Langholm Flood Protection Scheme
Preliminary Ecological Appraisal

Dumfries and Galloway Council

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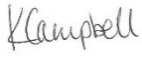
	Signature:			
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EXECUTIVE SUMMARY

RPS Consulting Services Ltd (RPS) was commissioned by Dumfries and Galloway Council to carry out an ecological constraints assessment in the Langholm area; this took the course of a Preliminary Ecological Appraisal (PEA) following industry standard guidance.

Langholm is located at the confluence of the River Esk, Wauchope Water and Ewes Water and the surveys primarily focussed on the three rivers to identify their suitability to support Important Ecological Features (IEFs). The information collected will be used to advise on the requirement of further ecological survey work. The surveys will similarly inform the options appraisal process for a Flood Protection Scheme (FPS) to reduce the risk of flooding to properties in the Langholm area.

A desk-based assessment was undertaken as part of the PEA. This identified that the study area forms part of the Newcastleton Hill Special Protection Area (SPA) which is designated for the population of hen harrier which it supports. Two Sites of Special Scientific Interest (SSSI) are located within 5km of the survey area with designating species and habitats including hen harrier and upland plant assemblages.

The PEA identified that there is potential for the following protected species within the survey area; otter, badgers, reptiles, bats, nesting birds and fish. It is recommended that prior to carrying out any construction work, species-specific Phase 2 surveys are carried out for all protected species identified to be potentially present within the survey area.

1. INTRODUCTION

1.1 Background

RPS was commissioned by Dumfries and Galloway Council to carry out an ecological constraints assessment in the Langholm area (central Ordnance Survey grid reference NY 36443 84668); this took the course of a Preliminary Ecological Appraisal (PEA) following industry standard guidance (CIEEM, 2017)[1].

Langholm is located at the confluence of the River Esk, Wauchope Water and Ewes Water and the surveys primarily focussed on the three rivers to identify their suitability to support Important Ecological Features (IEFs). The information collected will be used to advise on the requirement of further ecological survey work. The surveys will similarly inform the options appraisal process for a Flood Protection Scheme (FPS) to reduce the risk of flooding to properties in the Langholm area.

The survey area comprises a maximum 100m buffer of the identified watercourses; the site location is presented in Figure 1.

1.2 Report Objectives

The key objectives of the ecological constraints appraisal were to identify:

- the presence of any legally protected habitats listed within European or UK legislation;
- the presence of habitats which might offer suitable niche requirements for legally protected fauna;
- the presence of invasive non-native plant species subject to legal control; and,
- any requirement of further ecological survey work to inform the development process or subsequent options appraisal process of the Flood Protection Scheme.

1.3 Limitations

The weather throughout the survey was dry and mild. Some areas had restricted access due to private land/residential areas. These restrictions were not deemed to have a significant impact on the survey results.

It was not the purpose of the survey to carry out a targeted search for the presence of protected species or their resting places (objectives are listed in Section 1.2). The results of the survey are designed to inform the requirement for further, species specific surveys and should be treated as such.

[1] https://www.cieem.net/data/files/Publications/Guidelines_for_Preliminary_Ecological_Appraisal_Jan2018_1.pdf

2. LEGISLATION

The sections below detail relevant European and UK legislation which has been taken into consideration for the purposes of this constraints appraisal and associated report.

2.1 The Conservation of Habitats and Species Regulations 1994

European protected habitats and species are defined under the European Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (otherwise known as the Habitats Directive). Protected habitats include heaths, flushes and mires, and protected species include otters (*Lutra lutra*) and all species of bat (*Chiroptera* spp.). The Habitats Directive is transposed into Scottish law through the Conservation of Habitats and Species Regulations 1994 and aims to maintain or restore European protected habitats and species listed in the relevant Annexes in a favourable conservation status.

2.1.1 Habitats

The Habitat Regulations makes provision for a network of Natura sites; Special Areas of Conservation (SACs) for animals and habitats and Special Protection Areas (SPAs) for birds.

Under the regulation all competent authorities must consider whether any plan or project will have a "likely significant effect" on a Natura site. If there is likely to be an impact then there is the requirement for a Habitats Regulations Appraisal (HRA).

In addition to the above Ramsar sites (Internationally Important Wetlands) should be treated as Natura sites.

2.1.2 European Protected Species

This above legislation makes it an offence to deliberately or recklessly kill, injure or disturb European Protected Species. Their places of shelter are fully protected, and it is an offence to damage, destroy or obstruct access to or otherwise deny the animal use of a breeding site or resting site, whether deliberately or not. It is also an offence to disturb in a manner that is, or in circumstances which are likely to significantly affect the local distribution or abundance of the species, disturb in a manner or circumstances which are likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young. Any activity which is likely to affect such a species requires prior consultation with the relevant statutory nature conservation organisation. In Scotland, this means that Scottish Natural Heritage (SNH) should be consulted.

A licence from the SNH is required in cases of potential disturbance of European Protected Species or damage or destruction of a resting site as a result of work activities. Under Regulation 44 2(e) of the Conservation (Natural Habitats etc.) Regulations 1994 licences may be granted for:

- preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.

Importantly, under Section 3 of Regulation 44, in order for a licence application to be successful, two tests must be satisfied, namely:

- there is no satisfactory alternative (including retaining the status quo); and
- the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in its natural range.

2.2 The Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 provides protection to a range of species and habitats. The Nature Conservation (Scotland) Act 2004 and Wildlife and Natural Environment (Scotland) Act 2011 the amend the Wildlife and Countryside Act in Scotland.

Section 9 of the Act provides protection to certain animal species. Enhanced protection is provided for species listed in Schedule 5 which includes water voles and red squirrels. It is an offence to intentionally or recklessly kill, injure or take animals listed in Schedule 5, with the exception of water voles, which are protected in respect of section 9(4) only, meaning that water vole habitat is protected, although the animals themselves are not. It is also an offence to recklessly damage, destroy or obstruct access to any place used for shelter or breeding by species listed under Schedule 5. Any works which may potentially cause disturbance to such a species requires prior consultation with SNH.

The Wildlife and Countryside Act 1981 (as amended) also protects against the spread of invasive non-native plant and animal species (INNS). Specifically in relation to plants, it is an offence under this legislation to plant or otherwise cause a plant to grow in the wild at a place outwith its native range and includes species such as Japanese knotweed (*Fallopia japonica*), giant hogweed (*Heracleum mantegazzianum*) and rhododendron (*Rhododendron ponticum* and hybrids).

In addition to the above, all wild birds, their nests and their eggs are protected under the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to intentionally or recklessly:

- kill, injure or take any wild bird (excluding certain specified game and other licence-controlled species);
- take, damage, destroy or otherwise interfere with the nest of any wild bird while it is in use or being built;
- obstruct or prevent any wild bird from using its nest; or
- take or destroy the egg of any wild bird.

In addition, there are some rare breeding species, such as golden eagle, barn owl or kingfisher, which are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), which receive extra protection, making it an offence to intentionally or recklessly:

- disturb any species listed under Schedule 1 of the Act whilst at the nest site, or while building a nest;
- disturb the dependent young of any species listed under Schedule 1;
- disturb any species listed under Schedule 1 which leks while it is doing so;
- harass any wild bird included in Schedule 1A; or
- take, damage, destroy or otherwise interfere with any nest habitually used by any wild bird included in Schedule A1, even when that nest is not in use.

2.3 The Protection of Badgers Act 1992

Badgers are protected under the Protection of Badgers Act 1992. In Scotland, this legislation was updated by the Nature Conservation (Scotland) Act 2004, which makes it an offence to recklessly take, injure or kill a badger, or destroy, disturb or interfere with its sett. In addition, badgers are afforded protection from cruel ill-treatment. This has been defined to include preventing a badger access to its sett, as well as causing the loss of significant foraging resources within a badger territory.
A licence from SNH is required in cases of potential disturbance of badgers or damage or destruction of a badger sett as a result of work activities.

3. METHODOLOGY

3.1 Desk Based Assessment

A desk-based review of biological records was carried out based on the standard best practice methodology provided by the Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidance for Preliminary Ecological Appraisal (CIEEM, 2017)[1]. The study aimed to gather information on the potential value of the site and the wider study area specifically in terms of statutory and non-statutory conservation designations, protected habitats and protected species (including otters, water voles, badgers, bats and red squirrels).

Southwest Scotland Environmental Information Centre (SWEIC) was contacted to supply records of protected species presence and any statutory or locally designated sites within the study area and a surrounding 5km buffer. The SNH online database SNHi Sitelink[2] was also consulted for any designated sites within 5km of the survey boundary, such as Special Areas of Conservation (SAC) or Sites of Special Scientific Interest (SSSI). Dumfries and Galloway Raptor Study Group was contacted on 19 September to provide raptor records, also within 5km of the survey area.

3.2 Field Survey Method

The PEA survey was undertaken on 12 and 13 September 2018 by experienced field ecologists, using the survey approaches described below. Signs of the presence of protected species and species of conservation interest were recorded as Target Notes (TN). These are referenced in this report as TN (then the number); these are also mapped in Figure 2. Full Target Note Record details are given in Appendix 1.

3.2.1 Protected Species

Otter and Water Vole

All waterbodies, watercourses and minor ditches within the survey area, where access was permitted and where it was safe to do so, were assessed for their potential to support otter and water vole. Any incidental recordings of otter field signs were noted as described in Bang and Dahlstrøm (2001), including resting sites (e.g. holts and couches), spraints, prints and feeding remains. Habitat suitability criteria of water vole are based on information given in Strachan and Moorhouse (2011). Field signs which are indicative of the presence of water voles include:

- feeding signs including grass and reed clippings;
- lawns and runways throughout the area showing a regular passage of the species along certain routes;
- burrows in banks along watercourses, and where no banking is available, signs of nests in the surrounding grasses or reeds; and,
- latrines and piles of droppings.

Pine Marten

Pine marten are recognised as difficult to survey for, as their scats (the most obvious field signs) are similar to those of fox and stoat when seen in the field. As such the surveys focussed on assessing the habitat suitability. This typically includes mature woodland, including coniferous plantations, although pine marten will forage in open habitats as well. In particular, the survey searched for areas which might hold suitable potential for denning

[2] http://gateway.snh.gov.uk/sitelink/index.jsp

sites including hollow trees, root plates, boulder piles or rocky outcrops. Pine marten signs are described in Harris and Yalden (2008).

Badger

Areas of suitable badger habitat such as broadleaved woodland, copses and scrub, particularly those surrounding cultivated areas were identified within the survey area as these tend to be favoured by the species (although they have also been known to occupy areas of forestry plantation). Any incidental field signs of badger and any indicative evidence were noted. Badger field signs are described in Bang and Dahlstrøm (2001), and in SNH (2001) and include:

- setts (including main, subsidiary and outlier setts);
- latrines (dung pits used as territorial markers);
- prints;
- foraging signs (snuffle holes); and,
- guard hairs snagged on wire fencing.

Any of the above signs (with the exception of foraging signs) can be taken as diagnostic evidence of the presence of badger.

Red Squirrel

Areas of suitable habitat for red squirrel were identified within the survey area. Any incidental recordings of red squirrel field signs were noted including:

- dreys (tree-top resting sites); and,
- feeding remains (chewed pine cones, particularly at traditional feeding stations such as on top of tree stumps).

It should be noted that it is not possible to distinguish red squirrel dreys and feeding remains from those of grey squirrels. The most reliable method of confirming the species presence is the sighting of an actual animal. Therefore, given the relatively low likelihood of seeing a red squirrel during the survey, the main aim of the survey was to identify whether squirrels (regardless of species) were likely to be present within the site.

Reptiles and Amphibians

Areas of suitable habitat for reptiles and amphibians were identified within the survey area. The habitat requirements of common lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*), adder (*Vipera berus*), common frog (*Rana temporaria*), and common toad (*Bufo bufo)* (the species most likely to occur in this part of Scotland) are relatively broad but in general they require areas of dense vegetation such as grassland, heath, scrub and woodland edge for foraging and shelter. Reptiles also require more open, preferably south facing areas in which to bask (Gent and Gibson, 2012), and suitable refugia habitat such as wood and rock piles in which to shelter and more importantly to hibernate during the winter.

Bats

The ecological constraints appraisal included an assessment of the habitat within the survey area to support bat species for roosting, foraging or commuting. Habitats were categorised to be of negligible, low, moderate or high suitability based on the roosting or commuting suitability criteria outlined in Table 1; surveys are used to inform the requirement for follow up surveys.

TABLE 1 – BAT HABITAT SUITABILITY CRITERIA		
Suitability	**Description of Roosting Habitat**	**Foraging and Commuting Habitat**
Negligible	Negligible habitat features on site not likely to be used by roosting bats.	Negligible habitat features on site not likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or un-vegetated streams, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to its size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Site close to and connected to known roosts.
Notes: From Bat Survey for Professional Ecologists: Good Practice Guidelines (3rd edn), (Collins, 2016).		

Fish

The habitat suitability for spawning fish is based on walkover protocols by Hendry and Cragg-Hine (1997), SEPA (2010a) and Summers *et al*. (1996) and includes:

- good water quality – a preference for well oxygenated unpolluted water;
- substrate – gravel, stone and rocks are required for spawning and as cover for juveniles;
- water depth – deeper pools are required in river habitats for adults to rest during migration to spawning grounds; and
- bankside vegetation – bankside vegetation such as riparian trees provide shade and a food source from terrestrial invertebrates.

Birds

Areas of suitable habitat within the survey area were assessed for their potential to support breeding birds. Given the time of the survey i.e. outwith the main breeding bird season (Mid-March to August) evidence of previous activity was noted including (but not limited to):

- nests – both disused and in use;
- splash marks or faeces; and
- feeding remains such as plucking stations.

4. RESULTS

4.1 Desk Survey Results

Table 2 presents the results obtained when consulting the SNH database[2] for designated sites within 5 km.

TABLE 2 – DESIGNATED SITES WITHIN 5 KM OF THE DEVELOPMENT SITE

Name	Designation	Survey site proximity	Qualifying Species
Langholm – Newcastleton Hill	SPA	1.5 km east	Hen harrier (breeding)
Langholm – Newcastleton Hill	SSSI	1.5 km east	Hen harrier (breeding), carboniferous geology, upland assemblages
River Esk, Glencartholm	SSSI	4.5 km south	Arthropods and carboniferous geology

Notes:
SPA – Special Protection Area; SSSI – Site of Special Scientific Interest

Table 3 details the results of the desk study conducted to inform the potential for protected species presence within 5 km of the survey area.

TABLE 3 – HISTORICAL RECORDS OF PROTECTED SPECIES PRESENCE WITHIN 5 KM OF THE DEVELOPMENT SITE BETWEEN 2008 AND 2018

Species	Species Latin name	Most recent record	Total no. of records	National conservation status
Birds				
Hen Harrier	*Circus cyaneus*	2017	40	ANNEX 1 – EC Birds Directive
Barn Owl	*Tyto alba*	2015	4	ANNEX 1 – EC Birds Directive
Common Crossbill	*Loxia curvirostra*	2015	3	ANNEX 1 – EC Birds Directive
Red Kite	*Milvus*	2014	3	ANNEX 1 – EC Birds Directive
Marsh Harrier	*Circus aeruginosus*	2014	1	ANNEX 1 – EC Birds Directive
Goshawk	*Accipiter gentilis*	2014	1	ANNEX 1 – EC Birds Directive
Golden Eagle	*Aquila chrysaetos*	2012	1	ANNEX 1 – EC Birds Directive
Osprey	*Pandion haliaetus*	2014	3	ANNEX 1 – EC Birds Directive
Merlin	*Falco columbarius*	2017	29	ANNEX 1 – EC Birds Directive
Hobby	*Falco subbuteo*	2014	9	ANNEX 1 – EC Birds Directive
Peregrine	*Falco peregrinus*	2017	2	ANNEX 1 – EC Birds Directive
Kingfisher	*Alcedo atthis*	2014	2	ANNEX 1 – EC Birds Directive
Fieldfare	*Turdus pilaris*	2017	5	ANNEX 1 – EC Birds Directive
Redwing	*Turdus iliacus*	2014	2	ANNEX 1 – EC Birds Directive
Brambling	*Fringilla montifringilla*	2017	1	ANNEX 1 – EC Birds Directive
Snow Bunting	*Plectrophenax nivalis*	2015	2	ANNEX 1 – EC Birds Directive
Other Species				
Bats	*Chiroptera* spp.	2016	29	ANNEX 2 – EC Habitats Directive
Slow worm	*Anguis fragilis*	2014	10	Wildlife and Countryside Act 1981 (Schedule 9.1 and 9.5)
Adder	*Vipera berus*	2009	8	Wildlife and Countryside Act 1981 (Schedule 9.1 and 9.5)

Notes:
Records are from the last 10 years. If a protected species is not present in the above table, this does not necessarily indicate absence from the search area during this period.

Dumfries and Galloway Raptor Study Group was contacted on 19 September for raptor records within the search area, but no reply was received.

4.2 Field Survey Results - Watercourses

Field survey results are outlined in the following sections. Target notes for ecological records and photos are displayed in Appendix 1 which supplements mapped results in Figure 2.

4.2.1 River Esk

The River Esk is the largest river system in the survey area flowing north to south through Langholm. The characteristics of the River Esk vary but generally it is relatively fast-flowing, approximately 20m wide with varying depth depending on the character of the river at that location. It typically has a rocky bed with larger boulders protruding from the surface and very little evident instream vegetation. Within the survey area the banks are rocky and low with a shallow slope, covered by a mixture of semi-natural broadleaved woodland, scattered parkland and riparian trees such as alder (*Alnus* spp.) and willow (*Salix* spp.) lining the margins. Land use in this area is predominantly public access footpaths, private residential housing and rough grazing. Foot bridges and larger road bridges span the river at various points within the survey area.

Invasive Non-Native Species (INNS)

Two small patches of Himalayan balsam (*Impatiens glandulifera*) were recorded in the survey area on the east bank of the River Esk (TN01).

Small stands of *Rhododendron ponticum* were noted in woodland on the southwest back of the River Esk (TN02).

4.2.2 Ewes Water

The River Esk and the Ewes Water have their confluence to the north of Langholm. The Ewes Water is generally shallow and fast flowing and 15m wide where it meets the River Esk, gradually becoming deeper and with decreased flow rate further upstream. The banks are mostly vegetated and rocky and with mature riparian trees overhanging the water. The river bed comprises stone and boulders with some larger boulders protruding from the surface.

Invasive Non-Native Species (INNS)

Small patches (1m^2) of Himalayan balsam were recorded in the survey area on the north bank of the Ewes Water (TN03) and on the margins of a public footpath (TN04).

4.2.3 Wauchope Water

The River Esk and the Wauchope Water have their confluence in the centre of Langholm. The Wauchope Water is generally shallow and fast flowing and 15m wide where it meets the River Esk, gradually becoming deeper and with decreased flow rate further upstream. Mature riparian trees line the banks, which have an understorey of dense vegetation and rocks. Like the River Esk and Ewes Water, the river bed comprises stone and boulders.

Invasive Non-Native Species (INNS)

Small patches (1m^2 to 5m^2) of Himalayan balsam were recorded in the survey area on the south bank of the Wauchope Water (TN05 and TN06).

4.3 Field Survey Results - Protected Species

Habitats across the survey area offer good refugia and foraging areas for European and UK protected species.

4.3.1 Otter

Suitable habitat for otters was identified along the three watercourses surveyed. The River Esk, Ewes Water and Wauchope Water are fast-flowing rivers with stone beds and larger boulders lining the banks and protruding from the surface. The banks are lined with riparian trees, some with exposed root systems which form areas commonly used by otters as resting sites. No signs of otters were identified during the survey, though this is not considered to indicate the absence of the species.

4.3.2 Water Vole

Limited water vole habitat was identified in the survey area. The three watercourses are considered unsuitable for water voles due to the fast-flowing water and lack of dense vegetation (comprising grasses, ferns and soft rush) which would provide suitable water vole habitat. These findings indicate the potential for water vole in the survey area is negligible.

4.3.3 Badger

No indicative evidence of badgers was discovered during the survey. However, the areas of woodland within the survey area are considered to offer moderate foraging and refuge habitat for this species. Sloped areas of broadleaved woodland were noted frequently to have good potential for badger sett building or foraging and therefore the potential for finding badgers on site is considered to be moderate.

4.3.4 Red Squirrel

Frequent areas of broadleaved woodland and occasional coniferous woodland were recorded throughout the survey area giving potential for the presence of red squirrel. Red squirrels frequently build tree-top resting sites in coniferous plantation woodland. No signs of squirrels were identified during the survey and no records of red squirrels were found from the last 10 years during the desk assessment, therefore it is considered unlikely that red squirrels are present in the area. Additionally, records of grey squirrel were identified, and the two species do not commonly coincide.

4.3.5 Reptiles and Amphibians

Piles of stone and stone walls have potential for use by reptiles for basking or as refugia. Stone walls frequently line the watercourse margins around the site. Favourable undisturbed habitat for foraging reptiles and amphibians is also present within the survey area and wider environment. Therefore, the potential for reptiles and amphibians in the survey area is considered to be moderate.

4.3.6 Bat Roost Potential

During the survey, four trees were identified with features of moderate or high potential for roosting bats (TN7 to TN10). Potential roosting features included the presence of rot holes, cavities and dead branches.

Residential houses and their associated out-buildings on the banks of the three watercourses were noted within the survey area. Of the buildings present:

- “old” buildings of stone construction with concrete asbestos or slate roofing and soffits provide moderate roosting potential for a roost of high conservation concern (TN11 and TN12);
- a pavilion (TN13), Langholm Academy and Sports Centre (TN14) and two stable blocks (TN15 and TN16) are present within the 100m survey buffer and provide low or moderate roosting potential; and,
- stone bridges spanning the River Esk and the Wauchope Water have moderate potential for roosting bats due to the crevices and cavities between the stones forming the structure of the bridges (TN17 and TN18).

The habitat within the survey area offers high potential to foraging and commuting bats. Treelines, hedgerows and watercourses support connectivity to the wider habitat whilst the watercourses provide abundant foraging and commuting potential.

4.3.7 Fish

Within the survey area spawning and nursery habitat for salmonids is available throughout the River Esk, Ewes Water and Wauchope Water.

4.3.8 Birds

A number of bird species were observed within the survey area. Woodland birds observed included; magpie (*Pica pica*), blackbird (*Turdus merula*), rock dove (*Columba livia*), pied wagtail (*Motacilla alba*), carrion crow (*Corvus corone*), jackdaw (*Corvus monedula*) and grey wagtail (*Motacilla cinerea*). A small number of bird species were noted on the River Esk and its tributaries. These included a dipper (*Cinclus cinclus*), mallard (*Anas platyrhynchos*), lesser black-backed gull (*Larus fuscus*), black-headed gull (*Chroicocephalus ridibundus*), grey heron (*Ardea cinerea*) and swallow (*Hirundo rustica*). The woodland in the survey area offers potential for breeding birds.

5. DISCUSSION AND RECOMMENDATIONS

5.1 Designated Sites and Habitat Assessment

The study area is associated with European and UK statutory designated sites, namely:

- Newcastleton Hill SPA with the qualifying species of breeding hen harrier; and,
- two SSSIs within 5km of the survey area: Newcastleton Hill and Glencartholm, with designating features including breeding hen harrier, carboniferous geology and upland plant assemblages.

In terms of habitats within the survey area, land use is predominantly public access footpaths, private residential housing and semi-natural and plantation broadleaved and coniferous woodland. Both the woodlands and watercourses in the survey area are considered of moderate ecological value according to the species which they may support, whilst also being listed as priority habitats on the Scottish Biodiversity List[3]; part of the 2020 Challenge for Scotland's Biodiversity.

Habitats within the 100m survey boundary were assessed for their potential to be categorised as Groundwater Dependent Terrestrial Ecosystems (GWDTE) (SEPA, 2014)[4], these included marshy grassland and areas of rough grazing. No habitats were considered to fall within the GWDTE category.

5.2 Protected Species

Habitat with the potential to support otter, badger, bats, reptiles and breeding birds was identified throughout the survey area. Although no evidence of the presence of these species was identified during the survey, this is not considered to indicate their absence.

The following sections therefore discuss each species in turn and makes recommendations for further surveys required to inform the development of flood prevention works within the survey area.

Otter

Suitable habitat for otters was identified throughout the survey area, therefore it is recommended that dedicated surveys for the presence and activity of otters are carried out prior to any works taking place.

If resting sites are found, and works are required to take place within 30m of a confirmed resting site or 100-200m of a natal holt (a breeding holt), an EPS (European Protected Species) disturbance licence will be required from SNH under Regulation 44 2(e) of the Conservation (Natural Habitats etc.) Regulations 1994, in order to permit the potentially disturbing work. The specific buffer requirements for otter holts can be influenced by a number of local factors and must be confirmed with SNH in advance of disturbing activity being undertaken, particularly in regards to natal holts. EPS disturbance licences may only be granted subject to strict tests being granted, as detailed in the Introduction under the Relevant Protected Species Legislation Section, further details of which can be found on SNH's website[5].

[3] https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL (accessed 25.09.18)

[4] Scottish Environment Protection Agency (SEPA) (2014) Land Use Planning System Guidance Note 31.

[5] https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/licensing/species-licensing-legislation

Water Vole

The potential for finding water vole in the survey area is deemed to be negligible due to the lack of extensive suitable habitat, therefore their presence can be ruled out at this stage. Therefore, there is no requirement for dedicated surveys for the presence of water vole within the survey area.

Badger

Areas of sloped woodland with the potential to support sett-building badgers are present in proximity to the proposed flood defence infrastructure on the banks of all three watercourses. Therefore, additional targeted surveys are recommended prior to any work commencing. Although badger surveys can be carried out at any time of year it is recommended that surveys take place in early spring or late autumn when badgers are active but the vegetation is low enough that badger field signs are not obscured.

If any badger setts are identified an exclusion zone of 30m should be instituted until the current status of the sett can be ascertained. Where standard construction activities/felling is planned to take place within 30m of an active sett then a disturbance licence will be required from SNH. For activities such as pile driving the exclusion zone could be extended to 100m. Licences are not generally issued during the breeding season (30 November to 1 July).

Red Squirrel

Although favourable woodland habitat for red squirrels is present within the survey area, it is considered unlikely that the species is present as no confirmed sightings have been reported in the last 10 years. Additionally, grey squirrels have been recorded in the area and the two species do not usually coincide. Therefore, no dedicated red squirrel surveys will be required.

Reptiles

Suitable habitat and features of potential refugia and hibernacula for reptile species were identified in the survey area. These features include stone walls and piles of stone which line the banks of the River Esk within the survey area. These potential refugia may be impacted by the construction of the embankments and walls that will constitute the proposed flood defence measures. Given the likely presence of these species it is advised that these should be dismantled under the supervision of a suitably experienced ecologist and relocated and recreated in an appropriate area in the vicinity of suitable habitat following the guidance provided in Edgar *et al*. (2010).

Bat Roost Potential

The habitat throughout the survey area is deemed to have high potential for foraging commuting bat species. During the ecological constraints appraisal field surveys both trees and structures were identified as having roosting features suitable to support larger numbers of roosting bats. It is advised that any trees or structures within 100m of the proposed work be assessed fully for the potential to support roosting bats and where necessary follow up surveys may be required to ascertain likely presence/absence. In line with the current guidance a preliminary bat roost assessment can be carried out at any time of year while presence/absence surveys should be carried out in the main bat activity season, considered to be May to September in Scotland (Collins, 2016). Where bats are found to be present and would be impacted by the proposed works a disturbance licence from SNH will be required with an accompanying mitigation/compensation plan.

Fish

Suitable salmonid spawning habitat was identified within the survey area. SEPA usually insist that quantitative electrofishing surveys are carried out if the information is to inform a Controlled Activity Regulations (CAR) licence however, this may not be an option due to the width and depth of the three rivers. A survey strategy for fish should therefore be agreed with consultees, including measures to avoid disturbance and mortality of fish during flood prevention works. Minimising sediment release during the works will be key to avoiding negative impacts on existing populations. Similarly, consideration of the timing of works is required to minimise sensitive periods in the life cycle of salmonids.

Birds

If works are to be undertaken during the bird breeding season (generally considered to extend between March and August inclusive), breeding bird checks would be required within and adjacent to the construction areas prior to works commencing. If nests are identified and deemed to be active, a temporary pause of works, or a watching brief to identify species and monitor for any signs of disturbance during works, may be required. This may also require a buffer area to be implemented during the breeding attempt. Some bird species are afforded extra protection under Schedule 1 of the Wildlife and Countryside Act (1981), and dependent on their sensitivity to construction activities, may require an increased buffer area to minimise disturbance during this period.

Invasive Non-Native Species

Rhododendron ponticum and Himalayan balsam, both invasive non-native plant species (INNS), were found within the survey area. Where disturbance of an INNS may occur, this will need to be considered in terms of biosecurity of plant or personnel working on site. Relevant precautions should be taken to ensure the spread of these species does not occur, including fencing and signage to mark out areas of issue, and ensuring wheel washes, foot baths and biosecurity stations if appropriate are present for contractors to use. All staff should be briefed to fully ensure awareness of what the species looks like and the issues associated with it. Where a species requires long-term management, ensuring a site management plan is put together that addresses all issues associated with it is essential.

In Scotland the main legislation relating to the control of non-native species is the Wildlife and Countryside Act 1981 as amended by the Wildlife and Natural Environment (Scotland) Act 2011. Under this legislation it is the landowner or land manager's responsibility to prevent the planting or otherwise causing to grow in the wild of any non-native plant, or releasing of any non-native animal or spread of any non-native species out-with its native range. Infestations of *Rhododendron ponticum* and Himalayan balsam can be controlled by pulling and burning or chemical spraying of stems. Contractors should follow guidance issued by the Forestry Commission[6].

Prior to construction activities commencing, it is recommended that updated INNS surveys are completed of the construction area to ensure, if required, suitable biosecurity procedures are implemented.

[6] https://www.forestry.gov.uk/PDF/fcpg017.pdf/$FILE/fcpg017.pdf

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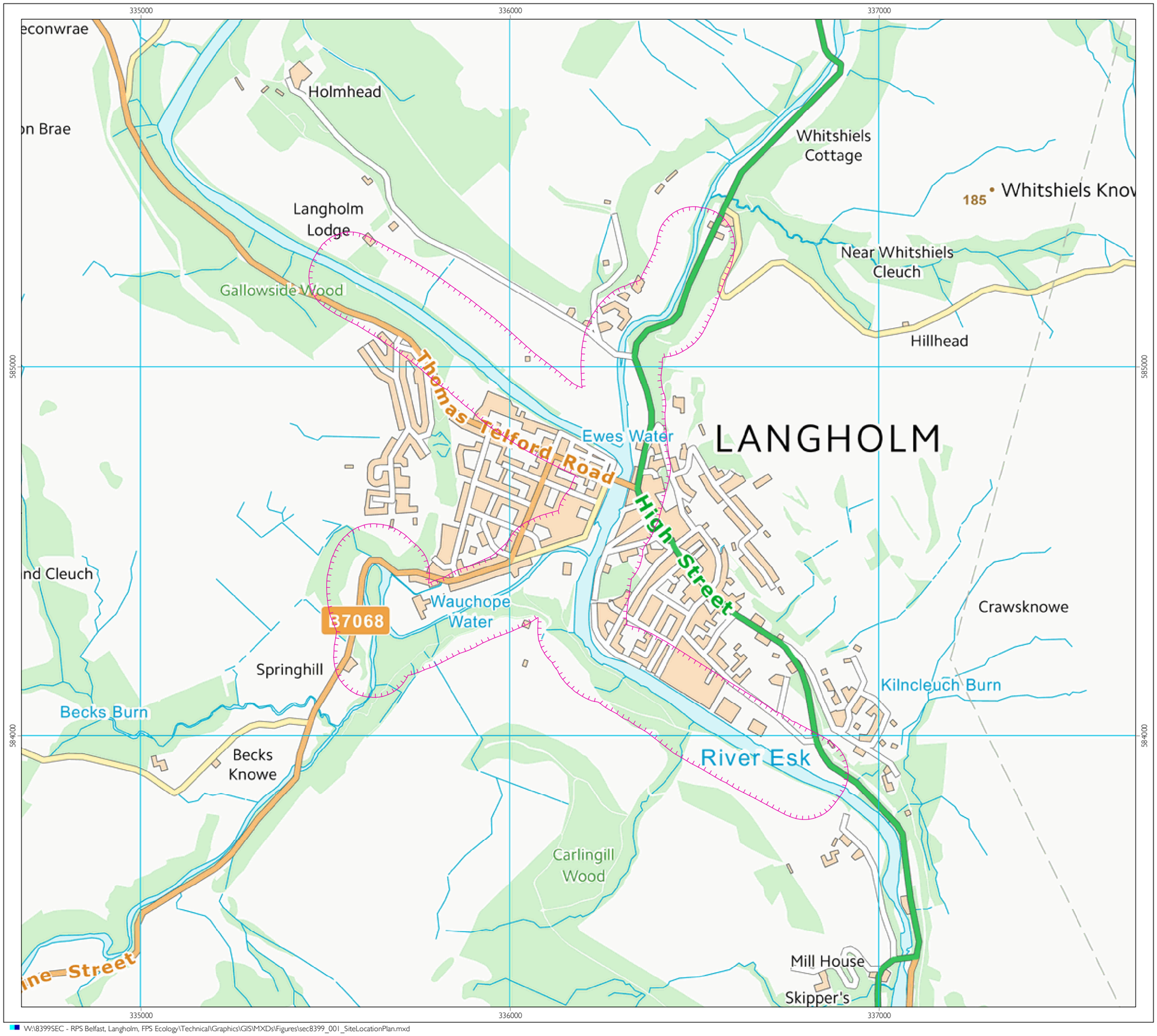
FIGURES

List of Figures:



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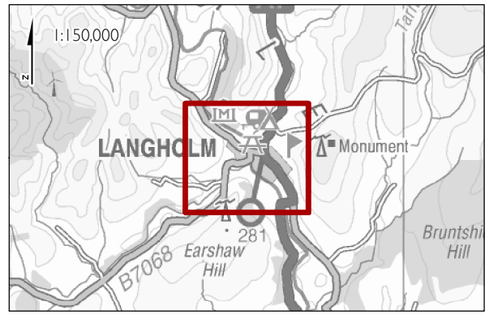
RPS

Legend

Survey boundary (100 m buffer)



0 500 m

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Scale: 1:10,000 @A3

Date: 24/09/2018	Job No: SEC8399	Rev: -
Drawn: KAG	Checked: AC	Approved: KS

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Site Location Plan

Figure 1

Langholm, FPS

RPS

336000 337000

585000

584000

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

Survey boundary (100 m buffer)

Survey results (no. of observations)

- Rhododendron (1)
- Himalayan balsam (5)
- Bat tree roost potential - high (3)
- Bat tree roost potential - moderate (1)
- Bat built structure roost potential - high (2)
- Bat built structure roost potential - moderate (3)
- Bat built structure roost potential - low (3)

0 200 m

N

Scale: 1:7,000 @A3

Date: 24/09/2018	Job No: SEC8399	Rev: -
Drawn: KAG	Checked: AC	Approved: KS

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Survey Results

Figure 2

Langholm, FPS

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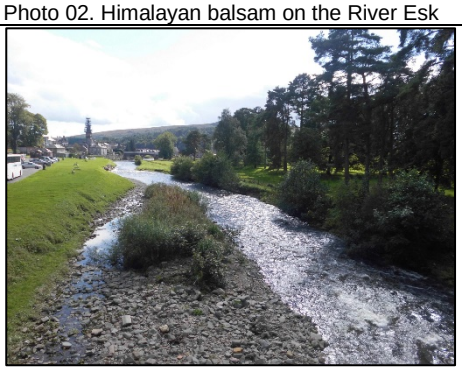
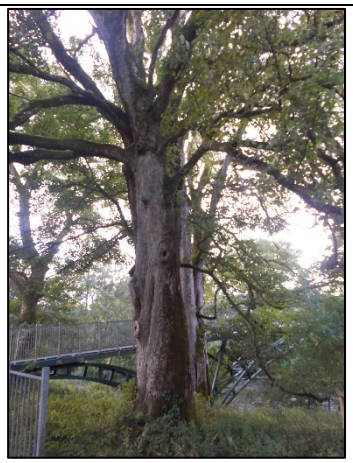
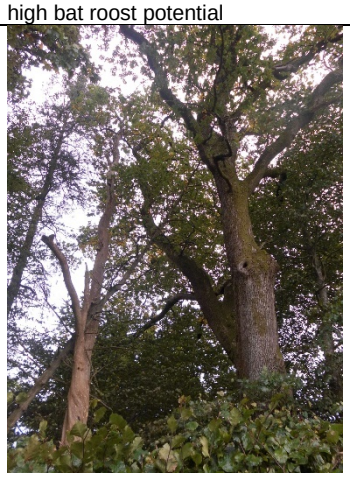
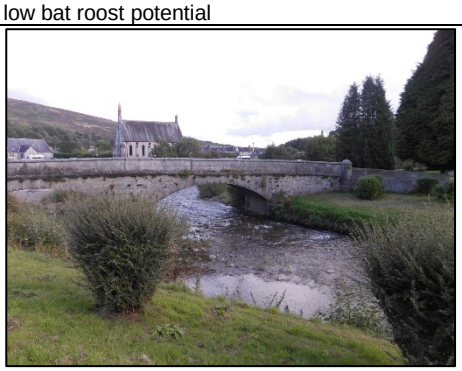
APPENDIX 1 – TARGET NOTES

TN	Easting	Northing	Details	Photo Reference
--	336272	584523	The River Esk is a fast flowing, 20m wide river than flows in a southerly direction through Langholm.	 Photo 01. The River Esk
01	336295	584559	Two small patches (1m^2) of Himalayan balsam on the east bank of the River Esk	 Photo 02. Himalayan balsam on the River Esk
--	336327	584766	The Ewes Water is a 15m wide fast flowing river which joins the River Esk on the north of Langholm	 Photo 03 – The Ewes Water
02	335574	585216	Small patches (3m^2) of Rhododendron in woodland on the south west bank of the River Esk	-
03	336297	584794	Small patches (1m^2) of Himalayan balsam on the north bank of the Ewes Water	-
04	336150	584874	Small patches (1m^2) of Himalayan balsam on a public footpath on the north bank of the Ewes Water	-

TN	Easting	Northing	Details	Photo Reference
--	336024	584396	The Wauchope Water is a 6m wide fast flowing river which joins the River Esk in the centre of Langholm.	 Photo 04 – The Wauchope Water
05	336044	584416	Small patches ($1m^2$) of Himalayan balsam on the south bank of the Wauchope Water	-
06	335991	584384	$5m^2$ patch of Himalayan balsam on the south bank of the Wauchope Water	-
07	335990	584996	Mature sycamore with knot holes and dead branches giving high bat roost potential.	 Photo 05 – Mature sycamore with high bat roost potential
08	335847	585107	Mature oak with rot holes and dead branches giving high bat roost potential	 Photo 06 – Mature oak with high bat roost potential

TN	Easting	Northing	Details	Photo Reference
09	335895	584986	Mature sycamore with knot holes and dead branches giving high bat roost potential.	 Photo 07 – Mature sycamore with high bat roost potential
10	336161	584227	Mature oak and dead tree beside it have moderate bat roost potential due to rotten stem and woodpecker holes and knot holes.	 Photo 08 – Mature oak and dead tree with moderate bat roost potential
11	336035	584316	Residential building of stone construction with slate tiles, wooden soffits and lead flashing. The building has high bat roost potential.	 Photo 09 – Building with high bat roost potential.
12	335576	584260	Residential building of stone construction with slate tiles; inaccessible for photographs.	--
13	336328	584994	Wooden pavilion with slate tiles and lead flashing. The structure has moderate bat roost potential.	

TN	Easting	Northing	Details	Photo Reference
				 Photo 10 – Pavillion with moderate bat roost potential
14	335951	584937	Langholm Academy and Sports Centre are modern buildings with metal soffits and lead flashing. The buildings have moderate bat roost potential.	 Photo 11 – Langholm Academy and Sports Centre have moderate bat roosting potential.
15	336186	584191	A stable with associated storage and work sheds of wooden construction with corrugated iron roof has moderate bat roost potential.	 Photo 12 – Stable with moderate bat roost potential
16	335601	584416	A stable of wooden construction with corrugated iron roof has low bat roost potential.	 Photo 13 – Stable with low bat roost potential
17	336313	585023	A stone bridge spanning the River Esk has some gaps between the stonework giving low bat roost potential.	

TN	Easting	Northing	Details	Photo Reference
				 Photo 14 – A stone bridge over the River Esk has low bat roost potential
18	336162	584519	A stone bridge spanning the Wauchope Water has some gaps between the stonework giving low bat roost potential.	 Photo 15 – A stone bridge over the Wauchope Water has low bat roost potential