Ecologist / ECoW has satisfied themselves that no squirrel are present within the structure, the drey can be destroyed in a controlled manner to ensure no injury or killing of animals.

F. A licence return must be sent to NatureScot Licensing Team detailing all drey destruction works carried out under the Project Licence.

4.3 NatureScot Survey Licence

The Ecologist / ECoW must obtain a survey licence from NatureScot Licensing Team prior to using the following invasive survey methods:

a. Where squirrel dreys are not clearly visible from the ground, and the Ecologist / ECoW needs to establish whether they are being used for breeding (i.e., non-invasive methods as described above cannot be used), camera traps mounted on adjacent trees may be employed (under survey licence from NatureScot) as an alternative in suitable weather conditions. Camera survey must be carried out for at least three consecutive days. The ECoW / Ecologist must be confident that this method is appropriate for detecting use at the given location.

b. Where the above survey methods are inappropriate, inspection of squirrel dreys may be undertaken by tree climbing or cherry picker and endoscopic inspection (under survey Licence from NatureScot) to confirm the presence/absence of young squirrels.

5 Revision History

No	Overview of Amendment	Previous Document	Revision	Authorisation
01	Transfer to new template and Nomenclature	TG-PS-LT-710 (Rev1.00)	1.00	[redacted]
02	Author change, typos corrected, and web links updated	TG-PS-LT-710 (Rev1.00)	1.01	[redacted]
03	Links checked author details updated. Transfer to New Template. Updates relating to NatureScot and simplification of legislation.	TG-NET-ENV-504 (Rev1.01)	2.00	[redacted]
04				

Appendix A Project Licence Method Statement Template

<PROJECT TITLE>

METHOD STATEMENT FOR WORKS UNDER (insert licence details)

<insert species record reference>

<insert date>

Introduction

This document, prepared on behalf of SHE Transmission provides a Method Statement for <insert details of works> to be completed under <insert licence details>. These works are required in order to facilitate the delivery of the <insert Project details> (the Project).

Condition <insert No.> of the above Licence states that a <insert species> Protection Method Statement be submitted to NatureScot Licensing Team for written approval, under specific circumstances, prior to commencement of works which could affect <insert species>. Therefore, no works which would <insert licensed activity> <insert species> shall take place without written confirmation of NatureScot approval of this method statement.

This Method Statement makes reference to the following documents:

<insert licence details>, NatureScot

Species Protection Plan (SPP): <insert SPP No. and title> Rev. X <insert date>

Further information is provided in Table 1: Summary of Data.

Licensable Works

Introduction

<Insert details>

Baseline Description

<Insert description, including photographs / location plan>

Table 1: Summary of Data

Reference	Easting	Northing	Date recorded	Description	Date works exclusion zone demarcated & distance

Survey Summary

<Insert details>

Description of the Proposed Licensable Works

<Insert details>

Works Duration

<Insert details>

Consideration of Alternatives

<Insert details>

Impact Assessment

<Insert details>

Method Statement Site Briefing (to be delivered to relevant staff prior to works)

Site: <insert description>

Reference number: <insert species record reference>

Client: SHE Transmission

Task: <insert description of works>

Prepared by: <insert individual or Company name>

Licensed Agent: <insert name>

Method statement for <insert works description>

Before works commence:

All relevant personnel will be made aware of the presence and location of the constraint and mitigation.

<insert details of methodology>

During works:

<insert details of methodology>

<Insert Contractor's name>

I, the undersigned, confirm receipt of this method statement and fully understand and agree to work to the conditions therein.

Signature of Contractor's Representative:..... Date ..../ /

Print name in full: .....

Scottish & Southern Electricity Networks
TRANSMISSION

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-505

Safety, Health and Environment

Bird Species Protection Plan

TG-NET-ENV-505	Bird Species Protection Plan		Applies to Transmission ✓
Revision: 3.00	**Classification:** Internal	**Issue Date:** November 2024	**Review Date:** November 2032

	Name	Title
Author	[redacted]	Consents and Environment Manager
Checked by	[redacted]	Senior Consents and Environment Manager
Approved by	[redacted]	Lead Consents and Environment Manager

Contents

1 Introduction

Construction works have the potential to negatively impact on breeding birds as a result of either direct destruction of nests or disturbance which may result in breeding failure and/ or a reduction in the bird's physiological condition. In addition, it is an offence to disturb some particularly sensitive species both within *and* outwith the breeding season. These species are discussed in Section 4. The bird breeding season runs from March to August (primarily), though the precise timing within this period varies from species to species, and some species start breeding earlier or finish later than this.

This SPP outlines the procedures that must be followed where there is a potential for breeding birds to be affected. It explains the responsibilities of Scottish Hydro Electric Transmission (SHE Transmission) and its *Contractors*, the legislative protection for birds, and the measures required to minimise impacts on birds and thereby the risk of criminal offences being committed.

2 References

The documents detailed in Table 2.1 – Miscellaneous Documents, should be used in conjunction with this document.

Table 2.1 – Miscellaneous Documents

Title
Wildlife and Countryside Act 1981 (as amended in Scotland)
NatureScot Licencing https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/licensing/species-licensing-z-guide/
NatureScot (2022) Disturbance Distances in selected Scottish Bird Species

3 Responsibilities

It is the *Contractor*'s responsibility to comply with all the requirements of this plan and it is both the *Contractor*'s and SHE Transmission's responsibility to monitor compliance with the plan.

4 Legislation

4.1 All Wild Birds

All wild birds are protected by law under the Wildlife and Countryside Act 1981 (as amended).

It is an offence to intentionally or recklessly[1]:

- kill, injure or take a bird
- take, damage, destroy or interfere with a nest of any bird while it is in use or being built
- obstruct or prevent any bird from using its nest
- take or destroy an egg of any bird

4.2 Schedule 1 birds

Additional protection is given to rare breeding birds listed under Schedule 1 of the WCA. It is an offence to disturb;

- any bird while it is building a nest
- any bird while is in, on, or near a nest containing eggs or young
- any bird while lekking
- the dependent young of any bird

4.3 Schedule 1A and A1 birds

Further protection is given to birds listed on Schedule 1A and A1 of the Act, making it an offence at **any time of year** to:

- Intentionally or recklessly harass a white-tailed eagle, golden eagle, hen harrier orred kite(1A); and
- Damage, destroy or interfere a nest habitually used by a white-tailed eagle or golden eagle (A1).

At present, it is not possible to obtain a derogation to disturb Schedule 1 breeding birds or destroy nests of any wild breeding birds for the purposes of development. However, the control of certain species is licensable in a restricted number of circumstances, such as for reasons of public health and safety. A licensing system is also in place for surveying protected species if a disturbance offence is possible.

Further advice is available on the NatureScot website: https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/licensing/species-licensing-z-guide/birds-and-licensing.

[1] Reckless acts would include disregard of mitigation aimed at protecting birds, resulting in killing, injury, and/or disturbance of birds or their nests.

5 Protection Plan

In advance of construction at any location where breeding birds may be present, it is **essential** that this plan is followed.

5.1 Pre-construction Surveys and Data Collation

1. Pre-construction surveys for breeding birds will be completed a maximum of 3 months prior to start of any works in a particular area, and at an appropriate time of year, to ensure availability of up-to-date information to inform any mitigation measures required.
2. Surveys will be carried out by suitably experienced ecologists / ornithologists using methods agreed with NatureScot under Survey Licences where required.
3. Pre-construction surveys will:
   - include up to 1000 m either side of Limits of Deviation (LOD's) / boundaries for substation construction areas and access tracks; and
   - where appropriate, be undertaken in accordance with NatureScot's Guidance on Assessing the Impact of Overhead Power Line Proposals on Birds for overhead lines.
4. Relevant local recorders/monitoring organisations, e.g. local Raptor Study Groups, will be contacted at the pre-construction phase for recent records of sensitive species that might be affected[2].

5.2 Review of Works and Impact Assessment

1. The Ecological Clerk of Works (ECoW)/Environmental Adviser will review whether construction activities are likely to affect breeding birds and, if so, what mitigation options are available. A hierarchical approach to mitigation will be applied to any occupied bird habitat that may be affected under the Project works, as detailed in the "General mitigation" section below. Priority will be given to assessing and mitigating impacts to species listed on Schedule 1.
2. Construction teams will be advised by the ECoW/ Environmental Adviser of existing / new constraints together with mitigation options.
3. Project Geo-databases and / or relevant site documentation, e.g. Construction Environmental Management Plans (CEMP's), will be updated with new and amended information as it is produced, with changes communicated to appropriate staff as required.

[2] The Scottish Raptor Study Group is a network of experts who monitor and record raptor species across Scotland. For a fee, they will provide data on breeding raptors within a particular area. Visit www.scottishraptorstudygroup.org/contact/

5.3 General Mitigation

1. This SPP is designed to provide the Contractor and Ecological Clerk of Works (ECoW) with an approved methodology for protecting breeding birds.
2. The ECoW will attend site and check for signs of nesting on a regular basis throughout the construction period to ensure all environmental mitigation relevant to breeding birds is delivered. Note that new nests can quickly become established, so regular inspection of the working areas is crucial during the bird breeding season (within 48 hrs prior to construction works due to occur).
3. A hierarchical approach to mitigation following Programme / Avoid / Risk Assess, will be applied to any birds that may be affected under the Project works.
    - Where practicable, works will be programmed outwith breeding season - see https://www.nature.scot/bird-breeding-season-dates-scotland for information on breeding seasons for areas likely to contain breeding sites .
    - For specially protected or sensitive species, appropriate buffer zones (see table in Appendix A) will be established upon confirmation of nest building / breeding taking place[3]. Buffer zones will be set out by a suitably qualified ECoW for all breeding birds and those species whose roost sites are also protected i.e. red kite and hen harrier. No works will be carried out within these zones whilst birds are:
        - building or using their nest,
        - still dependent on the nest site, or
        - present at roost sites. The ECoW will advise when it is safe for works to be carried out.
4. Where programme critical works must be carried out within the buffer zones, the ECoW will carry out a Protected Species Risk Assessment (Appendix B) to assess whether disturbance can be avoided during the works. Considerations will include the species involved, local topography, natural screening, type of works, time of year, time of day and existing levels of human activity, e.g. farming, forestry and habitation. NatureScot should be contacted to determine whether a formal consultation is required.

[3] NatureScot guidance provides a suggested buffer zone range for specially protected or sensitive species (see table in Appendix A). The upper limit of the disturbance buffer should be used unless it can be demonstrated that a lower buffer is sufficient. This is intended to provide a precautionary approach, however it is noted that in certain circumstances lower buffers will be appropriate. Factors influencing whether a lower buffer would be considered sufficient include, but are not limited to; type of disturbing activity, duration, topography and known levels of habituation. NatureScot also recognise the importance of incorporating site-specific factors into consideration when applying buffers. The disturbance buffer may then be reduced if it can be demonstrated and agreed (in writing) by a Specialist Adviser and / or NatureScot as required, that works will not cause disturbance.

5. Monitoring will be undertaken by the ECoW or Specialist Adviser, where appropriate, to ensure no disturbance is caused[4]. An emergency procedure will be implemented by site workers if breeding birds are unexpectantly encountered within the footprint of construction works. All work within 50 m (non-scheduled species) or the relevant maximum protection distance for species listed in Appendix A will immediately cease, and the ECoW will inspect the site and ensure that works do not affect any nest, bird, eggs or young at this location, through micro-siting or re-programming of works as per the general mitigation outlined in this SPP.
6. In exceptional cases, standard mitigation measures (as outlined above) may be insufficient. In such scenarios, mitigation will be determined on a case-specific basis. No construction works shall be undertaken within the buffer zone until mitigation has been agreed (in consultation with NatureScot if required).

5.4 Specific Mitigation

5.4.1 Dissuasion Techniques

Dissuasion techniques may be used to make areas less attractive to nesting birds or birds returning back to a previous nesting location (dissuasion will not be carried out where there is potential to harass Schedule 1A species, or interfere with / damage a Schedule A1 nest). Dissuasion may include Scrub clearance / felling / strimming prior to the breeding season commencing . The placement of bird scarers / frightening devices may also be used as a dissuasion technique where appropriate. See details below:

- **Habitat management**

  a) Scrub clearance / felling / strimming may be used to discourage birds nesting prior to the start of the breeding season in suitable areas. This method has a dual purpose in also dissuading reptiles / small mammals. For strimming, a sward is cut to a height of 2-5cm depending upon vegetation type and ground conditions and this can be achieved by hand strimmers or mechanical means depending upon the ground conditions. The advantage of this method is that the vegetation can be cleared in advance of the works and in slow growing areas, i.e. heath, there is a potential for the site to remain free of constraints for a longer period of time. The ECoW will advise on the potential for other ground nesting species to occupy these areas; in such instances, bird scarers may be appropriate in conjunction with the management of sward height.

  b) Clearance of habitat will be undertaken outwith the breeding season Weekly walkover checks by a suitably licenced and experienced ecologist shall then be undertaken to ensure that the mitigation measures are being effective. If clearance of habitat needs to be undertaken within the bird breeding season, a pre-works check should be undertaken by a suitably qualified ecologist within 48hrs of the clearance works.

[4] It is important to note that bird heart rate may be increased by exposure to human disturbance before alert behaviour or flight initiation responses are evident. Increased heart rate and increased levels of stress hormones have physiological costs and so disturbance may have subtle impacts even on birds that are not clearly showing behavioural responses to disturbance.

- **Active dissuasion / disturbance**

  a) At sites where there will be a high level of human activity, the noise and possible vibration from construction activities should dissuade some nesting activities.

  b) Areas identified to be at risk of nesting birds will be identified and disturbance levels at these locations will be increased. Sites will be visited regularly to dissuade birds from nesting (this may include tower climbing on overhead line projects).

  c) Several types of bird scarer/ frightening device can be used, and are detailed below. The use of each should be determined by the ECoW.

  d) Hawkeyes are probably the most effective of the bird scarers that have been used on the previous projects. A small number of these have been effective in deterring birds from nesting within construction areas. These will be deployed prior to the start of the breeding season and moved around the compound to stop the birds becoming accustomed to them.

  e) Ticker tape can be used in more sheltered areas and can work well, however they can be difficult to attach to poles/canes and work best on fencing such as that for the compounds.

  f) Scarecrows can be constructed using old PPE and are a cheap way to supplement the Hawkeyes.

  g) Scarers will be placed no later than 10 days before construction commences. Once deployed, scarers will be kept on site for a period sufficient to minimize the risk of birds settling on site during the works.

  h) As construction commences, suitable nesting sites within the construction footprint will normally be reduced. The frequency of ongoing checks will then be decided by the ECoW on a site-by-site basis.

5.4.2 Removing Disused Bird Nests

The objective of this mitigation is to provide specific guidelines for the protection of birds and their nesting places before and during construction works, but also to facilitate the removal of old or disused nests where required for construction or maintenance works, such as:

  a) in substations where birds have nested on equipment causing a fire risk;

  b) in order to allow dismantling of redundant towers; or

  c) where the presence of a disused nest interferes with construction, maintenance or upgrading of overhead transmission lines.

- **Not specially protected birds**

  a) It is an offence to remove a bird nest while it is being built or in use and it is an offence to take, destroy or possess the egg of a wild bird.

  b) If a bird nest is to be removed, then it must be shown to be disused. It is therefore recommended that the nest is removed outwith the bird breeding season.

c) Before a nest of any species is removed, where there is any doubt as to whether the nest is in use or not, it will be monitored by the ECoW over a period of a week. Direct observations of nests will be made on the 1st, 3rd and 5th days as well as monitoring from suitable vantage points and where necessary with camera traps. The nest will be removed only when there is clear evidence that the nest is disused and no eggs are present.

d) Should eggs be found, the nest will not be moved until a licence has been obtained from NatureScot for the taking of the eggs.

- **Schedule 1 species**

a) For white-tailed eagle and golden eagle (Schedule A1) it is an offence to remove or damage a nest at any time, regardless of whether it is currently in use.

b) The disused nests of any other Schedule 1 species needing to be removed will be subject to an assessment and agreed in writing with NatureScot. The assessment will detail the needs case for removal, bird species involved, monitoring, information about the nest and clarification of whether it is in habitual use, habitat and any further nests within the area associated with that bird. Nest monitoring will be undertaken by a suitably licensed and experienced ecologist and / or Specialist Adviser.

5.4.3 Drone and Aerial Surveys

NatureScot's guidance on disturbance distances are not differentiated in terms of the source of the disturbance, meaning that the same suggested buffer zones apply to drones as to any other source of disturbance. The following actions must be taken to satisfy compliance with the Wildlife and Countryside Act 1981 and specifically - Schedule 1 protected species:

a) Any surveys involving the use of drones to be discussed with SSEN Consents & Environment Manager (CEM) in advance of any surveys to ensure relevant data sharing and pertinent information can be provided regarding potential environmental constraints/considerations, to inform the drone survey method.

b) Drone Survey RAMS are to be provided to the SSEN CEM for review and approval at least one week before the survey is due to be undertaken.

6 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	Transfer to new template and Nomenclature	TG-PS-LT-718 (Rev 1.00)	1.00	[redacted]
02	Weblinks updated	TG-NET-ENV-505 (Rev 1.00)	1.01	[redacted]
03	Weblinks checked and updated where required.	TG-NET-ENV-505 (Rev 1.01)	2.00	[redacted]
04	Changed SNH Name to new operating name NatureScot Updated to incorporate NatureScot Guidance - Disturbance Distances in selected Scottish Bird Species	TG-NET-ENV-505 (Rev 2.00)	3.00	[redacted]
05				

Appendix A Summary Guidance on Species Specific Disturbance Distances

Note: the protection zone distances given here are indicative - specific distances will vary depending on individual sites and will require expert advice informed by information provided in Ruddock & Whitfield (2007).

Table A.1

Species	Buffer zone (m) suggestions during the breeding (BR) and non-breeding (NBR) seasons	Overall likely sensitivity to disturbance
Whooper swan, Cygnus cygnus	NBR = 200-600m	Medium
White-fronted goose, Anser albifrons	NBR = 200-600m	Medium
Bean goose, Anser fabalis	NBR = 200-600m	Medium
Pink-footed goose, Anser brachyrhynchus	BR ≤1000m NBR = 200-600m	Medium
Greylag goose, Anser anser	BR and NBR = 200-600m	Medium
Barnacle goose, Branta leucopsis	BR = 50-200m NBR = 200-600m	Medium
Common shelduck, Tadorna tadorna	BR and NBR = 100-400m	High
Mallard, Anas platyrhynchos	BR = 50-100m NBR ≥ 100m	Low/Medium
Gadwall, Anas strepera	BR and NBR = 100-200m	Medium
Pintail, Anas acuta	BR and NBR = 100-200m	Medium
Shoveler, Anas clypeata	BR and NBR = 100-200m	Medium
Eurasian wigeon, Anas penelope	BR = 100-200m NBR = 200-500m	High
Greater scaup, Aythya marila	NBR = 150-450m	High
Common eider, Somateria mollissima	BR = 100-200m NBR = 200-500m	Medium/High
Common scoter, Melanitta nigra	BR = 300-500m	High
Common goldeneye, Bucephala clangula §	BR = 100-150m NBR = 150-800m	High
Capercaillie, Tetrao urogallus †, §	BR (nesting females) and NBR = 100-150m BR (lekking males) = 1000m NBR = 100m	Medium/High
Black grouse, Tetrao tetrix	BR (nesting females) and NBR = 100-150m BR (lekking males) = 500- 750m NBR = 100m	Medium
Red-throated diver, Gavia stellata	BR = 500-750m NBR = ≤1000m	High
Black-throated diver, Gavia arctica	BR = 500-750m NBR = ≤1000m	High
Great northern diver, Gavia immer	NBR = 100-350m	Medium/High
Slavonian grebe, Podiceps auritus §	BR and NBR = 150-350m	Medium
White-tailed eagle, Haliaeetus albicilla *, †, §	BR and NBR = 250-500m	High
Osprey, Pandion haliaetus §	BR = 350-750m	Medium/High

Species	Buffer zone (m) suggestions during the breeding (BR) and non-breeding (NBR) seasons	Overall likely sensitivity to disturbance
Golden eagle, Aquila chrysaetos *	BR = 750-1000m NBR = 250-500m	High
Red kite, Milvus milvus *	BR and NBR = 150-300m	Medium
Marsh harrier, Circus aeruginosus	BR and NBR = 300-500m	Medium
Hen harrier, Circus cyaneus *, §	BR and NBR = 300-750m	Medium
Common buzzard, Buteo Buteo	BR and NBR = 100-200m	Low/Medium
Honey buzzard, Pernis apivorus	BR = 100-200m	Medium
Northern goshawk, Accipiter gentilis	BR = 300-500m	Medium
Kestrel, Falco tinnunculus	BR = 100-200m NBR = ≤50m	Low/Medium
Eurasian hobby, Falco subbuteo	BR = 200-450m	Medium
Peregrine falcon, Falco peregrinus	BR = 500-750m NBR = ≤200m	Medium
Merlin, Falco columbarius	BR = 300-500m NBR = ≤200m	Medium
Eurasian oystercatcher, Haematopus ostralegus	BR = 50-100m NBR = 150-300m	Medium
Ringed plover, Charadrius hiaticula	BR = 100-200m NBR = 100-300m	High
Grey plover, Pluvialis squatarola	NBR = 150-300m	Medium
Golden plover, Pluvialis apricaria	BR and NBR = 200-500m	Medium
Dunlin, Calidris alpina	BR = 100-200m NBR = 150-300m	Medium
Red knot, Calidris canutus	NBR = 100-300m	Medium
Purple sandpiper, Calidris maritima	BR and NBR <300m	Low/Medium
Wood sandpiper, Tringa glareola	BR = 150-300m	Medium
Common redshank, Tringa totanus	BR = 100-200m NBR = 200-300m	Medium
Greenshank, Tringa nebularia	BR and NBR = 300-500m	Medium/High
Black-tailed godwit, Limosa limosa	BR and NBR = 100-200m	Medium
Bar-tailed godwit, Limosa lapponica	NBR = 200-300m	Medium
Eurasian curlew, Numenius arquata	BR = 200-300m NBR = 200-650m	High
Whimbrel, Numenius phaeopus	BR and NBR = 100-300m	Medium
Red-necked phalarope, Phalaropus lobatus	BR <50m	Low
Little tern, Sternula albifrons	BR = 100-300m	Medium
Sandwich tern, Thalasseus sandvicensis	BR ≥200m	High
Common tern, Sterna hirundo	BR = 200-400m	Medium/High
Arctic tern, Sterna paradisaea	BR ≥200m	Medium
Roseate tern, Sterna dougallii	BR ≥200m	High
Snowy owl, Bubo scandiacus	NBR = 150-500m	Medium
Long-eared owl, Asio otus §	BR and NBR = 100-300m	Medium
Short-eared owl, Asio flammeus	BR and NBR = 300-500m	Medium/High
Tawny owl, Strix aluco	BR = 50-200m NBR ≥50m	Low/Medium

Species	Buffer zone (m) suggestions during the breeding (BR) and non-breeding (NBR) seasons	Overall likely sensitivity to disturbance
Barn owl, Tyto alba	BR = 50-100m NBR ≥50m	Low
Corncrake, Crex Crex	BR ≥100m	Medium
European nightjar, Caprimulgus europaeus §	BR = 150-500m	Medium/High
Kingfisher, Alcedo atthis	BR and NBR = 50-100m	Low/Medium
Crested tit, Lophophanes cristatus §	BR and NBR = 10-50m	Low
Crossbill species, Loxia spp §	BR and NBR = 50-200m	Low

Appendix B Protected Species Risk Assessment Template

<*Project name*> : Protected Species Risk Assessment

<Title including record ID and location>

Scope of Work

This method statement is applicable for <insert details of works to be undertaken>. The work comprises of:

Location and Access/Egress

<Insert details including map / plan>

Description of species, distance from planned works and ground conditions

Reference Number	BNGR letters	OS Grid reference	Place	Description	Distance from project works	Predicted project impact

<Insert details>

Programme of Works

The following works are planned within the buffer distance:

<Insert details including timing and duration>

Planned Equipment and Manpower

The operation will be carried out by the following personnel and using the following equipment:

<Insert details>

Risk Assessment/ Supervision of Work

<Insert details of baseline conditions including topography, proximity to works, existing disturbance levels, mitigation measures and operational controls, likely levels of disturbance from works and summary of risk rating (Low / Medium / High)>

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-506

Safety, Health and Environment

Water Vole Species Protection Plan

TG-NET-ENV-506	Water Vole Species Protection Plan		Applies to Transmission ✓
Revision: 1.02	**Classification:** Internal	**Issue Date:** December 2022	**Review Date:** December 2030

	Name	Title
Author	[redacted]	Environmental Net Gain Manager
Checked by	[redacted]	Consents and Environment Manager
Approved by	[redacted]	Head Of Environment

Contents

1 Introduction

This Protection Plan provides guidance and agreed procedures for the protection of water voles and their shelters during construction works on Scottish Hydro Electric Transmission (SHE Transmission) projects. The Plan contains two parts and details the procedures that must be followed where there is potential for water vole to be present (Part 1), and where a Project Licence for water vole has been issued by NatureScot to cover the project (Part 2):

Part 1 : General Protection Plan

This Part applies to all projects where water vole may be present. Part 1 outlines the responsibilities of SHE Transmission and the *Contractor* regarding protection of water vole. It also details relevant legislation, survey requirements, general mitigation measures and the requirement for licensing and mitigation.

Part 2: Project Licence Protection Plan

This is provided to *Contractors* in addition to Part 1 for large projects where a Project Licence has been issued by NatureScot to cover the work and identifies those activities and mitigation measures which are permitted under the Project Licence and those activities which require a Method Statement to be submitted to NatureScot for written approval before works can commence. This Part should be followed in conjunction with Part 1 and the relevant Project Licence to provide approved guidance and the relevant Project Licence to provide approved guidance and methodologies for carrying out work.

2 References

The documents detailed in Table 2.1 – Miscellaneous Documents, below should be used in conjunction with this document

Table 2.1 – Miscellaneous Documents

Title
Wildlife and Countryside Act 1981 (as amended in Scotland)
NatureScot Licensing

3 Part 1: General Protection Plan

3.1 Background

Water voles (*Arvicola amphibius*) are rat sized members of the rodent family which are found in habitats closely associated with waterways such as rivers and canals as well as upland areas of bog. In Scotland, they are absent from most of the islands and are under serious predation pressure from American mink (*Neovison vison*), which together with habitat loss have resulted in massive losses.

They usually have black fur in Scotland as opposed to the brown form found in England and Wales and have a short hairy tail, small eyes, a stout body with a chubby face. As suggested by the name they swim frequently and are often first noticed as they noisily 'plop' into water. Water voles predominately eat sedges and rushes although they have been known to predate on fish and invertebrates. Tormentil (*Potentilla erecta*) is a favoured plant in upland areas.

Water voles do not hibernate, but are less active during the period October to Mid-March. Females actively defend exclusive territories particularly during the May – August breeding season, during which they have up to 5 litters. Males have not been shown to defend territories and have larger home ranges. In upland areas colonies are small and discrete with high levels of colony extinction and colonisation within a widely dispersed metapopulation.

Water vole colonies are generally found in habitats with the following characteristics:

- Watercourses with banks covered in tall grass or sedge vegetation and scrub tends to be avoided
- Wet areas in uplands (up to 1000 m asl) often some distance away from 'typical' riparian habitats

Wet areas in uplands (up to 1000 m asl) often some distance away from 'typical' riparian habitats.

Signs of Water Vole:

1. Latrines – home ranges are marked by latrines near nests, burrows and where they enter or leave water. Faeces are characteristically 'tic-tac' shaped about 12mm long and 4mm wide.
2. Prints and tracks – water vole footprints are star shaped with four toes on the forefeet and five on the hindfeet. 4 – 9 cm broad paths though vegetation near water can also be an indication of water vole activity.
3. Feeding remains / feeding stations – although these can be confused with other species, neat piles of grasses, sedges or reeds about 10 cm long cut cleanly at a 45° angle can be evidence of water voles.
4. Water vole burrows – normally entrances have a diameter of between 4 and 8 cm and can be either above or below the water level along banks of watercourses. They are generally found within 2 – 5 m of the water's edge. but may be in places relatively far away from running water particularly in upland areas.

3.2 Responsibilities

It is the *Contractor's* responsibility to comply with all the requirements of this Protection Plan where water vole may be present, and it is both the *Contractor's* and SHE Transmission's responsibility to monitor compliance with the Protection Plan. The responsibility for applying for any Licence, including a Project Licence, may vary from project to project, but all applications and mitigation works will adhere to this plan.

3.3 Legislation

Water vole is afforded partial protection under Schedule 5 of the Wildlife and Countryside Act 1981, (as amended in Scotland), This legislation makes it an offence to recklessly[1]:

- Damage or destroy or obstruct access to, any structure or place which any water vole uses for shelter or protection
- Disturb a water vole while it is occupying a structure or place which it uses for shelter or protection

This legislation means that water vole habitat is fully protected in Scotland.

NatureScot can grant licences to enable certain activities that would otherwise be an offence, to be carried out in relation to water voles and their burrows, subject to the following:

a) that undertaking the conduct authorised by the Licence will give rise to, or contribute towards the achievement of, a significant social, economic or environmental benefit; and that there is no other satisfactory solution.

In granting a licence NatureScot has to take into account the consequences for water vole at a local population level, to assist this assessment NatureScot will need to see maps of the area of operations and also surrounding areas of suitable water vole habitat.

3.4 Surveying for Water Vole

1. Initial survey for water vole must be undertaken in all works areas containing suitable water vole habitat, a maximum of 12 months[2] prior to the works commencing (this includes site investigations) to allow for pre planning. In areas where water vole are identified additional pre-works survey must be carried out a maximum of 2 months prior to works commencing to ensure the availability of up-to-date information.
2. Survey must be carried out during the active season - between 1 April and 31 October (lowlands) and 1 May and 30 September (uplands) and ideally during the months of June, July or August.
3. Surveys must extend for a minimum of 10 m beyond working areas, including access tracks.
4. Surveys must be carried out by suitably qualified and experienced ecologists and will identify whether any water voles or places of shelter are likely to be affected by the works.

1.1

[1] Reckless acts would include not having or disregarding a mitigation plan aimed at protecting water vole resulting in damage, destruction or disturbance of any water vole place of shelter, or carrying out an activity which would result in an offence where the presence of water vole was foreknown.

[2] Note: Information from any previous surveys (e.g., surveys carried out to provide data for EIA or other Assessments) can be a useful guide to water vole activity in an area, particularly if burrows were recorded. However, surveys will always require to be updated if carried out more than 12 months prior to works commencing.

5. Appropriate monitoring (e.g., the use of suitable camera traps) should be undertaken where required to determine if any place of shelter is being occupied.

3.5 Review of Water Vole Survey

Once a water vole survey has been carried out, the ecologist / ECoW should review the survey results, apply the mitigation hierarchy outlined below and decide if a Licence is required (either Individual or Project) for the works.

Construction teams should be advised of existing / new constraints, together with mitigation and licensing requirements by the ecologist / ECoW.

Relevant site documentation and project information sources should be updated with new and amended information on water vole constraints as it is produced, with changes communicated to appropriate staff immediately.

3.6 Mitigation Hierarchy

There is a general presumption against works being carried out which could disturb water voles in their burrows or to destroy an occupied burrow. A hierarchical approach to mitigation of Avoidance - Disturbance - Destruction will be applied to any burrow that may be affected by works (See Figure 3.1).

Avoidance

This is the preferred option for occupied burrows identified within 10 metres of works. A protection zone of 10 metres should be marked and signed on the ground around each burrow or group or burrows with appropriate material to restrict work access.

All works personnel, machinery, vehicles and storage of materials must be restricted from entering.

Protection zones must be maintained until works are completed. Site staff should be briefed of their purpose through a Toolbox Talk and works micro-sited outwith the protection zone. If water vole disturbance can be avoided in this way, there is no need to obtain a Licence from NatureScot for the works.

Disturbance

For works within 10 metres of occupied burrows which cannot be avoided, a Licence for disturbance from NatureScot will be required (either Individual or Project).

Individual Licence applications to NatureScot should be accompanied by a Species Protection Plan which outlines how disturbance will be minimised and burrows protected, for example through screening of works and modifying protection zones.

If a Project Licence is in place, the methodology detailed in Part 2 of this document must be followed.

Displacement of water vole and destruction of burrows

In some instances, displacement of water vole for example by close strimming around burrows, followed by destruction of burrows may be necessary to allow works to go ahead. This work will always require a licence for disturbance and burrow destruction from NatureScot (either individual or project). These actions must only be undertaken as a last resort and when there is no alternative. This methodology is only likely to be effective if proposed displacement distances are less than 50 metres, and only acceptable where an experienced ecologist has confirmed that there is suitable alternative habitat for water vole burrows within 50 meters of the original burrow location. Displacement work and destruction of burrows will not be licensed during the inactive or breeding periods. Suitable times for displacement work to be carried out is as follows: late February to early April (lowlands) and late March and April (uplands). Individual Licence applications to NatureScot must be accompanied by a Species Protection Plan which outlines timings of works, how impacts to water vole will be minimised, individuals protected, and loss of burrows compensated for.

If a Project Licence is in place, a Method Statement must be submitted to NatureScot in accordance with Part 2 of this document for written approval prior to any works commencing.

Any water vole place of shelter subject to works under a Licence must be monitored during and after those works.

Live trapping and translocation of water vole, and destruction of burrows

This is a last resort action, and a justification will be required as to why there is no alternative to translocation. This work will need significant pre-planning, and the identification of a receptor site for displaced animals. If this situation is likely to arise NatureScot Licensing Team should be contacted at the earliest opportunity to discuss timings, methodologies and licensing. This work will require an individual licence from NatureScot.

3.7 Mitigation Measures

3.7.1 General Mitigation

1. The ECoW will attend site on a regular basis throughout the construction period to ensure all environmental mitigation relevant to water vole is delivered.
2. All works in proximity to waterbodies / watercourses must follow measures outlined in the project environmental information and Contractors Environmental Management Plan (EMP) to ensure their protection against pollution, silting and erosion.
3. An emergency procedure will be implemented by site workers if signs of water vole (e.g., latrines or animals) are encountered. All work within 10 metres will cease, and the ECoW will inspect the site and define mitigation (if required) in line with this SPP.
4. An exceptional circumstance procedure will be implemented should mitigation options not prove satisfactory in a particular case. In such a scenario, works will be halted whilst mitigation is determined on a case specific basis under consultation with NatureScot.

3.7.2 Monitoring and Reporting

1. The Environmental Representative will attend site on a regular basis throughout the construction period to ensure all environmental mitigation relevant to water vole is delivered.
2. Reports will be submitted to NatureScot as required by the relevant Licence.

3.8 Project Licence

A NatureScot Project Licence is likely to be the most appropriate form of Licence for any large scale and / or long running Project, which may result in a large number of minor unavoidable water vole offences. For example, multiple instances of disturbance to a number of water vole shelters over several years. A Project Licence can be used to standardise protected species mitigation / compensation, creating consistency across the project area and throughout the Project's lifespan. Project Licences do not negate the need for thorough pre-construction survey within 12 months of the planned project start date, and additional pre-construction survey within 2 months of works commencing, in areas where water voles have been found to be present. Any Project Licence application will need to be accompanied by a Mitigation / Compensation Plan and procedures for water vole included in Parts 1 and 2 of this SPP.

3.9 Individual Licence

For small scale Projects expected to be completed over relatively short timescales, which will result in a low number of unavoidable water vole offences an Individual NatureScot Licence is most likely to be appropriate. Licence applications should be accompanied by a Method Statement / Mitigation Plan and should be sent sufficiently in advance of the Project start date to ensure the licence is in place prior to work commencing. Further guidance and details of how to apply for a water vole licence can be found on the NatureScot website www.nature.scot/professional-advice/protected-areas-and-species/licensing/species-licensing-z-guide/water-voles-and-licensing

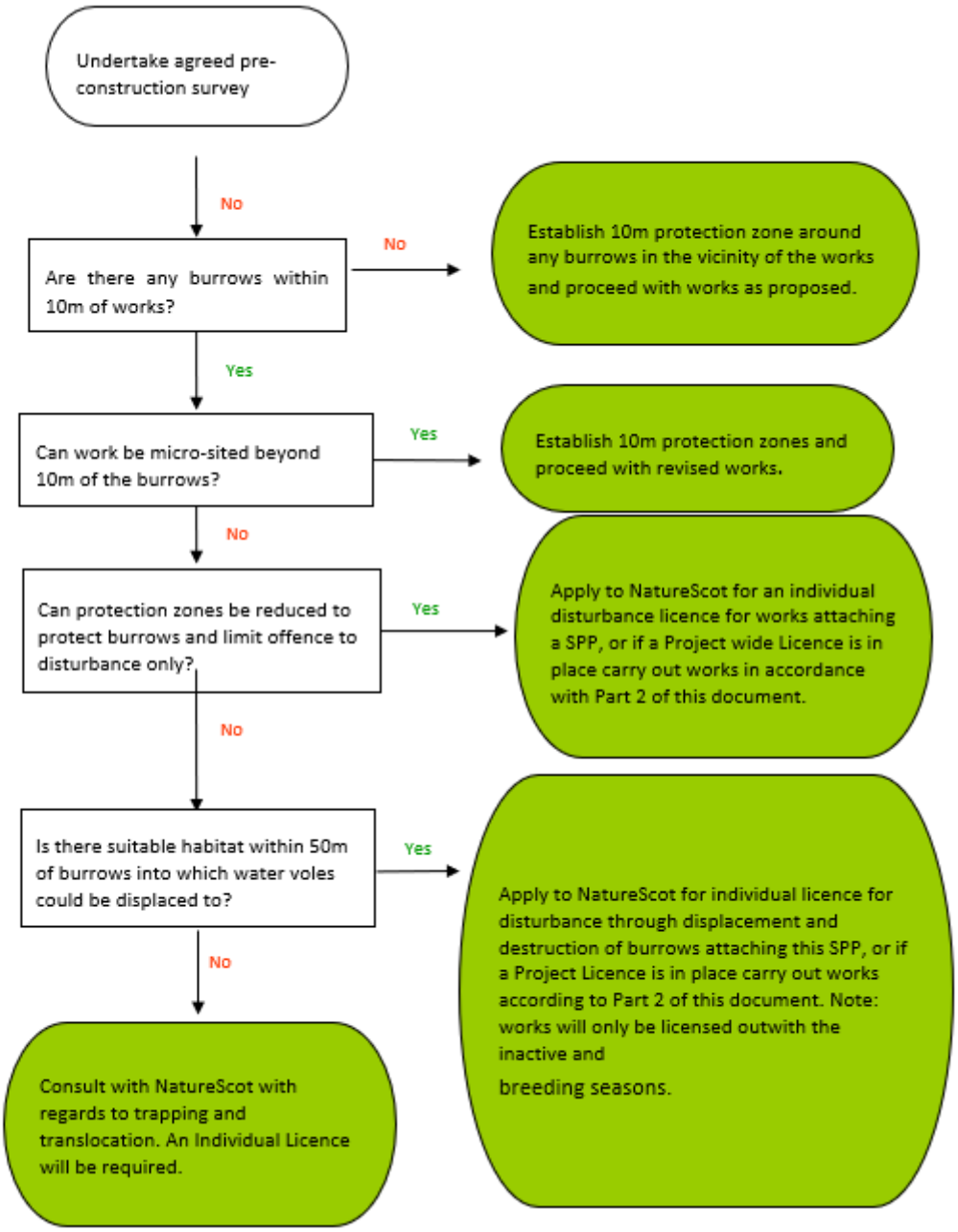

Figure 3.1 - Water Vole Decision Tree

4 Part 2: Project Licence Protection Plan

The following sections of this plan are to be read in conjunction with the Project Licence (insert Licence number) and its conditions.

As stated in the Project Licence, methodologies for certain mitigation activities permitted under the Licence are included in this Part of the SPP. More disruptive activities, listed in Section 1 below, will also require a specific Method Statement to be submitted to NatureScot Licensing Team for written approval (see Appendix A). It is the *Contractor's* responsibility to submit these Method Statements to both SHE Transmission and NatureScot for written approval. No works shall proceed without this written approval.

Sufficient time should be allowed for in the programme to carry out any consultation work and obtain necessary approvals.

The Project Licence will specify reporting requirements detailing all disturbance and destruction works carried out.

In advance of, and during construction at any location where there is the potential for a water vole to be present, it is **essential** that this plan is followed:

4.1 Works Allowed under the Project Licence

The following works may be carried out under this SPP without further approval from NatureScot, using the prescribed methodologies:

Disturbance to water voles in their places of shelter

a. In situations where it is not possible to maintain a 10 metres protection zone around a water vole burrow / place of shelter to avoid disturbance (*e.g.*, upgrade of an existing track or watercourse crossing; or construction of temporary track or watercourse crossing), but it is possible to establish a smaller protection zone (no less than 5 metres in radius) which will prevent damage or destruction of the burrows. The ECoW must mark out the reduced protection zone on the ground using appropriate marking materials and signage and ensure that it remains in place for the duration of the adjacent works.

b. The ECoW must undertake a Toolbox Talk with all contractors before the start of works to raise awareness of the presence of water vole, locations of, and restrictions posed by protection zones and any required mitigation.

c. During the construction works the ECoW must ensure that no plant and/or work personnel enter the protection zone.

d. All construction works within a 10 metres radius of water vole places of shelter must usually be completed within 1 day. Working methods must be adopted to reduce any unnecessary disturbance including the following:

- No parking of any plant or other vehicles
- No site compounds or welfare facilities

- No use of static plant and/or generators
- Artificial lighting, if required, is to be directed away from water vole habitat and riparian habitats in general
- No potential activities that may result in pollution, *e.g.*, re-fuelling, will be allowed within the protection zone. Silt control measures will be agreed prior to works with the ECoW to ensure no adverse impact on water vole habitat.

e. Use of any constructed tracks will not be subject to any subsequent restrictions on use.

4.2 Activities requiring a NatureScot Approved Method Statement

The following works require a Method Statement to be approved in writing by NatureScot Licensing Team before works can commence:

1. Displacement of water vole and destruction of burrows. Please note these activities will only be licensed to take place at the following times: late February to early April (lowlands) or late March and April (uplands) to avoid inactive and breeding periods.
2. Translocation, live trapping and destruction of burrows. Please note these activities will only be licensed to take place during March and April to avoid inactive and breeding periods.

The Method Statement template in Appendix A has been developed in conjunction with NatureScot and should be used by the Contractor / Named Agent for all submissions.

Proposed mitigation works should be agreed with NatureScot.

5 Revision History

No	Overview of Amendment	Previous Document	Revision	Authorisation
01	Transfer to new template and Nomenclature	TG-PS-LT-719 (Rev 1.00)	1.00	[redacted]
02	Weblinks updated, typos corrected, and decision tree corrected	TG-PS-LT-719 (Rev 1.00)	1.01	[redacted]
03	Transfer to New Template. Updates relating to NatureScot and simplification of legislation.	TG-NET-ENV-506 (Rev 1.01)	1.02	[redacted]
04				

Appendix A Project Licence Method Statement Template

<PROJECT TITLE>

METHOD STATEMENT FOR WORKS UNDER *(insert licence details)*

<insert species record reference>

<insert date>

Introduction

This document, prepared on behalf of SHE Transmission provides a Method Statement for ***<insert details of works>*** to be completed under ***<insert licence details>***. These works are required in order to facilitate the delivery of the *<insert Project details>* (the Project).

Condition ***<insert No.>*** of the above Licence states that a ***<insert species>*** Protection Method Statement be submitted to (NatureScot) Licensing Team for written approval, under specific circumstances, prior to commencement of works which could affect ***<insert species>***. Therefore, no works which would *<insert licensed activity>* ***<insert species>*** shall take place without written confirmation of NatureScot approval of this method statement.

This Method Statement makes reference to the following documents:

<insert licence details>, NatureScot

Species Protection Plan (SPP): ***<insert SPP No. and title>*** Rev. X *<insert date>*

Further information is provided in Table 1: Summary of Data.

Licensable Works

Introduction

<Insert details>

Baseline Description

<Insert description, including photographs / location plan>

Table 1: Summary of Data

Reference	Easting	Northing	Date recorded	Description	Date works exclusion zone demarcated & distance

Survey Summary

<Insert details>

Description of the Proposed Licensable Works

<Insert details>

Works Duration

<Insert details>

Consideration of Alternatives

<Insert details>

Impact Assessment

<Insert details>

Method Statement Site Briefing (to be delivered to relevant staff prior to works)

Site: *<insert description>*

Reference number: *<insert species record reference>*

Client: SHE Transmission

Task: *<insert description of works>*

Prepared by: *<insert individual or Company name>*

Licensed Agent: *<insert name>*

Method statement for *<insert works description>*

Before works commence:

All relevant personnel will be made aware of the presence and location of the constraint and mitigation.

<insert details of methodology>

During works:

<insert details of methodology>

<Insert Contractor's name>

I, the undersigned, confirm receipt of this method statement and fully understand and agree to work to the conditions therein.

Signature of *Contractor's* Representative:..... Date ..../ /

Print name in full: .....

Scottish & Southern Electricity Networks
TRANSMISSION

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TG-NET-ENV-509

Scottish and Southern Electricity Networks

SHE Transmission ISO14001:2015 Environmental Management System

Corporate SHE Management System Implementation Guide

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1 Introduction

Scottish Hydro Electric Transmission (SHE Transmission) is implementing an Environmental Management System (EMS) as part of the SSE Corporate SHE Management System, which is currently certified to ISO 14001:2015. This allows SHE Transmission to document and improve our practices in order to better satisfy the needs and expectations of our customers, stakeholders and interested parties.

This Technical Guide describes the EMS, delineates authorities, inter relationships and responsibilities of SHE Transmission personnel operating within the SSE SHE Management System. The Guide also provides references to the environmental documents that comprise the SHE Management System and our EMS requirements.

This Guide has been produced to familiarise SHE Transmission staff with the processes and controls that have been implemented in SSE and SHE transmission to meet the requirements of ISO 14001:2015.

The Guide uses the same format as ISO 14001 and each section comprises the following:

- Summary of ISO 14001 requirement (red text)
- Summary of SSE SHE Management System arrangements (green text); and
- Summary of SHE Transmission EMS arrangements (blue text)

2 References

The documents detailed in Table 2.1 - Scottish and Southern Electricity Networks Documents, Table 2.2 – SSE Documents, below should be used in conjunction with this document.

Table 2.1 - Scottish and Southern Electricity Networks Documents

Reference	Title
REF-NET-ENV-502	Construction Environmental Roles and Responsibilities
SM-NET-ENV-500	Consents and Environment Manual
TEM-NET-ENV-501	Consents and Environmental Specification
TEM-NET-ENV-503	Project Consents & Environment Plan (PCEP)
TEM-NET-ENV-504	Consents and Environmental Specification – Minor Works
PR-NET-GOV-002	Development, Issue and Control of Scottish and Southern Electricity Networks Documentation
PR-NET-ENV-501	Procedure for Routeing Overhead Lines and Underground Cables of 132kV and above
TG-NET-ENV-500	Freshwater Pearl Mussel Species Protection Plan
TG-NET-ENV-501	Badger Species Protection Plan
TG-NET-ENV-502	Bat Species Protection Plan
TG-NET-ENV-503	Otter Species Protection Plan
TG-NET-ENV-504	Red Squirrel Species Protection Plan
TG-NET-ENV-505	Birds Species Protection Plan

Reference	Title
TG-NET-ENV-506	Water Vole Species Protection Plan
TG-NET-ENV-507	Wildcat Species Protection Plan
TG-NET-ENV-508	Pine Marten Species Protection Plan
TG-NET-ENV-527	Wood Ant Species Protection Plan
TG-NET-ENV-524	Ornithology Methods for Transmission projects
TG-NET-ENV-525	An introduction to Biodiversity Net Gain
TG-NET-ENV-526	Biodiversity Net Gain Toolkit User Guide
FC-NET-ENV-500	BNG Procedure Flowchart
WI-NET-ENV-500	Consents and Environment Audit and Inspection Guidance
FO-NET-ENV-501	Project Environment and Consents Audit Form (embedded in WI-NET-ENV-500)
FO-NET-ENV-502	Monthly Site Environmental Inspection Form (embedded in WI-NET-ENV-500)
FO-NET-ENV-503	Internal EMS Audit Form (embedded in WI-NET-ENV-500)
N/A	Environmental Audit and Inspection Schedule – EMS SharePoint
N/A	Environmental Audit and Inspection Actions Tracker – EMS SharePoint

Table 2.2 – SSE Documents

Reference	Title
PO-COR-054	SSE Environment and Climate Change Policy
PR-GRP-016	Group Sustainability Policy
PR-COR-SHE-001	Safety, Health and Environmental Organisation Procedure
WI-COR-001	Development, Issue and Control of Company Documentation
MA-COR-LCP-001	Large Capital Projects Governance Framework Manual
PR-COR-002	Non-Conformance Management
RF-SHE-424	I-Care
MS-SHE-001	Safety, Health and Environmental Organisation
MS-SHE-003	Safety, Health And Environment Risk Management Standard
RF-SHE-400	SHE Legislation Register
MS-SHE-008	Personnel Training And Performance Standard
MS-SHE-012	Asset Integrity Standard
MS-SHE-004	Operational And Maintenance Procedures Standard
RS-SHE-300	Waste Management
RS-SHE-301	Storage of Oil and Hazardous Substances
CA-SHE-301-003	Spill Response
RS-SHE-303	Effluent and Drainage
RS-SHE-304	Working In, Near or Abstracting Water
RS-SHE-305	Equipment and Products Containing Hazardous Substances

Reference	Title
RS-SHE-306	Working on Habitats and Open Land
RS-SHE-307	Prescribed Operations, Air Emissions & Nuisance
MS-SHE-002	Plant and Process Information Standard
MS-SHE-010	Incident Reporting Management And Investigation Standard
MS-SHE-014	Audit Standard
RF-SHE-411	Internal SHE Audits
MS-SHE-015	Management Review Standard
MS-SHE-011	Emergency Planning and Response Standard

3 Business Unit Profile

SHE Transmission owns, operates and maintains the 400 kV, 275 kV and 132 kV electricity transmission network in the north of Scotland, in some of the UK's most challenging terrain. It forms part of Scottish and Southern Electricity Networks (SSEN) which is the trading name of the economically regulated network companies owned by SSE plc - Scottish Hydro Electric Transmission (SHE Transmission), Scottish Hydro Electric Power Distribution (SHEPD) and Southern Electric Power Distribution (SEPD).

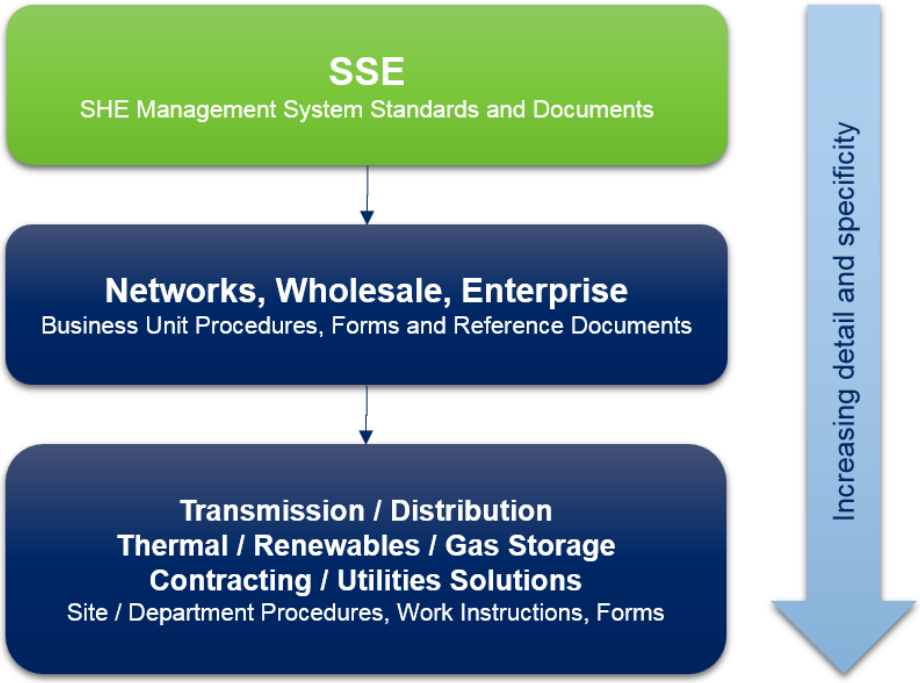
Our operating area is home to vast renewable energy resources, and this is being harnessed by new wind, hydro and marine generation. Working closely with National Grid, the GB transmission System Operator, SHET also enables these electricity generators to connect to the transmission system by providing connections and allowing the electricity generated by them to be transported to areas of demand across the country.

As a natural monopoly, we are regulated by the GB energy regulator, the office of Gas and Electricity Markets (Ofgem).

4 Environmental Management System Background

SSE as a group held a number of ISO 14001:2004 EMS certificates across its various business units and operational sites. Following revision of the ISO14001 standard in 2015, SSE has decided to re-model its EMS and certificates across the business. Figure 1 shows how the new SSE EMS is set up as a Parent (Group level - green) and Child (Business Units / Sites - blue) model, where all core EMS processes reside at the Group level, utilising the existing SHE Management System, and are cascaded down.

Figure 1: EMS Hierarchy



The Business Units are responsible for complying with the SHE Management System's Standards and implementing additional processes and controls relevant to their activities, products and services. Appendix A shows how these 2 levels of documentation relate.

The new EMS model will also allow uncertified areas of the group to gain certification to ISO 14001 with greater ease, by becoming part of the SSE Group EMS.

5 Context of the Organisation (Clause 4)

Clause 4 of ISO14001:2015 requires SSE to "determine the external and internal issues that are relevant to its purpose and that affect its ability to achieve the intended outcome of its environmental management system. Such issues shall include environmental conditions being affected by or capable of affecting the organisation."

5.1 Organisational Context

A high-level Group output is produced by the SSE Group Environment Manager in consultation with Corporate Affairs in iCARE - Section 5: EMS Organisation and Context (RF-SHE-424). This is a 'conceptual' understanding of the business for the purposes of ISO14001:2015.

As a major developer over the past 10 years, SHE Transmission has significant interaction with the environment through the activities we undertake in Scotland as we seek to develop and improve the transmission network in response to strong growth in renewable generation in the North of Scotland. With this work comes a legal

responsibility to design and build our projects in a manner which protects the natural and built environment. To this end, SHE Transmission's Environment and Consents Team has worked hard to develop and refine controls and processes to ensure these demands, responsibilities and the requirements of interested parties are met.

Our EMS arrangements will align with SSE's Environment and Climate Change Policy (PO-COR-054) and Group Sustainability Policy (PR-GRP-016), together with SHE Transmission's Sustainability Strategy, Sustainability Action Plan and RIIO-T2 Business Plan to ensure they take account of relevant internal and external factors when carrying out our business activities.

5.2 Relevant Interested Parties

A high-level Group output is produced by the SSE Group Environment Manager in consultation with Corporate Affairs in iCARE - Section 3: Interested Parties (RF-SHE-424). This is a 'conceptual' understanding of the business for the purposes of ISO14001:2015.

SHE Transmission, through SSEN, has a dedicated Stakeholder Engagement Team who coordinate and implement our stakeholder engagement strategy to ensure the decisions our business takes considers, and where appropriate, reflect the views and requirements of our customers and wider stakeholder interests.

5.3 Environmental Management System and Scope

SHE Transmission has chosen to implement an EMS as a strategic decision, with the intention of improving the overall environmental performance of the business to meet ever changing business requirements and contributing more effectively to the policies and objectives of the parent company, SSE plc.

SHE Transmission's activity scope is defined in RF-SHE-424 iCARE as "Transmission of Electricity and Development of the Electricity Transmission Network"

This scope can be further broken down into the following stages in our asset lifecycle:

- Design and development of new transmission electrical infrastructure (including decommissioning of existing assets)
- Construction and installation of new transmission electrical infrastructure
- Operation and maintenance of transmission electrical infrastructure assets

RF-SHE-424 - iCARE provides a consistent means of managing more detailed information generated by the Group EMS requirements.

6 Leadership (Clause 5)

Clause 5 of ISO14001:2015 requires 'Top Management' to demonstrate leadership and commitment with respect to the EMS. The SSE SHE Committee is 'Top Management' for Group elements; and relevant Unit leaders are 'Top Management' for Child elements. Top Management are accountable, but may delegate responsibility.

6.1 Leadership and Commitment

The SSE SHE Committee is 'Top Management' for Group elements and relevant Unit leaders are 'Top Management' for Child elements. Top Management are accountable, but may delegate responsibility.

The Transmission Executive Committee (TEC) is considered “Top Management” for SHE Transmission and shall demonstrate leadership and commitment with respect to the EMS. It is ultimately responsible for implementing the EMS (comprising SSE SHE Management System and business unit EMS arrangements).

The TEC is also responsible for conducting annual Management Reviews of the EMS to ensure:

- The continuing suitability and adequacy of the EMS
- Continual improvement opportunities are identified
- The need for any changes to the EMS and resources are met
- Actions are implemented where objectives have not been met
- Implications for the strategic direction of the business are reviewed

6.2 Environmental Policy

SSE has an Environment and Climate Change Policy (PO-COR-054) and Sustainability and Group Sustainability Policy (PR-GRP-016) that applies across the whole SSE Group. The Policy is reviewed by the ChiefExecutive, Corporate Affairs and approved by the SSE Board. Business Heads are accountable for communicating the Policy, and it is available on www.sse.com.

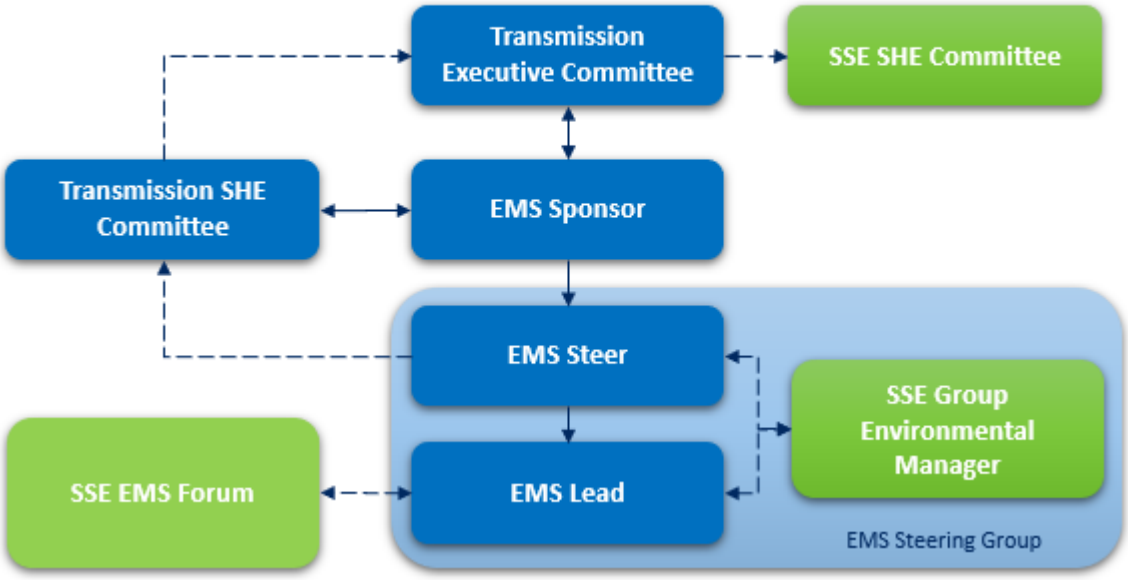
6.3 Organisational Roles, Responsibilities and Authorities

MS-SHE-001 Safety, Health & Environmental Organisation defines the organisational arrangements required to support the management of SHE risks, and the consultation and communication arrangements with employees. An SSE e-learning course has been developed as the means of communicating these responsibilities.

REF-NET-ENV-502 Construction Environmental Roles and Responsibilities and SHE Transmission’s Consents and Environmental Manual SM-NET-ENV-500 provide further role definitions relating to the development and construction of new infrastructure projects.

The Organisation chart in Figure 2 below identifies the core SHE Transmission team responsible for developing, implementing and maintaining the EMS, in conjunction with SSE’s Group Environmental Manager and EMS Forum. Their key roles and responsibilities are detailed in Appendix B.

Figure 2: SHE Transmission EMS Management Team



The TEC is responsible for business planning, development and the communication of our policies, EMS planning, the establishment of objectives, the provision of resources needed to implement and improve the EMS and for undertaking management reviews. The TEC has assigned the responsibility and authority to management teams and departments to:

- Ensure that EMS processes are delivering their intended outcomes
- Report on the operation of the EMS and identify any opportunities
- Ensure that improvement is taking place
- Ensure that environmental awareness is promoted through CARE
- Ensure that required changes to the EMS are planned and implemented
- Ensure the integrity of the EMS is maintained during business changes
- Ensure that responsibilities and authorities relating to the EMS are communicated and understood

All managers demonstrate their commitment to the development and improvement of the EMS through the provision of necessary resources, through their involvement in the internal audit process and through their proactive involvement in improvement activities.

All employees are responsible for the environmental aspects of their work and implementation of environmental policies and practices applicable to activities they undertake. Employees are motivated and empowered to identify and report any known or potential environmental problems and to recommend related solutions to aid the corrective and preventive action process.

7 Planning (Clause 6)

Clause 6 of ISO14001:2015 requires risks and opportunities and emergency situations to be identified and documented. These requirements are integrated into the environmental aspects process and outputs. In practice, all aspects are 'risks' or 'opportunities', so the approach adopted is to assess whether the risk is tolerable / acceptable, or the opportunity is material. This clause also requires documented information on key EMS planning processes.

7.1 Environmental Aspects

The approach to determining significant environmental aspects is as per MS-SHE-003 SHE Risk Management, and is recorded in the iCARE database (RF-SHE-424). The assessment is based upon a systematic framework of different activity, product and service types; their components parts; different aspect categories; and an evaluation of both inherent and residual likelihood and impact using a 6x6 matrix. These are assessed on a collective Group basis, and relevance to individual Units is noted.

When assessing inherent impacts and probability it is assumed that no specific controls are in place; when assessing residual impacts and probability is assumed that relevant current risk and management standards have been applied.

Significant environmental aspects are identified on the basis of inherent rather than residual risk. Aspects rated Medium and above are significant. Aspects with a compliance obligation are deemed to be at least Medium (inherent). Significant environmental aspects need to be addressed within the EMS if they are within the influence or control of SHE Transmission (i.e. a lifecycle perspective). Control / influence is recorded in iCARE.

A SHE Transmission specific aspects register has been created by filtering on “Relevance”. SHE Transmission’s EMS Team is responsible for reviewing our aspects register annually.

7.2 Compliance Obligations

Compliance obligations include:

- Legal requirements
- Internal and external commitments made by SHE Transmission; and
- Needs and expectations that form Compliance Obligations as identified in the Interested Parties assessment in iCARE (RF-SHE-424)

The Compliance Obligations are captured within the online Newground Environmental Legislation Register, accessed as per RF-SHE-400 SHE Legislation Register. Relevance of each Compliance Obligation to SHE Transmission is also identified.

The Register is maintained by means of a cross-business group that reviews the quarterly update provided by Newground.

The SHE Transmission EMS Lead sits within this Group and is responsible for bringing the quarterly update back into SHE Transmission for review by a nominated Panel within the Environment Team. The Panel reviews the update and records whether any changes are applicable to SHE Transmission or its Contractors on a Legislation

Review Minute which is saved in the Consents & Environment SharePoint site's EMS page. Where changes are applicable, the Panel will record any new requirements in the Minute and which, if any, documents or processes need to be updated. The Panel will report this to the Head of Environment who will be responsible for ensuring any changes are incorporated. Any new requirements will be reported through to the next Transmission SHE Committee by the Head of Environment.

A Planning Applications and Consents Tracker is located on the Consents & Environment SharePoint site which links to copies of planning consents within project folders. The Tracker is maintained by the Town Planning Team.

Other licences and authorisations are stored on the Consents & Environment SharePoint site and are maintained by the respective Environmental Project Managers.

7.3 Environmental Objectives

Environmental Objectives are set in cases where it is deemed by SSE Group or SHE Transmission that the current level of risk is not acceptable or tolerable, or where there is a material opportunity to improve, and action can be taken within the constraints of the organisational context.

Where action is best taken at a Group level (i.e. it is an action relevant across multiple Units), this results in a Group Objective. Where the action is best undertaken at a Unit level (i.e. it is an action relevant only locally), this results in a SHE Transmission Objective. Group Objectives may be considered to be 'Strategic' and SHE Transmission Objectives to be more 'Operational' or contribute to a Group Objective .

Objectives are recorded in iCARE and are related to Significant Aspects, Compliance Obligations, and Risks and Opportunities. More general Objectives relating to EMS improvements are recorded in the Group EMS Objectives tab in iCARE.

The Transmission SHE Committee and TEC are responsible for setting and periodically reviewing SHE Transmission's Environmental and Sustainability Objectives in line with SSE Group and its own Sustainability Strategy. These will be communicated throughout SHE Transmission via the annual SHE Plan. Members of the TEC will act as sponsors for relevant Objectives to ensure resources are made available to achieve them.

7.4 Planning Action

iCARE demonstrates how requirements of this Clause are met by means of Objectives, Operational Planning and Control, and Performance Evaluation relating to Significant Aspects, and their related Compliance Obligations, and Risks and Opportunities.

The Group Objectives should form the annual Group Environment Plan proposed by the Environment sub-Group. SHE Transmission considers our Environmental, Sustainability and EMS Objectives when developing our SHE Plan which is approved by the TEC.

The new SHE Transmission Consents & Environment SharePoint site will be the main area for storing EMS planning and checking information including:

- Environmental audits and inspections
- Environmental objectives and performance reporting
- Management reviews

8 Support (Clause 7)

Clause 7 of ISO 14001:2015 requires the resources needed for the establishment, implementation, maintenance and continual improvement of the environmental management system to be determined and provided. Resources can include human resources, natural resources, infrastructure, technology and financial resources.

8.1 Resources

Top Management has a responsibility to ensure that the functioning of the EMS is adequately resourced including human resources, financial resources, infrastructure and technology.

The Transmission Executive Committee (TEC) is responsible for ensuring adequate resources are made available to implement, maintain and improve the EMS within SHE Transmission.

8.2 Competence

In the Medium to Long term, competence will be managed throughout the Group via SSE's Learning Management System (LMS). Competence encompasses:

- Environmental issues
- environmental management systems
- technical craft and engineering competency; and
- audit competency

SHE Transmission follows MS-SHE-008 Personnel Training Performance. Management teams are responsible for determining competency requirements and ensuring they are managed / recorded in the LMS.

All employees are made aware of the relevance and importance of their activities and how they contribute to the achievement of our Environmental policies and objectives through the Performance Management process. SHE Transmission utilises the Learning Management System (LMS) to ensure that all employees are adequately trained to enable them to perform their assigned duties.

Staff training records are maintained to demonstrate competency and experience. The Human Resources Department of SSE maintains and reviews the training records to ensure completeness and to identify possible future training needs. Training records are maintained and include as a minimum; copies of certificates for any training undertaken to date, current job description and curriculum vitae.

REF-NET-ENV-502 Construction Roles & Responsibilities sets out key environmental roles and responsibilities for SHE Transmission and Contractor staff on our construction projects. These are set out in Contract documents such as TEM-NET-ENV-501 Consents and Environmental Specification (CES).

Competency for key environmental functions within SHE Transmission (e.g. the Consents and Environment Team) is also conducted via external courses, seminars and events. The Consents and Environment Manual (SM-NET-ENV-500) provides guidance on key project development and construction environmental management processes to improve consistency and ensure legal obligations are met.

8.3 Awareness

All employees are trained on the relevance and importance of their activities and how they contribute to the achievement of our Environmental policies and environmental objectives through the LMS.

Awareness of current environmental issues in staff and contractors is also raised through the use of E-moments in meetings, the SSE CARE (Commitment, Awareness, Rigour, Engagement) Initiative materials and SHE-bulletins. The Consents & Environment Team is responsible for facilitating the delivery of SHE Transmission's programme of works in a sustainable way. We do this by securing and implementing all development consents, identifying and meeting statutory requirements, successfully avoiding (and where not possible minimising) impacts on the wider environment and raising opportunities for improvements.

The Head of Environment is responsible for reviewing awareness requirements throughout the business to meet commitments set out in the CARE Initiative. These requirements are included in the SHE Plan and are approved by the SHE Committee and TEC.

8.4 Communication

8.4.1 Internal Communication

PR-COR-SHE-001 provides the formal process for communicating material changes to the SSE SHE Management System. This includes a Business consultation process to promote continual improvement.

The SSE 14001 Forum will meet quarterly to provide a means of internal communication on the EMS, with the objective of driving efficiency and improvement. The EMS Lead for SHE Transmission sits on the Forum and is responsible for communicating changes and requirements back to the SHE Transmission EMS Steering Group.

Communication of compliance obligation changes, including legislation updates are detailed in 7.2.

Communication media such as SSEnet, SSEnews, SHE Bulletins, and SHE Communications/Alerts provide ad hoc means of mass communication on Environmental issues.

Key indicators of SSE Environmental Performance are published monthly on SSEnet (https://ssecom.sharepoint.com/teams/corporate-it-safetynet/SitePages/PerformanceReporting.aspx) with a more detailed Safety, Health and Environment Report that is distributed extensively across the Group.

In addition, core SHE Transmission KPIs detailing environmental performance are produced and circulated on a monthly basis within SHE Transmission and reported to the TEC and wider business.

8.4.2 External Communication

Group reporting is undertaken by Corporate Affairs in the form of SSE's Annual Report, Sustainability Report, and Biodiversity Report. There may also be occasional environmental communications on SSE's websites. The scope of these reports extends beyond Units operating to ISO14001, and the content and format is determined by Corporate Affairs.

At a Unit level, external communication is driven by statutory reporting (Compliance Obligations), including PPC, CAR, waste returns reporting and Regulatory reporting to Ofgem on Carbon and SF6 through our annual Regulatory Reporting Pack (RRP) submission under RIIO T1 . These requirements are identified in iCARE. In addition, there may be engagement with stakeholders on a routine or ad hoc basis, including complaints.

SHE transmission also reports on performance through the annual Transmission Performance Report and the annual Transmission Sustainability Report.

8.5 Documented Information

Types of documented (including electronic) information identified in the SHE Management System include:

- Controls - policies, standards, procedures, work instructions, method statements, contracts
- Records - performance data, inspection and maintenance records, audit programmes, audit reports, Objectives progress reports, statutory reports, training records, waste transfer / consignment notes, incident reports, emergency exercise reports
- Information - external reference standards, compliance obligations, EMS outputs including iCARE, manufacturers information, technical assessments and reports

The control of documents is managed across SSE by WI-COR-001 Development, Control & Issue of Company Documentation.

SHE Transmission ensures that the EMS includes documented information that is required to be maintained by ISO14001:2015, SSE's SHE Management System and SHE Transmission to demonstrate the effective operation of our EMS. SHE Transmission's EMS documents are controlled in accordance with WI-COR-001 and more locally by SSEN's Development, Issue and Control of SSEN Documentation (PR-NET-GOV-002) which define the processes for:

- Approving documents for adequacy prior to issue
- Reviewing and revising as necessary and re-approving documents
- Ensuring that changes and current revision status of documents are identified
- Ensuring that relevant versions of applicable documents are available at points of use
- Ensuring that documents remain legible and readily identifiable
- Ensuring that documents of external origin are identified, and their distribution controlled
- Preventing the unintended use of obsolete documents; and
- Ensuring that documents of external origin are identified, and their distribution controlled

9 Operation (Clause 8)

Clause 8 of ISO 14001:2015 requires that the processes needed to meet EMS requirements, implement environmental objectives and address risks and opportunities are established, implemented and maintained. This includes establishing and implementing operating criteria, and the processes required to meet those criteria.

9.1 Operational Planning and Control

Operational Planning and Control defines the day to day measures to be applied to effectively manage Significant Environmental Aspects of SHE Transmission's activities and services.

In some cases, in particular where a process is subject to a regulatory consent, it will be appropriate to define relevant operating criteria that are consistent with this – e.g. planning conditions, ecology method statements, or noise levels.

Controls are distinct from actions driven by Environmental Objectives which aim to drive improvement (although Objectives may be set to improve the effectiveness of operational controls).

Key SHE Transmission Controls relating to our asset lifecycle are:

- Project management controls – e.g. Large Capital Projects Governance Framework Manual (MA-COR-LCP-001), Project Review Boards and environmental procurement frameworks
- Design and development controls - e.g. Consents and Environmental Manual (SM-NET-ENV-500), Procedure for Routeing Overhead Lines of 132 kV and above (PR-NET-ENV-501), Substation Site Selection Guidelines, Subsea Cable Route selection, planning consenting process and stakeholder engagement
- Engineering controls – e.g. transformer bund drainage specification and noise mitigation
- Construction procedures and controls – e.g. Consents & Environmental Specification (CES) (TEM-NET-ENV-501), Contractor Environmental Management Plans (CEMPs), Generic EMPs (GEMPs), Species Protection Plans (SPPs) (TG-NET-ENV-500 to 508), fuel handling, waste transfer, silt mitigation, construction noise and archaeology; and
- Inspection and maintenance procedures and processes – e.g. SF6 management , transformer oil replacement and oil / waste oil storage and handling / calibration

The SHE Management System Standards also require SHE Transmission to identify SHE Critical Systems (MS-SHE-012), and to establish SHE Critical (operation and maintenance) Tasks (MS-SHE-004). These are identified in the Governance EMP and the required inspection and maintenance tasks are added to the asset management systems (e.g.Maximo) where practical.

Environmental Risk Standards (RS-SHE-300 to 307) specify the requirements for control of key Environmental Aspects. iCARE provides the means for SHE Transmission to record relevant Operating Criteria and Controls against its Significant Environmental Aspects.

9.1.1 Control of Suppliers and External Processes

Outsourced processes in SHE Transmission include engineering design (e.g. substations, overhead lines, cables), environmental survey and mitigation (e.g. ecology and archaeology), construction, operation and maintenance services. These are managed by means of:

- Contractor / consultant engagement – e.g. frameworks and procurement processes
- Contractor performance monitoring and auditing; and
- Electrical plant procurement – e.g. frameworks and procurement processes

9.2 Emergency Preparedness and Response

Environmental incidents and emergencies occur during construction, operation and maintenance of our infrastructure. The most common being releases of silt or other polluting substances and spillages or leaks of fuel and oil.

CA-SHE-301-003, which specifically addresses spill response at sites where oil, fuel or other hazardous liquids are stored and used.

iCARE provides a means of recording relevant local plans against relevant Significant Environmental Aspects. Relevant Documented Information includes emergency procedures, training records, test exercise reports and incident reports.

TEM-NET-ENV-501 Consents and Environmental Specification details requirements for Contractors building new assets to prepare, implement and test an Emergency Response Plan, usually included in their Construction EMP.

Our Operations Team report oil leaks through the SEARs system and follow their own spill response plans. SF6 leaks are reported through the SEARS system. Fire response is carried out in accordance with PR-PS-181 Procedure for Fire Fighting or Rescue near lines and Substations.

10 Performance Evaluation (Clause 9)

Clause 9 of ISO 14001:2015 requires environmental performance to be monitored, measured, analysed and evaluated.

10.1 Monitoring, Measurement and Performance Evaluation

Environmental Performance information may be generated continuously by means of monitoring equipment or data gathering; routinely, by means of scheduled sampling or audit / inspection / checks, or ad hoc by exception in the event of reporting of incidents.

MS-SHE-002 establishes the requirement for Plant and Process Information to be maintained for compliance purposes.

MS-SHE-010 Incident Reporting Management and Investigation requires environmental incidents to be reported via the SSE SEARs system. The Group key indicators relevant to SHE Transmission are the number of major, serious and minor incidents from our construction and operational sites, for which annual targets are set by the SHE Committee. Running totals are reported in the weekly SHE Bulletin, and, against target, in monthly SHE Performance Reports.

SHE Transmission has determined in iCARE, against each relevant Significant Environmental Aspect, if it is appropriate to have a monitoring / measurement or performance evaluation programme, and if so the method and frequency of monitoring / measurement, and the location of the associated records and reporting method.

Where monitoring involves instrumentation, this is identified in iCARE along with associated calibration process and records, and any associated process alarms. In cases where there is a requirement to submit a regulatory compliance report, the relevant instruction is identified.

10.1.1 Evaluation of Compliance

Compliance obligations comprise quantitative performance requirements (e.g. noise limits) and management requirements (e.g. consents, licences and Duty of Care).

Compliance evaluation is achieved by reviewing monitoring information (for quantitative performance) and audit results (management requirements); and available assessments made by regulators. Instances of non-compliances are recorded in SEARs and reported as applicable in the monthly SHE performance report.

During the design and development phase of new projects the LCP Governance process requires a Governance Environmental Management Plan (GEMP) to be produced which sets out all consenting and other legal obligations required for a project, together with gate reviews which seek to ensure projects have all consents and licences in place before proceeding to construction.

During construction, SHE Transmission's Consents and Environment Team carry out periodic inspections and audits to check compliance with the GEMP, Construction Environmental Specification (CES) and the Contractor's Construction Environmental Management Plan (CEMP).

During the operation and maintenance of assets procedures and requirements to manage legal obligations around SF6 and transformer oil are reviewed periodically by the Maintenance Managers. Internal audits (Safety, Environment & Quality) are also carried out on these activities and review performance against legal requirements.

10.2 Internal Audit

Internal audit results are critical inputs that help to assess the effectiveness of our EMS. MS-SHE-014 and RF-SHE-411 define requirements for SHE Internal Audits across the SSE Group. Audit plans are produced annually by both SSE Group (Core processes and Risk Standards) and within SHE Transmission (Operational and Process Controls).

WI-NET-ENV-500 Consents and Environment Audit and Inspection Guide defines the process for carrying out periodic audits and inspections on our projects and Contractors during construction, as well as internal EMS audits.

System audits are conducted at planned intervals, in accordance with our audit schedule, to determine whether the EMS conforms to SHE Management System arrangements and to the requirements of ISO 14001:2015 and whether EMS controls are being implemented and compliance obligations met.

SHE Transmission's audit schedule is based upon consideration of the status and importance of each process comprising our EMS, and is maintained in the Consents and Environment SharePoint site's EMS page. Audit plans and audit reports are Documented Information.

The selection of competent auditors and their subsequent impartial conduct ensures objectivity throughout the audit process. Each Auditor ensures that:

- The results of each are reported to the Head of Environment
- Timely appropriate corrective action is undertaken where required
- Audit reports are retained as evidence of the effective implementation of the audit schedule

10.3 Management Review

MS-SHE-015 defines requirements for Management Reviews across SSE Group. These will be undertaken at aGroup level and in individual business units. Management review reports are Documented Information.

The Transmission SHE Committee is delegated by the TEC to review and report on SHE Transmission's environmental performance at planned intervals by reviewing:

- Trends in nonconformities and monitoring results
- Conformity to compliance obligations
- Audit findings
- Communications from interested parties (external and internal)

Key findings and recommendations are presented to the TEC for approval and action. The primary outputs of management review meetings are the actions necessary to make changes or improvements to the EMS and the provision of resources needed to implement these actions. Responsibilities for required actions are assigned to members of the Transmission SHE Committee and TEC as appropriate. Any decisions made during the meetings, assigned actions and their due dates are recorded in minutes and saved on the Consents and Environment SharePoint site.

11 Improvement (Clause 10)

Clause 10 requires SHE Transmission to determine opportunities for improvement and implement necessary actions to achieve the intended outcomes of our EMS.

11.4 Non-conformity and Corrective Action

MS-SHE-010 Incident Reporting Management and Investigation defines the corrective action process in the event of a hazard or an incident, using the SEARs database. The SEARs database provides a record of non-conformities and corrective actions for incidents (and hazards).

WI-NET-ENV-500 Consents and Environment Audit and Inspection defines the Corrective Action process. Corrective actions are recorded in the Environmental Audit and Inspection Action Tracker which is maintained by the Head of Environment in the Consents and Environment SharePoint's EMS page. Corrective actions may also be recorded by the individual project in a project specific tracker or through meeting minutes.

Management with responsibility and authority for implementing corrective actions are notified promptly of non-conformities. SHE Transmission takes action to eliminate the cause of non-conformities in order to prevent their recurrence. Corrective actions are appropriate to the effects of the non-conformities raised.

The resulting corrective actions are reviewed by the Head of Environment and are reported to the Transmission SHE Committee in order to determine if changes to the EMS are required, or whether any new risks or opportunities need to be considered. Documented information concerning the nature of any non-conformances and their resulting corrective action is retained.

Follow-up audits may be conducted to ensure that effective corrective action is taken and that the action is appropriate to the impact and nature of the problem encountered.

11.5 Continuous Improvement

The principle processes for Improvement come from the SHE Management System and include Incident Reporting (MS-SHE-010), Audit (MS-SHE-014) and Management Review (MS-SHE-015) which all have provision for triggering improvement, along with innovation. In addition, SHE Transmission's Project Consents and Environmental Auditing provides a feedback mechanism to improve the performance of construction activities, whilst the LCP Governance process and Lessons Learned sessions allow good practice to be carried over into new projects.

Performance against the objectives set out in our SHE Plan is reviewed by the Transmission SHE Committee on an ongoing basis, with annual performance reporting to the TEC.

The overall effectiveness of continuous improvement processes is assessed through our management review process.

12 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New document created	n/a	1.00	[redacted]
02	Updated with TEC reference and other process and document changes / improvements	TG-NET-ENV-509(Rev1.00)	2.00	[redacted]
03	Review of document due, updated reference table 2.1 and Appendix A.	TG-NET-ENV-509(Rev2.00)	3.00	[redacted]
04	New reference document added. One removed, two others numbers amended.	TG-NET-ENV-509(Rev3.00)	3.01	[redacted]
05				

Appendix A EMS Documented Information

(Document names in Grey Italics are in development / draft and not currently controlled)

ISO14001 Clause	Description	SSE Group Documents		SHE Transmission / SSEN Documents	
5.1	Environmental Policy	PO-COR-054	Environment & Climate Change Policy		
		PR-GRP-016	Group Sustainability Policy		
5.3	Roles & Responsibilities	MS-SHE-001	Safety , Health & Environment Organisation	SM-NET-ENV-500	Consents and Environmental Manual
		RF-SHE-424	iCARE	REF-NET-ENV-502	Construction Environmental Roles & Responsibilities
6.1	Environmental Aspects	MS-SHE-003	SHE Risk Management		
		RF-SHE-424	iCARE		
6.1	Compliance Obligations	RF-SHE-400	SHE Legislation Register		
6.2	Environmental Objectives	RF-SHE-424	iCARE	N/A	EMS Objectives – Management review
6.2	Environmental Management Plans			N/A	SHE Plan
7.2/7.3	Competence and Awareness	MS-SHE-008	Personnel Training & Performance	SM-NET-ENV-500	Consents and Environmental Manual
7.4	Internal Communication	PR-COR-SHE-001	SHE Organisation Procedure	SM-NET-ENV-500	Consents and Environment Manual
7.4	External Communication	RF-SHE-424	iCARE	SM-NET-ENV-500	Consents and Environment Manual
					Transmission Performance Report

7.5	Documented Information	WI-COR-001	Development, Control & Issue of Company Documentation	SM-NET-ENV-500	Consents and Environment Manual
		RF-SHE-424	iCARE	PR-NET-GOV-002	Development, Issue and Control of Scottish and Southern Electricity Networks Documentation
				N/A	Consents and Environment SharePoint Site
				N/A	SSEN Safetynet
8.1	Operational Planning & Control	RS-SHE-300 to 307	SSE Risk Standards	SM-NET-ENV-500	Consents and Environment Manual
		RF-SHE-424	iCARE	TEM-NET-ENV-501, TEM-NET-ENV-503	Project Consents and Environmental Specification (CES), Project Consents & Environment Plan (PCEP)
		RS-SHE-300	Waste Management		*Substation Site Selection*
					Subsea Cable Route Selection
				PR-NET-ENV-501	Procedure for Routeing Overhead Lines and Underground Cables of 132kV and above
				TG-NET-ENV-500 to 508	Species Protection Plans
				N/A	Generic Environmental Management Plans
				N/A	Beauly Oil Depot Working Plan
					SF6 Management Manual

				TG-NET-ENV-524	Ornithology Methods for Transmission projects
				TG-NET-ENV-525 TG-NET-ENV-526 FC-NET-ENV-500	An introduction to Biodiversity Net Gain Biodiversity Net Gain Toolkit User Guide BNG Procedure Flowchart
				MA-COR-LCP-001	LCP Governance Framework Manual
8.2	Emergency Preparedness & Response	MS-SHE-011	Emergency Planning and Response Standard	TEM-NET-ENV-501	Project Consents and Environmental Specification (CES)
		CA-SHE-301-003	Spill Response		
9.1	Performance Monitoring	MS-SHE-010	Incident Reporting, Management andInvestigation	N/A	SHE Performance Report
				TEM-NET-ENV-501	Project Consents and Environmental Specification (CES)
					SF6 Management Manual
				N/A	Consents and Environment SharePoint Site
9.1	Compliance Evaluation	N/A	SHE Performance Report	WI-NET-ENV-500	Project Consents and Environment Audit and Inspection Guidance
					SF6 Management Manual
				N/A	SHE Performance Report
9.2	Internal Audit	MS-SHE-014	SHE Auditing	WI-NET-ENV-500	Project Consents and Environment Audit and Inspection Guidance

				FO-NET-ENV-501	Project Environment and Consents Audit Form (embedded in WI-NET-ENV-500)
				FO-NET-ENV-502	Monthly Site Environmental Inspection Form (embedded in WI-NET-ENV-500)
		RF-SHE-411	SHE Internal Audits	FO-NET-ENV-503	Internal EMS Audit Form (embedded in WI-NET-ENV-500)
9.3	Management Review	MS-SHE-015	Management Review	N/A	Management Review Minutes
10.2	Nonconformity & Corrective Action	MS-SHE 010	Incident Reporting, Management and Investigation	SM-NET-ENV-500	Consents and Environment Manual
		MS-SHE-014	SHE Auditing	WI-NET-ENV-500	Consents and Environment Audit and Inspection Guide
		PR-COR-002	Non-conformance Management		

Appendix B SHE Transmission Key EMS Roles and Responsibilities

Specific key roles in relation to the EMS have also been established, these being:

Transmission Executive Committee (TEC)

Governance is required for both the EMS implementation and its ongoing maintenance and improvement. The Transmission Executive Committee will provide ultimate governance and reporting to the wider business for SHE Transmission and be responsible for:

- Annually reviewing and setting of SHE Transmission Environmental Objectives including acting as individual sponsors for relevant Objectives
- Ensuring adequate resources are made available to implement, maintain and improve the EMS within SHE Transmission
- Carrying out annual Management Reviews

Transmission SHE Committee

The Transmission SHE Committee is designated by the TEC and is responsible for:

- Reviewing progress of the SHE plan on a regular basis
- Performing an annual management review of the EMS and SHE Plan and reporting to the TEC on key findings and recommendations
- Identify and propose new Objectives for approval by the TEC

EMS Sponsor / Management Representative

This top level role will act as the liaison between the Transmission Leadership Team and the EMS Steer / Lead during EMS development, implementation and operation and will be responsible for:

- Reporting on progress during EMS implementation to TLT
- Taking leadership for EMS objectives, targets and performance programmes
- Securing resources and training etc for EMS implementation and ongoing environmental performance improvements
- Providing periodic updates on environmental performance to TLT and leading in Management Review sessions
- Providing scrutiny and steering on EMS scope and business requirements

EMS Steer

This is an EMS development, implementation and operation interface role between the EMS Lead and EMS Sponsor, key responsibilities are likely to be:

- Member of the EMS Steering Group
- Providing scrutiny and steering on EMS scope and business requirements
- Providing updates and requirements to EMS Sponsor during implementation
- Development of EMS Audit schedule for SHE Transmission

- Co-ordinating, reviewing and analysing environmental performance data with EMS Lead
- Reporting on environmental performance related to EMS objectives and targets to EMS Sponsor

EMS Steering Group

This is a strategy and interface group between the SHE Transmission EMS Team and the SSE Group SHE Management System. Key responsibilities are likely to be:

- Reviews and guides development, implementation and operation of SHE Transmission's EMS
- Identifies and facilitates links between current / developing business management systems and EMS requirements
- Providing updates and requirements to EMS Team

EMS Lead

This is the main role for developing the EMS and will play a key part in implementing and maintaining the EMS. Key responsibilities will be:

- Member of the EMS Steering Group
- Developing the EMS strategy in conjunction with the SSE EMS Forum and SSE Group Environmental Manager
- Implementing the EMS strategy in accordance with business requirements
- Developing key EMS documents and processes to ensure conformance to ISO 14001:2015 requirements
- Collating and reporting on environmental performance data
- Development of EMS Audit schedule for SHE Transmission
- Providing general awareness training and developing learning modules

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-524

Consents & Environment

Ornithology Methods for Transmission Projects

TG-NET-ENV-524	Ornithology Methods for Transmission Projects		Applies to Transmission ✓
Revision: 1.00	**Classification:** Internal	**Issue Date:** November 2021	**Review Date:** November 2029

	Name	Title
Author	[redacted]	Consents & Environment Manager
Checked by	[redacted]	Environmental Net Gain Manager
Approved by	[redacted]	Head of Consents & Environment

Contents

1 Introduction

SHE Transmission owns, operates and maintains the 400kV, 275kV and 132kV electricity transmission network in the north of Scotland, in some of the UK's most challenging terrain. It forms part of Scottish and Southern Electricity Networks (SSEN) which is the trading name of the economically regulated network companies owned by SSE plc - Scottish Hydro Electric Transmission (SHE Transmission), Scottish Hydro Electric Power Distribution (SHEPD) and Southern Electric Power Distribution (SEPD).

Our operating area is home to vast renewable energy resources, and this is being harnessed by new wind, hydro and marine generation. Working closely with National Grid, the GB transmission System Operator, SHET also enables these electricity generators to connect to the transmission system by providing connections and allowing the electricity generated by them to be transported to areas of demand across the country.

SHE Transmission has significant interaction with the environment through the activities we undertake in Scotland as we seek to develop and improve the transmission network in response to strong growth in renewable generation in the North of Scotland. With this work comes a legal responsibility to design and build our projects in a manner which protects the natural and built environment. To this end, SHE Transmission's Environment and Consents Team has worked hard to develop and refine controls and processes to ensure these demands, responsibilities and the requirements of interested parties are met.

1.1 Introduction / Scope of document

The aim of this guidance is to outline the most appropriate recommended ornithological input to inform the planning, design and routeing stages of the works, and outline the recommended technical methods to undertake the desk study, field survey, collision risk assessment and reporting stages of the works. Although this guidance is primarily designed for developments requiring EIA, aspects will also be relevant to non EIA works e.g. line upgrades and maintenance. Survey effort will be directly related to the potential impact of the proposed works.

2 References

The documents detailed in Table 2.1 - Scottish and Southern Electricity Networks Documents, Table 2.2 – External Documents, and Table 2.3 – Miscellaneous Documents below, should be used in conjunction with this document.

Table 2.1 - Scottish and Southern Electricity Networks Documents

Reference	Title
TG-NET-ENV-505	SSEN Transmission Birds Species Protection Plan

Table 2.2 –External Documents

Reference	Title
A675474	Assessing Connectivity with Special Protection Areas (SPAs). SNH.
A675503	Assessing the Cumulative Impact of Onshore Wind Energy Developments. SNH.

Reference	Title
C278917	Recommended bird survey methods to inform impact assessment of onshore windfarms. SNH.
C205425	Windfarms and Birds: Calculating a theoretical collision risk assuming no avoiding action. SNH.

Table 2.3 – Miscellaneous Documents

Title
Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds. SNH. 2016 ref.: A2047189

3 Ornithological Assessment and the Planning Process

The ornithological assessment process can inform both the consent and the construction stages of proposed development, and so inclusion at the earliest stages of design can be beneficial to developments. Ornithological input during the early stages, based on thorough desk study (including consultation) and preliminary reconnaissance visits to the site, have the advantage of assisting in the initial route selection process, thereby negating the requirement to undertake unnecessary field surveys.

It is considered that field survey effort should be based on one 12-month period (commencing in March/April or September/October wherever possible in order to correspond with the accepted start dates of the breeding and non-breeding seasons respectively) unless, following consultation with Scottish Natural Heritage (SNH) or another regulatory stakeholder, there is sufficient reason to extend this period to incorporate additional targeted survey effort (or conversely, sensitivities are sufficiently low or localised that reduced survey effort is considered appropriate).

3.1 Cumulative Impacts:

Cumulative ornithological impacts may arise when more than one development combine to create a potentially greater impact than would result from the development in question alone. Furthermore, cumulative impacts from effect interactions within the scheme may also be relevant.

When considering cumulative impacts (from wind farms, Overhead Line (OHL) developments, large infrastructure projects), the bird populations being assessed (including those of nearby designated sites - Special Protection Areas (SPAs), Ramsar sites, Sites of Special Scientific Interest (SSSIs) and NHZs) need to be considered in association with impact assessments from nearby developments within the dispersal range of any target species highlighted by the desk study (referencing (2012) where appropriate).

3.2 Terminology:

For the purposes of this document, the following terminology is adopted:

- Study area – the area within which data collection is completed (this varies depending on the nature of the data collection and is thus necessarily generic)
- Corridor – the area within which the various route options are contained

- Route – linear area under consideration for the final OHL alignment
- Alignment – preferred location of the OHL for which EIA is completed; and
- Limit of Deviation (LOD) – the maximum area covered by potential minor deviations from the preferred alignment

3.3 Data Collection Methodology Guidance:

- The OHL ornithology surveys are based on three phases
- An initial desk study to inform the routeing process and provide a context for all subsequent survey and assessment
- A reconnaissance visit to inform the field surveys; and
- Targeted field surveys

  Consultation with SNH should be in accordance with the current SNH working arrangements.

  Survey design and field survey methods should always target those species with the highest legal protection (Annex 1 or Schedule 1 species) or highest biodiversity value (Red List species or Biodiversity Action Plan (BAP) species).

3.4 Desk Study:

As a default position, 'front-loading' data collection through desk study and consultation should allow a sufficiently informed approach to route selection without necessarily having to progress field survey work across a number of areas. This data collection exercise will also serve to inform all subsequent survey and assessment and will be sufficient for inclusion into final reporting.

It is recommended that in order to maximise the efficiency of consultation with SNH at this stage, a standardised document is produced which collates all existing information as obtained from online resources and relevant non-statutory stakeholders. This information should then be mapped (with support tables/text as appropriate) in order that it can be presented succinctly to SNH for their comments during initial project consultation (i.e. alongside preliminary consultation on other relevant disciplines in order to increase the likelihood of response at this stage).

The desk study should be based on a checklist of appropriate sources. This will include relevant authorities and organisations, as well as existing records covering designated sites, habitat overviews, habitat connectivity, existing databases of bird sightings, and previous work undertaken in the area.

It is accepted that in some instances there will be a requirement to progress field survey work across a number of route options during the routeing selection (e.g. where particular potential sensitivities exist, or in the interests of achieving an overall programme for the project); with this in mind the implementation of detailed field survey work is somewhat fluid in this respect and will be decided on a site-by-site basis.

Desk Study Sources:

The desk study resources could include, but are not limited to:

- Existing SHE Transmission/SSE information
- Other relevant Environmental Statements (i.e. wind farms, where available)

- SNHi
- SNH connectivity guidance
- NBN Gateway / Atlas of Living Scotland
- Local Biological Records Centres
- Forestry Commission Scotland (FCS)
- Local Biodiversity Action Plan (LBAP)
- The Royal Society for the Protection of Birds (RSPB)
- Local Raptor Study Groups (LRSGs); and
- Local Bird Reports and Recorders
- Information requested will include, but not be limited to:
    - the location of important bird assemblages (outwith readily available information pertaining to designated sites)
    - known recently- or habitually-used target species breeding/foraging/roosting locations
    - known recently- or habitually-used flight routes (e.g. wildfowl flight routes between foraging and roosting locations
    - important bird habitats/features
    - target species sightings of note; and
    - any other pertinent information based on the specific location of the proposed route

3.5 Site Reconnaissance:

On successful completion of the desk study (or whilst this is ongoing, depending on timing/programme considerations), a preliminary site visit will be made in order to ground-truth the potential study area and pinpoint locations for VP watches to be conducted.

Following the site visit and VP location selection, each viewshed will be calculated in ArcGIS Spatial Analyst (or similar software) to establish the appropriate number and location of VP watches to be completed. The calculations should be based on VPs covering a 180° arc and a 2 km viewshed distance. The viewshed mapping should show the minimum height visible at all locations within each viewshed, this is typically shown by colour coding heights into suitable bands such as 0-10 m, 10-20 m etc. which should correspond with any known parameters of the proposed OHL, e.g. if the conductor and earth wires of the OHL are likely to occupy the area between 20 m and 60 m above ground level, then the viewshed should show visibility of flights at 20 m over 2 km). These calculations allow selection of suitable VPs to ensure that all flight lines of birds can be recorded within the risk zone.

In addition to production of viewshed maps, a standardised, ornithological methods document should be produced detailing the proposed survey methods, survey effort and the species or habitats for which targeted surveys are proposed within the study area.

This document will engage SNH into continued dialogue with the aim to secure approval of the proposed survey approach. This is particularly important for developments in, or adjacent to, designated sites where a high level of impact on bird populations or on protected species may be expected.

3.6 Field Survey Methods:

The suite of bird surveys required for OHL developments will follow standard guidance, with surveys based on time of year, habitat and species. Each survey will be targeted to concentrate on the key species and habitats identified in the desk study and during the reconnaissance visit. It is a critical consideration of this guidance that exact survey requirements including search areas are considered on a case-by-case basis. The most frequently required surveys are as follows:

- Vantage Point (VP) watches to record bird flights within the study area
- Upland breeding bird surveys to record breeding activity on moorland areas within the study area
- Winter bird surveys to record any bird activity through the winter months

Waterbody searches to record any species specific activity by divers or other waterfowl in or adjacent to the study area, or where the target species is likely to utilise the preferred route for commuting purposes; and

Raptor searches to record locations of raptor nests and species specific activity in or adjacent to the survey area, or where the target species is likely to utilise the OHL corridor for foraging or roosting purposes.

3.7 Black grouse and capercaillie surveys:

Additional surveys (such as lowland breeding bird surveys/Common Bird Census, etc.) will likely be required in a number of circumstances; the full suite of survey methods and extents will be agreed with SNH.

As discussed above, one calendar year of survey effort is recommended. Survey effort in the relevant breeding seasons should not be split across years.

All field surveys will be undertaken by experienced surveyors, holding the relevant licences if required, with an excellent understanding of flight heights and data recording in the field.

3.8 Vantage Point (VP) Watches:

VP watches follow the standard guidance for onshore wind farms, as outlined by Madders (unpublished; given as appendix in Whitfield, 2002; Whitfield & Bullman, 2004; and SNH, 2014) with survey effort equating to 72 hours per year unless sufficient reason exists for varying this (such as to ascertain/confirm habitual flight routes for diver species). Surveys will be undertaken across the entire day, with due consideration given to key periods for the perceived target species (e.g. dawn/dusk watches to pick up geese movements to/from feeding grounds), and will comprise maximum 3 hour watches.

When selecting VP locations, the aim is to cover all of the flight activity survey area such that no point is greater than 2km from a VP. It is important that VPs are chosen to achieve maximum visibility with the minimum number of points. As detection of flight activity will decrease with

distance, VPs are located as close to the survey area as possible. However, to minimise the observer's effect on bird behaviour, VPs are best located outside the survey area where possible. In order to minimise disturbance, VPs are not located near to sensitive sites for target species, i.e. nest, roost or lek sites. Observers try to position themselves inconspicuously so as to minimise their effects on bird movements. Care should also be taken not to locate VPs in locations that may lie directly between the site and a roost or nest site of a key target species, as this can influence the behaviour of birds to be surveyed.

Where VPs are located within the study area, they should not be used simultaneously with other VP locations which overlook them as the presence of an observer either sitting at or moving to/from the VP will probably affect bird behaviour.

The majority of VPs are likely to be required in upland areas where there is a chance of raptor activity, by waterbodies or farmland where there is a chance of accumulations of roosting or foraging waterfowl, or alongside forest edges where there is a chance of forest grouse (black grouse or capercaillie) being present. Before surveys commence, it is advised that the surveyor walks the viewshed area to acquaint him/herself with the topography and to gauge relative heights of landscape features, access permitting. As the potential collision risk zone is narrower on OHL developments than on wind farm projects, the accuracy of flight height is more critical to assess accurately in the field should a collision risk assessment be required.

There should be a break of at least 30 minutes between VP watches to minimise observer fatigue. Watches can be suspended and then resumed to take account of changes in visibility, e.g. fluctuations in the cloud base, passing rain shower or for the observer to rest. A combination of more than 9 hours VP watches should not be carried out by the same observer(s) over the course of a single 24 hour period.

Flight direction, flight height, and flight length of the target species are drawn onto a 1:25,000 Ordnance Survey map as per wind farm guidance, although the following is recommended:

Rather than using 15 second time periods to ascertain flights within each height band, it is recommended that each change of height band during the flight will be recorded to the nearest second, as will the total flight time;

Rather than solely recording each flight as appearing within each height band, each flight height will be recorded as accurately as possible to assist with a collision risk assessment, should it be required; and

Within the same OHL development, the height of the wooden poles or lattice towers is likely to vary, and VP data and the subsequent analysis is able to reflect this imbalance by using a variation in height bands during fieldwork.

3.9 Upland Breeding Bird Surveys:

The survey method outlined is suitable for many moorland and open country species including waders, skuas, gulls, red grouse and some wildfowl species (SNH does not recommend the method for surveying moorland passerines and thus is excluded here). SNH guidance recommends an adapted Brown & Shepherd (B&S) method with four survey visits at least seven days apart.

Surveying is based on a constant search method involving spending 20 - 25 minutes in each 500m x 500m quadrat, both within the survey area and a pre-determined 500m buffer zone.

This equates to spending 100 minutes for every square kilometre. Each quadrat is walked to ensure that all parts are approached to within 100m. At regular intervals, the surveyor scans the area for species and also listens out for calls and songs. These should cover the whole breeding season between mid-April and late-July, and be conducted between 8:30 hours and 18:00 hours. They should be carried out in a wind of Beaufort force 4 or less, and in dry weather.

3.10 Winter Bird Surveys:

The upland winter walkover survey closely follows the adapted B&S moorland breeding bird survey method, with fieldwork being undertaken up to four times during the period October to March. Distances and times are more liable to vary depending on the ground conditions, weather conditions, available daylight hours and/or likelihood of birds being present within certain habitats in remote areas.

3.11 Waterbody Searches:

Searches are made for protected waterfowl on all waterbodies inside and out with the main study area. Following SNH guidance, site specific searches may be required for nesting red-throated divers (searches are undertaken on all potentially suitable waterbodies within 1km of the development area), black-throated diver (waterbodies up to 1km), or Slavonian grebe or common scoter (often combined with the diver surveys). In the event breeding divers are located during these searches, it may be necessary to conduct further searches across suitable habitat, to fully ascertain breeding numbers and flight line data to and from their nesting locations. Additionally, full consideration should be made of SPA connectivity distances. The water bodies are visited at least twice during the breeding season if nothing was present. However, if occupied, it may be necessary (should sufficient risk of disturbance exist) that sites are revisited later in the breeding season to determine nest locations, breeding success and productivity.

Species specific VPs may also be required should protected waterfowl species be recorded in, or immediately adjacent to, the survey area (due consideration should be paid at this stage to SNH connectivity guidance (SNH 2012). For divers, these VPs are often undertaken around dawn and dusk.

3.12 Raptor Searches:

Surveys consist of targeted walkovers of the site once breeding in a specific area is suspected following previous survey results, or based on correspondence with the relevant consultees. Detailed species specific guidelines of breeding season visit schedules (i.e. in order to correspond with variations in breeding season timing), location of home ranges/territories/nests are followed (Hardey et al. 2013). Raptor nest monitoring can continue until the end of August depending on the timing of the brood, geographical location and the weather conditions. Several raptor species, especially red kite, white- tailed eagle and hen harrier, form communal roosts mostly out with the breeding season. Roost sites within 2km of the proposed development are monitored (including winter roosts).

It is likely that a key component in informing this survey element will be information obtained from the LRSG. As a precautionary measure, the LRSG should also be contacted to ensure that nest/territory watches aren't being completed concurrently which may result in unacceptable levels of disturbance to birds.

3.13 Coastal Waterbird Searches:

Where required, searches are made for protected waterfowl, waders, gulls and terns in coastal areas generally within 2 km of the main study area following SNH bird survey guidance (SNH 2014). Likely surveys which may be required are for assemblages of wintering waders and waterfowl as well as coastal roosts of gulls and terns, as well as for breeding gulls and terns.

Breeding coastal waders will be surveyed based on O'Brien and Smith lowland wader methodology (SNH 2014; Gibert et al. 1998). Three surveys visits will be undertaken between mid-April and mid-June during the three hours following dawn. Coastal breeding sites including saltmarsh, grazing marshes, shingle beaches, dunes, rocky shores and lowland grassland will be surveyed.

Species surveys will be undertaken on a site by site basis following species specific methodology.

3.14 Data Management:

To ensure that all data recorded in the field are managed efficiently with minimised risk of error during the digitisation process, it is recommended that digital data collection is used where possible.

For analogue data entry onto field data sheets, it is recommended that standardised recording forms are used to ensure consistency data collection.

It is recommended that the data are checked under standard quality assurance peer reviews during every transfer process (i.e. from field data sheet to spreadsheet) to ensure consistency and accuracy is maintained. This process should be logged for auditing purposes and subject to spot-checks to ensure compliance. Hard copy data sheets should also be scanned and saved electronically in order to provide a secure back-up of all collected information.

3.15 Collision Risk Assessment:

On completion of the baseline data collection exercise, the requirement for and method of collision risk modelling shall be agreed with SNH. The two possible options at this stage are as follows:

- No modelling required; and
- Quantitative Method

The quantitative model has been accepted by SNH on recent relevant OHL projects and assesses potential risk levels to birds flying through the OHL corridor, based on actual flight heights. This has been used effectively to establish estimated mortality rates to direct flying wildfowl following collaboration with SNH to determine avoidance rates, but could also be used effectively for other species groups.

This method is discussed in more detail below.

3.16 Quantitative Assessment Method:

Should flight activity be such that collision risk modelling is deemed as being required (both in terms of in terms of potential collisions but also considering what this means in assessment terms, i.e. effect upon the conservation status of the population in question), then it is

proposed that the quantitative assessment method is employed in order to generate a number for the collision risk. The following parameters should be reviewed on a project by project basis to ensure applicability and it may be necessary to develop a more site specific model to ensure acceptance of methodology by SNH.

3.17 Risk Window:

The first stage of this model is to identify what exactly the birds could potentially collide with. In the case of an OHL, this is the conductor and earth wires (the towers themselves are considered likely to be sufficiently visible to allow birds to avoid them). In order to identify whether birds fly at the heights that the conductor and earth wires would occupy within the proposed development, information provided by SHE Transmission project design engineers, specifically relating to anticipated wire height and characteristics is utilised to identify the airspace occupied by these wires: this is termed the 'risk window'. The risk window is taken to be the airspace from the lowest conductor wire to the earthwire.

All flights observed during vantage point survey work are then allocated into one of the three defined flight height bands relating to this risk window.

3.18 Number of Birds at Risk of Collision:

After 12 months of Vantage Point surveys, the digitised data is analysed to identify flights above and below the risk window. Flights which do not cross the footprint of the OHL LOD will be discounted from further analysis.

For all remaining flights passing through the risk window, the number of flights per hour can then be extrapolated from the total number of flights and total survey hours. This in turn allows the number of flights during the active season to be estimated.

3.19 Calculation of Active Season:

For diurnal resident species, the active season is all of the daylight hours within a full year. The active season for seasonal species is taken to be the period between the first and last records of that species made during the surveys or as derived from other scientific data.

For some species, nocturnal activity will need to be included in the total activity time. For example, for wildfowl, it might be appropriate to consider that they are active for 25% of available night-time hours. This should be decided and agreed with SNH prior to, or during the early stages of, survey effort commencing.

As well as calculating the total available hours for a species, it is important to consider how many hours were surveyed for the appropriate period. For resident, diurnal species, that is the number of hours completed over a full year of VP surveys, for others, it is the number of hours surveyed during the period taken to be that species active season.

3.20 The Probability of Colliding with a Wire:

It is assumed in the SNH wind farm collision risk model (SNH 2000)[1] that the probability of a bird encountering a turbine rotor disk is proportional to the percentage of the risk window frontal area taken up by all the wind farm rotors combined. Similarly, for an OHL, the probability of colliding is assumed to be proportional to the extent of the risk window occupied by wires and excluding all the areas of airspace in between.

3.21 This is calculated by multiplying the potential vertical area occupied by a given bird species by the total length of wire, allowing for wire sag and dividing by the total area of the risk window.

The potential vertical area occupied by a bird is calculated by considering a flying bird to be a semi-circular shape with an end-on area (the part that could collide) equal to: $(\pi(d/2)2)/2$

Other shapes were considered such as a full circle shape to allow for a bird approaching the wire not in horizontal flight; however, this was found to provide extremely high and unrealistic numbers (approximately 75%) for the amount of airspace occupied by the wires. Conversely a simple box shape was found to be over-simplistic, giving very low numbers (approximately 10%) and so the model was altered to incorporate a semi-circle, which still allows for a level of wing movement similar to that observed in flying wildfowl and raptors.

The probability of collision is calculated for all of the wires on a given OHL, including any earth wire. For a steel lattice tower OHL, there are typically seven wires in total. This is a conservative approach which allows the collision risk for bird flights whose trajectory means that they could safely fly through the first set of wires (on one side of the towers), but could potentially hit the second set on the other side of the towers)to be taken into account. As the trajectory of birds entering the risk window is not taken into account in this model it is important that all wires are assessed as an individual risk to any flying bird that crosses the risk window.

- The probability of a collision for a 100 m section of OHL
- Risk window: a m (highest wire) - b m (lowest wire = c m (height)
- 100 m (length) x c m (height) = d m^2

Each individual length of wire is multiplied by half the wingspan of a bird. (the top to bottom of the semicircle which represents a flying bird (a bird would therefore be considered to hit the wire if it were to touch the wire at any point, from the tip of a fully extended upward or downward wing or by the top of its head/body).

A precautionary 35 % was chosen to be used in the actual CRA for whooper swans. This was to allow for potential errors resulting from the use of a semi-circular shape to represent a bird, e.g. half the wingspan used to represent the semicircle of a bird does not account for the head or neck of the bird which could also hit the wires. A semicircle also does not account for particularly vigorous wingbeats that might go higher or lower, and therefore occupy more space than the semicircle representation.

[1] SNH Guidance Note Series (2000). Windfarms and Birds: Calculating a theoretical collision risk assuming no avoiding action

1.4	Here is an example for whooper swan:
1.5	Whooper swan wingspan 2.35/2 = 1.175
1.6	(By advice from OHL engineers the sag of the wires adds 0.01 m length for every 1 m. Therefore 100 m OHL length amounts to 101 m of actual wire.)
1.7	1.175 m x 101 m= 118.7 m^2
1.8	118.7 m x 7 (wires) = 830.7 m^2
1.9	Proportion of total risk window (3,000 m^2 for this particular example) to wire airspace (830.7 m^2) gives an answer of 28 %.
1.10	(830.7 / 3000) x 100 = 27.69 %

Figure 3.1 - Worked Example of the Proportion of a Collision Risk Window Relevant to Whooper Swans

3.22 Summary and Final Calculation:

For each species modelled, the following calculations are completed:

- The number of birds observed at collision height is divided by the number hours of observation to derive a per hour flight rate at collision height
- That number is multiplied by the number of activity hours in the season/time period being considered (e.g. for season specific qualifying features of SPAs, whose flight activity during these seasons only will be relevant when assessing potential collision risk effects upon it)
- This number is then multiplied by the probability of a collision with a wire if passing through the risk window; and
- This gives a collision risk figure which assumes no avoidance
- The collision risk figure is multiplied by an appropriate avoidance rate (typically SNH wind farm avoidance rates in the absence of other data); and
- This gives the final per annum collision risk for each species

Where appropriate, this model is then re-run to incorporate design changes through mitigation.

3.23 Construction Mitigation:

The main source of mitigation is the incorporation of ornithological constraints in to the design process in order that such sensitivities are avoided. Where this is not possible, or not wholly achieved, there are three standard forms of construction mitigation which can be employed. Standard mitigation measures currently employed include:

- Sympathetic timing of works to avoid key bird activity periods (e.g. the breeding season);
- The use of a variety of bird flight diverters (BFDs) on OHL; and
- The use of a variety of earth or wire marking on the earth line.

Undergrounding sections of transmission lines is only advised in certain circumstances where there is predicted to be a significant population level effect or an effect on the integrity of a designated site population and where no other suitable alternative is available.

3.24 Chapter Writing:

Due to the similarity to undertaking ornithological assessments for wind farms and other large-scale renewable energy projects, the chapter writing will be based on standard chapter formats. A recommended summary of contents is provided below in paragraph 6.1.3, and to ensure current guidance is adhered to, due consideration will be paid to the latest CIEEM EcIA guidance (CIEEM, 2016).

Chapter structure:

- Introduction
- Assessment Methodology and Significance Criteria
- Sensitive Receptors
- Baseline Conditions
- Assessment of Effects, Mitigation and Residual Effects
- Summary

4 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New document created	N/A	1.00	[redacted]
02				

Scottish & Southern Electricity Networks

TG-NET-ENV-525

Environment

An Introduction to Biodiversity Net Gain

TG-NET-ENV-525	An Introduction to Biodiversity Net Gain		Applies to	
			Distribution	Transmission ✓
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Contents

1 Introduction

Scottish Hydro Electric Transmission (SHE Transmission) owns, operates and maintains the 400 kV, 275 kV and 132 kV electricity transmission network in the north of Scotland, in some of the UK's most challenging terrain. It forms part of Scottish and Southern Electricity Networks (SSEN) which is the trading name of the economically regulated network companies owned by SSE plc - SHE Transmission, Scottish Hydro Electric Power Distribution (SHEPD) and Southern Electric Power Distribution (SEPD).

Our operating area is home to vast renewable energy resources, and this is being harnessed by new wind, hydro and marine generation. Working closely with National Grid, the GB transmission System Operator, SHE Transmission also enables these electricity generators to connect to the transmission system by providing connections and allowing the electricity generated by them to be transported to areas of demand across the country.

SHE Transmission has significant interaction with the environment through the activities we undertake in Scotland as we seek to develop and improve the transmission network in response to strong growth in renewable generation in the North of Scotland. With this work comes a legal responsibility to design and build our projects in a manner which protects the natural and built environment. To this end, SHE Transmission's Environment and Consents Team has worked hard to develop and refine controls and processes to ensure these demands, responsibilities and the requirements of interested parties are met.

1.1 Introduction / Scope of document

This report provides background to Biodiversity Net Gain (BNG) and SHE Transmission's implementation of the BNG process, across project development work to date as well as providing details on the technical application of the revised Defra metric. SHE Transmission has published commitments to BNG including the commitment of achieving overall 'No Net Loss' on new infrastructure projects gaining consent in 2020 onwards, and achieving Net Gain on projects gaining consent from 2025 onwards. This report considers the broad aims of incorporating BNG into the SHE Transmission's gate stages of terrestrial project development, and how this industry-leading process can be of benefit to the business.

2 References

The documents detailed in Table 2.1 – Scottish and Southern Electricity Networks Documents, and Table 2.2 – External Documents , should be used in conjunction with this document.

Table 2.1 – Scottish and Southern Electricity Networks Documents

Reference	Title
TG-NET-ENV-526	Biodiversity Net Gain Toolkit User Guide
FC-NET-ENV-500	BNG Procedure Flowchart

Table 2.2 – External Documents

Reference	Title
Link	Higher Level Stewardship Farm Environment Plan Manual. 3rd Edition. Natural England (2010)

3 SHE Transmission's Approach to BNG

3.1 Introduction

This document provides background to BNG and SHE Transmission's implementation of the BNG process, across project development work to date as well as providing details on the technical application of the revised Department of Environment, Food and Rural Affairs (Defra) metric. SHE Transmission has published commitments to BNG including the commitment of achieving overall 'No Net Loss' (NNL) on new infrastructure projects gaining consent in 2020 onwards, and achieving Net Gain (NG) on projects gaining consent from 2025 onwards. This report considers the broad aims of incorporating BNG into the SHE Transmission's gate stages of terrestrial project development, and how this industry-leading process can be of benefit to the business.

3.2 What is BNG?

The International Union for the Conservation of Nature (IUCN) and the Convention on Biological Diversity (CBD) define biodiversity as follows:

"'Biological diversity' means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems."

A loss of this biodiversity can occur from many development activities even when efforts are made to avoid this as part of the Environmental Impact Assessment (EIA) process. The principle of BNG is to avoid, minimise and restore nature, and ensure that negative impacts from development are compensated by either equivalent or preferably additional gains for biodiversity (no net loss and net gain respectively). The BNG approach takes a more holistic approach than EIA which addresses specific aspects of the environment individually rather than a system as a whole. In applying BNG, addressing biodiversity impacts should be prioritised to deliver improvements within the development footprint. This will require early consideration of the development boundary to ensure it provides sufficient areas for biodiversity compensation. Only as a last resort should biodiversity losses be compensated outside of the development or 'offsite' (known as biodiversity offsetting). This follows the mitigation hierarchy which is one of the key principles of BNG.

BNG is a quantitative, stepwise assessment process applied to development to fully quantify biodiversity impacts. It should ideally be applied at all stages of development, from site selection and site design to construction and operational phases, to minimise biodiversity losses through the development process. Minimising impacts and maximising biodiversity outputs requires close working between landscape specialists, design engineers, ecologists, biodiversity specialists, project managers, and ideally the principal contractor. Through its application, BNG identifies clear, quantifiable impacts which can be factored into engineering and landscape design considerations.

For example, the BNG process can support the assessment of how best to improve habitats, and can alert the developer to areas that are of high environmental value and therefore should be avoided during development. BNG is a move away from opinion-based assessments of biodiversity change and allows for transparent comparable reporting backed up by a robust evidence base.

BNG is based on the application of a standardised environmental metric to quantify biodiversity losses and gains. Within the UK, most commonly used metrics are based on the 2012 Defra metric . By collating data on type, condition and area of habitat, the metric provides a quantified indicator of the biodiversity on-site before and after development in terms of 'biodiversity units'. This information can then be used to assess whether the development meets BNG targets for the habitats on site. It can also be used in conjunction with qualitative ecological data for the site (such as information on legally protected sites and species) to enable a full assessment of biodiversity impacts as part of an EIA.

The application of BNG is guided by ten 'Good Practice Principles' which are a set of industry developed standards to achieve sustainable wins for biodiversity and development. The principles state that achieving net gain requires 'doing everything possible to avoid losing biodiversity', involving stakeholders, and creating habitat that is valuable locally. The good practice principles for development are as follows:

- Apply the mitigation hierarchy;
- Avoid losing biodiversity that cannot be offset by gains elsewhere;
- Be inclusive and equitable;
- Address risks;
- Make a measurable Net Gain contribution;
- Achieve the best outcomes for biodiversity;
- Be additional;
- Create a Net Gain legacy;
- Optimise sustainability; and
- Be transparent.

A key principle is the strict application of the mitigation hierarchy. The hierarchy dictates that biodiversity impacts from developments should first be avoided, mitigated, and compensated for on-site and only as a last resort be compensated for off-site (offset). If applied and implemented successfully BNG results in more biodiverse developments and can provide wider benefits for people, such as improved air quality and recreational amenities. If a development can follow these ten principles, it is possible for the development project to achieve lasting biodiversity net gain.

The Defra metric for BNG assessment has been in use across a variety of the UK's development projects since 2012. It has recently been reviewed and a revised metric (version 2.0) underwent a trial period with the final version due to be published in December 2020. As part of this trial, SHE Transmission has reviewed and adapted the new metric to allow it to be used for its development projects, and to inform the adoption and development of the metric within Scotland.

3.3 SHE Transmission's Biodiversity Ambition

SHE Transmission is committed to protecting and enhancing the environment by minimising the potential impacts from its construction and operational activities on biodiversity. As part of this approach, SHE Transmission undertook a trial in July 2017 of BNG at the Spittal Substation development, part of the Caithness-Moray project. The baseline biodiversity of the site pre-development and the resulting biodiversity after implementation of the consented landscape plan was assessed. The assessment revealed that the development would result in a 23% net loss of biodiversity. Modifications to the landscape plan to maximise the available land and therefore the biodiversity outputs were discussed, then the adapted landscape plan design was assessed using the Defra metric. It highlighted that, if implemented and habitats given appropriate time to mature, the site would achieve a 34% net gain in biodiversity. This trial was evidence to show the possibilities for achieving biodiversity gain from a substation development.

SHE Transmission applied BNG assessments to three further substation developments in 2018; Stornoway, Tomatin and Fort Augustus. These sites varied greatly from the value of their baseline habitats, scale, the constraints of each site, and the detail of their habitat management plans post-development. The BNG assessments for these sites enabled SHE Transmission to develop a further understanding of the BNG process and gain valuable lessons and insights to its application and potential benefits for the business and the wider environment.

During this process, SHE Transmission published its Sustainability Strategy in May 2018 and became the first Scottish developer to make commitments to BNG, highlighting SHE Transmission's leadership in tackling biodiversity loss.

SHE Transmission 's published commitment for new infrastructure projects is to:

- Ensure natural environment considerations are included in decision making at each stage of a project's development
- Utilise the mitigation hierarchy to avoid impacts by consideration of biodiversity in project design
- Positively contribute to the UN and Scottish Government Biodiversity strategies by achieving an overall 'No Net Loss' on new infrastructure projects gaining consent in 2020 onwards and achieving Net Gain on projects gaining consent in 2025 onwards.
- Work with our supply chain to gain the maximum benefit during asset replacement and upgrades
- For upgrade, maintenance and operational activities, SHE Transmission propose to:
- Collaborate with partners to realise opportunities for improving the biodiversity on and around our existing sites
- Enhance biodiversity through a comprehensive review of management activities.

In August 2018, SHE Transmission held an internal BNG event, presenting to the SHE Transmission environmental management team followed by a workshop to enable the team to discuss the opportunities and complexities of the implementation the BNG process across the SHE Transmission business.

Following this, SHE Transmission developed a detailed project scope to fully investigate implementation of BNG at project development gate stages, develop a SHE Transmission specific BNG toolkit for use across the business, their consultants and contractors, and enable a full assessment of the new BNG metric to ensure it meets the needs of SHE Transmission's Scottish developments.

3.4 Benefits of BNG Implementation

It is accepted that different development projects will bring different environmental constraints, considerations and potential issues. The project specific benefits that BNG brings may therefore be different in each case. There are wider potential benefits which have been gained by developers who have similarly applied and committed to BNG. The transparency and comparability of the standardised BNG tool allows developments to be more accessible to stakeholders and local objectors. The range of wider business benefits are listed below with a few examples of the project specific benefits already gained by SHE Transmission.

Project Specific Benefits

3.4.1 Resolving Local Objections

At Tomatin Substation there were local concerns over removal of conifer plantation and the loss of habitat to make way for the substation. Through the application of BNG and subsequent landscape plan design changes, SHE Transmission could show that after development the substation site would achieve a 47% net gain in biodiversity, rather than the loss that was perceived by the local community. This uplift was achieved by replacing planned tree planting with areas of more diverse heath/grassland habitats. Also, more dense scrub was proposed away from the areas of blanket bog to avoid drying them out.

3.4.2 Easing Planning Application Issues

In response to the Fort Augustus Substation application, the Forestry Officer raised concerns over the area for woodland replanting to account for the overall woodland loss during the construction and operational phase. In applying BNG it was possible to demonstrate no net loss in woodland cover and assuage the concerns of the Forestry Officer.

Wider Business Benefits:

The wider benefits provided by BNG are many and include:

3.4.3 Leadership

- Influencing other energy infrastructure developers (Scottish Power Energy Networks and National Grid are now considering the implementation of BNG);
- With no policy requirement for BNG in Scotland, SHE Transmission are raising the bar by setting good practice policy. They are leading by example and setting Scottish standards for development;
- Informing Scottish Government and NatureScot (SNH) by sharing lessons learned and supporting wider industry uptake of BNG;
- Demonstrating action against the United Nations sustainable development goals (UN, 2015).

3.4.4 Reputation

- Applying BNG without legal or strong external policy requirements in Scotland shows clear dedication to Corporate Environmental Responsibility and to sustainable development;
- Gaining trust and confidence from reporting biodiversity performance and improving stakeholder relations;
- Industry awards for innovation in biodiversity improvements can help raise the company profile and gain support from customers and stakeholders;
- Taking positive steps to meet the Scottish Government's Biodiversity and Pollinator Strategies.

3.4.5 Commercial

- Local ecological objections could be resolved through the application of BNG;
- Reduced cost to the business by integrating biodiversity considerations up front, reducing the financial considerations of obtaining biodiversity compensation offsite;

3.4.6 Gaining A Competitive Advantage

- Being future ready by having experience in the application of BNG and ability to deliver this for the organisation should it become mandatory;
- Adding value to the site selection process by quantifying resources to enable reductions in biodiversity impact.

3.4.7 Securing Efficiencies

- BNG can help with progression through the planning system (especially on environmentally controversial sites) and reduce development timescales/delays by addressing biodiversity impacts early in the process;
- Helps ensure an efficient design process for biodiversity and can add value through engagement with local stakeholders.

4 BNG industry benchmark

4.1 Introduction

The concept of BNG has become more recognised internationally over the last 20 years across development industries, developers and consultants. Since 2012, BNG has gained recognition in the UK and been implemented by a growing number of developers.

This chapter provides background information on the international and national strategies and policies which provide support for BNG, in addition to the widely accepted standards and principles for BNG. It will provide the results of a benchmarking exercise of the developers undertaking BNG assessments across the UK, including SHE Transmission, and considers the benefits and limitations of the BNG approaches taken.

4.2 International Conventions and Strategies

The loss of biodiversity has been recognised for a number of decades and prompted the Convention on Biological Diversity (CBD) to be established in 1992. The CBD has set international targets in an attempt to slow and stop the global decline in biodiversity. The most recent target which the global community is signed up to is the Aichi Biodiversity Targets. In relation to BNG, target 5 is the most specific which states that, 'By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.'

In response to the Aichi Targets, the European Union (EU) set out its Biodiversity Strategy to 2020. The main target from the strategy which drives BNG from a European stance is to achieve NNL and restore at least 15% of degraded ecosystems. As part of the EU strategy, member states were tasked with producing national Biodiversity Strategies to drive progress against the target. A new Biodiversity Strategy for 2030 was published in 2020 which includes the commitment to restore significant areas of degraded and carbon-rich ecosystems and prevent any further damage.

A further international push for the use of BNG in reducing biodiversity losses comes from the United Nations (UN) Sustainable Development Goals, published in 2015. The aim of Goal 15 is to, 'Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss'.

Alongside the CBD, EU and UN targets and goals, a number of international organisations have set up standards and guidance on the application of BNG to help meet these targets. Of those organisations, perhaps the most recognised is the Business and Biodiversity Offsets Programme (BBOP) which was originally established by Forest Trends in 2004. BBOP brought together business, financial institutions, government agencies and civil organisations to collaborate on best practice in BNG. BBOP focussed on developing guidance on the implementation of the mitigation hierarchy (to avoid, minimise, restore, and lastly, offset biodiversity impacts) - a key principle of BNG. Part of BBOP's goal has been to work towards standardising BNG guidelines, methodologies and standards internationally.

The original forty members of BBOP, including representatives from governments, non-governmental organisations and financial institutions, quickly grew traction, expanding to over one hundred members, showing a strong desire in the industry to move forward with BNG. BBOP has produced many documents and handbooks to help provide a standard for BNG, including a 'Roadmap for Government and Policy Benchmark' and resource papers on limits and no net loss as well as 'The Standard on Biodiversity Offsets'. BBOP's international BNG principles are widely accepted by BNG practitioners and have been discussed by the UK government, intergovernmental organisations such as the IUCN and taken up by numerous companies such as Total.

At present around 100 countries currently have a legislative or strong policy requirement on developers to achieve either NNL or a NG in biodiversity for their development projects. The number of countries with these requirements is continually increasing. Countries such as Germany, the USA and Australia have been implementing these BNG principles for infrastructure development for some time; in the case of Australia, they have been using BNG for 20 years. BNG is also under discussion throughout the EU; the EU Business and Biodiversity Platform is continuing with BBOPs work and supports BNG.

International lending organisations, such as the International Finance Corporation (IFC) have particularly high standards for BNG under their Environmental and Social Performance Standards. Their standards were written by The Biodiversity Consultancy, another organisation recognised for setting good practice standards for BNG in international development. These standards have since become adopted by other lending institutions which are signatories to the Equator Principles of international lending, such as the World Bank who revised its standards in Oct 2018 to meet those of the IFC.

4.3 The UK and BNG

Within the UK BNG has been in use for development since 2012. Within England, Defra set up a metric to quantify UK habitats which could be used in BNG assessments. A pilot to use BNG in development was run from 2012 – 2014 across seven local authorities. Since this time, support for BNG has grown, with a number of large developers publishing formal commitments to BNG, such as Highways England, Network Rail, Barratt Homes, National Grid, and SHE Transmission.

Since the pilot, Professional Membership Bodies CIEEM, IEMA and CIRIA published the UK Good Practice Principles for BNG These principles were adapted from the internationally accepted Business and Biodiversity Offset Program (BBOP) principles.

These bodies have since commissioned UK BNG guidance to be written to guide the development industry in the practical implementation of BNG. The author group for the guidance (Balfour Beatty, Footprint Ecology, WSP, Natural England and Forest Trends) undertook a series of industry consultation events in 2017 and published the guidance document in early 2019. This document is the first standard for the UK industry on good practice for achieving BNG. It recognises BNG as an opportunity for development schemes to benefit biodiversity.

In October 2018, a set of international social standards and principles for BNG was published to ensure that biodiversity action does not have a detrimental effect on the wellbeing of people. It sets out principles to ensure that social impacts from BNG can be considered to ensure no net loss in the social benefits provided by BNG. While the principles may need further development before they are fit for purpose in the UK, they very much align with the wellbeing aspects of natural capital and ecosystem services assessments and creates a further link towards the achievement of Environmental Net Gain (ENG), which was discussed in the UK Government's 25 Year Environment Plan, launched in early 2018.

4.4 Scotland's Policies and Strategies

Scotland's ambition to protect and restore biodiversity has been set out in the Government's '2020 Challenge for Scotland's Biodiversity' and Scotland's Economic Strategy (2015) which states that 'Protecting and enhancing this stock of natural capital, which includes our air, land, water, soil and biodiversity and geological resources is fundamental to a healthy and resilient economy'.

The Scottish Government have not yet made firm statements in support of BNG, however the Scottish Planning Policy (SPP) states that 'The planning system should...seek benefits for biodiversity from new development where possible, including the restoration of degraded habitats and the avoidance of further fragmentation or isolation of habitats' which aligns with the mitigation hierarchy. With the review of the SPP and National Planning Framework 3 (NPF3), and publication of NPF4 planned for 2020/21, it is possible that Scotland will move towards supporting BNG principles within the planning process.

The Scottish Government is undertaking Biodiversity Offsetting Research, to conclude in 2021, which may inform future legislation and the inclusion of BNG. In addition, the Scottish Government held a consultation in 2018 on the development of an Environment Strategy for Scotland. The ideals of stemming the loss of biodiversity were clear within the consultation Discussion Paper, however no specific mention of BNG as a tool to achieve this was made.

Despite not being a mandatory requirement within Scotland, the development industry is leading the way, with SHE Transmission very much at the forefront of BNG in Scotland. There is increased interest in the voluntary application of BNG principles and assessments with Network Rail and CalMac Ferries Ltd more recently applying BNG assessments in Scotland.

4.5 Current Change and Future Direction of BNG

A consultation took place in early 2019 to assess whether to update planning requirements in England under the Town and Country Planning Act 1990 with BNG principles. The consultation has resulted in the UK Government making the statement in March 2019 that they will 'use the forthcoming Environment Bill to mandate 'biodiversity net gain' – meaning the delivery of much-needed infrastructure and housing is not at the expense of vital biodiversity'. This demonstrates that the UK Government is willing to focus on BNG as a way of halting biodiversity loss while still developing infrastructure.

The Defra metric has recently been reviewed and the final version (BM 2.0) will be published in December 2020. As part of this process, SHE Transmission will assess the suitability of the new metric for its development projects, which will also inform the use of the metric within the Scottish development industry.

Natural England is piloting an ecosystems services assessment metric, known as the Ecometric since early 2019. The ambition is to publish the results of these pilots in late 2020. This metric follows on from the Defra BNG metric and measures the natural capital benefits achieved as a result of implementation of BNG on development projects. This aligns with achieving the aims of the UK Government's 25 Year Environment Plan and demonstrating Environmental Net Gains.

4.6 UK BNG Industry Benchmark

There is currently no set standard to allow a formal BNG benchmarking process. However, a review of industry benchmarking has been provided by undertaking a review of the standards that the BNG leaders within the UK are working to in relation to adopting BNG, and an assessment of how they are performing against specific aspects of BNG. Developers currently practicing BNG across the UK were therefore considered against the following criterion:

- Formal Biodiversity Net Gain Commitments
- Biodiversity Targets
- Methodologies of BNG Application
- Implementation Process
- Level of BNG Application

A traffic light system was used to highlight how each developer is performing against each criterion (Table 4.1).

Table 4.1 – BNG Industry Benchmark

Red Amber Green rating	Criteria
	The company is efficiently and effectively employing Biodiversity Net Gain within their developments.
	The company is making positive moves towards the Biodiversity Net Gain approach for their developments.
	The company is not yet efficiently and effectively employing Biodiversity Net Gain within their developments.

The benchmarking exercise has established that SHE Transmission are performing well against the criterion listed above and rank in the middle of the UK's BNG practitioners. Formal BNG commitments have been published in the Sustainability Strategy and the targets are time-bound, as such, in both of these areas, SHE Transmission have scored 'green'. In the other areas (methodologies of BNG application, the implementation process, and the level of BNG Application) the company scores 'amber'. This highlights that the company has already begun trialling BNG methodologies and implementing the outputs across some development projects.

This current strategic project will set out a methodology for BNG implementation across the project design phases and develop associated guidance for staff, consultants and contractors. As a result, this will serve to move SHE Transmission further up the benchmarking 'list' to become one of the few developers across the UK which implements a strategic BNG process across the business to achieve its published BNG targets. Implementing SHE Transmission's targets and methodologies will ensure SHE Transmission is an industry leader of BNG.

5 Delivery of BNG by Developers

5.1 Introduction

In the UK many companies are pledging to support the goals set out in the UK's and Scotland's Biodiversity Strategies by adopting BNG principles. This chapter considers the adoption of BNG by other developers within the UK and outlines their current biodiversity or wider environmental commitments.

5.2 Network Rail

Network Rail has committed to make 'a measurable net positive contribution towards biodiversity in the UK', with the perceived benefit of taking a 'grassroots, collaborative approach to enabling stakeholders to create new habitats locally', creating Green Transport Corridors and enhancing habitats used by protected and notable species.

In 2013 Network Rail launched its first net-positive biodiversity offset scheme on Streatham Common in South London, using the Defra metric for calculating biodiversity loss. Through 'The Thameslink Programme', several pilots were run in order to test a model for achieving BNG, leading to the development of a toolkit and more recently (in 2018) a 'Biodiversity Calculator', to allow for the application of the biodiversity unit metric.

Network Rail has committed to following the mitigation hierarchy of avoidance, mitigation and then compensation as a last resort. As part of the implementation of BNG, Network Rail have undertaken on-site planting when possible and have trained staff in biodiversity protection and enhancement measures.

5.3 Highways England

Highways England has committed to a reduction in the net loss of biodiversity by 2020, committing to no net loss by 2025 and achieving an overall biodiversity net gain by 2040.

Highways England plan to achieve this following the company's Biodiversity Plan, originally published in June 2015. Highways England recognise in the document that roads can have a detrimental effect on biodiversity, however they are committed to 'minimising environmental impacts and protecting the quality of the surrounding environment' by embedding biodiversity into the company and working in partnership with other government bodies such as Defra and Natural England, service providers and infrastructure operators such as Network Rail.

Highways England plan to implement BNG on landscape scale biodiversity projects, reducing the amount of habitat fragmentation and enhancing the biodiversity value of the land surrounding development projects. Their overall goal is to embed the enhancement of biodiversity into the culture of their company. In 2017-2018 Highways England appointed WSP to undertake a biodiversity baseline assessment of their 'soft estate' along the Strategic Road Network (SRN) using the Defra metric. The project included production of a methodology for implementation of BNG across their development portfolio and operations management, in addition to methodologies for corporate biodiversity reporting and evaluation, in line with the biodiversity targets.

5.4 Barratt Homes

Another company embedding BNG into their development processes is Barratt Homes, who 'seek to create a net gain for biodiversity in design across all developments [where there is no prior planning permission] from 2020'. Barratt Homes has partnered with RSPB to help improve their management of biodiversity across their developments, with the RSPB supporting Barratt Homes in the production of their 'Growing with Nature Guide'. Specific projects have included a swift nesting brick project and the design of show home gardens to be 'havens for wildlife'.

Barratt Homes has implemented BNG in the Deram Parke project, 'using the local council biodiversity impact guidelines'. The project retained and enhanced two hectares of woodland while creating new grassland and wetland habitats on site. Overall net gain in design was secured via a thirty-year management plan for improving the condition of an ancient woodland close to the development site. Barratt Homes suggests their reasons for adopting the BNG approach is to address the widespread decline of native wildlife via an industry-wide approach. They wish to fulfil their duties to provide housing for Britain without costing Britain's wildlife.

5.5 Berkeley Group

In May 2017, the Berkeley Group committed to creating a net biodiversity gain on all new developments, with a target of maintaining local habitats' distinctiveness and improving the chances of attracting and retaining regionally distinctive species by conserving local populations and improving habitat connectivity, pledging that there will be more nature at each site post-development then there was before development began. Their methodology is based on the Defra

metric and UK standard for BNG to ensure they can 'measure, implement and monitor net gain' across all their developments.

In support of these aims, the Berkeley Group developed 'The Nine Concepts'. Examples of the nine concepts are management, green infrastructure and connectivity, resolving around three themes; people, biodiversity and built form. The nine concepts work alongside Berkeley Groups 'Social Sustainability Toolkit' to support the company's commitment to biodiversity net gain during development. The company's move towards BNG will benefit them by aligning with their long-term business strategy, named 'Our Vision', a strategy with the aim or providing high quality and exceptional service.

5.6 CalMac Ferries Ltd

CalMac Ferries Ltd has committed to protect and enhance existing biodiversity across the network through sustainable management and adapting to change by 2020. In late 2017, a Biodiversity Action Plan (2017-2020) was developed to support CalMacs commitments. To reach these goals, they will implement control of non-native species and habitat creation, which have already been implemented at both Castlebay and Lochboisdale harbours. CalMac are more recently working to understand the biodiversity baseline at each of their 26 Scottish harbours with plans to show a measurable improvement in biodiversity at each site using the Defra metric to quantify change.

CalMac Ferries Ltd will develop a Biodiversity Management Plan for each harbour. For each habitat a 'prescription' was given for the harbour manager to action to increase the condition and overall biodiversity of each habitat. Although not a fully comprehensive biodiversity net gain management plan, it allows for an overall improvement of a large amount of area, while prescribing one improvement per habitat is an achievable goal for harbour managers to achieve. CalMac hopes that improving the biodiversity of the habitats will increase visitor satisfaction and may increase the number of species that frequent the area, whilst enabling them to report on their Biodiversity Duty.

5.7 HS2

HS2 aims to achieve NNL in biodiversity across Phase One of the route and is doing so by using methodology based on the Defra metric and following the mitigation hierarchy for habitat enhancement and offsetting. The scheme was designed where practicable to avoid impacts on sensitive ecological receptors. Where this was not possible measures were taken to mitigate the impacts of the scheme, compensation being used as a last resort when no other mitigation was possible.

A specific and tailored metric toolkit was developed for HS2, led by an industry steering group. Applying the BNG principles may have made the project more feasible for stakeholders and raised the profile of the development.

5.8 Transport for London

Transport for London (TfL) have a commitment to protect and enhance its natural assets. TfL has a key target of delivering 'Net Gain Biodiversity'. In Policy 8 of the Mayor's Transport Strategy: 'TfL will ensure transport schemes protect existing green infrastructure where possible, or, if there is a loss, provide new green infrastructure in order to deliver a net gain in biodiversity'. Using the BNG approach will help enhance and protect TfL's natural assets, build a reputation for being a green and responsible company and showing leadership on BNG across greater London.

As part of its commitments, TfL have undertaken a biodiversity baseline of their estate using the Defra metric to quantify biodiversity. As part of the project, an innovative method of assessing single trees across the estate was developed. TfL have continued with their aims and have commissioned a report on natural capital tools and how they could be applicable to delivering against company and London-wide targets

5.9 Greater Manchester Combined Authorities

Greater Manchester Combined Authority's (GMCA) has a 'greener' vision for the city and has undertaken a city-wide study examining: risk management from quantifying gains and losses in biodiversity; the benefits of building local private and public partnerships; enhanced clarity and new investment opportunities for business; and perceived benefits for GMCA including health and well-being benefits.

The pilot studies consist of WSP working with developers to look at the possibility for biodiversity gain through BNG methodology when it is applied from the outset of a development. The project is due to be completed in 2019 alongside a report outlining a 'greener vision' for the city.

6 The Development of the UK BNG Metric

6.1 Introduction

The following provides a summary and comparison of the two biodiversity net gain metrics developed by Natural England on behalf of Defra. The two metrics are the Defra 2012 offsetting metric and the metric 2.0 currently under development by Natural England. The former was developed to support the biodiversity offsetting pilots set up by Defra in 2012. Since then this metric has been developed, becoming the industry standard for assessing biodiversity net gain and adopted by a range of organisations. The latter is an evolution of the Defra 2012 method and is expected to be published in 2019 to support biodiversity net gain becoming mandatory for new developments in England.

Both methods are used to compare the state of biodiversity before and after a development or habitat management intervention. Both also use habitats and their condition as a proxy for assessing biodiversity, translating this information into a biodiversity unit score.

6.2 Defra 2012 Biodiversity Offsetting Metric

6.2.1 Before Development

The biodiversity metric developed by Defra in 2012 uses three characteristics of habitats as a proxy measure for biodiversity:

- Distinctiveness - the richness, diversity or rarity of a habitat type.
- Area - the area the habitat covers, measured in hectares.
- Condition - the quality of the habitat.

These three characteristics are given numerical scores. Distinctiveness gives scores 2, 4 or 6, with a score of 6 being given to priority habitats and scores of 2 given to habitats that support the least biodiversity, such as an arable field. Condition is assessed using the Farm Environment Plan guidance

published by Defra, and is assigned scores 1, 2 or 3 depending on the results of the survey, with 3 assigned to the best quality habitats and 1 to the worst. These numbers are multiplied by the habitat area to give a score in biodiversity units for the habitat parcel.

Hedges are treated differently with the length in metres multiplied by the condition to give a hedgerow or linear unit score. The biodiversity unit scores from area-based habitats and linear unit scores from hedgerows are kept separate.

6.2.2 Post Development

The same three characteristics are used to calculate a post development biodiversity unit score for the habitats. However, in addition, the biodiversity unit score associated with any area-based habitat that is created or enhanced is multiplied by the following three risk factors:

- Difficulty Risk - the risk associated with the difficulty to deliver the habitat;
- Temporal Risk - the risk associated with the time taken to create the habitat; and
- Spatial Risk - the risk associated with the distance between the area of impact and the area of habitat creation/enhancement.

Each of these risk factors is assigned a number between 1 and 0. These numbers vary for each habitat and for the activity (creation or enhancement). The numbers are broadly assigned within the Defra 2012 method but have been developed and formalised by HS2 and most recently within the BREEAM assessment of ecological change methodology.

Hedges are treated differently again, and the post development hedgerow or linear unit score is simply equal to the length of hedge created.

6.2.3 Enhancement and Creation

Since the publication of the Defra 2012 method one important addition has been made to the method. This is a clarification on the difference between enhancement and creation of a habitat. Creation consists of creating the habitat from bare ground or similar and the risk factors are applied to the post development habitat value. Enhancement consists of managing or altering the existing habitat so that it changes and is improved for biodiversity. In such cases the risk factors are only applied to the change in biodiversity value between pre- and post-development. As such, the risk factors are not applied to the existing habitat when enhancement is undertaken. This clarification was made by Natural England in 2017.

6.3 Natural England 2019 BNG Metric

Natural England are currently developing an update to the Defra 2012 Biodiversity Net Gain (BNG) metric to be published later this year. This method follows the same approach as the 2012 method but contains the following updates:

- Habitat classification system
- An excel based toolkit with default values to standardise the calculations;
- Distinctiveness score range;
- Condition assessment methodology;
- Condition score range;

- Habitat quality measures for connectivity and strategic significance;
- A change to the spatial risk factor;
- A measure for accelerated succession;
- A change to the hedgerow calculation to bring it in line with the way the units are calculated for the other habitats; and
- A new metric to assess watercourses (in development with the Environment Agency).

These proposed changes are set out below with a description of the impact they have on the biodiversity assessment.

6.4 Proposed Changes to the Metric

6.4.1 Habitat Classification System

The Defra 2012 metric used a habitat classification system called Integrated Habitat System. It was developed by Somerset Environmental Record Centre and based on an integration of broad, priority, Annex 1 and Phase 1 habitat classification systems. Since 2012 most organisations using the metric have converted this so that it uses Phase 1 habitat classifications as this is the standard field method for the industry.

The new metric is based upon the UK Habitat Classification system (UKHab) that was released in 2018. The advantages and disadvantages to using UKHab within the new metric are set out in Table 1.

It is recommended that UKHab is used within the new toolkit but it should be recognised there will be a transition period where Phase 1 is used and translated into UKHab definitions. This will lead to some variation in data quality in the short term. Currently due to concerns regarding the classification of waterbodies, Phase 1 will continue to be used until such a time a more suitable classification system for watercourses is developed.

Table 6.1 – Advantages and Disadvantages of Using UK Habitat Classification System in Biodiversity Assessments

Advantages of using UKHab instead of Phase 1	Disadvantages of using UKHab instead of Phase 1
UKHab covers priority habitats well and consistently meaning it provides a good focus for habitats of conservation concern.	Phase 1 is the standard field method for the industry and widespread training will be needed to adopt a new approach.
UKHab includes a wide range of habitats, including urban habitats and Annex 1 habitats (however this level is not captured in the new metric).	The commercial implications of undertaking UKHab surveys are not understood (for example, it may take more time to complete a UKHab survey than a Phase 1 survey).

6.4.2 Distinctiveness Score Range

The new method added two new categories to the distinctiveness score from those in the Defra 2012 metric: very high and very low (Table 6.2). Natural England's BM 2.0 guidance lists 16 habitat types as very high including blanket bog.

Table 6.2 – Distinctiveness Scores

Category	Score	Example of Habitat Type
Very High	8	Priority habitats, as defined in the Scottish Biodiversity List, that are the highest priority for biodiversity conservation, meaning they are highly threatened and/or internationally scarce e.g. blanket bog.
High	6	Priority habitats, as defined in the Scottish Biodiversity List, requiring urgent conservation action e.g. upland heathland
Medium	4	Semi-natural vegetation not classed as Priority Habitat e.g. semi-improved grassland.
Low	2	Lower value semi-natural vegetation e.g. rhododendron scrub, bracken
Very Low	0	Little or no biodiversity value e.g. developed land, sealed surface.

The addition of the very low score will have little effect as areas of developed land (buildings, roads, etc.) were given a N/A score already. However, the addition of the very high could have a significant effect, increasing the biodiversity unit score for a specific set of habitats (Table 6.3).

Table 6.3 – Example 1 - Change in Baseline Score Due to Addition of the 'very high' Distinctiveness Category

Pre-development (Baseline) Biodiversity Assessment					
Area (ha)	Distinctiveness	Condition	Connectivity	Strategic Significance	Biodiversity Units
1	6	3	1	1	18
1	8	3	1	1	24

This categorisation in BM 2.0 has been designed to reflect the of the rarity of the habitat in England, alongside the % of that habitat protected by SSSI in England, Priority habitats as well as international classifications. There is the possibility it gives a distinctiveness rating which is too high for some more common Scottish habitats, or too low for certain habitats native to Scotland (e.g. native pine woodlands). As such, the categorisation in the SHE Transmission toolkit has been refined for Scottish habitats.

Currently the SHE Transmission toolkit does not include the categories of very high or very low, therefore blanket bog in the BM 2.0 would have a distinctiveness of 'very high', but of 'high' in the SHE Transmission toolkit.

6.4.3 Condition Assessment Methodology and Scoring

Guidance on condition assessment is provided in the SHE Transmission Toolkit User Guide (TG-NET-ENV-526) and it is recommended that assessments set out in the Higher Level Stewardship Farm Environmental Plan Manual (FEP) are used.

The scoring for the habitat condition has also changed slightly. In addition to the scores of 1 (Poor), 2 (Moderate) and 3 (Good) Natural England introduced a score 0 for some urban features. In addition other scoring has been implemented for Lakes and Rivers.

Guidance on condition scoring is included within the SHE Transmission Toolkit User Guide and alongside the Natural England categories allows additional intermediate scoring with Fairly Poor (1.5) and Fairly Good (2.5) as well as allowing a 0 score for agricultural land. The other scores will be for the assessor to assign if they believe that the condition falls between one of the other categories

6.4.4 Habitat Quality Measure - Connectivity

In addition to the habitat characteristics used in the 2012 method Natural England added two new characteristics, connectivity and strategic significance. These work in a similar way to the existing characteristics. Numbers will be assigned to each one and then they will be multiplied to the other characteristics to calculate a biodiversity unit score for both pre- and post-development.

Connectivity is a measure of how connected the habitats are to surrounding habitats and how suitable they are to support species movement. Natural England are developing a method that will be available to use across England that will assign connectivity scores (Table 6.4) to patches of habitat 200m by 200m in size. The method will be able to be run pre- and post-development to identify any change in connectivity. SSEN have further defined the connectivity categories to be more applicable to Scotland (see Table 6.5).

However, due to uncertainty as to whether the above method is suitable for Scotland current SSEN Guidance is that High and Very High distinctiveness habitats should be assigned a Moderate connectivity multiplier and all other habitats a Low connectivity multiplier. This Guidance is also within the SHE Transmission Toolkit User Guide (TG-NET-ENV-526).

Table 6.4 – Natural England's Connectivity Categories and Scores

Connectivity Category	Score
Highly aggregated/connected:	1.15
Moderate aggregation/connectivity:	1.1
Low aggregation/connectivity:	1

Table 6.5 – Connectivity Categories Adapted for Scotland

Connectivity Category	Score
Highly aggregated/connected: the habitat is directly connected to, or within 200 metres of an area of habitat outside of the development site which is of the same broad habitat category.	1.15
Moderate aggregation/connectivity: the habitat is within 200 – 500 metres of an area of habitat outside of the development site which is of the same broad habitat category.	1.1
Low aggregation/connectivity: the habitat is over 500 metres or more from an area of habitat outside of the development site which is of the same broad habitat category.	1

6.4.5 Habitat Quality Measure - Strategic Significance

The second quality measure added by Natural England is strategic significance as summarised in Table 6.6. This is a measure of how important the location of the impact and any compensation is for biodiversity. Natural England has determined this as being identified within a local biodiversity policy or strategy such as a habitat restoration plan or a Green Infrastructure Strategy. Although the number used in the calculation (High 1.15, Medium 1.1 and Low 1) will be set by Natural England and Defra, how each category is assigned to each habitat type will be decided locally.

As some local biodiversity policies cover large areas of Scotland, the strategic significance categories have been adapted to better suit the situation in Scotland, as detailed in Table 6.7, while keeping the individual scores the same (High 1.15, Medium 1.1 and Low 1). Habitats are therefore assessed on their ability to contribute/ support significant sites for nature in Scotland or support the same communities of species found in those sites.

Table 6.6 – Natural England's Strategic Significance Categories and Scores

Strategic Significance Category	Score
High strategic significance Within area formally identified in the local policy	1.15
Medium strategic significance Not in area defined in the local policy	1.1
Low strategic significance Not in area defined in the local policy (or compensation not within area of local policy), or where no local environmental spatial policy is in place	1

Table 6.7 – Strategic Significance Categories Adapted for Scotland

Strategic Significance Category	Score
High strategic significance: the habitat contributes to or supports significant sites for nature (National Park, Special Protection Area, Special Area of Conservation, Site of Special Scientific Interest, Ramsar, National Nature Reserve) located within 1 km or supports the same communities of species.	1.15
Medium strategic significance: the habitat contributes to or supports significant sites for nature (National Park, Special Protection Area, Special Area of Conservation, Site of Special Scientific Interest, Ramsar, National Nature Reserve) located within 2 km, and supports the same communities of species.	1.1
Low strategic significance: the habitat does not contribute to or supports significant sites for nature (National Park, Special Protection Area, Special Area of Conservation, Site of Special Scientific Interest, Ramsar, National Nature Reserve) located within 2 km and/or doesn't support the same communities of species.	1

It is important to note that the inclusion of the connectivity and strategic significance characteristics will have a significant effect on the assessment because they add to the way the biodiversity units are calculated for pre- and post-development as set out in Table 6.8 and 6.9, which show worked examples.

Table 6.8 – Example 2 - Change in Pre-development Assessment Due to the Addition Connectivity and Strategic Significance Quality Measures

Pre-development (baseline) biodiversity assessment					
Area (ha)	**Distinctiveness**	**Condition**	**Connectivity**	**Strategic Significance**	**Biodiversity Units**
1	4	2	1	1	8
1	4	2	1.15	1.15	10.58

Table 6.9 – Example 3 - Change in Post-development Assessment Due to Connectivity and Strategic Significance

Post-development biodiversity assessment									
Area (ha)	Distinctiveness	Condition	Connectivity	Strategic Significance	Creation / Enhancement	Temporal Risk	Difficulty risk	Spatial Risk	Biodiversity Units
1	4	2	1	1	Creation	0.7	1	1	5.6
1	4	2	1.15	1.15	Creation	0.7	1	1	7.4

6.4.6 Spatial Risk Factor

The spatial risk factor aim is to encourage the habitat compensation to be close to the site of impact. In the updated metric Natural England are proposing to change the numbers used in this risk factor as set out in Table 6.10, while the risk is determined by proximity to local planning authority (LPA) or national character areas (NCA).

The change in the numbers used for this risk factor will mean that proximity has less effect on the overall score for a site. This is in part due to connectivity and strategic significance being dealt with separately.

Natural England's categories for spatial risk are not appropriate for Scotland. The categories have been adapted for SHE Transmission developments while maintaining the new individual risk multipliers (Table 6.11).

Table 6.10 – Natural England's Spatial Risk Categories and Change in Scores

Category	Multiplier in 2012	Multiplier in 2019
Compensation inside LPA or NCA, or deemed to be sufficiently local, to site of biodiversity loss	1	1
Compensation outside LPA or NCA of impact site but in neighbouring LPA or NCA	0.5	0.75
Compensation outside LPA or NCA of impact site and beyond neighbouring LPA or NCA	0.33	0.5

Table 6.11 – Spatial Risk Factor Categories Adapted for Scotland

Category	Risk Multiplier
Habitat provides compensation within 1 km of the area of loss.	1
Habitat provides compensation within 2 km of the area of loss.	0.75
Habitat provides compensation over 2 km from the area of loss.	0.5

6.4.7 Accelerated Succession

Within the new method Natural England define enhancement as any improvement to the biodiversity of a habitat while remaining the same broad habitat type. For example, a change from improved to species rich grassland would be considered enhancement because the habitat remains grassland throughout. If a habitat is altered so that it changes broad habitat type but still within a typical successional pathway, it can now be considered to be under 'accelerated succession'. For example, a grassland being planted with trees so that a woodland is created would be subject to accelerated succession rather than creation or enhancement.

Although the formula for calculating the biodiversity units for a habitat under accelerated succession has been made available there are still fundamental questions about the formula, when it is applied and its implications. For this reason, it is recommended that accelerated succession is excluded from SHE Transmission's biodiversity assessments until the method has been clarified and tested.

In the meantime, SHE Transmission should consider habitats that would fall into this category as being enhanced for the purpose of calculating the post-development biodiversity units.

6.4.8 Hedgerow Calculation

The hedgerow assessment has been changed so that the distinctiveness, condition, connectivity and strategic significance of the hedge are taken into account along with the length. This is true for the hedges present at the start and end of the development, as well as those created or enhanced. This brings the hedgerow calculation in line with the area-based habitats. However, hedgerow units should still not be combined with the biodiversity units from other habitats as they are based on the length not the area of the habitat.

This is a positive change which will make it easier to meet the requirement for delivering biodiversity net gain for hedges. SHE Transmission are advised to adopt this new approach.

6.4.9 Watercourse Calculation

A new watercourse metric was developed by the Environment Agency for use with the Natural England tool which is based on the extent and diversity of the physical features including the vegetation. The condition assessment is based on geomorphic principles and is called the River Metric Survey. This includes a desk-based reach-scale assessment to indicate the current river type, followed by a field survey to capture subreach scale physical features, habitats vegetation structural features and human interventions to assess the condition of the river. This method of survey requires appropriately trained and accredited surveyors to undertake it.

It is recommended that it is field tested before it is embedded into the work of SHE Transmission. There are risks that the assessment method is not suitable for Scotland and/or takes considerable additional time to run.

6.5 Summary

The updated metric being developed by Natural England adds additional factors and formulae to the 2012 metric. This adds a level of complexity that was not present previously. However, the improvements will not only enhance the approximation of biodiversity value but will also make it easier to deliver net gain for biodiversity if the habitats that are created or enhanced are placed in optimal locations. This means that a smaller area of compensation may be required if the habitat increases connectivity of the site and/or is placed in a strategically important location.

6.6 Recommendations

It is recommended that SHE Transmission adopt the new metric for use on SHE Transmission projects with the following provisos:

- UKHab is the habitat categorisation which is used within the new toolkit and metric. However, it should be recognised that there will be a transition period where Phase 1 data is used and will need to be translated into the UKHab classification system. This may lead to variation in data quality in the short term.
- The FEP is used in the interim until the new condition assessment method is finalised and tested.
- SHE Transmission do not assign a condition score of zero to habitats until Defra publish the updated method as it is understood that this is one of the areas still under debate.
- SHE Transmission do not use the accelerated succession formula until it is published and tested. In the interim period, SHE Transmission should consider habitats that would fall into this category as being enhanced for the purpose of calculating the post development biodiversity units.

7 Technical Application of the Metric

7.1 The BNG Assessment

Two toolkits have been developed to quantify biodiversity baselines at the site selection stage (Site Optioneering Toolkit), and to full quantify biodiversity change for development projects (Full Toolkit). A Toolkit User Guide has been written to guide the use of the toolkits (TG-NET-ENV-526).

This section provides additional information and detail to be considered for the BNG process and explains the biodiversity calculations.

The nominal figures used to quantify the biodiversity of a habitat are the Biodiversity Unit (BU), which is used for area habitats, and the Linear Unit (LU), as described previously. The Biodiversity and Linear Units represent the area and length of the habitat respectively, as well as the distinctiveness, condition, connectivity and strategic significance.

This methodology uses the change in BU or LU as an indicator of a site's change in ecological value overall. The methodology calculates the BU for a project pre- and post-development and provides a simple and accessible means of estimating changes, promoting ecological protection, mitigation and enhancements in relation to the built environment.

This chapter details the following technical aspects required to deliver a BNG assessment:

- Biodiversity Baseline Assessment
- Habitat creation, enhancement and accelerated succession
- Risk multipliers
- Post-development biodiversity/linear unit calculations

7.2 Biodiversity Baseline Assessment

7.2.1 The Biodiversity Calculation

A biodiversity unit (BU) is the nominal figure used to quantify the biodiversity of a habitat. It represents the distinctiveness, condition, connectivity, strategic significance, and the area of a habitat. Also included within the assessment is information on the habitat type. Representing biodiversity via biodiversity units means that the Post-Development Biodiversity can be easily compared to the Pre-Development biodiversity, aiding the user to assess whether or not a development is designed to deliver No Net Loss or Net Gain. Based on the Natural England guidance, the basic formula for calculating biodiversity units is:

Distinctiveness Score x Condition Score x Area (ha) x Connectivity x Strategic Significance = Biodiversity Units

As well as the Biodiversity Unit calculation, the overall assessment for a BNG development will include the collection of information on habitat type and species, habitat features such as Invasive non-native species and suitability for protected species. This information should be detailed in the biodiversity reports.

7.2.2 Linear Habitats

The calculation for Linear Habitats produces Linear Units rather than Biodiversity Units. The calculation remains the same, except area is replaced by Length (measured in m):

Distinctiveness Score x Condition Score x Length (m) x Connectivity x Strategic Significance = Linear Units

The assessment method for waterbodies is still to be published by Defra.

7.2.3 Distinctiveness

For some Phase 1 habitat types, multiple distinctiveness bands can apply, depending on the type of habitat in order to allow for Priority habitats. Assumptions can be made based on surrounding habitats or surveyor knowledge, or a precautionary approach can be taken (i.e. the highest of the two possible bands is input as the distinctiveness).

Even though distinctiveness is automatically assigned, the user (suitability qualified expert) can overwrite this information if it's felt that the distinctiveness should be rated differently. Any changes to the set distinctiveness ratings should be captured and evidenced in the narrative of the associated biodiversity net gain report in the limitations section.

7.2.4 Condition

Condition is defined as the quality of a particular habitat. For example, a habitat is in poor condition if it fails to support the rare or notable species for which it is valued, or if it is degraded as a result of pollution, erosion, invasive species or other factors.

For biodiversity assessments using the habitat classification system of Phase 1, condition should be assigned based on the methodology presented in FEP manual. Once the habitat has been identified during the survey the ecologist should look up the habitat in the FEP manual. If the type differs from the types in the FEP manual, the habitat should be matched to its best equivalent, and the reasons for the habitat choice should be recorded.

Where a FEP condition assessment is not possible (perhaps due to lack of access to site) and the condition cannot be based on relevant local data (such as surveys on other areas within the Development Footprint) the condition of the habitat should be assumed. All medium and high distinctiveness habitats should be assumed to have moderate condition unless there is existing evidence that the habitat is of good condition. All low distinctiveness habitats should be assumed to be in poor condition. These assumptions follow a precautionary principle and all assumptions made should be outlined and justified in the associated biodiversity report within the limitations section so it is obvious the data has been assumed rather than expertly assessed.

If the habitat present on Site is not covered by the FEP or if some of the criteria are not relevant for the habitat being assessed the ecologist should use their expert judgement to select the appropriate criteria, detailing this in the biodiversity report.

There are seven condition bands ranging from 'Good' to 'Non-applicable- Other'. 'Fairly good' and 'Fairly Poor', with values of 2.5 and 1.5 respectively, are for when the surveying ecologist has assessed the habitat as one score but has enough evidence to justify increasing or decreasing the score by 0.5, such as the presence or lack of an important species. This decision must be justified in the biodiversity report.

Natural England recently published updated condition assessment designed to align with surveys undertaken using the UKHab habitat classification system and may also be usable with Phase 1 surveys, superseding the previously used FEP. It is our understanding that further modifications will be required to these assessments in 2020, therefore SSEN guidance still recommends FEP-based assessments.

7.2.5 Connectivity and Strategic Significance

The connectivity and strategic significance categories and scores are detailed in Section 6.4. These scores of habitat quality are applied in the pre- and post-development calculation.

7.3 Habitat Creation, Enhancement and Accelerated Succession

7.3.1 Creation

Habitat creation consists of the removal of the present habitat in the action of creating the new habitat or creating habitat where none was previously present. For example, removing scrub in order to create a wetland habitat or removing hard standing to create grassland or changing an area of bare ground into another habitat type.

If the habitat is being created the equation is:

PD Distinctiveness x PD Target Condition x PD Area (ha) x PD Connectivity x PD Strategic Significance x Delivery Risk x Temporal Risk x Spatial Risk = POST-DEVELOPMENT UNITS (creation)

(PD = Post-development)

The three risk multipliers (delivery risk, temporal risk and spatial risk) are detailed in section 5.4.

7.3.2 Enhancement

Habitat enhancement consists of improving the condition of an existing habitat and thereby increasing the ecological value of a habitat type through measures that improve its biodiversity and/or by removing factors that detract from its value. Habitat enhancement means that the habitat remains in the same broad habitat type; for example, managing improved grassland so that it

becomes semi-improved grassland, which would seek to increase species biodiversity. Another example of habitat enhancement is the removal of invasive or undesirable dominant species which may improve a habitats condition.

If the habitat is being enhanced the equation is:

(PD Distinctiveness x PD Target Condition x PD Area (ha) x PD Connectivity x PD Strategic Significance – PreD Biodiversity Units) x Delivery Risk x Temporal Risk x Spatial Risk = POST-DEVELOPMENTAL BIODIVERSITY UNITS (enhancement)

(PreD = Pre-development)

A project can include both areas of habitat creation and areas of habitat enhancement.

7.3.3 Accelerated Succession

Accelerated succession is when one broad habitat type is converted to another broad habitat type; for example, if an area of grassland was managed to become an area of woodland. This differs from enhancement as areas that are enhanced remain in the same broad habitat type but with increased condition or distinctiveness.

Note: The calculation has not yet been agreed and tested by Natural England and the UK's BNG practitioners. It will be added to this document, toolkits and the Toolkit User Guide once the approach has been agreed.

7.4 Risk Multipliers

Habitat creation and enhancement during the BNG process is not without risks and uncertainties. To mitigate for these risks, the metric includes risk multipliers. The risk multipliers are included in the post-development biodiversity calculations, reducing the number of units generated by an area of compensation habitat.

The risk factors do not cover all eventualities but provide a numerical value for the main risks to delivering biodiversity gains. The metric sets out three risk factors: how difficult it is to create or enhance a habitat (delivery risk), time taken for created or enhanced habitats to reach target condition (temporal risk) and distance of habitat compensation from the development footprint (spatial risk).

7.4.1 Delivery Risk

The delivery risk is the risk associated with the difficulty to create or restore a habitat and the uncertainty of outcome this creates. This risk will vary between habitat types due to ecological factors and the level of available information and techniques to create habitats within a realistic timeline. This risk is addressed by the habitat-specific 'difficulty' multiplier.

Table 7.1 – Delivery Risk Factors

Difficulty of creation / enhancement	Risk Multiplier	Example (According to BREEAM) – Phase 1 Habitat
Very high	0.1	Blanket bog
High	0.33	Acid grassland: Unimproved (High distinctiveness)
Medium	0.67	Dry dwarf shrub heath: Basic
Low	1	Acid grassland: semi-improved

7.4.2 Temporal Risk

In delivering compensation for habitat loss, the timing of the impact may not coincide with the new habitat reaching the required quality or level of maturity, which could result in loss of biodiversity for a period of time. Additionally, there may be a time gap between the habitat loss and the start of the creation or enhancement of new habitat. Where possible, the development should prevent this additional time gap, for example, enhancement of habitats or creation of offsets out with the development area could begin prior to development.

Where this is not possible and is justified, this additional time gap needs to be accounted for. These two time lags together are called the Temporal Risk. For example, a development clears an area of woodland. Five years later it implements its compensation, which will take 25 years to reach target condition. So, the time to target condition is 30 years and the assigned risk factor for this is 0.343. The years to target condition and risk factors are listed in Table 7, and a detailed list in included within the toolkit user guide.

Table 7.2 – Temporal Risk Factors

Years to target condition	Risk Multiplier
1	0.965
5	0.837
10	0.700
20	0.490
30	0.343

There is no set guidance for each habitat type on the time it takes to reach a specific condition. The ecologist should estimate number of years to target condition based on expert opinion, with reference to suitable literature, and fully justify it within the final report. Some guidance is provided by Natural England to align with the new metric covering the time taken to reach target condition for enhanced and created particular habitats, along with the time to target condition for hedgerows.

Should any compensation be created in advance of the impact, the Biodiversity Unit value of the compensation at the time of the development can be calculated. Since these values are no longer predicted the difficulty and temporal risk factors do not need to be applied.

7.4.3 Spatial Risk

Spatial risk is the risk associated with delivering compensation for the loss of a habitat at distance from that loss (i.e. generally the greater distance can mean a greater risk as the compensation will have lower connectivity to the original habitat) The spatial risk factor is applied to the post-development Biodiversity Unit calculation when the compensation for habitat loss is being delivered at distances outside of the development site, as detailed in Section 6.

7.5 Post-Development Biodiversity/Linear Units Calculation

The Post-Developmental calculations should assess the following of habitats within the development site:

- Areas of no change - Which areas will be retained with no action (i.e. no habitat enhancement)

- Areas of loss - Which areas will be permanently lost to development (i.e. no habitat creation) and which areas will be temporarily lost due to the construction phase and then reinstated (i.e. habitat creation)
- Areas of change - Which areas will have action to increase biodiversity units improving the condition and possibly the distinctiveness of a broad habitat type (i.e. habitat enhancement) and which areas will have action to increase biodiversity units by changing one habitat to another (accelerated succession).

For each of the above steps, data should be collated on habitat type, distinctiveness and condition. The post-development Biodiversity or Linear Units are then calculated as follows:

Pre-Development Biodiversity/Linear Units – Biodiversity/Linear Units lost due to the development + Post-Development Biodiversity/Linear Units (creation and enhancement)

= TOTAL POST-DEVELOPMENT BIODIVERSITY/LINEAR UNITS

7.5.1 Cultural Heritage

The BNG process does not take into account cultural heritage and the social importance of certain habitats (e.g. a habitat that provides a green space to a community or a site of cultural importance). Developers should ensure these aspects are taken into account alongside the BNG process and that the delivery of BNG does not have an unintended adverse impact on communities for example, by moving accessible green space further from the communities.

8 Remote Sensing and BNG

8.1 Introduction

Remote sensing data can be used to help determine biodiversity baselines at various stages of project development, enabling the BNG process. This chapter considers the various remote sensing data available, the pros and cons of remote sensing data sources, and the methodologies of application used by developers across the UK to understand biodiversity across their corporate portfolio. This chapter also outlines the remote sensing data required by SHE Transmission to provide habitat data to enable BNG assessments during project development and across extensive areas and the future direction of remote sensing methodologies.

8.2 Commonly Used Remote Sensing Data

Remote sensing data analysis is a fast-growing field within Geographic Information Systems (GIS) where more information than ever can be gathered for a given area with no physical presence needed. Often, with full UK coverage and a resolution down to 2.5cm, we can now determine the physical and spectral characteristics of even the smallest features on the ground. LiDAR (Light Detection and Ranging) data is the most valuable remote sensing dataset in many cases, looking at a whole range of physical characteristics. Using advanced algorithms and semi-automated editing we can now pick out a multitude of different features automatically from the LiDAR point clouds such as trees, hedges, buildings, roads, bridges, waterbodies, street furniture and terrain.

Spectral data can also be just as powerful by showing information on the reflectance of objects on the ground. This can be visible light or Near Infrared light (these two datatypes form multispectral

data). The cost of using this data can vary dramatically on capture method and resolution of data. Large areas of satellite aerial capture can be expensive however the data can be used for multiple purposes. Additional to this, hyperspectral data uses are becoming far more widespread as it commonly contains over 200 bands of spectral light which can be used to differentiate different ground cover types much more effectively. It is now even being utilised to capture plant species with high degrees of accuracy over small areas.

8.3 Current Uses of Remote Sensing Data for BNG

Remote sensing can be used for pre-classification of habitat types using the Phase 1 ecological classification system, improving site survey efficiency. This is completed by using Red Blue Green (RGB) and Near Infrared imagery to form NDVI (Normalised Difference Vegetation Index). This is then combined with LiDAR height data and Ordnance Survey MasterMap (OSMM) data to classify areas into appropriate Phase 1 habitat areas. On-site verification with mobile mapping tools is used to make changes to the dataset where habitat is different to that that was mapped remotely. Habitats that are currently captured include: amenity grassland, agricultural land, running water, mixed woodland, scrub, bare ground, hardstanding and buildings. These identify the majority of the habitats found within lowland UK and the same technology and algorithms can be applied to all UK habitat types. This is currently identifying the first level of Phase 1.

This methodology has been completed by multiple projects across the UK as well as projects for HS2 Phase 2b and Transport for London (TfL). For the TFL project, consultants were tasked to create a complete Phase 1 baseline dataset to allow baseline biodiversity units to be calculated across the TFL estate. To do this, data was collated from GiGL (Greenspace information for Greater London) and put into a hierarchy from highest quality to lowest. This was: previously conducted Phase 1 survey datasets no more than 10 years old; SSSI areas; Natural England's Priority Habitat data; and finally, remotely sensed Phase 1 habitat information. In this case, the remote sensing data was used to fill in any gaps in the other datasets to allow for a full baseline assessment to be made. The datasets were used to improve the local parameters for the classification from the NDVI dataset (Adjoining Habitats), allowing for the output data to be used as a standalone dataset rather than a requirement for on-the-ground verification.

The results of the project are outlined in the following quote from Kylie Jones, TfL Project Manager:

"WSP were appointed to work with TfL to develop an innovative approach to producing a biodiversity baseline across our entire estate (highways, rail and underground) to ensure we can begin to track progress against our goal of delivering net gain biodiversity. Not only did the WSP project team work closely with the TfL to ensure our objectives were met, they went one step further adding value, suggesting more efficient ways of gathering data, meeting with relevant stakeholders and exploring new ways of working, which led to an innovative and cost-effective solution which is now being rolled out across other organisations, making robust data collection across large areas more accessible."

"This was the first time biodiversity baseline data has been collected to this level of detail on this scale and is now the basis of ensuring we can meet Mayoral strategic objectives set out in the draft London Environment Strategy and Mayors Transport Strategy. The project was shortlisted for a TfL contractor award for 'best environment project'. For the first time TfL can track progress against biodiversity objectives. WSP have undoubtedly added value to our organisation and we look forward to working with them again."

TfL also used high resolution LiDAR data to capture objects (such as trees) in high resolution and accuracy, and used the National tree map for efficient capture of large sites.

A similar methodology to that of TfL has recently been commissioned by a Water Company with over 1,000 sites across a region of England.

Highways England also completed a biodiversity baseline assessment over their national network using a similar hierarchy, however instead of generated remote sensing data, the developer used a 30m habitat resolution dataset (the Centre for Ecology & Hydrology's Land Cover Map 2015). There were inherent limitations in using this coarse dataset along the narrow road corridors where small habitat areas were not identified due to the coarse resolution used.

The major issue found when using only remote sensing techniques is that the data accuracy will never be the same as that gathered by a surveyor out on site, this is because the current multispectral data does not hold enough information, even when supplemented with high resolution LiDAR. This may be mitigated with the use of hyperspectral data however the field is still in its infancy for use in such a wide range of ecological habitats and needs more work to make useful contributions to survey data. Verification from sample on-site surveys can be used to parameterise the approach and make it more accurate for broad habitat types.

Additional to this, one of the major hindrances to these techniques being used is the cost; where off-the-shelf aeroplane data is around £100 per square kilometre per dataset, the cost of capturing airborne remote sensing data for each area is significantly more and can mean it is then not an appropriate use of the technology for some cases. Drone capture can mitigate this; however, a pilot needs to go out on site to capture the data which can incur high travel costs for small areas of capture per day.

NatureScot have undertaken a similar approach to WSP's Remote Sensing Ecological Phase 1 methodology. However, it should be noted that NatureScot classified habitats according to the EUNIS (European Nature Information System) and Habitats Directive Annex I in accordance with the 'Manual of terrestrial EUNIS habitats in Scotland' rather than Phase 1 or UKHab. In the report the authors discuss a methodology of mapping remote and challenging terrain in Scotland using an approach widely applied in Sweden for vegetation mapping. For their technique they used stereo colour infrared (sCIR) along with a desk-based mapping exercise and a small amount of fieldwork to map two 100 km2 sites in Scotland to a high degree of accuracy. Additionally, they are investigating potential use of Sentinel satellite imagery and machine learning to complete seven Special Areas of Conservation (SACs) on the west of Scotland.

8.4 Future Developments for Remote Sensing

Currently there is major development in the areas of hyperspectral data and machine learning. These elements are allowing for far higher accuracy classifications of habitat. This uses multiple bands within the hyperspectral data and looks for patterns within the data showing specific species spread across a habitat.

A recent peer reviewed paper from the Remote Sensing journal states:

"hyperspectral imaging, with the ability to collect information at a high spectral resolution using contiguous spectral bands, each with a narrow spectral range, is known to be capable of fairly accurate identification of different species. This can even be used to produce highly accurate

species-level vegetation maps in highly complex grasslands with fine-scale mosaics of different vegetation types."

This, is conjunction with high resolution LiDAR, will allow for highly sensitive spectral and physical aspects of habitat to be calculated. The current aim of this area of industry is to classify over 70% of the JNCC habitat classification codes with over 80% accuracy and distinguish them across all areas of the UK without ground references across an Area of Interest.

8.5 How Could SHE Transmission Use Remote Sensing?

This methodology may be useful for SHE Transmission's site selection (optioneering) stage as it would enable provision of data across areas without the need for surveyors on the ground. It could also be used for specific site assessments; however, it is likely that surveyors will be on-site for a range of survey purposes at that stage and so on-the-ground habitat surveying may be the preferred option. It should be considered that applying remote sensing to large-scale infrastructure projects, such as SHE Transmission's overhead lines (OHL) and underground cable (UGC) developments may have its drawbacks; the variance of vegetation types across a long linear route may be large and as a result the ground-truthing needed may have to be significantly widespread to account for this variation.

Remote sensing could be used post development to assess habitat change over longer terms to enable monitoring of biodiversity change at the estate level. Similarly, it could be used to measure change due to operational management and estate improvements. This monitoring would be reliant upon updated remote sensing data being available in addition to ensuring suitable time periods between survey monitoring to enable habitats to mature and change to be captured.

In terms of the SHE Transmission uses for this remote sensing approach and the benefits it could hold, the best route may be to undertake an extensive area of desk-based data creation using the data outlined in this report (high resolution imagery, near infrared and height data) with a sample of ground-truthed data. An analysis for the wider area could then be run, based on those specific parameters using machine learning techniques. This would mitigate the more standardised parameters that may not capture the complexities of remote habitats in Northern Scotland as well as providing data for areas that are more difficult to access. Utilising as many verification datasets as possible would help improve the accuracy and effectiveness of the remote sensing classifications.

SHE Transmission could look to drive innovation and lead in this area by using hyperspectral data, along with the high-resolution LiDAR and machine learning methodologies mentioned above, to develop a much higher accuracy remote sensing survey. This could be based on a species group level classification, and potentially habitat condition classification, where reflectance would be able to achieve a high level of differentiation and therefore capture habitat types using the chosen survey method with the highest level of accuracy possible. This is currently in the realm of developing technologies (see section 4.4) however, remote sensing experts advise that this is the most robust methodology in deployment. The further benefits of this methodology are that data for this are widely available from satellite sources and can be purchased based on individual areas of interest.

Specific confidence measures are not available due to the nature of these technologies, as many are still in development stages. These datasets in close spatial proximity to a remotely sensed area, can make habitat classifications highly accurate compared to data poor areas where there are no datasets available to cross reference the spectral characteristics against.

9 Natural Capital and Environmental Net Gain

There are two key ways that SHE Transmission could integrate a natural capital approach into its decision-making and move towards its target of Environmental Net Gain:

- Project level implementation to help deliver net benefits for the environment and people at the development site scale;
- Through integrated reporting at the corporate level, aimed at capturing multiple aspects of value created by SHE Transmission.

9.1 Six key areas of work which would support this transition are outlined below.

9.1.1 Informing Planning And Development

Run trial natural capital assessments for a suite of developments using the Natural England Eco-metric or EcoServe-GIS to review the net change in natural capital value (including Biodiversity Units) before and after development. The outputs could be presented and reviewed at a workshop within SHE Transmission to discuss the use of this data for informing decision-making and reporting against environmental commitments.

9.1.2 Greening The Network

Develop a project-level assessment protocol to inform decision-making on the most appropriate green infrastructure for any new development. This would be based on a range of criteria including the contribution to net gain in biodiversity and the potential to positively impact on key environmental and social issues (such as flood risk, climate mitigation, health and well-being). Step-by-step guidance and flow diagrams could guide the user in selecting the most appropriate tool and sources of evidence for any given circumstance.

9.1.3 Demonstrating SHE Transmission's Contribution To National Environmental Targets

Undertake a 'state of natural capital' assessment for the estate. This would augment the Biodiversity Net Gain methodology. The most straight-forward approach would be to apply the Natural Capital Planning Tool or Natural England's Eco-metric. These scorecard approaches would be cheapest to run but other tools would produce a more informative and comprehensive assessment. Other suitable tools would be GI-Val, EcoServe-GIS or potentially the Urban Greenspace Valuation Toolkit currently in development. It is likely that some adaptations would be needed to make the tools fit-for-purpose for the SHE Transmission estate. This information could potentially feed into a Natural Capital Account for SHE Transmission.

9.1.4 Making The Case For Investing In Green Infrastructure

Demonstrate the economic value of SHE Transmission's soft estate in delivering benefits to the business and to wider society. This could be done using GI-Val or the Urban Greenspace Valuation Toolkit. This would be useful in making the case for further investment in green infrastructure to internal audiences such as the finance team.

9.1.5 Taking The Lead On Environmental Net Gain

The UK Government has pledged to leave the environment in a better state than it found it. To deliver on this pledge, the 25 Year Environment Plan outlines a policy to embed an environmental

net gain principle for development, including housing and infrastructure, resulting in “measurable improvements for the environment”.

The Scottish Government has not yet published its Environment Strategy for Scotland, however in its Discussion Paper the government set out its intentions for an ambitious strategy. It seems reasonable to assume that environmental net gain will be included within the strategy. If this is the case, the government will be looking for business leaders to help define this new approach in a way which is practical, flexible and enables businesses to create and demonstrate value. SHE Transmission is in a strong position to contribute and show leadership. The biodiversity work that SHE Transmission has already undertaken is a great step towards delivering environmental net gains. Exploring the use of natural capital assessments would enable SHE Transmission to work with the NatureScot and other stakeholders to develop an agreed approach that would deliver measurable environmental improvements for Scotland.

10 Future Direction for SHE Transmission

The following recommendations are suggested to enable SHE Transmission to continue to develop the BNG process to deliver more for the business:

Address land purchase requirements at project concept stages to ensure the necessary space for net gain

Involve the Principal Contractor earlier in the development process to enable more detailed design discussions, understand the areas required for temporary construction works which need to be assessed for the temporary habitat impacts (in particular, including access tracks), and establish habitat compensation requirements and feasibility.

Decide on the extent or number of projects that a BNG assessment will cover. For example, should it cover:

- Grid connection only
- Grid connection plus the substation
- Grid connection, plus the substation, plus energy generator

It is recommended that SHE Transmission assess each project individually, with the BNG assessment covering the site boundary, making the calculations easier and clearer for submission to planning authorities.

- Maintain a GIS database of all BNG data and update it at regular intervals (quarterly/annually/or at planning application submission) to allow monitoring and evaluation of BNG outputs and enable biodiversity reporting. One way to do this is to require that all consultants and contractors provide GIS shapefiles to SHE Transmission of the baseline biodiversity data, in addition to the landscaping information which would include information on habitat types created/enhanced, distinctiveness, target condition, and time to target condition.
- Undertake annual biodiversity reporting to show the progress of BNG. This should report on the percentage of development projects which have undertaken a BNG

assessment. Of those projects, it can show the percentages that achieved no net loss and net gain. This will enable SHE Transmission to report against the Sustainability Strategy targets made to 'Positively contribute to the UN and Scottish Government Biodiversity strategies by achieving an overall 'No Net Loss' on new infrastructure projects gaining consent in 2020 onwards and achieving Net Gain on projects gaining consent in 2025 onwards'.

- Consider use of the wider corporate estate to deliver biodiversity offsetting areas and potentially set up habitat banks for use by other developers. For example, wind farm developments may provide opportunities to enable offsetting closer to the SHE Transmission development projects.
- Consider how best to achieve the 'net gain legacy' set out in the good practice principles which involves ensuring management plans covering 25-30 years are in place and delivered to achieve the net gains set out in design. The management activities should include adaptive management, monitoring and evaluation to ensure biodiversity targets can be met.
- Undertake a remote sensing trial to establish how new technology and emerging datasets may enable determination of Scottish upland/peatland habitat, allowing this data to be factored into site selection considerations or enabling habitat surveys in remote/difficult to reach areas.
- The following recommendations are suggested to enable SHE Transmission to progress with applying BNG in the marine environment:
    - Work should be undertaken to identify and cost how the surveys already undertaken can be modified to gather data on the biodiversity using the area of the marine environment effected by the development, the seabed, water column and/or surface.
    - Research should be undertaken to update and clarify how the costs for habitat creation / enhancement overlap with and can be absorbed within other project activities.
    - SHE Transmission should use the MMO (2019) data layers to identify key sites within SHE Transmission's operational area that could be used to compensate for development impacts.
- SHE Transmission be part of the Defra working group to ensure that the metric is fit for purpose for Scotland, SHE Transmission, habitat trading rules are agreed, and to ensure that SHE Transmission is at the forefront of this work as it develops.
- Undertake a bespoke review of Natural Capital Tools for SHE Transmission which provides an overview of current evidence, tools and case studies relevant to SHE Transmission's interests and commitments in the context of recent policies for Scotland relating to the natural environment and the concept of natural capital. This could help inform considerations of how to move towards Environmental Net Gain.
- Establish a Scottish BNG Working Group with consultants, developers, NatureScot, Scottish Forestry, and other stakeholders to develop the BNG process and discuss lessons learned through regular meetings. This Working Group should work closely

with the BNG practitioners and experts across the UK to ensure development of BNG in Scotland remains comparable to that in the rest of the UK.

11 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New document created	N/A	1.00	Richard Baldwin
02				

Scottish & Southern Electricity Networks
TRANSMISSION

TG-NET-ENV-526

Consents and Environment

Biodiversity Net Gain Toolkit User Guide

Inveralmond House, 200 Dunkeld Road, Perth PH1 3AQ ssen.co.uk

TG-NET-ENV-526	Biodiversity Net Gain Toolkit User Guide		Applies to Transmission ✓
Revision: 2.00	**Classification:** Public	**Issue Date:** October 2022	**Review Date:** October 2030

	Name	Title
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Checked by	[redacted]	Consents and Environment Manager
Approved by	[redacted]	Head of Consents and Environment

Contents

Inveralmond House, 200 Dunkeld Road, Perth PH1 3 **ssen.co.uk**

1 Introduction

Scottish Hydro Electric Transmission (SHE Transmission) owns, operates and maintains the 400 kV, 275 kV and 132 kV electricity transmission network in the north of Scotland, in some of the UK's most challenging terrain. It forms part of Scottish and Southern Electricity Networks (SSEN) which is the trading name of the economically regulated network companies owned by SSE plc - Scottish Hydro. SHE Transmission, Scottish Hydro Electric Power Distribution (SHEPD) and Southern Electric Power Distribution (SEPD).

Our operating area is home to vast renewable energy resources, and this is being harnessed by new wind, hydro and marine generation. Working closely with National Grid, the GB transmission System Operator, SHE Transmission also enables these electricity generators to connect to the transmission system by providing connections and allowing the electricity generated by them to be transported to areas of demand across the country.

SHE Transmission has significant interaction with the environment through the activities we undertake in Scotland as we seek to develop and improve the transmission network in response to strong growth in renewable generation in the North of Scotland. With this work comes a legal responsibility to design and build our projects in a manner which protects the natural and built environment. To this end, SHE Transmission's Environment and Consents Team has worked hard to develop and refine controls and processes to ensure these demands, responsibilities and the requirements of interested parties are met.

2 References

The documents detailed in Table 2.1 - Scottish and Southern Electricity Networks Documents, and Table 2.2 – External Documents, should be used in conjunction with this document.

Table 2.1 - Scottish and Southern Electricity Networks Documents

Reference	Title
TG-NET-ENV-525	An Introduction to Biodiversity Net Gain
FC-NET-ENV-500	Biodiversity Net Gain Procedure Flowchart

Table 2.2 – External Documents

Title	Link
Biodiversity Net Gain – Good practice principles for development. CIEEM, CIRIA, IEMA (2016)	Link
Biodiversity Net Gain – Good practice principles for development. A Practical Guide. CIEEM, CIRIA, IEMA (2019)	Link
Ancient Woodland Inventory (Scotland). The Scottish Government (2015).	Link
Introduction to the Test Biodiversity Metric. Defra. (2019).	Link
Ecology Calculation Methodology – Route 2 GN36. BREEAM (2018).	Link
Biodiversity Metric 3.1 – Habitat Condition Assessment Sheets with Instructions	Link

3 The Biodiversity Toolkits

3.1 Introduction

This document sets out the steps for running a Biodiversity Unit Calculation. Biodiversity Net Gain is a target for development projects, in which biodiversity losses are outweighed by measures taken to avoid, minimise or compensate impacts of the project. This guide describes how to measure baseline biodiversity, and the change in biodiversity, using SHE Transmission's toolkits, and details the following steps:

Step 1: assessment of the biodiversity baseline.

Step 2: inform avoidance, mitigation and compensation proposals.

Step 3: assessment of post development biodiversity.

Step 4: production of the final reports.

SHE Transmission have produced two toolkits; the Biodiversity Site Optioneering Toolkit, and the Biodiversity Toolkit. Together these are called 'the biodiversity toolkits' (see Figure 3.1).

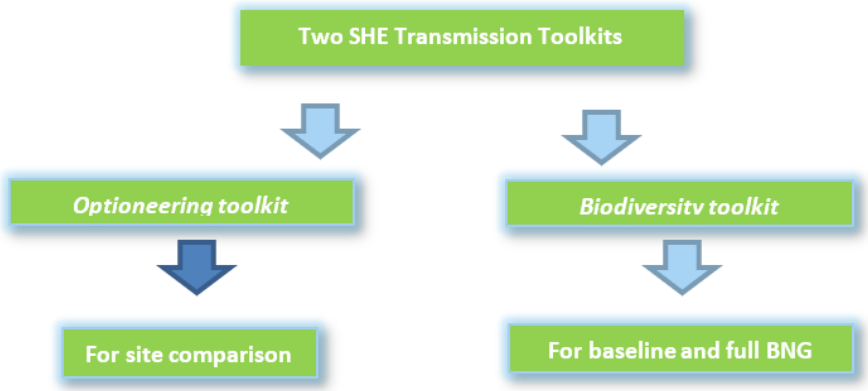


Figure 3.1 - She Transmission Toolkits

The biodiversity toolkits are Excel spreadsheets that will help run the biodiversity assessment. The toolkits can be used to assess the biodiversity impacts of a given development scheme or to assess the biodiversity benefits of a corresponding landscaping or offsetting scheme to help optimise their design.

A biodiversity metric (version 3.1) has been developed Department for Environment Food and Rural Affairs (Defra) metric for Biodiversity Net Gain (BNG) is now being used in England. SHE Transmission has reviewed and adapted the Defra metric to allow it to be used for its development projects, and to inform the adoption and developments in Scotland. These features have been included in both Toolkits.

The guide to SHE Transmission's Site Optioneering Toolkit can be found in **section 3**.

The guide to SHE Transmission's Biodiversity Toolkit can be found **in section 4**.

A flowchart setting out the BNG process reporting requirements has been developed FC-NET-ENV-500.

3.2 Information Required for a BNG Assessment

The following is a list of the information required to complete a BNG assessment:

- The red line boundary for the development (ensuring this covers all areas used for temporary construction works)
- Temporary works plans clearly showing areas of permanent or temporary habitat loss
- Landscape plan or reinstatement plans showing the permanent development and planting information for the areas of habitat to be created or enhanced
- Area or length of each habitat including irreplaceable habitat – these should be excluded from the assessment at the outset
- Phase 1 or UK Habitat Classification (UKHab) information for each habitat
- Habitat Condition Assessment score for each habitat

3.3 Projects requiring BNG

As set out in our 'Approach to Implementing Biodiversity Net Gain' SHE Transmission are looking to achieve No Net Loss (NNL) on all projects gaining consent from April 2020 and Net Gain (NG) on projects gaining consent from April 2025. However, the following type of project do not require to follow the BNG reporting process. This is due to the limited impacts on biodiversity of the development or the fact that SHE Transmission is not the consent holder.

- Marine projects until such time an accepted BNG approach has been developed
- Substation projects where works are within the operational area. This includes asset replacement or installation, fence replacement and other upgrades
- Refurbishment of existing OHLs such as reconductoring and reinsulating
- Resilience felling including projects where an upgrade results in an increase in the operational area
- Projects which are constructed under Permitted Development rights or Electricity Act Exemptions, excluding electricity cable installation
- Elements of a project which are applied for by others e.g., temporary contractor compounds, bellmouths and access tracks
- Minor Public Road Improvements (PRIs)
- Projects which have an insignificant effect on biodiversity due to the limited size of the footprint or the low value of habitats present

- Subsequent consent applications on sites which have an existing BNG assessment. The original BNG assessment will however require updating

4 Biodiversity Assessment Overview

4.1 The Mitigation Hierarchy

The principles of the Mitigation Hierarchy underpin the BNG process and should be considered roughout every step of the BNG process.

The Mitigation Hierarchy

1. ***Avoidance*** **– measures taken to avoid potential biodiversity impacts**
2. ***Minimisation*** **– measures taken to reduce the duration, intensity, extent and/or likelihood of impacts that can't be avoided**
3. ***On-site restoration*** **– measures taken to enhance or recreate habitats after development impacts where avoidance or mitigation is not possible**
4. ***Offset (Off-site compensation)*** **– measures taken to compensate for any residual, adverse impacts after full implementation of the previous three steps of the Mitigation Hierarchy**

Figure 4.1 - The Mitigation Hierarchy

The information gathered from the biodiversity baseline is used to inform avoidance, mitigation and compensation measures proposed for the project. The aim is to minimise the ecological impacts and provide opportunities for enhancing biodiversity.

Users must work with the people responsible for the design of the project (engineers, landscape architects etc) to identify the type of impact caused by the scheme. This may already be set out in an Ecological Impact Assessment (EcIA) which will identify whether impacts on biodiversity are direct or indirect, temporary or permanent, or as a result of cumulative impacts.

4.2 Calculation Biodiversity and Linear Units

In both toolkits the Units are calculated using the following characteristics of the habitats:

- Habitat area (hectares) or length (metres)
- Distinctiveness
- Condition
- Connectivity
- Strategic significance

Go to Appendix A for definitions to understand more about:

- **Biodiversity Units and Linear Units**
- **Distinctiveness**
- **Condition**
- **Strategic significance**
- **Connectivity**

These characteristics are described in the Glossary (Appendix A).

The Habitat Condition Assessment for the different habitats are found on the Natural England publications website; Biodiversity Metric 3.1 – Habitat Condition Assessment Sheets with Instructions. The link is provided in Table 2.2 of this document.

Each characteristic is given a numerical value. These are set out in the toolkits. These numbers are multiplied together to get a Biodiversity Unit or Linear Unit score. The score for the habitats before the development can be compared to the score post- development to identify whether the development delivers a net gain in biodiversity. The calculation and a worked example can be seen in Figure 4.2.

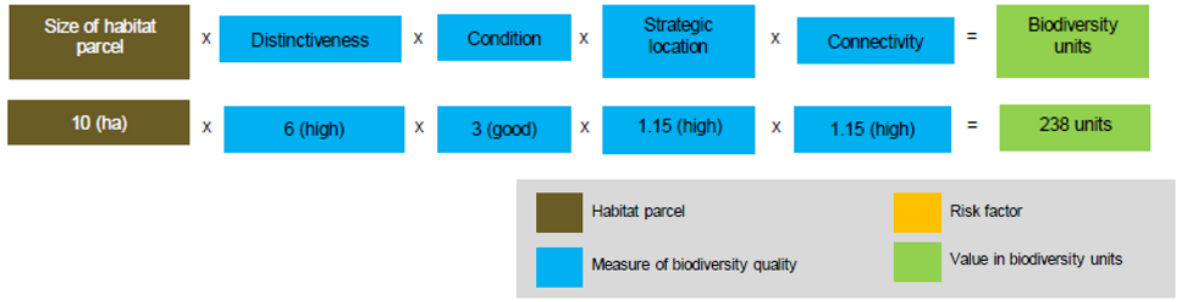


Figure 4.2 – Post pre-development/intervention biodiversity unit calculation

4.3 Areas Included Within the Assessment

For the purpose of the biodiversity assessment, SHE Transmission defines the site as the land either temporarily or permanently impacted by the scheme plus any hardstanding, landscaping, site access and areas used for the purpose of the development for temporary site storage and buildings.

In addition, the assessment should include any land outside the development boundary where there is an indirect impact on biodiversity and any additional areas being used to compensate for biodiversity impacts (offsets).

4.4 Designated Sites and Protected Species

Irreplaceable habitats and designated sites e.g., Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSI) within a scheme boundary must be identified. Impacts to these areas should be avoided, mitigated and, as a last resort, compensated for following national legislation, policy and guidelines. These areas (the sites and any mitigation or compensation) should be excluded from the biodiversity unit calculations.

Consideration should be given to the foraging habitats for qualifying species of a SPA even when the habitat is outside the SPA. The implications of the proposed habitat change in view of conservation objectives of a potentially affected qualifying species should be summarised in the Biodiversity Net Gain Assessment Report. If it is predicted that the conservation objectives of the SPA are undermined (or this cannot be ruled out) as a result of the project development then the report should consider appropriate retention, enhancement or creation of suitable alternative foraging

resources. Only in cases where the habitat change is predicted to adversely affect the SPA site integrity will the foraging habitat be considered irreplaceable.

Separately, the habitats in designated sites will be qualitatively assessed to ensure the mitigation hierarchy is followed rigorously. The same approach is to be followed for projects that impact on irreplaceable habitats i.e., a BNG assessment is required for all non-irreplaceable habitats on that particular project.

Projects affecting protected species must fully comply with legislation and planning policy. If the project involves habitat creation or enhancement for a protected species license, those habitats can be included in the biodiversity unit calculation to capture the biodiversity losses and gains that they contribute to a project.

4.5 Peatland Habitats

For the purposes of SHE Transmission BNG assessments only areas of blanket bog or raised bog assessed as being in moderate, fairly good or good condition are deemed as irreplaceable habitat in Scotland. Therefore, unlike the Natural England Biodiversity Metric 3.1, peatland habitats in poor condition are not considered irreplaceable.

4.6 Semi Natural Ancient Woodland

Ancient Semi-Natural Woodland (ASNW) and Plantations on Ancient Woodland Sites (PAWS) are classed as irreplaceable habitats. If woodland habitat is found on site during the survey and it is deemed to be of high distinctiveness, then the Scottish Ancient Woodland Inventory (AWI) should be checked to assess if the habitats are classed as ancient woodland. If both areas match and the surveyor has found no reason to suggest the woodland is not ancient, then the area(s) should be classed as irreplaceable habitat and should not be included in the calculations. Other woodlands on 'Roy' woodland sites and long-established woodlands of plantation origin (LEPO) referred to in the Scottish AWI are not considered as irreplaceable.

Furthermore, irreplaceable woodland should be referred to ASNW or PAWS in all reports and assessments.

If the woodland habitat on site matches with the AWI but the surveyor has questions over the validity of the area being ancient woodland, then a specialist survey should be commissioned to establish whether the habitat is ancient and therefore irreplaceable.

4.7 Watercourses

Currently condition assessments for watercourses are based on Higher Level Stewardship Farm Environment Plan (FEP) which are poorly developed for use with the metric. Until such a time that condition assessments are fully developed in Scotland our interim position is as follows;

All non-priority habitat watercourses will be assigned the UK Habitat classification of 'Other rivers and streams'. 'Natural' watercourses not covered in the FEP will be assigned a distinctiveness of 'High'. All culverts or concrete lined channels will be assigned 'Low' distinctiveness.

4.8 Condition assessment

Condition assessments for all other habitats aside from waterbodies should follow the technical guidance developed for the most recent Natural England Biodiversity Metric should be used. The categories used are Good / Moderate / Poor. Intermediate scores of Fairly Good / Fairly Poor are also acceptable when the habitat falls between two categories. Habitats with no biodiversity value or agricultural should be classed as n/a.

4.9 Strategic significance

Strategic significance criteria used in the SSEN Transmission toolkits mirrors that set out in the Natural England BM 3.1 Guidance and is shown in Section 6.4 of this document.

4.10 Indirect Impacts

Where data is available (for example in an Ecological Impact Assessment (EcIA)), areas affected by indirect impacts (such as change in air quality due to the development) should be included in the assessment, with justifications provided for in the Pre- and Post-Development Biodiversity Unit scores. If these areas have been identified but the data on the change in the habitat due to the indirect impacts are not available, it should be assumed that the habitat decreases in condition by one step (e.g., from Good to Moderate).

4.11 Developments with No Impact on Biodiversity

Development that does not require an ecological survey (due to having no direct impact on semi-natural habitats) may still have the potential to deliver benefits for biodiversity. For example, trees and flower beds can be integrated within pavement or hard landscaping schemes, or green roofs and walls included within structures. Where development takes up these opportunities for enhancement the Biodiversity toolkit should still be used to demonstrate the Biodiversity Units gained from the creation of the new green space.

4.12 Toolkit Version

The current version of the toolkit (v3) should be used for all new projects.

5 SHE Transmission's Biodiversity Site Optioneering Toolkit

SHE Transmission's Biodiversity Optioneering Toolkit has been designed to help with decision making and mitigation by allowing the user to compare sites and therefore allow for easier site selection.

The data required from each site for the Optioneering Toolkit is a biodiversity baseline identifying the habitats likely to be on site. This can be gained via remote sensing, online maps and/or aerial imagery that covers the strategic option area. This means the results will be estimations of the biodiversity on site rather than fully accurate baselines. Assumptions, particularly on the habitats

and condition of those habitats, may need to be made and where this is required these need to be fully documented in the BNG report.

There are ten available 'Option' tabs (highlighted in green in Figure 5.1), with each corresponding to a different site for the selection process.

Figure 5.1 – Biodiversity Optioneering Toolkit tabs

The Optioneering Toolkit contains a number of tabs. The tab titled 'Guide' (as highlighted in red in Figure 5.1) contains further information on the biodiversity toolkit and its use.

5.1 Project Details Tab

The Project Details tab (highlighted in blue in Figure 5.1), is shown in detail in Figure 5.1. Project details can be input into this page, such as project title, lead and reference number as well as the toolkit lead and approver. There is a drop-down menu for 'Habitat classification system', with the option of either Phase 1 or UKHab data depending on which has been used for the habitat survey and condition assessment.

Once a classification system has been chosen in the 'Project Details' tab, the toolkit will adapt to this system and only offer drop-down options related to the chosen system in the Unit Calculation tab.

Below the project details is a table where each of the sites (including name and location and a brief description of works) can be input.

There is another drop-down for 'Type of project', where the choices are linear or area, depending on what type of habitat is being assessed (e.g., overhead line or a substation). If linear is chosen, the grey boxes beneath the 'End' of the Location (Grid reference) column will open and become light blue. The end point of the linear route can then be input.

The work-through example can be seen in Figure 5.2. For the purpose of the work-through, the 'Habitat Classification System' will be Phase 1 and the 'Type of project' will be Area. As the 'Type of project' is Area, the 'End' option of the Location (Grid Reference) is greyed out.

Biodiversity SOT

Scottish & Southern Electricity Networks

Project title	Insert Project title		
Project lead	Insert name of Project lead		
Project reference number	Insert project reference number		
Toolkit lead	Insert name of Toolkit lead		
Toolkit approver	Insert name of Toolkit Approver		
Habitat classification system	Phase1		
Date toolkit completed or updated	Insert date of completion	Type of project	Area

Site Ref	Site name	Location (Grid Reference)		Brief description of works
		Start	*End*	
1	Site 1	Insert Grid Reference		Insert brief description of works
2	Site 2	Insert Grid Reference		Insert brief description of works
3				

Figure 5.2 – Project Details Tab

5.2 Biodiversity Unit Calculation

Within the Options tabs (Labelled as Opt 1, Opt 2 etc) (highlighted in green in Figure 5.1), each habitat should be input independently, collated by habitat type, distinctiveness and condition.

In the *'Calculation Units (Area/Linear (H.W)) tab, choose the correct unit type:*

- **Phase1_Area – for use with area habitats**
- **Phase1_Linear_H – for use with linear hedgerow habitats**
- **Phase1_Linear_W – for use with linear watercourse habitat**

Figure 5.3 – Biodiversity Options

The distinctiveness column will automatically populate. The rest of the data (condition, connectivity, strategic significance) can then be input using the drop-down menus (see Appendix A for the Glossary). The area or length of habitat is to be input manually (in hectares and metres respectively).

Connectivity factors in the relationship of a habitat to surrounding habitats while strategic significance takes into account the importance of the surrounding habitat in local legislation and policy.

It is recommended that habitats other than ponds with an area of less than 0.01 are not input into the biodiversity calculations as they are not large enough to be considered a viable habitat and be effectively managed to increase overall biodiversity. This is also true for the Biodiversity Toolkit.

Once all the details have been input the baseline Biodiversity Units or Linear Units will calculate automatically.

Any notes can be added into the 'Notes' box beside each habitat row.

Option 1 - Site 1						
Phase 1 Habitat	Area or Length of Habitat *(ha / m)*	Distinctiveness *Band*	Condition *Rating*	Connectivity *Rating*	Strategic significance *Rating*	Suggested Action
A1.1.1 : Woodland : Broadleaved - semi-natural (High)	5.40	High	Good	Moderate	Medium	Avoid, Mitigate or Compensate
C1.1 : Bracken : Continuous (Medium)	3.40	Medium	Moderate	Moderate	Medium	Mitigate, Compensate

Figure 5.4 – Biodiversity Site Optioneering Toolkit- Option 1

As can be seen in the worked example in Figure 5.4, once the Phase 1 habitat type, area, condition and connectivity and strategic significance ratings have been input. The Optioneering Toolkit will automatically populate the 'Suggested Action' based on each habitats distinctiveness score (see section 3.4). The toolkit will also automatically calculate the Biodiversity Units.

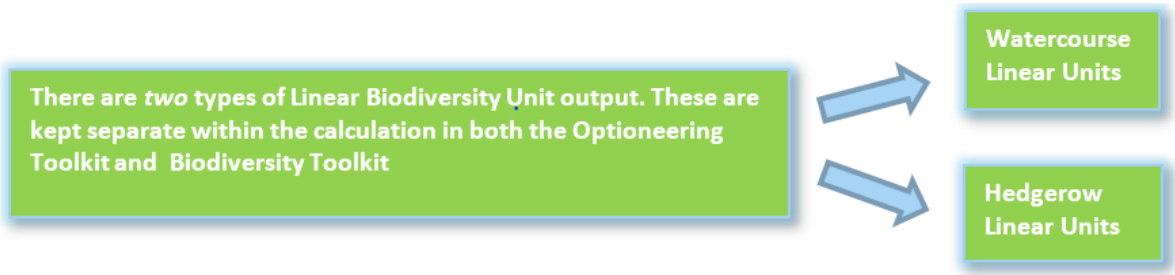


Figure 5.5 – Biodiversity Site Optioneering Toolkit- watercourses and hedgerows

If the Calculation Units had been input as Linear, the toolkit would have calculated 'Linear Units' (Figure 5.5). The area for linear units must be input as metres. Figure 5.6 shows a worked example with both Watercourse Linear Units and Hedgerow Linear Units. The toolkit has automatically calculated the Linear Hedgerow Units (H) and the Linear watercourse Units (W). These scores are treated separately within the toolkit and should remain separate throughout the reporting process.

Option 1								
Ref	Calculation Units *(Area / Linear (H/W))*	UK Habitats	Area or Length of Habitat *(ha / m)*	Distinctiveness *Band*	Condition *Rating*	Connectivity *Rating*	Strategic significance *Rating*	Suggested Action
Project Total								
1	UKHab_Linear_H	Native Species Rich Hedgerow with trees	23.00	Medium	Moderate	Moderate	Medium	Mitigate, Compensate
2	UKHab_Linear_W	Rivers and lakes – Other rivers and streams (High)	19.00	High	Moderate	Moderate	Medium	Avoid, Mitigate or Compensate
3								

Figure 5.6 – Biodiversity Site Optioneering Toolkit- Linear Units

5.3 Suggested Action

The Suggested Action column offers suggestions on how best to implement the mitigation hierarchy depending on the distinctiveness score of a habitat. Lower distinctiveness scores (Very Low, Low) can be developed and enhanced, whereas habitats with higher distinctiveness scores (Medium, High, Very High) are best to be mitigated, compensated or avoided completely (Table 5.1).

As demonstrated in Figure 5.4 and 5.6, the toolkit will automatically populate the 'Suggested Action' column depending on the distinctiveness of the habitat input into the 'Phase 1 Habitat' column.

Table 5.1 - Suggested Action

Distinctiveness Rating	Suggested Action
Very High	Avoid
High	Avoid, Mitigate or Compensate
Medium	Mitigate, Compensate
Low	Potential to Develop
Very Low	Potential to Develop

5.4 The Dashboard

The Dashboard tab allows for easy comparison of the possible Site options and automatically creates side by side bar charts allowing the user to compare the Biodiversity and Linear (hedgerow and watercourse) Units. Beside the bar charts is a summary table. Figure 5.7 is an example of a toolkit that has been used to compare 10 option sites.

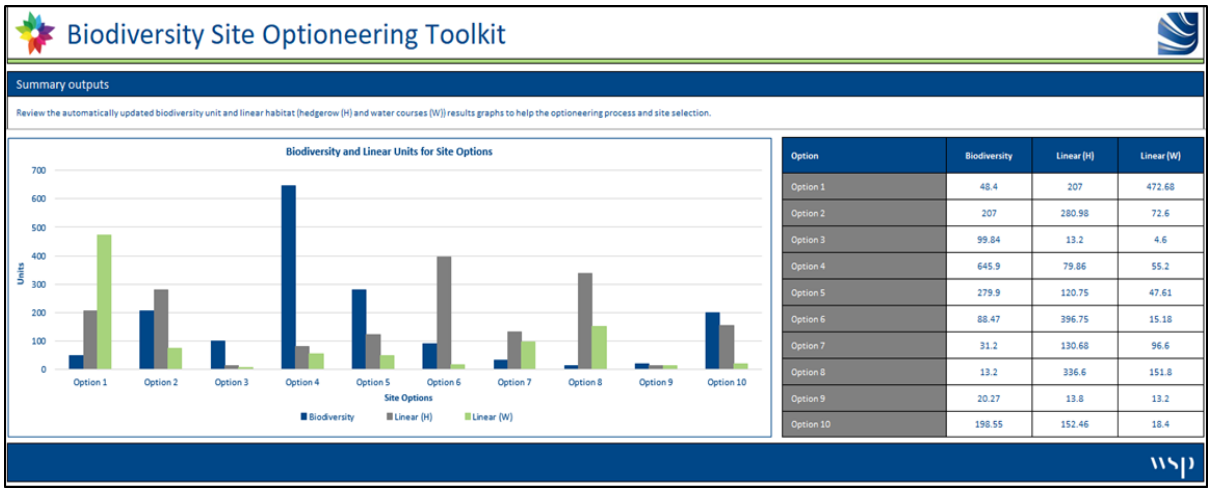


Figure 5.7 – Biodiversity Site Optioneering Toolkit- Dashboard

5.5 Deliverables

The deliverables of the Biodiversity Site Optioneering Toolkit are a Strategic Option Report to highlight areas of irreplaceable/valuable biodiversity which should be avoided, and the production of a biodiversity hotspot map. The Optioneering toolkit can also be used to deliver a Route Options

Report for linear routes. These reports can be used to inform the engineering, land requirements and landscape designs to avoid and mitigate biodiversity impacts as far as possible.

5.6 Biodiversity Site Optioneering Toolkit Flowchart

The flowchart in Figure 5.8 is a step-by-step guide to using the Biodiversity Site Optioneering Toolkit.

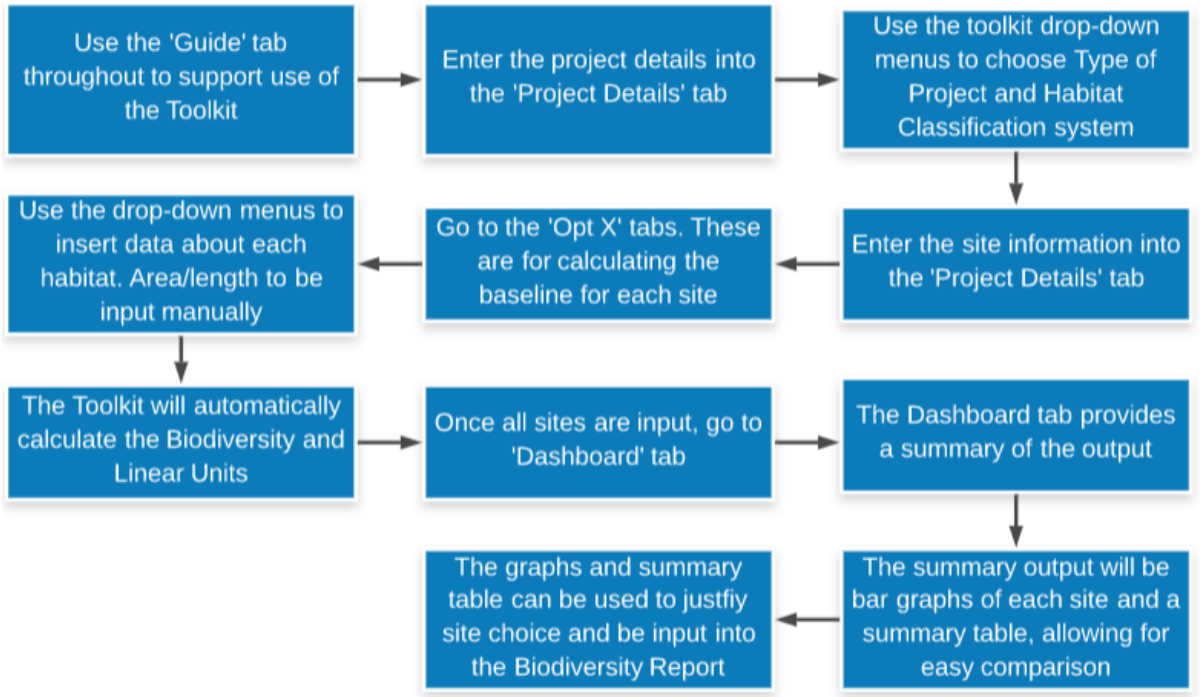


Figure 5.8 – Biodiversity Site Optioneering Toolkit- Flowchart

6 SHE Transmission's Biodiversity Toolkit

SHE Transmission's Biodiversity Toolkit is for use once the Site has been selected and is used for calculating the Biodiversity Units before, during and after works on a specific development site. The deliverables include baseline and full Biodiversity Net Gain assessments. The toolkit can be used to assess whether a development will reach No Net Loss or Net Gain.

The biodiversity toolkit contains a number of tabs. The tab titled 'Guide', as highlighted in red in Figure 6.1, contains further information on the biodiversity toolkit and its use.

Figure 6.1 – Biodiversity Site Optioneering Toolkit- Guide Tab

For each habitat type Biodiversity Units are calculated based on the approach set out in the Defra metric (2019). The change in Biodiversity Units or Linear Units are used as an indicator of a site's change in ecological value overall. The Biodiversity Units and each type of Linear Units are kept separate through-out the assessment.

Throughout, work with the people responsible for the design of the project (engineers, landscape architects etc) to identify the type of impact caused by the scheme. This may already be set out in an EIA which will identify whether impacts on biodiversity are direct or indirect, temporary or permanent, or as a result of cumulative impacts.

6.1 Project Details Tab

Summary information about the project should be entered into the Project Details tab in the toolkit to make it clear what the assessment covers (Figure 6.1, highlighted in blue). These details include Project title, lead and reference number as well as the name of the toolkit lead and approver.

In the Project Details, there are two drop-down menus. One is for 'Habitat classification system', with the choice between Phase 1 and UKHab. The next drop-down is 'Type of project', with the choice between linear and area. Once the habitat classification system has been chosen, the toolkit will automatically adapt to this and only offer the options that align with the chosen system throughout the other tabs.

For location (Grid Reference), the 'End' cell will only open and turn from grey to light blue when the Type of project is Linear. For projects with area habitats, this cell will remain grey and closed.

There is also a cell with space to enter a brief description of works. The Project Start Date and Project Duration relate to the commencement of clearance works and the length of time before restoration or creation of habitat commences.

A work-through example of the Project Details tab can be seen in Figure 6.2. This example uses Phase 1 data from a previous SHE Transmission development and is a step-by-step guide on how to use the Biodiversity Toolkit. For this example, the 'Habitat Classification System' used is Phase 1 and the 'Type of project' is Area.

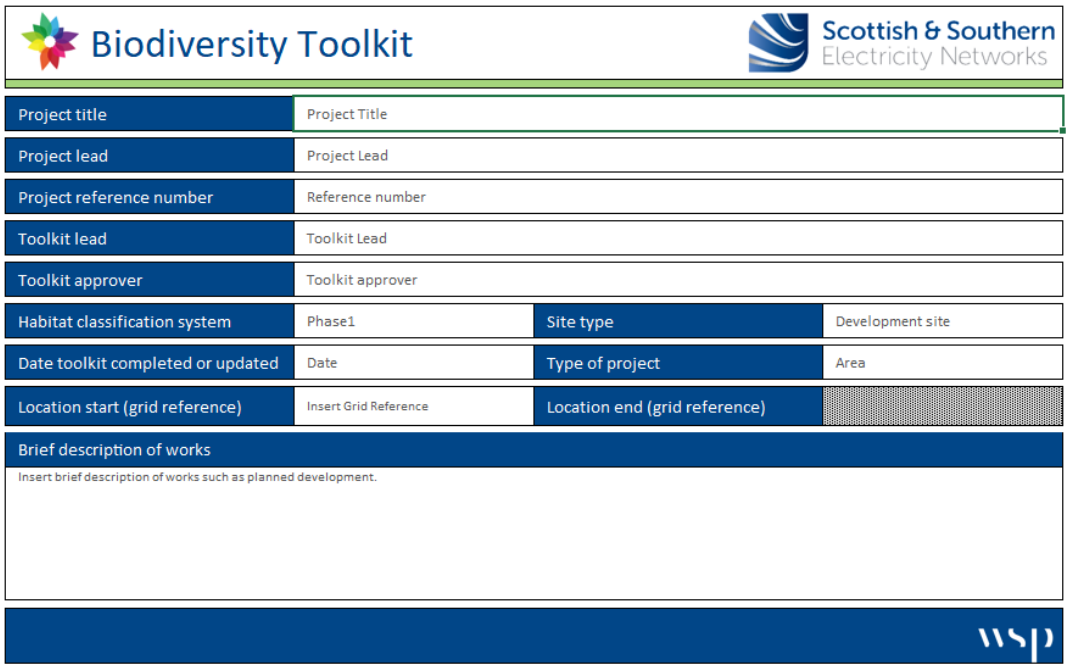


Figure 6.2 – The Project Details Tab

6.2 The Unit Calculation Tab

The Unit Calculation tab (Figure 6.1, highlighted in green) consists of a Before works (baseline) section, an Action (During Works) section and a After work actions (Following actions) section as well as summary tables for the Post-development units and Net Change in Units. The details of each habitat should be input into the rows.

The options for Calculation Units (Area/Linear), Phase 1/UKHab habitat type, condition, connectivity and strategic significance (see section 4.5) are all drop-down menus. The area/length of a habitat is to be input manually.

The Biodiversity or Linear units will be calculated automatically. Linear (H) Units relates to the linear units of hedgerows, and Linear (W) relates to the linear units for watercourses (see Figure 5.4).

6.3 Before Works (Baseline) Calculations

The information gathered from the biodiversity baseline is used to inform avoidance, mitigation and compensation measures proposed for the project. The aim is to minimise the ecological impacts and provide opportunities for enhancing biodiversity. The deliverable is a Biodiversity Baseline assessment.

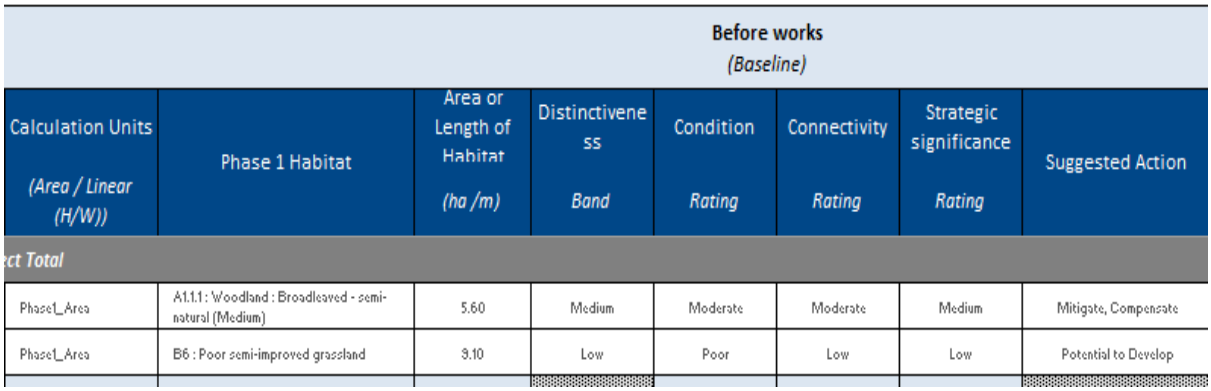
The details of each habitat should be input into the rows. The options for Calculation Units (Area/Linear), Phase 1/UKHab habitat type, condition, connectivity and strategic significance are all drop-down menus. The area/length of a habitat is to be input manually.

3	Phase1_Area	B5 : Marsh/marshy grassland (High)	0.45	High	Good	Low	Low
4	Phase1_Area	B5 : Marsh/marshy grassland (High)	0.82	High	Moderate	Low	Low

Figure 6.3 – Habitats With Different Condition and/or Distinctiveness Scores Should be Treated Separately

When the habitat type is input, the distinctiveness will be automatically populated. Depending on the distinctiveness, the toolkit will also automatically populate the Suggested Action column (see section 3.4 for information on Suggested Action). If there are areas of the same habitat but with differing condition or distinctiveness, these should be treated separately (Figure 6.3).

After all the data has been input, the Biodiversity or Linear units will be calculated automatically. Linear (H) Units relates to the linear units of hedgerows, and Linear (W) relates to the linear units for watercourses. This data can then be used in the Biodiversity Baseline Report.



		Before works (Baseline)					
Calculation Units (Area / Linear (H/W))	Phase 1 Habitat	Area or Length of Habitat (ha /m)	Distinctiveness Band	Condition Rating	Connectivity Rating	Strategic significance Rating	Suggested Action
ct Total							
Phase1_Area	A1.1.1 : Woodland : Broadleaved - semi-natural (Medium)	5.60	Medium	Moderate	Moderate	Medium	Mitigate, Compensate
Phase1_Area	B6 : Poor semi-improved grassland	3.10	Low	Poor	Low	Low	Potential to Develop

Figure 6.4 – Before works (Baseline)

For the worked example (Figure 6.4), the Phase 1 habitat classification has been used. As the Phase 1 habitat classification has been chosen for habitat classification in the Project Details tab, only Phase 1 options will be available in the Unit Calculation tab.

6.4 Connectivity and Strategic Significance

The definitions of both connectivity and strategic significance can be found below. When working out the connectivity of a habitat, as our suggested Categories (Table 6.1) have not yet been agreed with other stakeholders, we will mirror the approach originally adopted by Natural England i.e., High and Very High distinctiveness habitats should be assigned a Moderate connectivity multiplier and all other habitats a Low connectivity multiplier. Note that connectivity is no longer in the Natural England Biodiversity Metric.

Table 6.1 - Connectivity Categories

Connectivity Category	Score
Highly aggregated/connected: the habitat is directly connected to, or within 200 metres of an area of habitat outside of the development site which is of the same broad habitat category.	1.15
Moderate aggregation/connectivity: the habitat is within 200 – 500 metres of an area of habitat outside of the development site which is of the same broad habitat category.	1.1
Low aggregation/connectivity: the habitat is over 500 metres or more from an area of habitat outside of the development site which is of the same broad habitat category.	1

Table 6.2 - Strategic Significance Categories

Strategic Significance Category	Score
High strategic significance: Formally identified in local strategy, plan or policy.	1.15
Medium strategic significance: Location ecologically desirable but not identified in a local strategy, plan or policy.	1.1
Low strategic significance: Not identified in a local strategy, plan or policy OR no strategy or plan is in place in the area.	1

6.5 Developments with No Impact On Biodiversity

As mentioned above, development that does not require an ecological survey may still have the potential to deliver benefits for biodiversity and the toolkit should still be used to demonstrate the Biodiversity Units gained from the creation of the new green space.

To do this, enter the habitat type, area and condition into the drop-down menus in the Biodiversity Unit Calculation tab in the **Before Works (baseline)** section. Hardstanding and buildings should be included in this calculation although the distinctiveness of the habitats will be automatically given a zero score. The toolkit will automatically Baseline Biodiversity Units.

Include details from drop down menus in the relevant columns. Where these are the same for multiple areas of habitat, copy and paste to each relevant row.

Include any supporting information in the Notes column for each area of habitat type and condition. This is important for transparency and to help those reviewing and assuring the quality of the calculations.

6.6 Green Infrastructure Features

Green Infrastructure features, such as green roofs, rain gardens and street trees should be assigned the UKHab or Phase 1 habitat classification that most closely represents the habitat. Green walls consisting of climbing plants should treated as linear habitats and green walls consisting of plug planting should be considered as area-based habitats.

6.7 Action (During Works)

In the Unit Calculation tab, there is an Action (During works) (Figure 6.5) segment that allows for the calculation of Biodiversity Units or Linear Units. Landscape plans can be used to assess what areas of habitat will be retained.

The details input (the area retained and/or removed) should relate to the adjacent habitat in the Before works (Baseline) segment. After inputting area retained the toolkit will automatically calculate the area removed, and will then calculate the Biodiversity or Linear units that will be retained or lost (whether temporarily or permanently, directly or indirectly) due to the development.

Potential areas for habitat creation should be identified at this stage. The toolkit will provide clarity on the habitats that are negatively affected by the project at this stage. Compensation should be targeted at delivering net gains that are least ecologically equivalent in type and condition to the habitats lost. This means replacing loss with the same habitat type or one that will still support the species affected but of higher ecological value. For example, replacing semi-improved grassland with unimproved grassland. This can be described as compensating following the principle of 'like for like or better'.

Action (During Works)							
Area or Length of Habitat		Biodiversity Units		Linear Units (H)		Linear Units (W)	
Retained	*Removed*	*Retained*	*Removed*	*Retained*	*Removed*	*Retained*	*Removed*
5.60	**9.10**	**54.21**	**18.20**	**0.00**	**0.00**	**0.00**	**0.00**
5.60	0.00	54.21	0.00	-	-	-	-
0.00	9.10	0.00	18.20	-	-	-	-

Figure 6.5 – Action (During Works)

Insert the area of habitat to be retained in the correct row. For example, if 5.60 hectares of Broadleaved semi-natural woodland (Medium distinctiveness, Moderate condition) was to be retained, it would be input into the Action (During Works) in the same row as the habitat in Before Works (Baseline), as shown in Figure 6.6.

Before works (Baseline)												Action (During Wo			
Ref	Calculation Units (Area / Linear (H/W))	Phase 1 Habitat	Area or Length of Habitat (ha /m)	Distinctiveness Band	Condition Rating	Connectivity Rating	Strategic significance Rating	Suggested Action	Units			Area or Length of Habitat		Biodiversity Units	
									Biodiversity (Area)	Linear (H)	Linear (W)	*Retained*	*Removed*	*Retained*	*Removed*
Project Total									72.41	0.00	0.00	5.60	9.10	54.21	18.20
1	PhaseI_Area	A1.1 : Woodland : Broadleaved - semi-natural (Medium)	5.60	Medium	Moderate	Moderate	Medium	Mitigate, Compensate	54.21	-	-	5.60	0.00	54.21	0.00
2	PhaseI_Area	B6 : Poor semi-improved grassland	9.10	Low	Poor	Low	Low	Potential to Develop	18.20	-	-	0.00	9.10	0.00	18.20

Figure 6.6 – Before Works (Baseline) and Action (During works)

Once the retained habitats have been input, the toolkit will automatically calculate the total area that has been retained as well as the total area that has been removed (Figure 6.8).

6.8 After Works (Following Actions)

The area of the habitat to be created or enhanced, as well as the distinctiveness band, target condition, connectivity, strategic significance, difficulty and time to target condition should be input into the After-work actions (*Following Actions*).

Biodiversity Units and Linear Units resulting from the development, including newly created enhanced and retained habitats, are referred to as post-development Biodiversity Units/ Linear Units. Data to enable these to be calculated should be gathered from the ecology and landscape plans for the site, as well as other relevant information, for example retained habitat drawings.

In the toolkit select where the habitat is being enhanced or created from the drop-down menu in the After Works (*Following Actions*) section (Figure 6.8), which is located in the Unit Calculation tab. In the toolkit the appropriate equation is automatically selected once either Creation or Enhancement are selected in the 'After work action' drop-down.

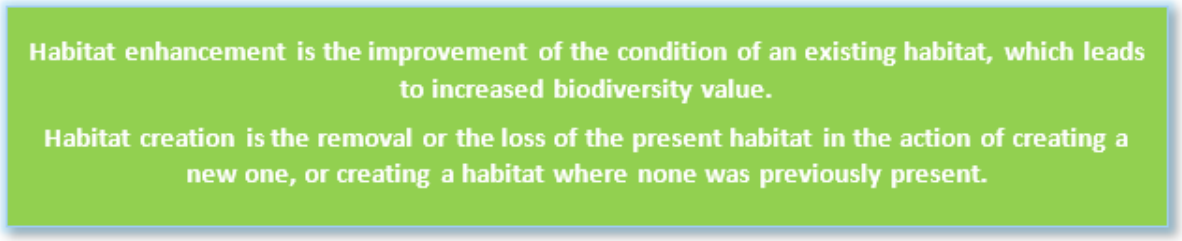


Figure 6.7 – Habitat Enhancement / Creation definitions

For the After works calculations, three risk multipliers are factored into the calculations. These are the delivery risk, the time to target condition and spatial risk.

Each risk factor is given a numerical value. These are set out in the toolkits. These numbers are multiplied together to get a Biodiversity Unit or Linear Unit score. The score for the habitats before the development can be compared to the score post- development to identify whether the development delivers a net gain in biodiversity.

Delivery risk is the risk associated with the difficulty to create or restore a habitat (Table 6.3). The delivery risk should be input underneath the 'Difficulty' column.

Table 6.3 - Years to Target Condition and Risk Multipliers

Years to Target Condition	Risk Multiplier
1	0.965
5	0.837
10	0.700
20	0.490
30	0.343

Table 6.4 - Delivery risk categories and Risk Multipliers

Difficulty of Creation / Enhancement	Risk Multiplier
Very high	0.10
High	0.33
Medium	0.67
Low	1

Time to target condition is the number of years it is estimated to take before the enhancement or creation of a habitat reaches the desired result (Table 6.4). These estimates should be based on the agreed values e.g., BREEAM GN36 but also on professional judgement.

Any areas of compensation outside of the development site (offsets) will require application of the spatial risk (Table 6.5).

Table 6.5 - Spatial Risk Categories and Risk Multipliers

Category	Risk Multiplier
Habitat provides compensation within local LPA area.	1
Habitat provides compensation outwith local LPA but within neighbouring LPAs.	0.75
Habitat provides compensation outwith the local LPA and the neighbouring LPAs.	0.5

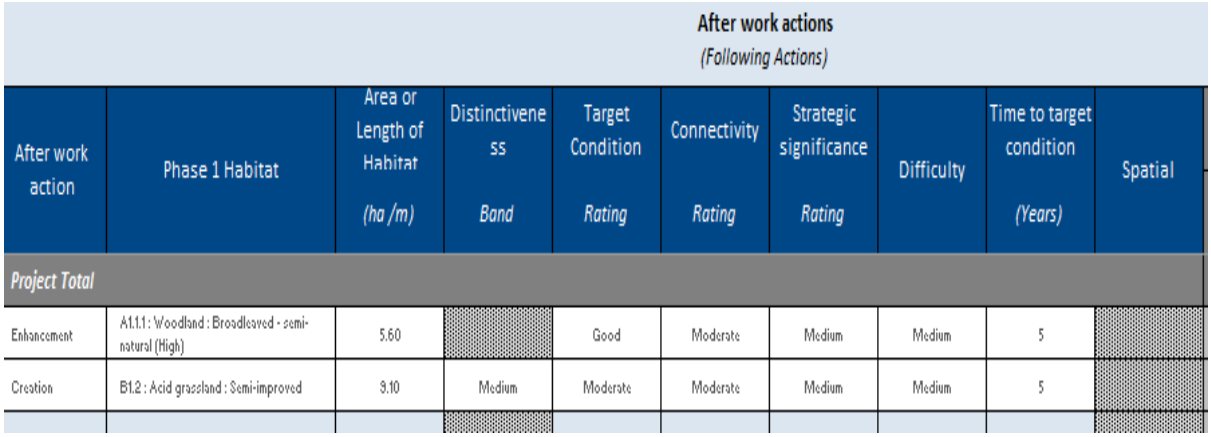
To calculate the biodiversity units, enter the target habitat type, target condition and area into the Biodiversity Unit Calculation tab in the relevant After Works Actions (Following Actions) cells. Then enter the Connectivity rating and the Strategic significance rating using the associated dropdowns. The scores for these ratings will appear automatically. This will calculate the post-development Biodiversity or Linear Units.

Please note that the After-Works Actions (Following Actions) sections are normally filled grey to avoid data entry. To enter details of an area of habitat enhancement or creation into the toolkit, first the Before Works (Baseline) and Action (During Works) sections must be completed. The toolkit will then automatically fill the cells light blue to allow data entry.

A scheme may require more rows for data entry of after development features than are available as a result of before development data entry. In this case, simply add new items to the Before Works (Baseline) sections must be completed. The toolkit will then automatically fill the cells light blue to allow data entry.

A baseline area may need to be split, and segments entered into the toolkit separately if there are different plans for the different segments of the habitat. For example, if half an area of hardstanding was to remain as hardstanding and the other half to be converted to grassland you would need to input two separate lines into the toolkit.

Figure 6.8 demonstrates an area to be enhanced and an area of habitat to be created.



After work actions
(Following Actions)

After work action	Phase 1 Habitat	Area or Length of Habitat *(ha /m)*	Distinctiveness *Band*	Target Condition *Rating*	Connectivity *Rating*	Strategic significance *Rating*	Difficulty	Time to target condition *(Years)*	Spatial
Project Total									
Enhancement	A1.1.1 : Woodland : Broadleaved - semi-natural (High)	5.60		Good	Moderate	Medium	Medium	5	
Creation	B1.2 : Acid grassland : Semi-improved	3.10	Medium	Moderate	Moderate	Medium	Medium	5	

Figure 6.8 - After Works (Following Actions)

Once the Area, Condition etc has been added to the toolkit, input the Difficulty, Time to target condition and Spatial risk ratings (Figure 6.8, highlighted in red), using the associated dropdowns.

The risk multiplier will be input automatically by the toolkit. The toolkit when then calculate the Biodiversity or Linear Units created and enhanced (Figure 6.8). The toolkit will also calculate the overall After works units for each habitat.

At the end of the process, the toolkit will have automatically calculated the Post-Development Units as well as the Net Change in Units for each habitat (Figure 6.9), and will allow the user to assess whether a development has delivered in No Net Loss or Net Gain by allowing comparison between post-development units and pre-development units.

As can be seen in the working example (Figure 6.9), there has been no change to the Biodiversity Units of one area, but an increase of 31.20 Biodiversity Units in the second area.

Post development			Net change		
Post development units			Net change in units		
Biodiversity (Area)	Linear (H)	Linear (W)	Biodiversity (Area)	Linear (H)	Linear (W)
103.61	**#VALUE!**	**#VALUE!**	**31.20**	**#VALUE!**	**#VALUE!**
54.21	#VALUE!	#VALUE!	0.00	#VALUE!	#VALUE!
49.40	-	-	31.20	-	-
TBC	TBC	TBC	TBC	TBC	TBC

Figure 6.9 - Post-development and Net Change Segment of Unit Calculation Tac

Figure 6.10 shows the final post-development calculation for newly created habitat as automatically worked out by the toolkit as well as a worked example.

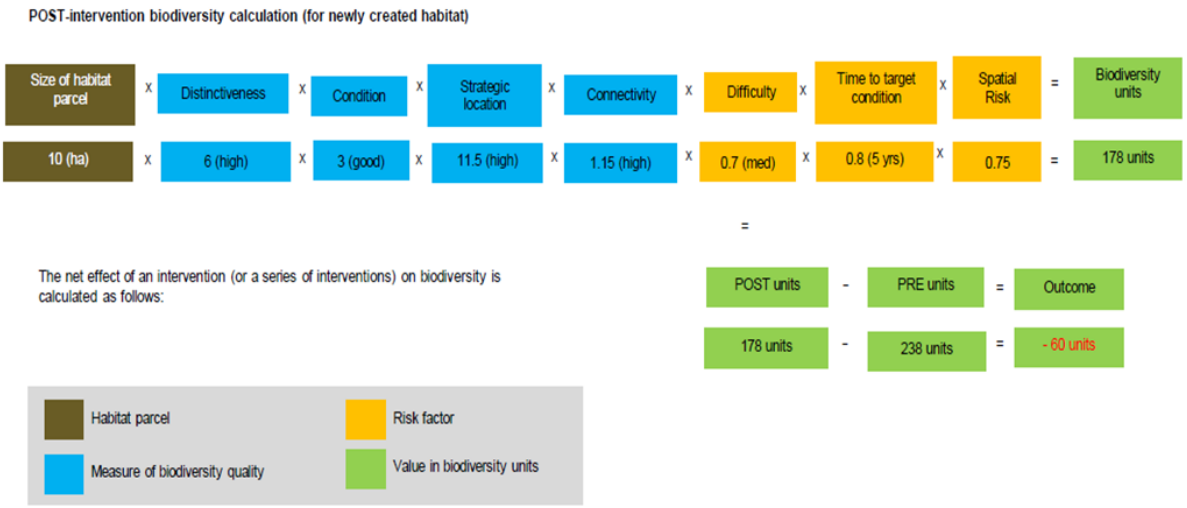


Figure 6.10 - Final Post Development Calculation

6.9 The Dashboard

Use the Dashboard Tab (Figure 6.11, highlighted red) within the toolkit to support reporting on no net loss or net gain for biodiversity.

Figure 6.11 - Biodiversity Toolkit Dashboard Tab

The Dashboard tab (Figure 6.12) is automatically populated, providing summary information for reporting and decision-making purposes. These summary tables and charts should be included in the final report. They provide opportunities for monitoring the impacts of development within the project. The final report should also include a short narrative on how the development has followed the ten Good Practice Principles.

It should be noted that the Dashboard will not take into account the loss of priority habitat and the Dashboard may show the development as reaching Net Gain despite the loss of priority habitat. This will need to be detailed in the Biodiversity Report along with details of any irreplaceable habitat impacted on.

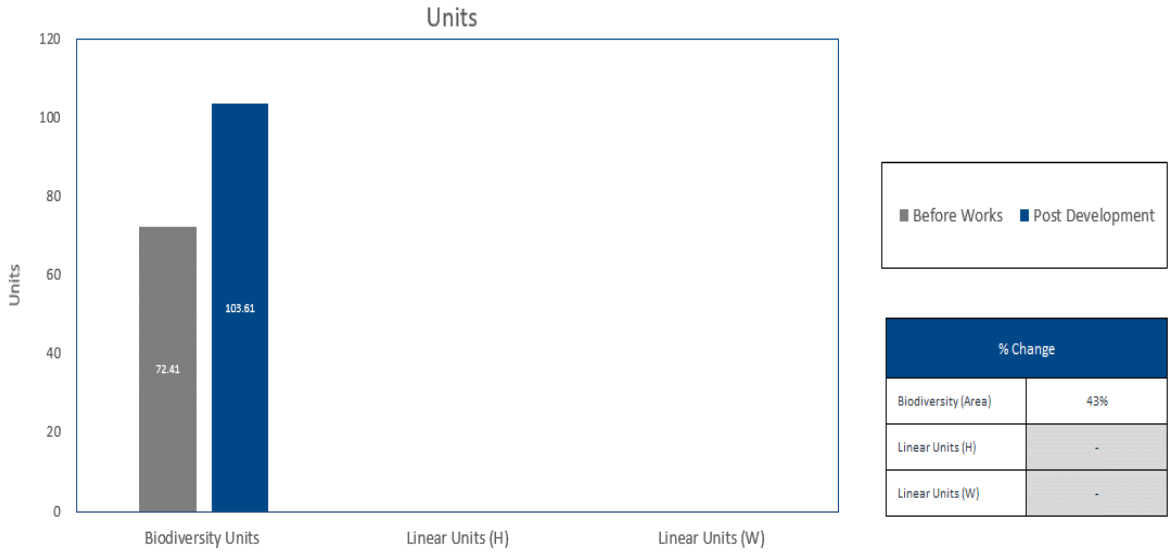


Figure 6.12 - Dashboard

The three tables to the right of the dashboard show the Pre-development (Before Works) and Post-Development Biodiversity Units for the development overall as well as the net change. There is also a bar chart that visually demonstrates the change in biodiversity or linear units before works and Post-development. A small table beside the bar chart shows the percentage change in biodiversity and linear units (Figure 6.12).

The working example shown in Figure 6.12 shows a positive net change of 43% in Biodiversity Units, an increase of 31.20 BU overall.

The bar chart and tables on the dashboard can be used within associated biodiversity reports.

6.10 Biodiversity Toolkit Flowchart

Figure 6.13 is a step-by-step flowchart of how to use the Biodiversity Toolkit from beginning to end.

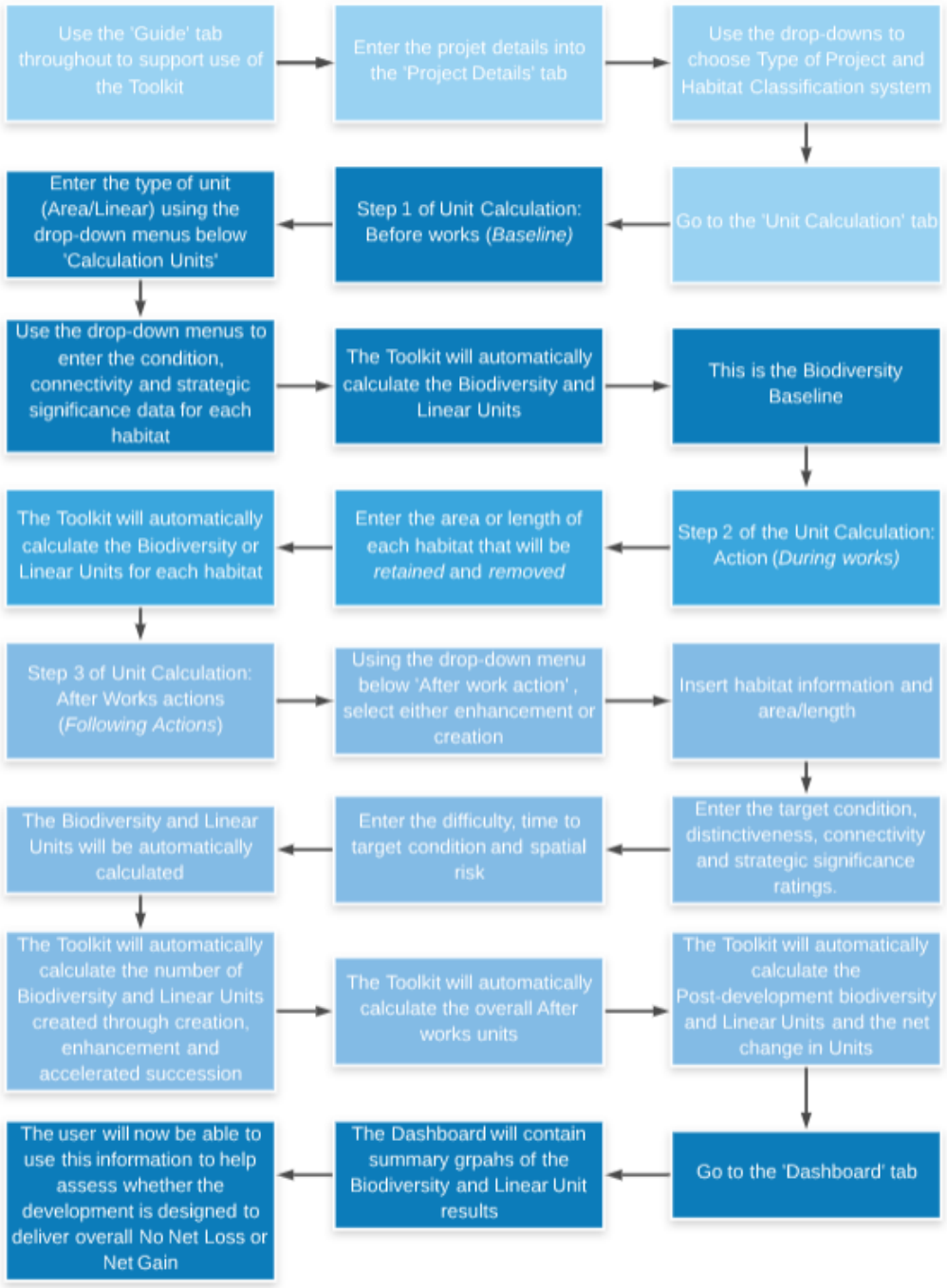


Figure 6.13 - Biodiversity Toolkit - Flowchart

7 Production of BNG Reports

7.1 Quality Assurance

In-house quality assurance should be undertaken after all data has been entered into the toolkit and the associated Biodiversity Net Gain report has been written to ensure that there are no errors in the data. The quality assurance should be completed by a SHE Transmission staff member who is trained in BNG. When completing the toolkit, consultants and contractors should produce an associated report detailing the findings and including any limitations or assumptions made during the assessment process.

7.2 Optioneering Report

SHE Transmission's Site Optioneering Toolkit can be used to inform the site selection process by providing a biodiversity baseline for the different site options. The summary graphs and table found in the Dashboard tab can be used to inform decisions.

7.3 Project Design Reporting

The calculations quantify the predicted scale and scope of biodiversity loss or gain from a scheme design. This should be summarised and communicated to the project design team at the earliest opportunity. This can then be used as part of a design review process to influence built and landscaping design and construction works activities to avoid and minimise impacts and design of onsite landscaping to target required habitat types. This reinforces the application of the mitigation hierarchy.

Once the scheme has been finalised, the detailed calculations, inputs and outputs should be included in the suite of documents upon which the decision to progress with the scheme is made. For example, as an appendix to the EcIA. The final copy of the biodiversity project toolkit populated for the project should also be submitted to the determining authority in support of information set out in any reports.

7.4 Project As-Built Reporting

Calculating Biodiversity Units during the design stage is a prediction of losses and gains in habitat and of the project's final balance regarding Biodiversity Units on completion. These predictions should be validated during project construction by collecting 'as-built' data on the actual losses and gains in habitat. Undertake the biodiversity unit calculation as construction progresses to help identify any issues early and ensure that the project's biodiversity target remains on track. Report the 'as-built' biodiversity unit calculation on completion of the scheme.

Ongoing management will be required to deliver the predicted gains, and a long-term management plan should be detailed in the biodiversity report.

7.5 Project Wide No Net Loss and Net Gain for Biodiversity

Applying the methodology enables a project to identify as either a 'no net loss' or 'net gain' biodiversity project. Impacts on designated sites, irreplaceable habitats and legally protected species are dealt with separately. The project must also demonstrate post-development units as a percentage of the pre-development units (see Figure 7.1) that are:

95% - 104%: the project can predict it will achieve a project wide Biodiversity No Net Loss in design for the habitats assessed.

105% or more: the project can predict it will achieve a project wide Biodiversity Net Gain in design for the habitats assessed.

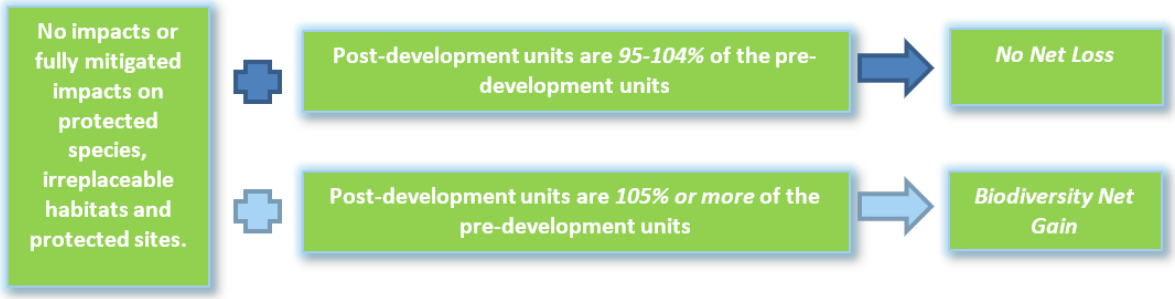


Figure 7.1 – Demonstrating BNG NNL or NG

This gain needs to be demonstrated separately for each broad habitat type and each habitat with a high or very high distinctiveness score as well as the project as a whole for the project to be able to claim that it can deliver BNG in design.

Where designated sites, legally protected species or irreplaceable habitats are being affected, these impacts are compensated for outside of the BNG assessment. Projects should achieve net gains in other biodiversity features.

It is important to remember that the BNG calculations will deliver Net Gain in design or predict that BNG is possible, but will not deliver Net Gain. Ongoing management must be undertaken in order for a development to reach net gain.

7.6 Provision of Data

It is essential that project progress against the BNG target is regularly reported on. All toolkits, shapefiles and spreadsheets produced at the site optioneering, and consent application stages are required to be issued to SHE Transmission at the same time as any report for input into the BNG reporting geodatabase. These files should be in Excel format and should contain the attribute data required.

8 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New document created	N/A	1.00	[redacted]
02	Document put on new template. Document reviewed due to metric changes by Natural England	TG-NET-ENV-526 (Rev1.00)	2.00	[redacted]
03				

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Appendix A Glossary of Terms

Appendix A, Table 1

Term	Definition
Biodiversity Unit	A Biodiversity Unit is a nominal figure that is derived from a calculation using numerical values assigned for the distinctiveness, condition and size (area), connectivity and strategic significance of a habitat. Post-Development Biodiversity Units are calculated using risk factor multipliers to aid the discussion of loss, impacts avoided and gains of habitat as a result of management and development activities. The tool automatically calculates the number of Biodiversity Units based on the information that the user inputs.
Condition	Condition is defined as the quality of a particular habitat. For example, a habitat is in poor condition if it fails to support the rare or notable species for which it is valued, or if it is degraded as a result of pollution, erosion, invasive species or other factors. When Phase 1 habitat data is being used, the condition that a habitat is in is determined in accordance with the condition assessment methodology set out in the Farm Environment Plan (FEP). However, it is also possible that the new Condition Assessment may also apply to Phase 1 and may supersede the FEP as the method of assessing habitat condition. To achieve a condition rating, each condition has a series of criteria associated with it. To assign a condition band, the habitat has to meet a certain number of the criteria: • *Good*: All criteria are met; • Fairly good (based on ecologist's expert opinion for habitats falling between moderate and good condition and meeting all but one of the criterion as a minimum); • *Moderate*: All but one criterion are met, and; • Fairly poor (based on ecologist's expert opinion for habitats falling between moderate and poor condition); • *Poor*; Any habitat which fails two or more FEP criterion; • N/A: agriculture; • N/A – Other. Natural England is currently developing a new condition assessment that, once published, will align with the UKHab habitat classification system.
Connectivity	The relationship of a particular habitat patch to other surrounding similar or related semi-natural habitats facilitating flows of species and ecosystem service, based on the 'structural connectivity' model within the National Biodiversity Climate Change Vulnerability Model. The categories are: • Highly aggregated/connected; • Moderate aggregation/connectivity and; • Low aggregation/connectivity
Distinctiveness	Distinctiveness is a collective measure of biodiversity and includes parameters such as species richness, diversity, rarity and the degree to which a habitat supports species rarely found in other habitats (DEFRA 2012). The tool maps

Term	Definition
	out the relevant distinctiveness band (Very High/High / Medium / Low/Very Low) in the habitat matrix and will automatically assign the band to your selection. Phase 1 habitats can have three distinctiveness options. In this case the ecologist should use their expertise to assign a distinctiveness to the habitat. If the necessary information is not available the ecologist should take a precautionary approach and choose the highest distinctiveness.
Geospatial Reference	A reference, generally created by mapping software, for the specific location of a parcel of habitat.
Habitat Creation	The removal or the loss of the present habitat in the action of creating the new one or creating habitat where none was previously present (including bare ground). This includes, for example, removing scrub in order to create a wetland habitat or removing hardstanding to create new grassland habitat.
Habitat Enhancement	The improvement of the condition of an existing habitat, thereby increasing the biodiversity value of a habitat type. Enhancement is achieved through measures that improve habitat biodiversity capacity and/or remove factors that detract from its value. This includes increasing the diversity of species that can be supported by a habitat, for example by managing improved grassland so that it becomes semi improved grassland, which would seek to increase species diversity.
Linear Unit	A Linear Unit is a nominal figure that is derived from a calculation using numerical values assigned for condition and length of a linear habitat. In the new metric, distinctiveness, condition, strategic significance and connectivity are assessed for each linear habitat. In the toolkit the linear habitats or hedgerows or watercourses are input separately.
Local Biodiversity Priorities	Local (county or equivalent) biodiversity, green infrastructure or offsetting strategies. For example, local Biodiversity Action Plans (BAPs).
Parcel	A defined land area that is used to split different habitats for calculation purposes.
Priority habitat	Priority habitats are identified as being the most threatened habitats and requiring conservation action by the UK Biodiversity Action Plan (UK BAP), originally written between 1995 and 1999 and revised in 2007. In Scotland the Scottish Biodiversity List "Terrestrial Habitats" are the UK BAP priority habitats found in Scotland and includes two watching brief only habitats - Juncus squarrosus-Festuca ovina grassland and Nardus stricta-Galium saxatile grassland (which are not UK BAP priority habitats).
Risk Factor 1: Delivery Risk	Delivery Risk is the risk associated with the difficulty to create or enhance any specific habitat i.e. how hard (Very High / High / Medium / Low) it is to restore / enhance / create the habitat identified. Please note that the level of difficulty differs depending on whether you are creating or restoring the habitat.
Risk Factor 2: Spatial Risk	Spatial risk is the risk associated with delivering compensation for the loss of a habitat at a distance from that loss (i.e. generally the greater distance can mean a greater risk) and in relation to areas of strategic priority for biodiversity.

Term	Definition
Risk Factor 3: Temporal Risk	In delivering compensation for habitat loss, the timing of the impact may not coincide with the new habitat reaching the required quality or level of maturity, which could result in loss of biodiversity for a period of time. Additionally, there may be a time gap between the habitat loss and the start of the creation or enhancement of new habitat. Where possible, the development should prevent this additional time gap. Where this is not possible and is justified, this additional time gap needs to be accounted for. These two-time lags together are called the Temporal Risk. The Temporal Risk categories go from year 0 to year 32.
Risk Factors	Any risks to the delivery of biodiversity outcomes and the ongoing management of these outcomes. Within the metric, the risks associated with delivery and the location of the offset are taken into consideration using risk factors, as indicated below (delivery, spatial and temporal).
Strategic significance	Strategic significance gives extra value to habitats that are located in optimum locations for biodiversity and other environmental objectives, such as areas that are the focus of green infrastructure or local biodiversity plans. The categories are; • High strategic significance; • Medium strategic significance and; • Low strategic significance
Target Condition	The condition that the habitat will attain as a result of your actions. There are 18 categories ranging from 'Lower distinctiveness habitats' to 'Good-good.'