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WEST KINLEITH FARM

PROPOSED WOODLAND CREATION SCHEME

Extended Phase 1 Habitat Survey

Prepared for Scottish Woodlands, Priorwood, High Road, Melrose, Scottish Borders

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Executive Summary

- Tweed Ecology was commissioned by Scottish Woodlands to undertake an extended Phase 1 habitat survey of a proposed woodland creation site at West Kinleith Farm, by Balerno, City of Edinburgh.

- The Phase 1 habitat survey assesses the distribution of Groundwater Dependent Terrestrial Ecosystems (GWDTE) and identifies any areas where deep peat is likely to be present on the site.

- Evidence of protected mammals on the site was recorded with potential impacts assessed in this report along with potential mitigation requirements.

- 20 Phase 1 habitats and linear features were found on the site.

- Five habitats classifiable as GWDTE were encountered during the survey of the site (marshy grassland, unimproved acid grassland, unimproved neutral grassland, swamp and wet dwarf shrub heath). Some of the marshy grassland and unimproved neutral grassland present in parts of the site (M23 rush pasture and CG10 grassland) is classified as highly groundwater dependent using the SEPA guidance.

- Some of the wet dwarf shrub heath and wet modified bog towards the east of the site have potentially developed over deep peat and should be subject to further assessment (peat probing) to determine depth of peat before planting.

- Small areas of species-rich neutral grassland with common rockrose are present on the steep south-west facing slopes of Bell's Hill and steep south facing slopes above the Black Springs LBS.

- An area of swamp at the eastern end of the Black Springs arm of Threipmuir Reservoir supported a population of the nationally scarce lesser tussock-sedge.

- [redacted]One active badger sett was found on the site with others potentially present on the site [redacted]

- An old otter spraint was found [redacted] but no other otter evidence was recorded.

- A small pearl-bordered fritillary butterfly was recorded in marshy grassland in the east of the site.

- Recommendations are made on mitigation measures to maintain and enhance the important habitats and species of nature conservation value present on the site.

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Introduction

Tweed Ecology was commissioned by Scottish Woodlands to undertake an extended Phase 1 Habitat Survey at West Kinleith Farm, by Balerno, City of Edinburgh. The survey informed the assessment of any Groundwater Dependent Terrestrial Ecosystems (GWDTE) and areas of deep peat (> 0.5 m in depth) present on the site. Together these assessments inform potential woodland planting areas and assess the current nature conservation value of the habitats occurring on the site.

Records of protected and notable fauna species were also made during the P1HS. An assessment of the nature conservation importance of the habitats and records of fauna and flora species recorded is provided, along with potential mitigation measures that could be adopted to minimise the impact of woodland planting on habitats and species of nature conservation interest.

The planting proposal extends to around 240 hectares of enclosed farmland and hill grazings approximately 2 km southeast of Balerno on the southwestern side of Edinburgh. The land ranges in altitude from approximately 250 m to 415 m above sea-level and is currently used for grazing sheep.

The survey was undertaken over three days between 12th and 21st July 2023 by Reuben Singleton CEnv MCIEEM, who has over 30 years' professional experience as an ecologist. Over that time, he has undertaken many habitat and vegetation surveys across Southern Scotland.

This report details the P1HS and GWDTE survey and classification methods, results and main conclusions. Forestry Commission guidance on GWDTE (FCS, 2018) has been reviewed to provide further information in assessing the potential impacts of woodland creation upon the GWDTE present on the site and to inform mitigation.

Photographs showing the range of vegetation typically found across the site are presented in **Annex 6**.

Site Description

The centre of the site is at NGR: NT193650, 2 km to the southeast of Balerno in the City of Edinburgh local authority area. The site extends to approximately 238.65 ha in size, comprising enclosed farmland and hill grazings utilised for sheep grazing. The site ranges in altitude from approximately 252 m to 415 m above sea-level.

Most of the site is currently extensively grazed by sheep with the enclosed ground largely classifiable as semi-improved acid grassland, while the hill grazings consist of a mosaic of unimproved acid grassland, moorland and rush pasture. The enclosed fields appear to have been reseeded but did not have any livestock present at the time of the survey. Immediately adjacent to the west and southwest boundaries of the site lie Harlaw and Threipmuir Reservoirs. The site is subject to a high level of recreational pressure with several rights of way and informal paths crossing the site. Many

recreational users gain access to the site from the busy Harlaw Car Park which lies only 600 m northwest of the site boundary.

The site can be crudely divided into two halves, with the western, lower in-bye ground consisting of semi-improved acid grassland and where drainage has failed marshy grassland dominated by soft rush (*Juncus effusus*). A promontory of gently rising ground extends in an east-west direction between Harlaw and Threipmuir Reservoirs, with and an arm of Threipmuir Reservoir known as Black Springs forming much of the southern site boundary. On the steeper south-facing slopes above Black Springs, a diverse mosaic of semi-natural habitats have developed including unimproved acid and neutral grassland, dense gorse (*Ulex europaeus*) scrub and dense bracken (*Pteridium aquilinum*). At the eastern end of Black Springs, a small area of swamp has developed in the transition between open water and terrestrial habitat.

Mature Scots pine (*Pinus sylvestris*) plantations are present on the shores of Harlaw and Threipmuir Reservoirs, providing a buffer from the prevailing winds from the southwest. A more recent mixed plantation established for around 15-20 years with Sitka spruce (*Picea sitchensis*), Scots pine, silver birch, rowan, sycamore (*Acer pseudoplatanus*), aspen (*Populus tremula*) and alder (*Alnus glutinosa*) extends from Harlaw Reservoir into the centre of the site at Craigentarrie, Two former farmhouses are present; Craigentarrie in the centre of the site which has lost its roof and is reduced to four walls and the Threipmuir farmhouse and steading at the west of the site which is currently used as an outdoor centre by Youth Vision. A neglected orchard with a range of young apple trees and cultivated roses is present to the south of the farm steading.

The eastern half of the site is characterised by hill grazings dropping steeply from near the summit of Harbour Hill (421 m) at the northeast boundary down to around 300 m, after which the land slopes gently downwards to the northern boundary of the site. Management appears to be extensive grazing by sheep. Much of the lower ground to the east was formerly used as a firing range (Malleny Rifle Range), most likely used by troops based at Dreghorn and Redford Barracks. The range was in use from the late 19th century and was probably used in both World Wars. A range of semi-natural habitats are present including unimproved acid and neutral grassland, marshy grassland, wet dwarf shrub heath, wet modified bog and bracken (dense and scattered). A small area of basic flushed grassland is present on the lower slopes of Bell's Hill on the south-eastern boundary of the site. A mature Scot's pine shelterbelt with occasional broadleaves including rowan (*Sorbus aucuparia*), holly (*Ilex aquifolium*), hawthorn (*Crataegus monogyna*), silver birch (*Betula pendula*) and goat willow (*Salix caprea*) is present along the northern boundary of the site.

Watercourses are restricted to the Kinleith Burn and small unnamed burns which drain the site in an east-west direction. All of these watercourses are small (<1 m wide and <30 cm deep, fast-flowing with gravel substrate with heavily vegetated banks resulting in water only being visible at crossing points.

Trees within the site boundary are restricted to occasional rowan, hawthorn and elder (*Sambucus nigra*) which have managed to escape grazing, primarily in areas of dense gorse scrub towards the southwest of the site.

Methodology

Desk Study

Baseline data on the nature conservation interest of the site and a search area around the site extending to 500 m, including information on designated nature conservation sites and notable/protected species records, were sought from The Wildlife Information Centre (TWIC).

Notable and protected species were defined as:

- All European and UK protected species listed in legislation schedules;
- All animals classified as Nationally Notable (1-100 ten-kilometre squares in Britain).
- All species classified as Priority Species in the revised 2007 UKBAP List. Some of the species included are common and widespread, but are rapidly declining and thus listed to encourage further research;
- All species that are included on the Scottish Biodiversity List (SBL). Many of the species listed in the SBL are widespread and common but are listed for their cultural significance (e.g. robin), rather than their nature conservation value;
- Species listed for action within the Edinburgh Biodiversity Action Plan (LBAP); and
- Any non-native invasive species.

Phase 1 Habitat Survey

The survey was carried out in good weather by Reuben Singleton between 12th and 21st July 2023. The site was mapped using the descriptions set out in the Phase 1 Habitat Survey Handbook (JNCC, 2010).

Boundaries of vegetation communities were transferred onto a digital map tile(s) at an appropriate scale with photographs taken of each polygon of homogeneous vegetation. Characteristic vascular plant species were recorded for each vegetation community identified to assist classification.

Where present, EU Annex 1, Scottish Biodiversity List (SBL) and Edinburgh Biodiversity Action Plan habitats were identified.

An overall site species list was collated, with any notable species (Critically Endangered, Endangered, Vulnerable, Near Threatened, Scottish Biodiversity List and Edinburgh BAP) highlighted.

Botanical names (English and scientific) follow Stace (2019). Photographs were taken of each distinct vegetation stand.

The timing of the survey was considered to be optimal for the upland vegetation communities present on the site.

GWDTE Allocation

Groundwater Dependent Terrestrial Ecosystems (GWDTE) are wetland habitats that are specifically protected under the European Union Water Framework Directive (2000/60/EC). Guidance relating to GWDTEs sets out a list of NVC vegetation communities that are considered to be highly or moderately dependent on groundwater sources (SEPA, 2017).

To enable an assessment of the GWDTEs on the site, the NVC communities identified were reviewed using the SEPA guidance to indicate whether the vegetation communities on the site were likely to be groundwater dependent (SEPA, 2017). Where groundwater dependent vegetation communities were identified, an assessment of their sensitivity (high or moderate sensitivity) was undertaken.

Results

Desk Study

Habitats

No European sites (Special Areas of Conservation, Special Protection Areas and Ramsar sites) lie 5km of the proposed woodland planting proposal. Two Sites of Special Scientific Interest (SSSI) lie within 5km of the proposed woodland planting proposal; Balerno Common SSSI and Habbie's Howe – Logan Burn SSSI.

Balerno Common SSSI lies 1.2 km to the west of the site. It is a composite site comprising Red Moss, a raised bog, and Bavelaw Marsh, an area of open water with stands of emergent vegetation and adjacent marshy grassland. Red Moss is the largest and least disturbed area of raised bog in Edinburgh, while Bavelaw Marsh is the only area of fen of any size. In combination, these two areas form a site that is unique within Edinburgh in terms of size and diversity of both species and habitat.

Habbie's Howe - Logan Burn SSSI designated for its geological and biological interest lies 2 km to the south of the site. The site comprises a steep-sided ravine cut into old red sandstone conglomerate, with a number of base-rich intrusions. The ravine itself has a series of waterfalls, numerous rock outcrops and many unstable slopes with intermittent landslips. This combination of geology and geomorphology has resulted in a complex site with a variety of important bryophyte and lichen habitats. The site is of great regional importance as the only known Lothian locality for a number of species.

It is predicted that the qualifying interests of the designated sites mentioned above will not be impacted by the proposed woodland planting.

Four Local Biodiversity Sites (LBS) lie within 500 m of the site boundary; Bavelaw Burn, Black Springs, Harlaw Reservoir and Threipmuir Reservoir. Black Springs LBS abuts the southern boundary of the site for approximately 1.2 km, with a small area of swamp and marshy grassland actually within the site boundary (**Photo 1**). Threipmuir Reservoir LBS abuts the southwestern boundary of the site for approximately 900 m. Harlaw Reservoir LBS abuts the north-western boundary of the site for approximately 900 m. Bavelaw Burn approaches to within 410 m of the site to the northwest. None of the important features of these LBS will be affected by the woodland planting proposals providing that requirements for the protection of watercourses set out in the UK Forestry Standard, and the mitigation proposals set out later in this report are adhered to.

Several long-established woodlands of plantation origin (LEPO) listed on the Scottish Ancient Woodland Inventory are located within 500m of the proposed woodland planting, including the mature Scots pine plantations around Harlaw Reservoir and Whiteside Plantations (**Photo 2**) which both abut the northern boundary of the site. It is not anticipated that these woodlands will be adversely affected by the planting proposals. If native broadleaved species or further Scots pine are included in the woodland design abutting these areas of LEPO, then it is likely that their ecological value will be enhanced by the proposed scheme.

The specially protected species records (excluding birds) within 500 m of the site revealed by the TWIC data search are listed in **Table 1**.

Table 1 Species receiving special protection under the Wildlife and Countryside Act, 1981 recorded within 500 m of the proposed woodland planting at West Kinleith Farm Source: TWIC

Species	*Latin name*	Conservation Status[1]	Year of record
Flowering Plants			
Bluebell	*Hyacinthoides non-scripta*	WCA S8	2003, 2004
Reptiles			
Adder	*Vipera berus*	WCA S5	1959
Common lizard	*Zootoca vivipara*	WCA S5	1993, 1996, 1999
Mammals			
Badger	*Meles meles*	PBA	2013, 2014, 2019
Common pipistrelle	*Pipistrellus pipistrellus*	WCA S5	1998, 2002, 2006, 2016
Daubenton's bat	*Myotis daubentonii*	WCA S5	2016
Eurasian otter	*Lutra lutra*	WCA S5	1960, 1994, 2012, 2014, 2019
Pipistrelle bat species	*Pipistrellus sp.*	WCA S5	2016
Soprano pipistrelle	*Pipistrellus pygmaeus*	WCA S5	2006, 2016

[1] PBA Protection of Badgers Act, 1992
WCA S5/WCA S8 Species receiving special protection under Schedules 5 or 8 of the Wildlife and Countryside Act, 1981 (as amended)

Bluebells are protected from sale rather than receiving strict legal protection.

No great crested newt, otter, pine marten, red squirrel, reptile or water vole records were identified on the site or within 500 m of the site boundary by the TWIC data search.

The desk study identified several other species of conservation importance, although not receiving statutory protection, within 500 m of the site (**Table 2**).

Table 2 Species of Conservation Importance recorded within 500 m of the proposed woodland planting at West Kinleith Farm Source: TWIC

Species	*Latin name*	Conservation Status[2]	Year of record
Fish			
Brown trout	*Salmo trutta*	UKBAP, SBL, LBAP	1995, 2003, 2004
Bryophytes			
Beaked beardless-moss	*Weissia rostellata*	SBL	1973
Brown screw-moss	*Syntrichia princeps*	SBL	1904
Spreading earth-moss	*Aphanorrhegma patans*	SBL	2003
Plants			
Black -bindweed	*Fallopia convolvulus*	SBL	1993
Charlock	*Sinapis arvensis*	SBL	1993, 1994
Corn mint	*Mentha arvensis*	SBL	2019
Heath cudweed	*Gnaphalium sylvaticum*	SBL, LBAP	1994
Juniper	*Juniperus communis*	UKBAP, SBL, LBAP	1980, 1981-1999
Large-flowered hemp-nettle	*Galeopsis speciosa*	SBL, LBAP	1994
Marsh stitchwort	*Stellaria palustris*	UKBAP, SBL, LBAP	1996, 1998
Yellow-vetch	*Vicia lutea*	SBL	1990
Invertebrates			
A water-beetle	*Helophorus porculus*	SBL	1907
Bilberry bumblebee	*Bombus monticola*		2008, 2010, 2012, 2014, 2016
Ear moth	*Amphipoea oculea*	SBL	2017
Small heath butterfly	*Coenonympha pamphilus*	SBL	1986, 1996, 1997, 1998, 1999, 2000, 2007, 2008, 2009, 2010, 2016, 2017, 2019, 2020, 2022
White ermine moth	*Spilosoma lubricipeda*	SBL	2018
Mammals			
Brown hare	*Lepus europaeus*	UKBAP, SBL, LBAP	1994, 2010, 2014, 2015, 2016, 2018, 2019

Survey

The habitats found at West Kinleith are listed in **Table 3** over page. In order of decreasing spatial area habitats at West Kinleith consist semi-improved acid grassland, unimproved acid grassland, marshy grassland, wet dwarf shrub heath, unimproved neutral grassland, continuous bracken, wet heath acid grassland mosaic, wet modified bog, dense scrub, improved grassland, scattered bracken, tall ruderal, broadleaved plantation woodland, basic flush, cultivated ground (garden), amenity

[2] SBL – Listed in Scottish Biodiversity List.
LBAP – Species listed in the Edinburgh Biodiversity Action Plan (LBAP)

grassland, swamp and scattered scrub. The habitats within the survey area are mapped in **Annex 1** with target notes presented at **Annex 2**.

Table 3 Habitats recorded at West Kinleith.

Habitat Type	Phase 1 habitat	Area (ha)
Woodland and scrub	Broadleaved plantation woodland	0.52
	Dense scrub	1.07
	Scattered scrub	0.06
Grassland and marsh	Unimproved acid grassland	62.27
	Semi-improved acid grassland	85.06
	Unimproved neutral grassland	8.42
	Improved grassland	0.97
	Marsh/marshy grassland	49.88
Tall herb and fern	Continuous bracken	4.11
	Scattered bracken	0.67
	Other tall herb and fern – ruderal	0.66
Heathland	Wet dwarf shrub heath	19.57
	Wet heath/acid grassland mosaic	3.69
Mire	Wet modified bog	1.79
	Basic flush	0.38
Swamp, marginal and inundation	Swamp	0.07
Miscellaneous	Garden Ground	0.29
	Amenity grassland	0.08
TOTAL		**239.56 ha[3]**

[3] The habitat total is 0.91 ha more than the mapped site due to mapping/digitisation errors.

The following section summarises each of the Phase 1 habitat types that were mapped during the survey. A plant species list for the site is presented at **Annex 3**.

A1.1.2 Broadleaved plantation woodland

Two areas of recently planted broadleaved plantation woodland are present at the western end of the site in the vicinity of the Threipmuir farmhouse and steading. The plantation woodland is estimated to be between ten and 15 years of age with trees reaching 4 m height; species include osier (*Salix viminalis*), hazel (*Corylus avellana*), silver birch (*Betula pendula*) and alder (*Alnus glutinosa*).

The second area mapped as broadleaved plantation is actually a neglected orchard to the south of the Threipmuir steading comprising cultivated apple (*Malus domestica*) with a line of overgrown rose bushes along the fence line with the adjacent pasture field (**Photo 3**).

A2.1 Dense scrub

Dense gorse (*Ulex europaeus*) scrub has developed on steep slopes above the Black Springs arm of Threipmuir Reservoir. Occasional elder (*Sambucus nigra*) and rowan (*Sorbus aucuparia*) trees are scattered through the gorse scrub (**Photo 4**). Many large mammal paths were observed leading into the scrub which may have been created by badger (*Meles meles*) though close inspection of several large accessible holes found evidence only of foxes (*Vulpes vulpes*). These areas of scrub are likely to be highly attractive to breeding birds with many linnet (*Linaria cannabina*) observed during the habitat survey. This scrub community corresponds to the W23 *Ulex europaeus-Rubus fruticosus* vegetation community described in the National Vegetation Classification (NVC).

A2.2 Scattered scrub

A small area of scattered gorse scrub extending to 0.065 ha is present within a field of semi-improved acid grassland on a steep slope above the Black Springs arm of Threipmuir Reservoir.

B1.1 Unimproved acid grassland

Unimproved acid grassland is the second largest habitat type on the site. It occurs mostly in the areas of hill grazings to the east of the site. Several NVC communities are found with the most widespread being the *U4 Festuca ovina-Agrostis capillaris-Potentilla erecta* community. Dominant species are usually the grasses; red fescue (*Festuca rubra*), Yorkshire fog (*Holcus lanatus*) and common bent (*Agrostis capillaris*) with some wavy hair-grass *(Deschampsia flexuosa)* and sweet vernal-grass *(Anthoxanthum odoratum*). Herbs generally include tormentil (*Potentilla erecta*), heath bedstraw (*Galium saxatile*), common bird's-foot trefoil (*Lotus corniculatus*), common sorrel (*Rumex acetosa*) and yarrow (*Achillea millefolium*). Some areas are species-poor with only tormentil and heath bedstraw present, while richer areas on thinner soils have wild thyme (*Thymus drucei*), harebell (*Campanula rotundifolia*), yellow rattle (*Rhinanthus minor*) and lady's bedstraw (*Galium verum*) (**Photo 5**). There is some

evidence of historical 'rig and furrow' cultivation to the east of Craigentarrie at NT19776 664931.

Where the underlying soils retain more moisture, mat-grass (*Nardus stricta*) is more common, giving an appearance of a pale, whitish sward. The accompanying herb species in the U4 community described above are less common in this vegetation and generally restricted to tormentil and heath bedstraw. This vegetation corresponds to the U5 *Nardus stricta-Galium saxatile* community described in the NVC.

Where damper soil occurs on gently sloping ground and the underlying soils are likely to be shallow peat or gleyed podsols, heath rush becomes the dominant species. Here the vegetation viewed from a distance appears to be dark green and this is due to the species-poor dense rosettes of heath rush. These grasslands correspond to the U6 *Juncus squarrosus-Festuca ovina* vegetation community described in the NVC.

At the far east of the site on the steep, exposed, west-facing upper slopes of Harbour Hill a small area of grassland dominated by wavy hair-grass is present (**Photo 6**). This is a species-poor grassland habitat with only other species recorded being sheep's sorrel (*Rumex acetosella*), heath bedstraw, blaeberry (*Vaccinium myrtillus*) and red fescue together with some pleurocarpous mosses. This acid grassland community corresponds to the *U2 Deschampsia flexuosa* vegetation community described in the NVC.

B1.2 Semi-improved acid grassland

Semi-improved acid grassland is the largest habitat type recorded during the survey, occupying much of the lower ground in the western half of the site. It is generally species-poor with few taller herbs and characteristically shows signs of some previous improvement with a scattering of perennial rye-grass (*Lolium perenne*) and crested dogs-tail (*Cynosurus cristatus*) (**Photo 7**).

Dominant species in the sward are Yorkshire fog, common bent, smooth meadow-grass (*Poa pratensis*) and red fescue with occasional tufted hair-grass (*Deschampsia cespitosa*), smaller cat's-tail (*Phleum bertolonii*), false oat-grass (Arrhenatherum elatius), cock's-foot (*Dactylis glomerata*) and sweet vernal grass. Herbs largely absent with occasional creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), tormentil, common sorrel, autumn hawkbit (*Scorzoneroides autumnalis*) and common mouse-ear (*Cerastium fontanum*). In wetter areas, soft rush (*Juncus effusus*) is frequent.

This grassland community is not included in the NVC, but is referred to in the review of NVC coverage (Rodwell et al., 2000), corresponding to the Fe-Ho-An *Festuca rubra-Holcus lanatus-Anthoxanthum odoratum* provisional grassland community.

Elsewhere the semi-improved grassland shows evidence of reseeding with many native grasses still frequent in the sward but crested dog's-tail (*Cynosurus cristatus*) and perennial rye-grass (*Lolium perenne*) dominant. This grassland community

corresponds to the MG6 *Lolium perenne–Cynosurus cristatus* grassland community in the NVC.

B2.1 Unimproved neutral grassland

Four small areas of unimproved neutral grassland are present on the site, falling into two NVC communities. The largest of these lies on gently sloping ground towards the east of the site and is dominated by tufted hair-grass. Associates include Yorkshire fog, red fescue, wavy hair-grass, sweet vernal-grass, tormentil, lesser stitchwort (*Stellaria graminea*) and creeping buttercup. This grassland community corresponds to the MG9a *Holcus lanatus-Deschampsia cespitosa*; *Poa trivialis* sub-community described in the NVC.

The three other areas of unimproved neutral grassland are on steep southwest facing slopes of Bell's Hill at the east of the site (**Photo 8**) and on steep south-facing slopes above Black Springs to the south of the site (**Photo 9**). These are species-rich with quaking-grass (*Briza media*), common rockrose (*Helianthemum nummularium*), fairy flax (*Linum catharticum*), harebell, wild thyme, mouse-ear hawkweed (*Pilosella officinarum*), mountain pansy (*Viola lutea*), common spotted-orchid (*Dactylorhiza fuchsii*) and lady's bedstraw. These grasslands are classifiable as CG10 *Festuca ovina–Agrostis capillaris–Thymus praecox* grassland. CG10 is a priority habitat listed in Annex 1 of the EC Habitats Directive (6230 Species-rich *Nardus* grasslands, on silicious substrates in mountain areas) as well as being a UK Biodiversity Action Plan priority habitat and listed on the Scottish Biodiversity List (upland calcareous grassland).

B4 Improved grassland

A small area of improved grassland with a species-poor sward dominated by perennial rye-grass is present immediately to the north of the derelict Craigentarrie Farm. Broad-leaved dock (*Rumex obtusifolius*) was the only other species present.

B5 Marsh/marshy grassland

Marshy grassland is widely distributed across the site wherever groundwater reaches the surface. In places a relatively species-rich rush pasture is present, dominated by jointed rush (*Juncus articulatus*) with Yorkshire fog, tufted hair-grass, fen bedstraw (*Galium uliginosum*), lesser spearwort (*Ranunculus flammula*), glaucous sedge (*Carex flacca*), marsh bedstraw (*Epilobium palustre*), meadow vetchling (*Lathyrus pratensis*), water mint (*Mentha aquatica*) and bog pondweed (*Potamogeton polygonifolius*) often growing in rivulets (**Photo 10**). This habitat is classifiable as the M23a *Juncus effusus/acutiflorus-Galium palustre* rush pasture; *Juncus acutiflorus* sub-community, in the NVC.

Elsewhere the rush pasture habitat is species-poor with the dominant species being soft rush. This habitat is classifiable as the M23b *Juncus effusus/acutiflorus-Galium palustre* rush pasture; *Juncus effusus* sub-community, in the NVC.

Three areas of habitat in the eastern half of the site are dominated by tufted hair-grass with associates including jointed rush, flea sedge (*Carex pulicaris*), carnation sedge (*Carex panicea*), purple moor-grass (*Molinia caerulea*), velvet bent (*Agrostis canina*), greater bird's-foot trefoil (*Lotus pedunculatus*) and sneezewort (*Achillea ptarmica*). This grassland community corresponds to the MG9a *Holcus lanatus-Deschampsia cespitosa*; *Poa trivialis* sub-community described in the NVC.

Several areas of rush pasture dominated by soft rush with purple moor-grass, tufted hair grass, oval sedge (*Carex leporina*), common sedge (*Carex nigra*), marsh thistle (*Cirsium palustre*) and tormentil are present on the lower ground where drainage is poor. This rush pasture is classifiable as the MG10 Holcus lanatus-Juncus effusus community in the NVC.

Towards the east of the site, a heathier marshy grassland community dominated by purple moor-grass has developed where attempts have been made to drain boggy habitat. Associates include Yorkshire fog, tufted hair-grass, mat grass, velvet bent, carnation sedge, star sedge (*Carex echinata*) and heath wood-rush (*Luzula multiflora*) (**Photo 11**). This habitat is classifiable as the M25b *Molinia caerulea–Potentilla erecta* mire; *Anthoxanthum odoratum* NVC community.

The M23a and M25b vegetation communities fall under the purple moor-grass and rush pasture priority habitat in the UK Biodiversity Action Plan and are also listed on the Scottish Biodiversity List.

C1.1 Continuous bracken

Dense bracken (*Pteridium aquilinum*) is found at various locations along the southern boundary of the site on steep south-facing slopes (**Photo 12**). Here it grows sufficiently densely to exclude almost all other plants apart from a few grass species, tormentil and the occasional foxglove (*Digitalis purpurea*). It is considered likely that bracken cover is expanding into areas of U4 unimproved and semi-improved acid grassland.

Above the Black Springs arm of Threipmuir Reservoir, a small, narrow band (20 m) of H18 *Vaccinium myrtillus-Deschampsia flexuosa* heath lies upslope of the dense bracken. Here blaeberry (*Vaccinium myrtillus*) is dominant with associates including wavy hair-grass, tormentil and bell heather (*Erica cinerea*).

Stands of bracken are classifiable as the U20 *Pteridium aquilinum-Galium saxatile* NVC community.

H18 is listed in Annex 1 of the EC Habitats Directive (4030 European dry heaths and 4060 alpine and boreal heaths) as well as being a UK Biodiversity Action Plan priority habitat and listed on the Scottish Biodiversity List (upland heathland).

C1.2 Scattered bracken

A small stand of scattered bracken developed over unimproved acid U4 grassland is present at the south-east corner of the site.

C3.1 Other tall herb and fern - ruderal

Two small areas of tall ruderal vegetation are present on the site. One area has developed on disturbed soil [redacted] high up on Bell's Hill to the east of the site. Here the vegetation is dominated by common nettle (*Urtica dioica*), with creeping thistle (*Cirsium arvense*), spear thistle (*Cirsium vulgare*) and barren brome (*Anisantha sterilis*). This stand is classifiable as the OV25 *Urtica dioica-Cirsium arvense* NVC community.

The other area of tall ruderal vegetation lies to the south of Threipmuir Farm to the west of the site. The dominant species here is rosebay willowherb (*Chamerion angustifolium*) and it is likely to have become established on abandoned cultivated ground. This stand is classifiable as the OV27 *Epilobium angustifolium* NVC community.

D2 Wet dwarf shrub heath

Wet dwarf shrub heath is found extensively across the east of the site (**Photo 13**). Although this community is generally found over shallow peats, it can extend onto deep peat where the original bog vegetation has been damaged by burning, grazing, drainage and peat cutting. Many moor grips are still visible but have generally vegetated over making walking treacherous.

Heather is the dominant species with scattered blaeberry, cross-leaved heath (*Erica tetralix*), crowberry (*Empetrum nigrum*), tormentil, deer-grass (*Trichophorum germanicum*), green-ribbed sedge (*Carex binervis*) and heath rush. Purple moor-grass is common but never dominant.

This heath vegetation is classifiable as M15 *Trichophorum cespitosum – Erica tetralix* wet heath. M15 is listed in Annex 1 of the EC Habitats Directive (4060 alpine and boreal heaths) as well as being a UK Biodiversity Action Plan priority habitat and listed on the Scottish Biodiversity List (upland heathland).

D6 Wet heath/acid grassland

This mosaic of heathland and grassland habitats extending to around 3.7 ha lies immediately to the south of the well-used path leading to Maiden's Cleuch towards the west of the site. Acid grassland is the dominant habitat but heath vegetation is present throughout in a proportion of perhaps 80:20% grassland/heath. Dominant species are mat grass, red fescue, wavy hair-grass, tufted hair-grass, sneezewort, tormentil, heath bedstraw, heath woodrush with the most common heathland species being blaeberry and heather.

E1.7 Wet modified bog

A small area of wet modified bog extending to approximately 1.8 ha is present at the northern tip of the site (**Photo 14**). Although moor grips are not as visible in this area as they are in adjacent wet heath, some drying out of the bog is nonetheless likely to have taken place. The dominant species is purple moor-grass with associates

including heather, cross-leaved heath, heath rush, wavy hair-grass and blaeberry. Sphagnum mosses are present but uncommon with hypnoid mosses including red-stemmed feather-moss (*Pleurozium schreberi*), glittering wood-moss (*Hylocomium splendens*) and heath plait-moss (*Hypnum jutlandicum*) occurring in abundance.

The habitat is likely to be classifiable as the H18 *Vaccinium myrtillus-Deschampsia flexuosa* heath NVC community despite it being likely developed over deep peat.

E2.2 Basic Flush

A small area of basic flushed species-rich grassland occurs on the eastern boundary. Plant species include devil's-bit scabious (*Succisa pratensis*), fairy flax (*Linum catharticum*), glaucous sedge, flea sedge, quaking grass, jointed rush, common spotted orchid (*Dactylorhiza fuchsii*) and meadowsweet (*Filipendula ulmaria*), with occasional scattered bracken.

This habitat is classifiable as the M23a *Juncus effusus/acutiflorus-Galium palustre* rush pasture; *Juncus acutiflorus* NVC sub-community.

F1 Swamp

At the western end of the Black Springs arm of Threipmuir Reservoir, the open water transitions into swamp and marshy grassland (**Photo 15**). Dominant species in the swamp habitat are bottle sedge (*Carex rostrata*), marsh marigold (*Caltha palustris*), marsh cinquefoil (*Comarum palustre*), ragged-robin (*Silene flos- cuculi*) and marsh bedstraw (*Galium palustre*). The nationally scarce lesser tussock-sedge (*Carex diandra*) is present.

This habitat is classifiable as the S27b *Carex rostrata-Potentilla palustris* tall-herb fen: *Lysimachia vulgaris* NVC sub-community. S27 corresponds to transition mires and quaking bogs listed in Annex 1 of the EC Habitats Directive (7140) as well as being a UK Biodiversity Action Plan priority habitat and listed on the Scottish Biodiversity List (upland flushes, fens and swamps).

G2.3 Oligotrophic running water

Watercourses are restricted to the Kinleith Burn and small unnamed burns which drain the site in a westerly direction. All of these watercourses are small (<1 m wide and <30 cm deep, fast-flowing with gravel substrate with heavily vegetated banks resulting in water only being visible at crossing points. Aquatic vegetation is absent.

J1.1 Cultivated and disturbed land – arable

Threipmuir Farm is now used as an outdoor centre by the youth charity, Youth Vision. The farmhouse and steading are stone built with a range of wooden outbuildings and are surrounded by garden ground.

J1.2 Cultivated and disturbed land – amenity grassland

Amenity grassland is restricted to the intensively managed lawn at Threipmuir Farm.

J2.5 Wall

Several stone dykes bisect the site and delimit the site boundary at the western end of the site at Harlaw Reservoir. Some are in a poor state of repair with stone removed for use elsewhere. Where dykes remain intact or partially intact, they are likely to provide important reptile hibernacula and breeding bird habitat.

Deep peat assessment

No peat probing was undertaken during the course of the surveys. Deep peat (>50 cm depth) is potentially present where wet modified bog and wet dwarf shrub heath has been mapped on the hill ground to the west of the site. Moor grips are still visible across these areas and although vegetated over, they are still likely to be having a negative impact on these wetland habitats and the peat beneath. Although much of this habitat is likely to have developed over shallow peat, it is recommended that a peat depth survey is undertaken if any planting is proposed in these areas to determine the extent of any deep peat.

Groundwater Dependent Terrestrial Ecosystem (GWDTE) Assessment

Potential impacts on GWDTE outside the site boundary as a result of the proposed woodland planting will be restricted to those areas where marshy grassland occurs the north-east and south-east boundaries of the site. If any modification of the hydrology of these marshy grassland areas on the site boundary occurs through enhanced drainage or tree planting, then it is likely that this would be replicated in impacts for a short distance outwith the site.

Previous agricultural improvement practices across the site, especially the widespread evidence of moor gripping on the hill grazings to the east of the site and the semi-improved grassland to the west of the site are already likely to have significantly affected the hydrology of the site.

Nonetheless Phase 1 habitat identified as GWDTE at West Kinleith is widespread, particularly in the hill grazings to the east of the site. An assessment of the constituent NVC communities and their groundwater dependency, based on the SEPA guidance (SEPA, 2017) are presented in **Table 4**.

Table 4. GWDTE NVC communities recorded at West Kinleith Farm and their groundwater dependency classification.

Phase 1 classification	NVC Code	Groundwater Dependency (based on SEPA guidance)
Marshy grassland	M23	High
	M25	Moderate
Unimproved acid grassland	MG10	Moderate
	U6	Moderate

Phase 1 classification	NVC Code	Groundwater Dependency (based on SEPA guidance)
Unimproved neutral grassland	CG10	High
	MG9	Moderate
Swamp	S27	Moderate
Wet dwarf shrub heath	M15	Moderate

Two of the GWDTE NVC communities (CG10 and M23) encountered during the survey of the site are classified as highly groundwater dependent in the SEPA guidance.

It is important to note that the SEPA guidance uses the UK classifications to assess groundwater dependency. The Scottish groundwater assessment for the CG10 and M23 communities rates them as being moderately dependent on groundwater, rather than highly dependent, acknowledging that water from other sources (e.g. surface runoff, overbank flooding etc.) may be very important in their formation. Meanwhile the M25 and S27 communities are rated as having low dependence on groundwater in the Scottish groundwater assessment (TAG, 2009).

The value of the potential GWDTEs on the site has been further determined on the basis of their rarity, status in Scotland, condition and their groundwater dependency based on UKTAG tables (TAG, 2009), as detailed in **Table 5**.

Table 5 GWDTE Value at West Kinleith Farm

NVC Community	*Rarity*	*Condition*	*Groundwater dependency (based on UKTAG tables)*	*Value*
CG10	Widespread but local throughout Wales, northern England and Scotland	Good: Grazing maintains open sward and diversity, but bracken invasion may become a problem with relaxation of grazing	Moderate	Medium
M15	Widespread in the north and west Britain. Most common in the western Highlands. Common but much less extensive in the Southern Uplands.	Moderate: moderate sheep grazing but much evidence of previous drainage (moor grips).	Moderate	Medium
M23	Common: Widespread and especially common in south-west Scotland and the Inner Hebrides.	Good: moderate sheep grazing but some evidence of previous drainage (moor grips).	Moderate	Medium

NVC Community	*Rarity*	*Condition*	*Groundwater dependency (based on UKTAG tables)*	*Value*
S27	Widespread in the uplands and lowlands of Wales, northern England and Scotland.	Good: Ungrazed and protected as water supply. Supports nationally scarce lesser tussock-sedge.	Low	Medium
M25	Common: Especially common in SW Scotland	Moderate: moderate sheep grazing. Evidence of previous drainage and probable burning.	Low	Low
MG9	Common: Virtually ubiquitous in lowland grassland sites.	Good: moderate sheep grazing is retaining open habitat structure but some evidence of previous drainage (moor grips).	Moderate	Low
MG10	Common: Widespread in Lowland Britain up to 300m	Moderate: sheep grazing retains an open structure to the habitat, much evidence of previous agricultural improvement (drainage, fertiliser application).	Moderate	Low
U6	Very common in the Southern Uplands due to the long history of heavy grazing pressure and frequent burning	Poor: sheep grazing retains an open structure to the habitat, but much evidence of previous agricultural improvement (drainage, fertiliser application).	Moderate	Low

It is important to note that NVC data are not perfect proxies for defining both water dependency and the presence or absence of a wetland. Low predicted groundwater dependence from hydrogeological models can occur in association with high NVC groundwater dependence and vice versa (SNIFFER, 2007).

Protected Species

Badger

Badgers are present on the site but at a low density compared with much of southern Scotland. Occasional evidence of potential feeding activity was found in grassland areas across the site (snuffle holes where mammals had been digging for tubers and/or invertebrate larvae) but no latrines were encountered. Well used mammal paths were identified leading into dense bracken and gorse stands above the Black Springs arm of Threipmuir Reservoir, but only evidence of fox activity was identified in the large mammal holes that were accessible. [redacted]

Only one badger sett was confirmed during the survey; [redacted] There was some evidence that the sett had been bigger in the past with several other disused holes amongst the surrounding tall ruderal vegetation.

[redacted]

Bats

The Threipmuir Farm and steading buildings are assessed as having high bat roost potential with suitable roost features visible along the eaves and in the walls of the buildings (**Photo 17**). The derelict farmhouse at Craigentarrie despite not having a roof offers bat hibernacula potential in the thick external walls (**Photo 18**).

No trees with bat roost potential were identified on the site but the mature coniferous plantations of Scots pine along the northern boundary of the site at Harlaw Reservoir and Whiteside Plantations are likely to contain trees with features offering bat roost potential. The woodlands themselves together with open water associated with the Harlaw and Threipmuir Reservoirs are likely to be valuable for foraging bats, which could travel several kilometres to exploit high invertebrate populations.

Otter

Only one old otter (*Lutra lutra*) spraint was found on the site. This was on the spillway of the Black Springs arm of Threipmuir Reservoir at NT18696 64150 (**Photo 19**). It is likely that otters utilise the Harlaw and Threipmuir Reservoirs which are stocked with trout throughout the year. In addition, it is considered likely that the Black Springs arm of Threipmuir Reservoir is utilised by breeding amphibians in the spring, providing a highly attractive and nutritious seasonal food source for otters. The small size of watercourses bisecting the remainder of the site and absence of other open water bodies make it unlikely that otters traverse the remainder of the site on anything other than an occasional basis.

Water vole

No evidence of water vole were found during the field surveys. The Kinleith Burn and the other small watercourses draining the site are assessed as offering limited value for water vole due to isolation from known populations, despite having soft, highly vegetated banks suitable for burrowing.

Amphibians

There is no suitable habitat on the site for great crested newt (*Triturus cristatus*). No common amphibians were recorded during the site surveys, but excellent aquatic habitat is present in the Black Springs arm of Threipmuir Reservoir for breeding amphibians, with the desk study confirming that common frog (*Rana temporaria*),

common toad (*Bufo bufo*), palmate newt (*Lissotriton helveticus*) and smooth newt (*Lissotriton vulgaris*) are present in the vicinity of the site.

Reptiles

Excellent reptile habitat is present in the form of unimproved and semi-improved grassland, bracken, gorse scrub, heathland and bog across the site, particularly to the east on the hill grazings. The only reptile species that is likely to be present is the common lizard (*Zootoca vivipara*), though none were seen during the site surveys. Adder are expected to have been extirpated from the area.

Other Notable Fauna

Brown hare (*Lepus europaeus*) were recorded on four occasions across the site.

Notable bird species recorded during the vegetation surveys included a pair of peregrine (*Falco peregrinus*) flying northeast across the site on 12th July and an osprey (*Pandion haliaetus*) flying west over Threipmuir Reservoir on 21st July. Kestrel (*Falco tinnunculus*) were recorded on several occasions hunting over the east of the site while up to three curlew (*Numenius arquata*) were seen in the same area. Red grouse (*Lagopus lagopus*) droppings were found in wet heath towards the northern boundary.

The most important invertebrate species recorded on the site was the small pearl-bordered fritillary (*Boloria selene*) butterfly, with a very worn specimen recorded on 12th July at NT19245 65555 at the northeast of the site (**Photo 20**). This species is listed as a priority species for nature conservation on the Scottish Biodiversity List and UK Biodiversity Action Plan. Small pearl-bordered fritillary breed at low densities over extensive tracts of land, with larger numbers occurring in moist, sheltered areas where their foodplant, marsh violet grows. In the Pentland Hills, this butterfly is associated with rush pasture dominated by sharp-flowered rush. It is single brooded with adults typically flying from the end of May until early July, with a peak in numbers in June.

The presence of common rockrose on the site makes it possible that the northern brown argus butterfly (*Aricia artaxerxes*) is also present, although no butterflies or feeding signs of larvae were recorded during the surveys.

The small heath (*Coenonympha pamphilus*) butterfly, also a UKBAP priority species, is abundant on the site. This butterfly is very widely distributed across the UK, occurring in all counties apart from the Northern Isles. It has declined markedly in its range over the past 25 years, with monitored populations falling to about half the average size in the 1970's and 1980's, with many local extinctions.

Discussion and Recommendations

Habitats

The area of highest nature conservation value on and immediately adjacent to the site is associated with Black Springs arm of Threipmuir Reservoir which is designated as a Local Biodiversity Site (LBS). It is recommended that the steep south-facing slopes

above the reservoir which support a variety of semi-natural habitats (unimproved grassland, gorse scrub and bracken) remain unplanted up to the break in slope (**Annex 4**). If trees are to be planted in this area, then it will be important to avoid mechanical cultivation, fertiliser application and drainage to maintain the high water quality of the LBS. The dense areas of gorse scrub should be retained as they offer excellent nesting habitat for small passerine birds including linnet, long-tailed tit and yellowhammer, and it is also likely that badger sett(s) are also present.

The old Scots pine plantations along the northern boundary of the site at Harlaw Reservoir and Whiteside Plantations which are listed as long-established woodland of plantation origin in the Ancient Woodland Inventory would be enhanced by additional planting of Scots pine and native broadleaved trees in adjacent areas.

The moderately sensitive GWDTE associated with marshy grassland and wet heath areas (NVC M15 wet heath, M23 rush pasture and M25 mire) (**Annex 5**) should be taken account of in forest design, particularly in the micro siting of infrastructure and methods of ground preparation, but their existence should not preclude tree planting, particularly where broadleaved trees are proposed (Forestry Commission Scotland, 2018).

Where botanically poor GWDTE associated with failed drainage or overgrazing occur (MG9 and MG10 marshy grassland) these can be planted, although if they lie adjacent to habitats of nature conservation value, restoration should be considered (Forestry Commission Scotland, 2018).

Areas of unimproved neutral grassland containing common rockrose, and basic flushed grassland on the steep southwest facing slopes of Bell's Hill at the east of the site should remain unplanted. [redacted]

Opportunities exist to maximise the value of the forest design for sun-loving invertebrates through sensitive ride design. The topography of the site means that broadly north-east to south-west orientated rides will receive plenty of sun. To maximise the benefits for invertebrates, ride width should be one and a half to two times the height of the surrounding trees. Care should be taken to avoid a wind tunnel effect in design by avoiding straight lines and instead incorporating doglegs and curves into the ride layout as well as scalloped edges (Clarke et al., 2011). Reptiles such as common lizard (*Zootoca vivipara*) would also benefit from these design prescriptions.

Species

Badger

Badgers and their setts are comprehensively protected by the Protection of Badgers Act 1992, (as amended by the Nature Conservation (Scotland) Act 2004).

It is an offence to:

- wilfully kill, injure, take or attempt to kill a badger;

- to interfere with a badger sett by intentionally or recklessly causing or allowing:
- damage to a sett or any part of it;
- destruction of it;
- sett access to be obstructed, or any entrance of it; or
- disturbance to a badger when it is occupying it.

A badger sett is defined in law as any structure or place which displays signs of current use by a badger. Although there is some debate as to what constitutes current use, any activity at a sett within the previous 12 months is a generally accepted definition.

A protection zone must be set up around the sett [redacted] The protection zone must be clearly marked out on site and must extend at least 20 metres from each sett entrance. No vehicular access, including harvesting machines, should be permitted within a protection zone.

It may be possible to undertake low density planting of broad-leaved trees within 20 m of sett entrances, but this would need to be undertaken under a NatureScot Licence between 1st July and 30th November.

The distance from the site boundary of the second sett [redacted] should be confirmed. If it is more than 20 m from the site boundary, then no further action is required. If any sett entrances are less than 20 m from the site boundary then it will be necessary to set up a protection zone where no access should be permitted.

Bats

All British bat species and their roosts are protected under the following legislation and guidance:

- Bern Convention (with the exception of common pipistrelle) 1979 (Appendix II);
- Bonn Convention 1979;
- Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (Schedule 2 - which requires that they are given full legal protection);
- EUROBATS 1994;
- Habitats Directive 1992 (Annex IV); and
- NCSA 2004.

The European Union's Council Directive on the Conservation of Natural Habitats and Wild Flora and Fauna (92/43/EEC) (the Habitats Directive) was implemented by the Conservation (Natural Habitats &c.) Regulations 1994 (the Habitats Regulations), conferring strong legal protection to all bats and their roosts. There is no change to the protection of European protected species as a result of EU Exit.

Amendments to the Habitats Regulations (Amendment No. 2 (Scotland) Regulations 2007 – S.I. 2007/80) strengthened the legal protection and effectively removed bats from the provisions of the Wildlife and Countryside Act 1981 (WCA) and the Nature Conservation (Scotland) Act 2004 (as amended) (NCSA). Protection therefore rests with the amended Habitats Regulations, removing many of the defences previously available under the WCA.

Under the above legislation it is an offence to deliberately or recklessly:

- capture, injure or kill a bat;
- disturb bats;
- obstruct access to a bat roost;
- damage or destroy a roosting place (even if bats are not occupying the roost at the time); or
- possess or advertise, sell or exchange a live or dead bat or part of a bat.

Derogations under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) in respect to the destruction and disturbance of bat roosts can only be undertaken under licence through consultation with NatureScot (the licensing authority).

Providing that the buildings at Craigentarrie and Threipland that have been identified as having bat roost potential are retained, there is no further requirement for any additional survey work to inform the design of the Scheme.

Otter

Otter are known to visit the Harlaw and Threipland Reservoirs [redacted] Both reservoirs are stocked with fish meaning that a year-round food supply will be available, which will be boosted seasonally by breeding amphibians. [redacted] The presence of otter resting sites, including natal holts, in this dense gorse scrub cannot be ruled out. If any scrub removal is to be carried out, it is recommended that further survey is undertaken which should involve camera trapping to assess usage of well used mammal paths and holes.

Small pearl-bordered fritillary butterfly

Marshy grassland along the Kinleith Burn at the east of the site should remain unplanted, with sufficient buffers of at least 20m wide either side of the burn retained. This may allow the butterfly population to persist on the site.

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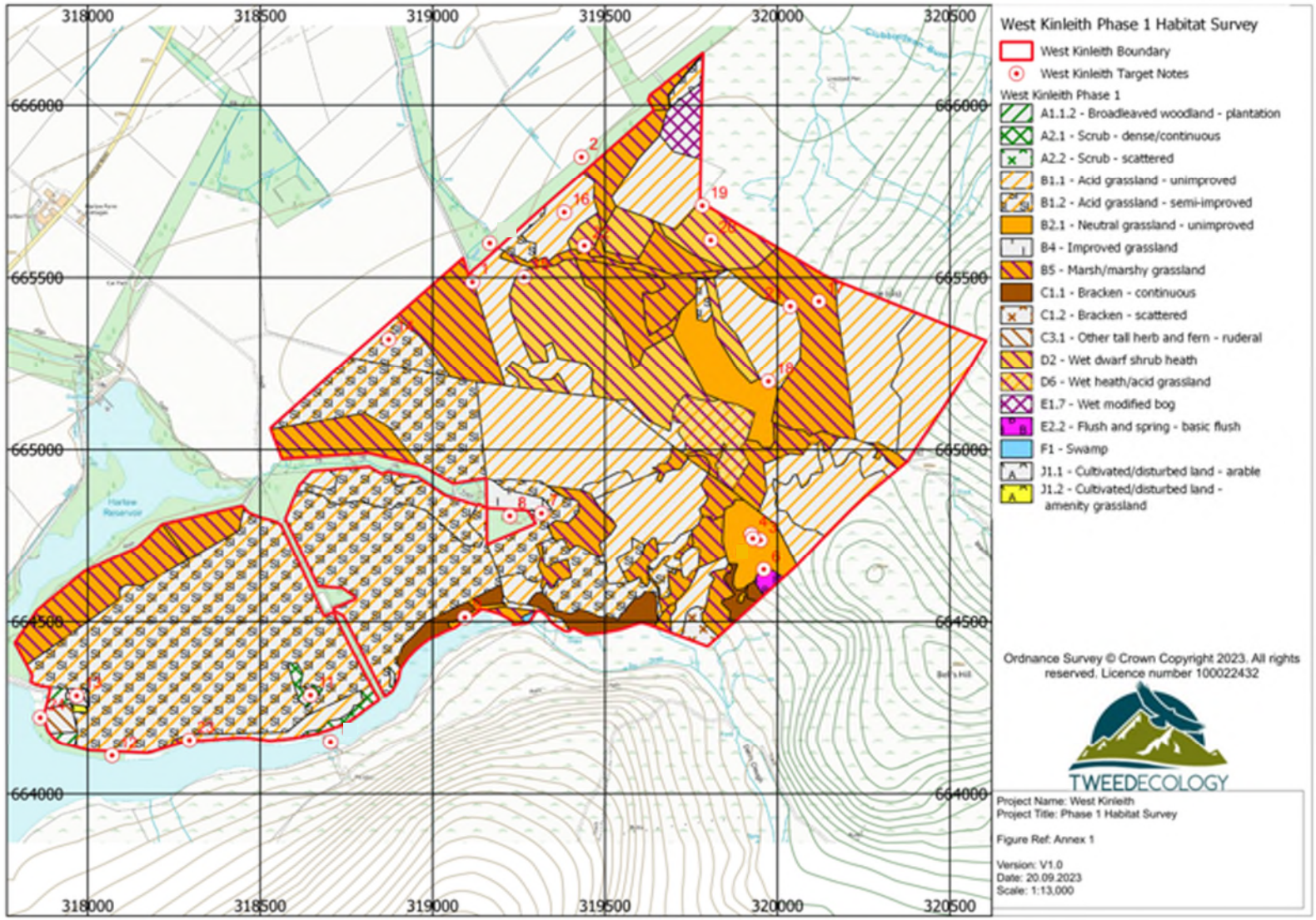
Annex 1 West Kinleith Phase 1 Habitat Survey



Annex 2 Target Notes

Reference	Grid reference	Target note
1	NT19113 65475	Acid flush with glaucous sedge, common yellow-sedge, common spotted orchid, lesser spearwort.
2	NT19434 65850	Mature Scots pine shelterbelt with rowan, holly, hawthorn, silver birch and goat willow occasional adding biodiversity.
3	NT19951 64738	Species-rich U4 grassland.
4	NT19924 64753	Small area of species-rich grassland (U1e) developed on thin soils associated with rock outcrop. Dominant species include early hair-grass, wild thyme, lady's bedstraw and sheep's sorrel.
[redacted]	[redacted]	[redacted]
6	NT19962 64648	Common rockrose, fairy flax and heath grass.
7	NT19317 64815	Craigentarrie Derelict property with no roof. Several walls remain offering low bat roost potential amongst masonry.
8	NT19222 64807	Mixed plantation with aspen. silver birch, alder, sycamore, rowan, Scots pine and Sitka spruce.
9	NT19093 64510	Very obvious mammal track leading out of bracken to boundary fence.
[redacted]	[redacted]	[redacted]
11	NT18648 64278	Fox earth. [redacted]
12	NT18070 64110	Semi-mature Scot's pine plantation.
13	NT17966 64285	Wooden buildings likely to offer high bat roost potential.
14	NT18871 65319	Small heath butterfly with white-barred gold moth (*Micropterix aruncella*).
15	NT19265 65501	Small pearl-bordered fritillary butterfly (very worn).
16	NT19381 65688	Brown hare.
17	NT20121 65431	Brown hare.
18	NT19974 65197	Brown hare.
19	NT19782 65708	Peregrine with prey flying in north-east direction whilst calling, with a second bird (juvenile?) diving to join it.
20	NT19806 65607	Red grouse droppings.
21	NT20037 65417	Curlew taking off from ground.
22	NT19441 65592	Lousewort - several plants growing in wet heath.
23	NT18294 64156	Brown hare.
24	NT17861 64221	Osprey flying west.
[redacted]	[redacted]	[redacted]

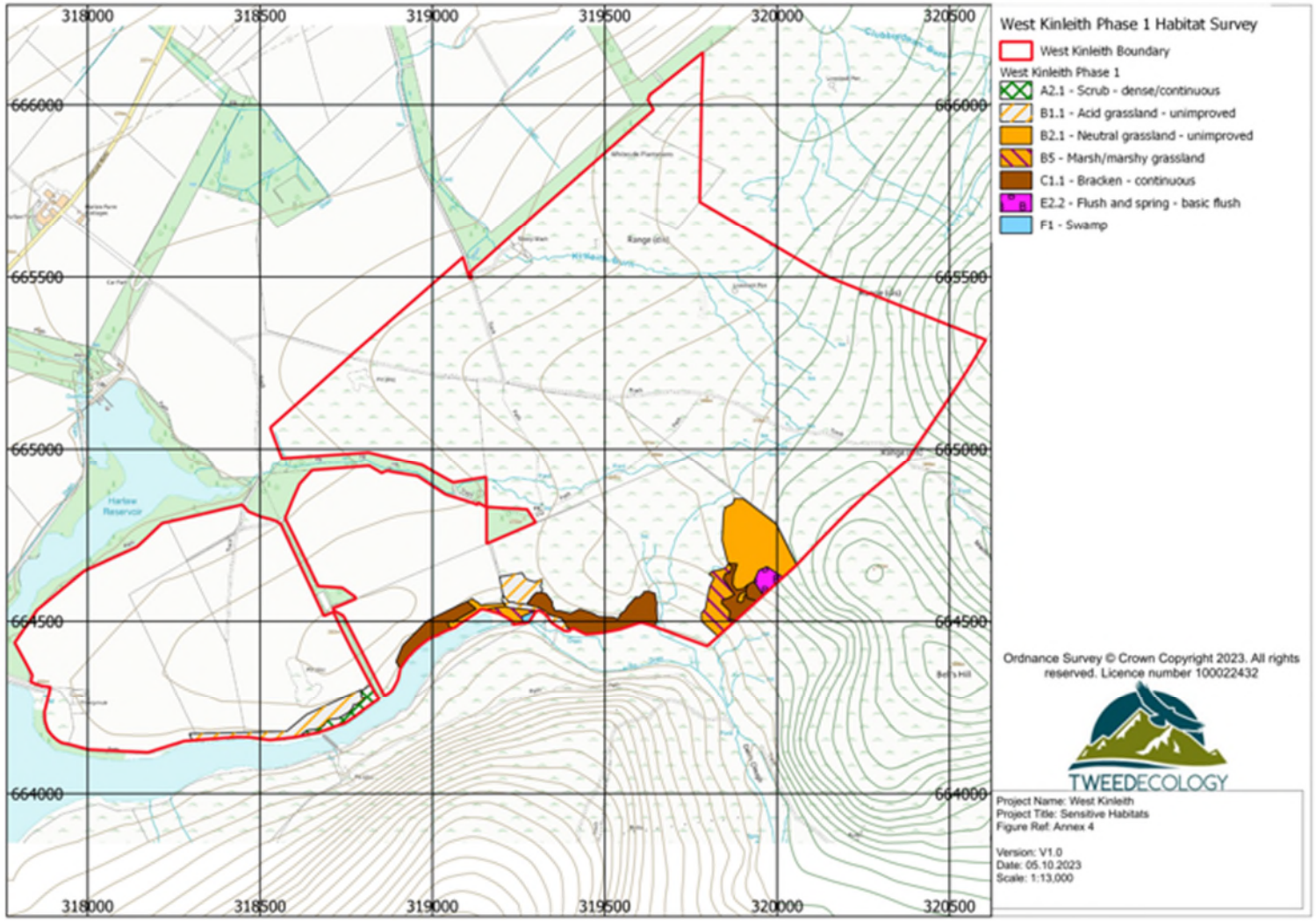
Annex 3 West Kinleith Plant Species List

Common name	***Scientific name***
Vascular plants	
Yarrow	*Achillea millefolium*
Sneezewort	*Achillea ptarmica*
Common bent	*Agrostis capillaris*
Creeping bent	*Agrostis stolonifera*
Early hair-grass	*Aira praecox*
Marsh foxtail	*Alopecurus geniculatus*
Wild angelica	*Angelica sylvestris*
Barren brome	*Anisantha sterilis*
Sweet vernal-grass	*Anthoxanthum odoratum*
False oat-grass	*Arrhenatherum elatius*
Quaking grass	*Briza media*
Heather	*Calluna vulgaris*
Marsh marigold	*Caltha palustris*
Harebell	*Campanula rotundifolia*
Shepherd's-purse	*Capsella bursa-pastoris*
Lady's smock	*Cardamine pratensis*
Common yellow-sedge	*Carex demissa*
Lesser tussock-sedge	*Carex diandra*
Star sedge	*Carex echinata*
Long-stalked yellow-sedge	*Carex lepidocarpa*
Oval sedge	*Carex leporina*
Common sedge	*Carex nigra*
Carnation sedge	*Carex panicea*
Pill sedge	*Carex pilulifera*
Flea sedge	*Carex pulicaris*
Common mouse-ear	*Cerastium fontanum*
Rosebay willowherb	*Chamerion angustifolium*
Creeping thistle	*Cirsium arvense*
Marsh thistle	*Cirsium palustre*
Spear thistle	*Cirsium vulgare*
Marsh cinquefoil	*Comarum palustre*
Pignut	*Conopodium majus*
Hawthorn	*Crataegus monogyna*
Crested dog's-tail	*Cynosurus cristatus*
Cock's-foot	*Dactylis glomerata*
Common spotted-orchid	*Dactylorhiza fuchsii*
Heath grass	*Danthonia decumbens*
Tufted hair-grass	*Deschampsia cespitosa*
Wavy hair-grass	*Deschampsia flexuosa*
Foxglove	*Digitalis purpurea*
Broad buckler-fern	*Dryopteris dilatata*
Male-fern	*Dryopteris filix-mas*
Crowberry	*Empetrum nigrum*

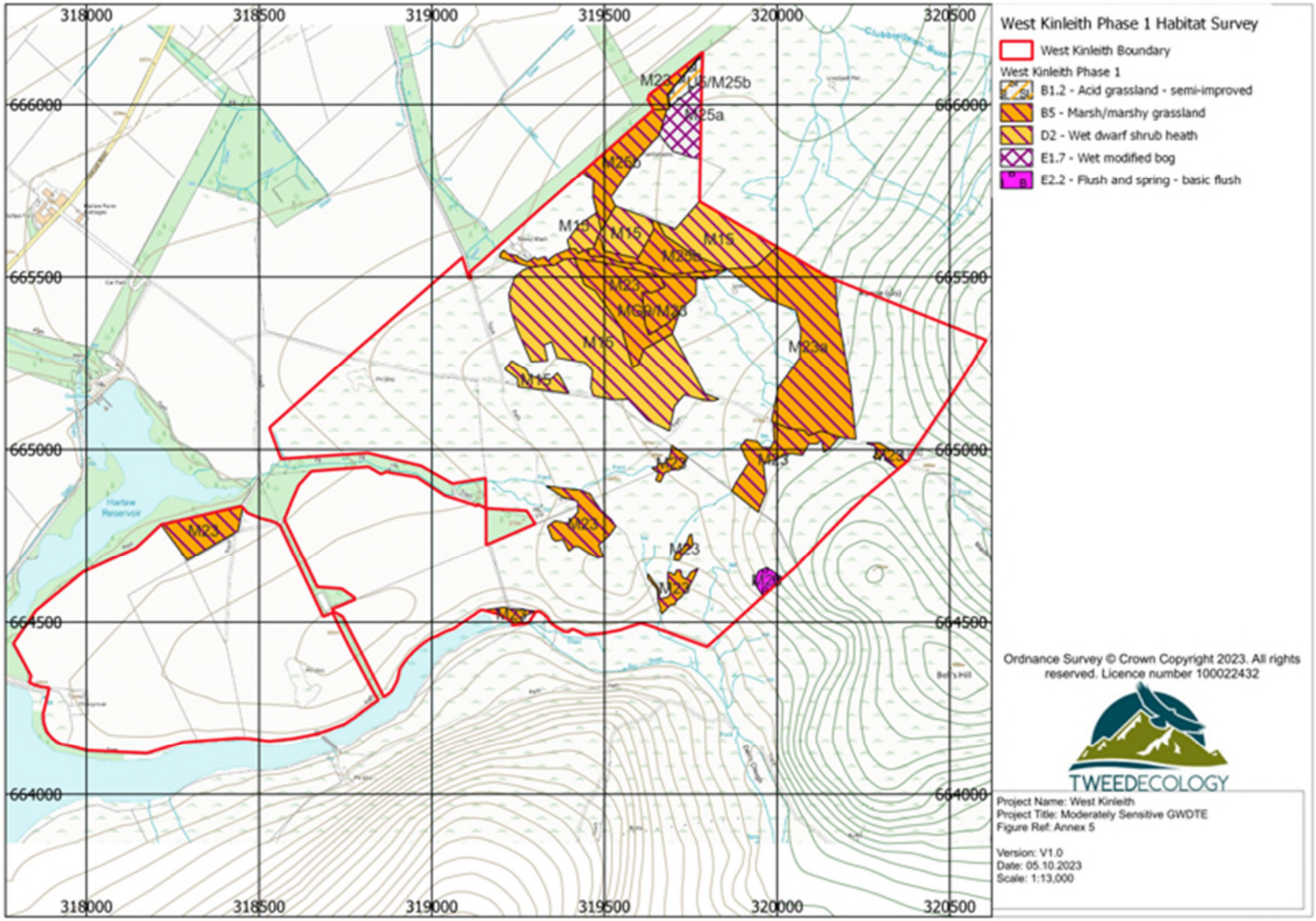
Common name	***Scientific name***
Marsh willowherb	*Epilobium palustre*
Field horsetail	*Equisetum arvense*
Water horsetail	*Equisetum fluviatile*
Marsh horsetail	*Equisetum palustre*
Bell heather	*Erica cinerea*
Cross-leaved heath	*Erica tetralix*
Hare's-tail cotton-grass	*Eriophorum vaginatum*
Eyebright	*Euphrasia officinalis agg.*
Sheep's fescue	*Festuca ovina*
Red fescue	*Festuca rubra*
Meadowsweet	*Filipendula ulmaria*
Cleavers	*Galium aparine*
Marsh bedstraw	*Galium palustre*
Heath bedstraw	*Galium saxatile*
Lady's bedstraw	*Galium verum*
Common rockrose	*Helianthemum nummularium*
Common hogweed	*Heracleum sphondylium*
Yorkshire-fog	*Holcus lanatus*
Marsh ragwort	*Jacobaea aquatica*
Common ragwort	*Jacobaea vulgaris*
Jointed rush	*Juncus articulatus*
Bulbous rush	*Juncus bulbosus*
Compact rush	*Juncus conglomeratus*
Soft rush	*Juncus effusus*
Hard rush	*Juncus inflexus*
Heath rush	*Juncus squarrosus*
Bitter vetch	*Lathyrus linifolius*
Meadow vetchling	*Lathyrus pratensis*
Fairy flax	*Linum catharticum*
Perennial rye-grass	*Lolium perenne*
Common bird's-foot trefoil	*Lotus corniculatus*
Greater bird's-foot trefoil	*Lotus pedunculatus*
Heath wood-rush	*Luzula multiflora*
Pineappleweed	*Matricaria discoidea*
Water mint	*Mentha aquatica*
Purple moor-grass	*Molinia caerulea*
Field forget-me-not	*Myosotis arvensis*
Creeping forget-me-not	*Myosotis secunda*
Mat grass	*Nardus stricta*
Lousewort	*Pedicularis sylvatica*
Reed canary-grass	*Phalaris arundinacea*
Smaller cat's-tail	*Phleum bertolonii*
Mouse-ear hawkweed	*Pilosella officinarum*
Scots pine	*Pinus sylvestris*
Ribwort plantain	*Plantago lanceolata*
Greater plantain	*Plantago major*

Common name	***Scientific name***
Annual meadow-grass	*Poa annua*
Spreading meadow-grass	*Poa humilis*
Smooth meadow-grass	*Poa pratensis*
Rough meadow-grass	*Poa trivialis*
Knotgrass	*Polygonum aviculare*
Bog pondweed	*Potamogeton polygonifolius*
Tormentil	*Potentilla erecta*
Creeping cinquefoil	*Potentilla repens*
Self-heal	*Prunella vulgaris*
Bracken	*Pteridium aquilinum*
Meadow buttercup	*Ranunculus acris*
Lesser spearwort	*Ranunculus flammula*
Creeping buttercup	*Ranunculus repens*
Yellow rattle	*Rhinanthus minor*
Dog rose	*Rosa canina*
Common sorrel	*Rumex acetosa*
Sheep’s sorrel	*Rumex acetosella*
Broad-leaved dock	*Rumex obtusifolius*
Grey willow	*Salix cinerea*
Elder	*Sambucus nigra*
Autumn hawkbit	*Scorzoneroides autumnalis*
Ragged-robin	*Silene flos-cuculi*
Prickly sowthistle	*Sonchus asper*
Rowan	*Sorbus aucuparia*
Lesser stitchwort	*Stellaria graminea*
Common chickweed	*Stellaria media*
Devil’s-bit scabious	*Succisa pratensis*
Wild thyme	*Thymus drucei*
Deer-grass	*Trichophorum germanicum*
White clover	*Trifolium repens*
Gorse	*Ulex europaeus*
Common nettle	*Urtica dioica*
Blaeberry	*Vaccinium myrtillus*
Germander speedwell	*Veronica chamaedrys*
Common field-speedwell	*Veronica persica*
Thyme-leaved speedwell	*Veronica serpyllifolia*
Tufted vetch	*Vicia cracca*
Mountain pansy	*Viola lutea*
Marsh violet	*Viola palustris*
Common dog-violet	*Viola riviniana*

Annex 4 West Kinleith Sensitive Habitats



Annex 5 West Kinleith Moderately Sensitive GWDTE



Annex 6 Photographs

Photo 1. Black Springs Local Biodiversity Site.

Photo 2. Whiteside Plantation – Scots pine long-established semi-natural woodland.

Photo 3. Neglected orchard and rose bushes at Threipmuir Farm.

Photo 4. Dense whin scrub at south of site above Black Springs LBS.

Photo 5. Typical U4 unimproved acid grassland with harebell.

Photo 6. Unimproved acid grassland (U6) high up on Harbour Hill at east of site.

Photo 7. Semi-improved acid grassland (Fe-Ho-An) at west of site.

Photo 8. Unimproved neutral grassland with common rockrose on Bell's Hill.

Photo 9. Unimproved neutral grassland with burnet saxifrage above Black Springs LBS.

Photo 10. Rush pasture (M23) dominated by jointed rush along headwaters of Kinleith Burn.

Photo 11. Marshy grassland (M25) dominated by purple moor-grass at east of site.

Photo 12. Dense bracken on steep slopes at southwest of site.

Photo 13. Wet dwarf shrub heath at east of site dominated by heather.

Photo 14. Wet modified bog at east of site.

Photo 15. Swamp with lesser tussock sedge at eastern end of Black Springs LBS.

Photo 17. Threipmuir Farm steading.

Photo 18. Craigentarrie derelict steading (**Target Note 7**).

Photo 20. Small pearl-bordered fritillary (**Target Note 15**).