

NORTH LOGIEALMOND: PROPOSED NEW WOODLAND PLANTING ECOLOGY SURVEYS

INTRODUCTION

SCOPE OF WORKS

Blairbeg Consulting Ltd have been commissioned to carry out a suite of ecological surveys in summer 2019 on behalf of Mark Hamilton Services Ltd for a proposed new woodland planting at North Logiealmond, near Trochry in Perthshire.

The objectives of the survey are as follows:

- To provide base-line information on the location, extent and floristics of the existing vegetation, and presence and status of protected species within the site as delineated by the extent of the proposed planting;
- To produce an annotated vegetation map using the Phase 1 classification to identify and map the habitats. This is supported by habitat descriptions and target notes;
- To provide details of sensitive habitat types – including Annex 1 listed habitats eg. peatlands, and groundwater dependent terrestrial ecosystems (GWDTEs) present within the proposed planting site;
- To provide information on the location of sensitive ornithological interest within the proposed planting site;
- To evaluate the status and nature conservation value of all sensitive ecological receptors and identify potential impacts resulting from new woodland proposal; and
- Recommend measures to mitigate any potential impacts of significance.

SITE CHARACTERISTICS

The site is located on the north side of Strath Braan, at central grid reference NN953373, and covers approximately 520ha of upland hill ground. The site extends from around Dullator burn in the west, to Corrody burn in the east, and takes in the summit of Rose Craig to the south.

The site rises from 220 m above sea level in the north to a high point of 468 m, the hill of Rose Craig, at the southern edge. Much of the central and northern areas of the site consist of moderately sloping ground, with steeper slopes on the eastern flanks of Rose Craig. The lower areas of ground to the north of site comprise abandoned, or lightly-utilised, field systems with the higher moorland areas being subject to programmes of heather burning for sporting (grouse-shooting) land-use.

TERRESTRIAL ECOLOGY SURVEYS

METHODOLOGY

BACKGROUND SURVEY

Baseline data on the nature conservation interest of the site and its surroundings, including information on protected species and habitats records were sought from the following sources:

- Joint Nature Conservation Committee (JNCC) website (<http://www.jncc.gov.uk/>);

- SNH Site Link website (<http://gateway.snh.gov.uk/>);
- The National Biodiversity Atlas website (<http://nbnatlas.org/>) (NBN Gateway); and
- Large-scale 1:10,000 Ordnance Survey (OS) maps in conjunction with colour 1:25,000 OS map (to determine the presence of ponds and other features of nature conservation interest).

Further information relevant to evaluation of the nature conservation features that could be affected by the development and the assessment of its effects upon them was obtained through searches of internet sources (e.g. UKBAPs, LBAPs) and the relevant published literature (i.e. relevant guidance documents and scientific papers).

PROTECTED SPECIES SURVEY

MAMMALS

Protected species surveys were undertaken in summer 2018, and followed the methodologies described below. An evaluation of the mammal species present on this site is provided in the results below.

OTTER

Otter field signs that were searched for, as described in Bang & Dahlstrøm (2001) and Sargent & Morris (2003), and include:

- Holts – these are underground features where otters live. They can be tunnels within bank sides, underneath root plates or boulder piles, and even man-made structures such as disused drains. Holts are used by otters to rest up during the day, and are the usual site of natal or breeding sites. Otters may use holts permanently or temporarily;
- Couches – these are above ground resting-up sites. They may be partially sheltered, or fully exposed. Couches may be regularly used, especially in reed beds and on in-stream islands. They have been known to be used as natal and breeding sites. Couches can be very difficult to identify, and may consist of an area of flattened grass or earth. Where rocks or rock armour are used as couches, these can be almost impossible to identify without observing the otter in situ;
- Prints – otters have characteristic footprints that can be found in soft ground and muddy areas;
- Spraints – otter faeces are often used to mark territories, usually deposited on in-stream boulders. They can be present within or outside the entrances of holts and couches. Spraints have a characteristic smell and often contain fish remains;
- Feeding signs – the remains of prey items may be found at preferred feeding stations. Remains of fish, crabs or skinned amphibians can indicate the presence of otter;
- Paths – these are terrestrial routes that otters take when moving between resting-up sites and watercourses, or during high flow conditions when they will travel along bank sides in preference to swimming; and
- Slides and play areas – slides are typically worn areas on steep slopes where otters slide on their bellies, often found between holts/couches and watercourses. Play areas are used by juvenile otters in play, and are often evident by trampled vegetation and the presence of slides. These are often positioned in sheltered areas adjacent to the natal holt.

Any of the above signs are diagnostic evidence of the presence of otter; however, it is often not possible to identify couches with confidence unless other field signs are also present. Spraint is the most reliable identifiable evidence of the presence of this species.

Any evidence of otter presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS.

SCOTTISH WILDCAT

Field signs of wildcat are described in Davis & Gray (2010) and SNH (2011). Field evidence searched for includes:

- Dens – can be found in hollow trees, rock crevices, rabbit burrows, disused fox dens and badger setts and under fallen debris;
- Prints – are distinctive cat prints, with no claw marks visible and a small palm pad with two indentations at rear;
- Scat – is usually cylindrical with a tapered end and contains feathers, fur and bone;
- Scratching posts on trees and fence posts; and
- Sightings.

Any of the above can be taken as diagnostic evidence that the presence of cats in the area. However, further surveys are required in order to identify if the cats present are wildcat or are a hybridisation with domestic cats i.e. feral cats.

If signs were found then further field survey methods would be required in order to establish if a den is present and if it is active. This can take several days/weeks depending upon the potential numbers of cats and habitat suitability. In areas where there are signs of wildcats camera traps can be used to try and verify presence and also to prove if a wildcat/hybrid or feral cat is present based on pelage characters. This would be the third step in the survey process if required (following the initial site assessment).

The key criteria for identifying Scottish wildcat are complex due to their ability to interbreed with domestic and feral cats. Scottish wildcat features and recognition are summarised in research by Kitchener *et al.*, 2005 with clear methods for identification based on pelage (coat characteristics) from the study of dead cats. However with live cats in the field this is more problematic due to the difficulty in observing cats. In addition it is believed from field research that true wildcats are now very rare in the field with very low populations in many areas with much larger feral populations now present. Detailed field research is still required to accurately determine wildcat densities in many areas.

Any evidence of Scottish wildcat presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS.

BADGER

Badger field signs that were searched for, as described in Neal & Cheeseman (1996), Bang & Dahlstrøm (2001) and SNH (2002), included:

- Setts – are places of shelter often located in woodland, at woodland edges, in hedgerows or amongst dense patches of gorse and scrub close to fields;
- Prints – tracks lead from setts to latrines and foraging areas and prints are identifiable from broad palm-pad and five toe pads with claw marks in a row;
- Latrines (and dung pits used as territorial markers) – are where badgers deposit faeces in small excavated pits, and are often located at territory edges or close to a main sett;
- Hairs – are often left in barbed wire or fencing as badgers pass through or underneath and are distinctive for their oval shape when rolled between finger and thumb; and

- Feeding signs (snuffle holes) - where badgers have dug up roots, grubs, or wasps nests and can be found throughout their territory.

Any of the above signs can be taken as diagnostic evidence of the presence of badger. Any evidence of badger presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS and photographs taken to visually catalogue the record.

WATER VOLE

The methodology prescribed in Dean *et al.* (2016) was followed in order to search for field signs of water vole. The field signs searched for included:

- Faeces – recognisable by their size, shape, and content. If not too dried-out these are also distinguishable from rat droppings by their smell;
- Latrines – faeces, often deposited at discrete locations known as latrines;
- Feeding stations – food items are often brought to feeding stations along pathways and hauled onto platforms. Recognisable as neat piles of chewed vegetation up to 10cm long;
- Burrows – appear as a series of holes along the water’s edge distinguishable from rat burrows by size and position;
- Lawns – may appear as grazed areas around land holes;
- Nests – where the water table is high. Above ground woven nests may be found;
- Footprints – tracks may occur at the water’s edge and lead into bank side vegetation. May be distinguishable from rat footprints by size; and
- Runways in vegetation – low tunnels pushed through vegetation near the water’s edge, less obvious than rat runs.

Any of the above signs can be taken as diagnostic evidence of the presence of water vole. Any evidence of water vole presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS.

RED SQUIRREL

Through areas of woodland any sightings of red squirrel, signs of feeding and evidence of active dreys were recorded:

- Dreys – are comprised of an outer shell of twigs and branches, with an inner layer of mosses, leaves, grass and conifer needles. Dreys are usually built close to the main stem of a tree;
- Feeding signs – can be stripped and nibbled conifer cones, split hazelnuts, nibbled fungus and berries.

Any evidence of red squirrel presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS.

PINE MARTEN

The field signs searched for included:

- Scats – These are typically dark in colour and 4-12cm long x 0.8-1.8cm in diameter. They often have a coiled twisted appearance, typical of many mustelid scats. Scats will often contain food remains including fur, feathers, bone, plant content and seeds. Scats vary tremendously in size, shape and colour, and it’s difficult even for experts to identify some pine marten scats. Scats are placed in latrines at well-used dens (e.g. on lids of den boxes), as well as at sites elsewhere in an individual’s

home range, where they probably fulfil a social communication role. Given the difficulty in confirming pine marten scat, any suspected scat will be sent for genetic analysis to conclusively distinguish it from other species.

- Footprints – The five-toed but slightly cat-like forefoot imprints measure approximately 40 x 45mm for females and 55 x 65mm for males; fur on the underside of feet in winter may blur prints and make them look larger, especially in soft snow, but pine martens have less fur on their feet pads than stone martens (present in continental Europe). Indistinct trails of bounding martens (stride length 60-100cm) may resemble those of hares, with prints in groups of two or three where one or both hind feet have registered over prints of forefeet.
- Den sites – Dens are usually not distinctive unless revealed by visible concentration of scats. Elevated den sites are preferred to keep martens safe from predators and provide insulation and shelter from the elements, and so hollow trees, owl boxes and the roofs of dwelling houses are often used, as well as purpose-built pine marten den boxes. Where such elevated dens are absent, they may den on the ground in rabbit burrows, rocky outcrops or under tree roof plates.

Any evidence of pine marten presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS.

HABITAT SURVEY

The vegetation was described and mapped following the methods described in National Vegetation Classification user's handbook (Rodwell, 2006) and the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 Habitat Surveys (JNCC, 2010). Plant species were identified and habitat types assigned and mapped in the field. Mapping polygons were delineated based on the composition of habitats. Full data for each polygon is provided in Appendix 2: NVC data. Polygons were laterally assigned a Phase 1 Habitat Classification, according to the relationships described in Phase One Habitat Classification (JNCC 2010). For the purposes of creating a visual representation of habitat types, the dominant Phase One Habitat Classification for each polygon is reflected. Phase 1 habitat maps were digitised using the ArcView 10.1 GIS package, with figures provided in Appendix 1: Figures.

More widely, target notes were also collected to provide an overview of the habitat types present, features of interest and to place the proposed development in the context of site. All target notes are accompanied by at least one photograph and provided in Appendix 3: Target notes.

Nomenclature for vascular plants follows Stace (2010), bryophytes and liverworts follow Atherton et al (2010) and for lichens Dobson (2011). A full species list for higher and lower plants identified within the site is provided in Appendix 4: Species List.

BASELINE CONDITIONS

PROTECTED SPECIES

DESK STUDY

Through the course of desk studies, no recent records (in past 25 years) were identified for any protected species within the site boundary.

FIELD SURVEY

No signs or shelters of protected species were recorded during field surveys.

HABITAT

Results from habitat surveys are mapped on Figures 1 and 2a-c, Appendix 1. NVC results are provided in Appendix 2: NVC data. Polygons are labelled on Figures 2a-c with a field identification number (FID) for cross-reference with data held in Appendix 2. Target notes are provided in Appendix 3, and locations displayed on Figure 5, Appendix 1. A species list is provided in Appendix 4.

The majority of the site consists of a mixture of dry and wet dwarf shrub heaths, varying with groundwater movement and substrate dryness. H12 *Calluna vulgaris-Vaccinium myrtillus* dry heath and H10 *Calluna vulgaris-Erica cinerea* dry heath form the bulk of these habitats. Many heath stands also form mosaics with acid or calcareous grassland communities. Large areas of these dwarf shrub heaths, particularly in the centre-west of the site, have been burnt for grouse moor management purposes, with consequent impacts on the habitat state and NVC classifications.

Flatter ground in the north of the site is dominated by grassland communities, which are generally neutral in characteristics and where on damper soils form stands of rush-dominated marsh and marshy grassland. Drainage of grassland habitats for agricultural purposes is evident, but many drains are obsolete and choked with vegetation. Mosaics of grassland communities are frequent, with neutral, acid and marshy grassland habitats forming indistinct mosaics and often transitional as soil type, depth and moisture content varies across slopes. Acidic and calcareous grassland communities are more prevalent on higher slopes, with the latter confined to small outcrops and knolls on Rose Craig.

Mire communities are rare, but present on the summit of Rose Craig and around The Speiran, a small but prominent knoll in the centre of the site. Flushes are typically acidic in nature, and often transitional to marshy grassland communities. They are almost always dominated by rushes, and are generally species poor. Bracken (*Pteridium aquilinum*) stands are present in the east of the site and are occasionally extensive, but generally in mosaic with dry heath communities. Other habitat types recorded were fragmentary in nature.

COMMUNITY SUMMARY TABLE

Habitat type	Status*	Groundwater dependency**
Broadleaved woodland (A1)		
W11 <i>Quercus petraea-Betula pubescens-Dicranum majus</i> woodland	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in Britain and Ireland; Upland oakwood	Low
Acid grassland (B1)		
U4 <i>Festuca ovina-Agrostis capillaris-Galium saxatile</i> grassland		Low
U4a <i>Festuca ovina-Agrostis capillaris-Galium saxatile</i> grassland, Typical sub-community		Low
U4b <i>Festuca ovina-Agrostis capillaris-Galium saxatile</i> grassland, <i>Holcus lanatus-Trifolium repens</i> sub-community		Low
U5 <i>Nardus stricta-Galium saxatile</i> grassland		Low
U6 <i>Juncus squarrosus-Festuca ovina</i> grassland		Moderate
Neutral grassland (B2)		
MG9 <i>Holcus lanatus-Deschampsia cespitosa</i> grassland		Moderate
MG10 <i>Holcus lanatus-Juncus effusus</i> rush-pasture		Moderate
Calcareous grassland (B3)		
CG10 <i>Festuca ovina-Agrostis capillaris-Thymus polytrichus</i> grassland	Species-rich <i>Nardus</i> grassland, on siliceous substrates in mountain	Low-Moderate

Habitat type	Status*	Groundwater dependency**
	areas; Upland calcareous grassland	
CG10a <i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Thymus polytrichus</i> grassland, <i>Trifolium repens</i> - <i>Luzula campestris</i> sub-community	Species-rich <i>Nardus</i> grassland, on siliceous substrates in mountain areas; Upland calcareous grassland	Low-Moderate
Marsh/marshy grassland (B5)		
MG9 <i>Holcus lanatus</i> - <i>Deschampsia cespitosa</i> grassland		Moderate
MG10 <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush-pasture		Moderate
M23b <i>Juncus effusus</i> / <i>acutiflorus</i> - <i>Galium palustre</i> rush-pasture, <i>Juncus effusus</i> sub-community	Upland flushes, fens and swamps	High
Tall herb and fern communities (C1 and C3)		
U20c <i>Pteridium aquilinum</i> - <i>Galium saxatile</i> community, Species-poor sub-community		Low
Dry heath (D1)		
H9 <i>Calluna vulgaris</i> - <i>Deschampsia flexuosa</i> heath	European dry heaths; Upland heathland	Low
H10 <i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath	European dry heaths; Upland heathland	Low
H10a <i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath, Typical sub-community	European dry heaths; Upland heathland	Low
H12 <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath	European dry heaths; Upland heathland	Low
H12a <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath, <i>Calluna vulgaris</i> sub-community	European dry heaths; Upland heathland	Low
H21 <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> - <i>Sphagnum capillifolium</i> heath	European dry heaths; Upland heathland	Low
Blanket bog (E1.6.1)		
M1 <i>Sphagnum denticulatum</i> bog pool community	Blanket bog; Blanket bog	Peatland
M2 <i>Sphagnum cuspidatum</i> / <i>fallax</i> bog pool community	Blanket bog; Blanket bog	Peatland
M3 <i>Eriophorum angustifolium</i> bog pool community	Blanket bog; Blanket bog	Peatland
M17 <i>Trichophorum germanicum</i> - <i>Eriophorum vaginatum</i> blanket mire	Blanket bog; Blanket bog	Peatland
M17a <i>Trichophorum germanicum</i> - <i>Eriophorum vaginatum</i> blanket mire, <i>Drosera rotundifolia</i> - <i>Sphagnum</i> species sub-community	Blanket bog; Blanket bog	Peatland
M19b <i>Calluna vulgaris</i> - <i>Eriophorum vaginatum</i> blanket mire, <i>Empetrum nigrum</i> ssp. <i>nigrum</i> sub-community	Blanket bog; Blanket bog	Peatland
Flushes (E2)		
M4 <i>Carex rostrata</i> - <i>Sphagnum fallax</i> mire	Upland flushes, fens and swamps	High
M6a <i>Carex echinata</i> - <i>Sphagnum fallax</i> / <i>denticulatum</i> mire, <i>Carex echinata</i> sub-community	Upland flushes, fens and swamps	High
M6c <i>Carex echinata</i> - <i>Sphagnum fallax</i> / <i>denticulatum</i> mire, <i>Juncus effusus</i> sub-community	Upland flushes, fens and swamps	High
M23b <i>Juncus effusus</i> / <i>acutiflorus</i> - <i>Galium palustre</i> rush-pasture, <i>Juncus effusus</i> sub-community	Upland flushes, fens and swamps	High
Other non-NVC habitats		
G1 Standing water		N/A
<p>*Status key Red text – Annex I habitat under EC Habitats Directive (as translated into UK legislation) Black text – Scottish Biodiversity List / UK Biodiversity Action Plan priority habitat **Groundwater dependency assessed based on: SEPA (2014) Land Use Planning System SEPA Guidance Note 31 – Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems</p>		

HABITAT AND COMMUNITY DESCRIPTIONS

WOODLAND AND SCRUB

Woodland communities are present as shelterbelt and small plantation coupes of coniferous woodland which lie within the north and western areas of the site. These are typically dominated by Scot's pine *Pinus sylvestris*, Sitka spruce *Picea sitchensis* and Larch *Larix spp.* Three coupes have been recently felled and are currently unplanted.

Semi-natural woodland is rare within the site and confined to the riverbanks along the Dullator Burn to the western boundary of the site. Here the canopy is dominated by Downy birch *Betula pubescens* and Alder *Alnus glutinosa* with occasional Aspen *Populus tremula*. The understorey is typically species-poor with abundant grasses Creeping soft-grass *Holcus mollis*, Wavy-hair grass *Deschampsia flexuosa*. The ferns Scaly male-fern *Dryopteris affinis agg.*, Broad buckler fern *Dryopteris dilatata* and Male fern *Dryopteris filix-mas* are scattered throughout broadleaved woodland areas.

Small isolated stands of willow scrub dominated by Grey willow *Salix cinerea* are present along the drainage ditch which runs parallel to the northern most track. These are typically comprised a few individual trees within neutral and marshy grassland communities. Rowan *Sorbus aucuparia* is also sparsely scattered in some heath areas.

Stands of Bracken *Pteridium aquilinum* dominate small areas of the banks of the Dullator Burn and Shochie Burn – and are generally species-poor stands of Bracken fronds overlying scattered Heath bedstraw *Galium saxatile*, Wood sorrel and Sweet vernal grass *Anthoxanthum odoratum*.

HEATHS AND MIRES

Dry dwarf shrub heath communities are dominant across much of the upper ground across the site, as well as occupying knolls and ridges on unimproved ground in the farmed landscape to the north and east of the site. The dry heath communities are almost entirely dominated by Heather *Calluna vulgaris* and Blaeberry *Vaccinium myrtillus*, and correspond to H12 *Calluna vulgaris-Vaccinium myrtillus* dry heath communities. In areas of steeper ground, banks and ridges there is increased abundance of Bell heather *Erica cinerea* and H10 *Calluna vulgaris – Erica cinerea* dry heaths but these are generally patchy and fragmented in amongst the more dominant H12 derived communities. On higher ground H18 *Vaccinium myrtillus-Deschampsia flexuosa* dry heaths exist on ground where prolonged snow-lie or higher grazing pressure has excluded Heather. All the dry heath communities are species-poor and typically comprised of the community constant species along with Wavy-hair grass *Deschampsia flexuosa*, Heath bedstraw *Galium saxatile*, Tormentil *Potentilla erecta* and pleurocarpous mosses *Pleurozium schreberi* and *Hylocomium splendens*. On damper substrates, for example on shaded or north-facing slopes or on flat ground next to rivers, the H21 *Calluna vulgaris-Vaccinium myrtillus-Sphagnum capillifolium* heath habitat was found. Stands usually consisted of well-developed Heather, Bell Heather, Bilberry and Cowberry with mounds of Red Bog-moss (*Sphagnum capillifolium ssp. rubellum*) underneath. Stands were assigned to the H21a *Calluna vulgaris-Pteridium aquilinum* sub-community (with Bracken absent). This habitat often formed mosaics with other dry heaths, particularly along river sides. Dry heaths are generally subject to programmes of muirburn and as such a mosaic of Heather *Calluna vulgaris* age structures exists across the site. There is little mature or degenerate heather, with most heathland being in pioneer and building phases. As such pioneer acid grassland communities dominated by Wavy-hair grass and Common bent *Agrostis capillaris* are often co-dominant or in fine-scale mosaics with dry heath communities.

Blanket bog communities are also relatively rare, but do occupy higher ground of Rose Craig as summit and shoulder mires, as well as the area of lochans around The Speiran. On Rose Craig these communities are dominated by Hare's-tail cotton grass *Eriophorum vaginatum* and Heather, reflecting an M19 *Calluna vulgaris-Eriophorum vaginatum* mire, with occasional Blaeberry and Cowberry *Empetrum nigrum*. Cowberry *Vaccinium vitis-idaea* and Cross-leaved heath are also scattered through the sward. These blanket bog communities are typically subject to muirburn as per Dry heath communities, and often have erosion features such as small

peat hags and gullies across their extent. They are also 'dry' in their nature with few *Sphagna* and the bryophyte layer is dominated by pleurocarpous mosses and Haircap moss *Polytrichum commune*. The area of blanket mire around the lochans associated with The Speiran, is wetter in nature, with more *Sphagna* forming extensive carpets and interspersed with sedges Common sedge *Carex nigra* and Bottle sedge *Carex rostrata*. There are also several small bog pools. Smaller areas of wet modified bog are present to the south-west of the site, reflecting stands of Hare's-tail Cottongrass *Eriophorum vaginatum* in mosaic with marshy grassland communities dominated by Soft rush *Juncus effusus*.

Acid flushes are scarce within the site and restricted to the upper reaches of burns at higher altitudes and within heath/mire areas. All acid flushes within the site are dominated by Soft rush *Juncus effusus* and Haircap moss. These flushes tend to transition to marshy grassland communities as they descend slopes, which become progressively richer in their flora.

GRASSLAND AND MONTANE COMMUNITIES

Acid grasslands are frequent within the site, and almost entirely dominated by U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* communities. These grasslands have a moderately rich sward with a sward of grass species Common bent, Red fescue *Festuca rubra*, Wavy-hair grass, Brown bent *Agrostis vinealis*, Sweet vernal grass *Anthoxanthum odoratum*, Yorkshire fog *Holcus lanatus* overlying Tormentil, Heath bedstraw and White clover *Trifolium repens*. These communities, as described above, are often in mosaic with dry heath communities as a result of burning and grazing regimes. Acid grasslands dominated by Mat-grass *Nardus stricta* and corresponding to U5 *Nardus stricta-Galium saxatile* grassland and those dominated by Heath rush *Juncus squarrosus* corresponding to U6 *Juncus squarrosus* grassland are present in small amounts and generally confined to higher altitude open grasslands. On lower slopes acid grasslands are also frequent and often transitional to neutral and/or marshy grassland communities which occupy richer and damper soils. These transitional communities are difficult to accurately distinguish in the field and generally have clumps of Tufted-hair grass *Deschampsia cespitosa*, Soft rush *Juncus effusus* interspersed, along with increased dominance of Yorkshire-fog, White clover and Meadow buttercup *Ranunculus acris*. True neutral grasslands are found in semi-improved and abandoned field systems to the north the site. Here, the grassland sward is dominated by Yorkshire-fog and Crested dog's-tail *Cynosurus cristatus* with carpets of White clover and Creeping buttercup *Ranunculus repens*. These communities are often ungrazed and choked with Soft rush *Juncus effusus* and Tufted hair-grass *Deschampsia cespitosa*. Differentiation from marshy grassland communities is difficult, and often there is a transitional or mosaic habitat type.

Calcaerous grasslands are restricted to small outcrops on higher ground. These are often heavily grazed, with a short sward of Thyme *Thymus polytrichus*, White clover *Trifolium repens*, Ribwort plantain *Plantago lanceolata*, Sheep's fescue *Festuca ovina* and scattered Dog violet *Viola riviniana*, Selfheal *Prunella vulgaris*, and Hairy lady's-mantle *Alchemilla filicaulis*.

Marshy grassland is abundant across the lower areas of the site, occupying the damper soils along burns and flushed slopes, and within abandoned field systems. The sward is dominated by *Juncus effusus*, *Deschampsia cespitosa* with frequent Marsh thistle *Cirsium palustre*, Marsh bedstraw *Galium palustre*, Marsh Willowherb *Epilobium palustre*, Sheep's sorrel *Rumex acetosa* and Creeping buttercup. These communities are often extensive mosaics of ungrazed MG9 *Deschampsia cespitosa* grassland and MG10 *Holcus lanatus-Juncus effusus* rush-pasture, interspersed with M23b *Juncus effusus-Galium palustre* rush-pasture *Juncus effusus* sub-community occupying wetter ground within or near flowing surface water. The M23 community is often slightly richer in flora than MG9 and MG10 grassland communities, with small amounts of mesotrophic forbs Water forget-me-not *Myosotis secunda*, Meadow buttercup *Ranunculus acris*, Lesser spearwort *Ranunculus flammula* and Greater bird's-foot trefoil *Lotus pedunculatus*.

OTHER COMMUNITIES

Waterbodies are rare within the site, but there are several small ponds associated with The Speiran. Waterbodies were not extensively surveyed, due to their obvious unsuitability for woodland creation, however it was noted that these small lochans were fringed by blanket bog communities with abundant carpets of *Sphagna*. Rivers and streams (burns) within the site are typical of upland areas, often fringed with Bracken, woodland and marshy grassland communities (see above).

METHODOLOGY

MOORLAND BREEDING BIRD SURVEY

The proposed new planting site consists of open moorland therefore the Brown and Shepherd method for use in assessing upland / moorland habitats was used to determine the breeding bird assemblage present at North Logiealmond. This survey methodology is described in detail in Brown and Shepherd (1993) and in Gilbert et al. (1998), and involved a surveyor walking a pre-determined route ensuring that all parts of the site were approached to within 100m, recording the location and behaviour of all birds encountered using standard BTO notation as defined in Bibby et al. (2000). The method, which is designed for recording waders, is commonly adapted to also record upland passerines. All registrations were mapped on 1:10,000 scale maps. Visits were made in daylight hours and acceptable weather conditions.

A three-visit version of the Brown and Shepherd method was carried out at North Logiealmond. The dates of the breeding bird surveys were as follows:

- Visit 1 – 30th April, 1st - 3rd May 2019;
- Visit 2 – 1st – 4th June 2019; and
- Visit 3 – 26th – 29th June 2019

BLACK GROUSE SURVEY

Two coordinated black grouse lek surveys were carried out on 2nd and 10th May 2019. The survey encompassed all suitable habitat for black grouse across the proposed planting area, buffered to a distance of 1.5 kilometres. Survey methods follow those described in Gilbert et al. 1998 and use a combination of walkover survey and a series of vantage point watches. The survey was carried out in calm conditions and from 1hour before until 2hours after sunrise.

BREEDING RAPTOR SURVEY

A modified breeding bird survey was undertaken on 15th May and 22nd June 2019 to identify areas of potential foraging and nesting habitat for breeding raptors within the proposed planting area. The survey comprised walkover and vantage point watches to ascertain the presence/absence of raptor species within the survey area. The survey was carried out in daylight hours and acceptable weather conditions.

BASELINE INFORMATION

MOORLAND BREEDING BIRD SURVEY

The survey recorded the species, as compiled in Table 1 below and displayed on Figure 1: Breeding Bird Territories.

Table 1: Numbers of each species recorded Visits 1 – 3.

Species	BTO Code	Visit 1	Visit 2	Visit 3
Black grouse	BK	0	1	0
Black-headed gull	BH	X	X	X
Buzzard	BZ	2	3	3
Canada goose	CG	1	0	1
Crossbill sp.	CR	0	0	1
Curlew	CU	9	13	10
Kestrel	K.	0	2	1
Lapwing	L.	2	1	1
Mistle thrush	M.	1	1	0
Mallard	MA	0	0	1
Meadow pipit	MP	78	76	87
Oystercatcher	OC	1	1	0
Peregrine	PE	1	0	2
Raven	RN	0	1	0
Skylark	S.	16	12	16
Stonechat	SC	1	0	1
Short-eared owl	SE	0	1	0
Snipe	SN	1	3	1
Teal	T.	1	0	1
Wheatear	W.	2	5	2
Whinchat	WC	2	2	3
Wigeon	WN	1	4	1
Wren	WR	3	0	5
Willow warbler	WW	1	0	0

X = Black-headed gull colony, exact count not undertaken but estimated at 200+ individuals

Table 2 displays the species of conservation concern recorded during the course of field surveys.

Table 2: Species of conservation concern recorded.

Species	BTO Code	Schedule 1	Annex I	Red	Amber	UKBAP
Black grouse	BK			✓		✓
Black-headed gull	BH				✓	
Crossbill sp.	CR			✓		
Curlew	CU			✓		✓
Kestrel	K.				✓	
Lapwing	L.			✓		
Mallard	MA				✓	
Meadow pipit	MP				✓	
Mistle thrush*	M.			✓		
Oystercatcher	OC				✓	
Peregrine#	PE	✓				
Skylark	S.			✓		✓
Snipe	SN				✓	
Whinchat	WC			✓		
Wigeon	WN				✓	
Teal	T.				✓	
Willow warbler	WW				✓	

*The Mistle thrush records are of overflying birds.

BLACK GROUSE SURVEY

The Black grouse survey recorded displaying males at a single locations within the proposed planting boundary, see Figure 5 (Confidential), Appendix 1. A total of five displaying males were recorded at the lek location.

RAPTOR SURVEY

A probable breeding attempt by Kestrel was recorded within the proposed planting boundary. The nest site was located in an existing coupe of coniferous plantation, dominated by Scot's pine, see Figure 5 (Confidential), Appendix 1.

Peregrine was regularly recorded during moorland breeding bird survey (3 registrations) and raptor survey visits (recorded on both visits sitting on rocks near The Speiran). In addition, pluck posts were identified (see Target Notes 12 and 13, Appendix 3) in the vicinity of The Speiran. Whilst no suitable breeding habitat is believed to be present within the proposed planting boundary, Peregrine are believed to use the site regularly for hunting, with the Black-headed gull colony at The Speiran a primary food source (fresh plucks of Black-headed gull were observed at both plucking posts). Wader and wildfowl species in this area likely also provide a prey source for Peregrine.

A single observation of a Short-eared owl was recorded during MBBS visits, to the south of the proposed planting boundary near the Allt Ceann Dalachan but no observations of breeding behaviour for this species were recorded during the course of raptor surveys.

LEGISLATIVE BACKGROUND

All wild birds, their nests and eggs are, with few exceptions, protected under the Wildlife and Countryside Act (WCA). Additional protection is provided to species listed under Annex I of the EC Birds Directive.

WILDLIFE AND COUNTRYSIDE ACT 1981

All wild birds in the UK are protected under the Wildlife and Countryside Act (WCA) 1981¹, as amended in Scotland by the Nature Conservation (Scotland) Act 2004². Under this Act, it is an offence to intentionally or recklessly:

- kill, injure or take any wild bird; or
- take, damage, or destroy or otherwise interfere with the nest of any wild bird while that nest is in use or being built; or
- obstruct or prevent any wild bird using its nest;
- take or destroy the egg of any wild bird;
- disturb any wild bird listed on Schedule 1 whilst it is building a nest or is in, on, or near a nest containing eggs or young, or whilst lekking;
- disturb the dependent young of any wild bird listed on Schedule 1; or
- harass any wild bird listed on Schedule 1A

In Scotland, under Schedule 1A of the WCA (as amended), it is an offence to intentionally or recklessly harass at any time any wild bird listed on Schedule 1A, i.e. white-tailed eagle (*Haliaeetus albricias*). Under Schedule A1 of the WCA (as amended), it is an offence to intentionally or recklessly damage, destroy or otherwise interfere with the nest when not in use of any of the above acts to be carried out.

For Schedule 1 and Schedule 1A bird species, a licence is required from SNH to carry out activities that may disturb birds while they are building a nest or are in, on or near a nest containing eggs or young, or cause disturbance of the dependent young (Hardy et al., 2013).

EC BIRDS DIRECTIVE

Bird species listed on Annex I of the Council Directive 2009/147/EC on the Conservation of Wild Birds (EC Birds Directive)³ are “the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution”.

Annex I species are protected from:

- Deliberate killing or capture by any method;
- Deliberate destruction of, or damage to, their nests and eggs or removal of their nests;
- Taking their eggs in the wild and keeping these eggs even if empty;
- Deliberate disturbance of these birds particularly during the period of breeding and rearing, in so far as disturbance would be significant having regard to the objectives of the Directive; and
- Keeping birds of species, the hunting and capture of which is prohibited.

¹ <http://www.legislation.gov.uk/ukpga/1981/69>

² <http://www.legislation.gov.uk/asp/2004/6/contents>

³ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32009L0147:EN:NOT>

UK BIRDS OF CONSERVATION CONCERN

A number of bird species considered to be of high nature conservation concern are listed in UK Biodiversity Action Plans (UKBAP), with additional species of local concern listed as Local Biodiversity Action Plan (LBAP) species.

The status of all British birds has been analysed by conservation agencies including the RSPB. On the basis of ongoing population trends, species are assigned to one of three lists of UK Conservation Concern (Eaton *et al.*, 2015). These are the red list, amber list and green list. Although the lists confer no legal status, they are useful in assessing the significance of impacts and appropriate levels of mitigation that may be required when birds are affected by development or other activity.

The red list comprises 67 species whose populations or range are rapidly declining, (recently or historically), and those of global conservation concern. Several common, but rapidly declining farmland birds are included on the red list, such as Skylark, Song Thrush and Tree Sparrow.

The amber list identifies 96 species that have undergone moderate declines in population and/or range. Birds on the green list are not considered threatened.

The status of a species in the lists of Birds of Conservation Concern (UK BoCC) bears little relationship to the statutory protection afforded it. However, inclusion on the red list is a factor in determining the species for which UK BAPs are developed.

TERRESTRIAL ECOLOGY

HABITATS

Suitability for planting has been assessed for each habitat polygon mapped, based on the sensitivity of component communities to disturbance, presence of sensitive species and the dependence of the plant communities on groundwater. Results are displayed on Figure 3, Appendix 1.

Areas dominated by flush and mire habitats are sensitive to disturbance and as such are not considered suitable for planting of trees.

RECOMMENDATIONS

To maximise the protection of sensitive habitats, and potential biodiversity benefits across the site, the best practice mitigation measures detailed below are proposed:

- Areas suitable for productive conifer are present across much of the site, however consideration of landscape and forestry factors has not been given in this assessment. It is considered that best practice measures for forest design including provision of connectivity between areas of open ground, variable density planting and feathering edges will result in benefits for biodiversity.
- Whilst much of the site is suitable for productive conifer, the percentage allocation for native woodland should be maximised and targeted around riparian areas, fringing of sensitive habitats and forest edges.
- Areas planted for productive conifer woodland should incorporate a diversity of species, with allowance for some areas of Scot's pine and Larch.
- Riparian areas should be carefully considered, and where possible elements of existing native woodland in these zones should be safeguarded and expanded/linked as far as is possible.
- Where habitats comprise a mosaic of heath and/or grassland communities with small areas of flush, marshy grassland and/or mire interspersed it is considered that there is scope for planting of some trees, placed carefully so as to avoid the sensitive elements within the habitat mosaic. It is likely, and preferable, that these areas are suitable for native broadleaved woodland dominated by Downy birch and Willow species.
- In areas dominated by marshy grassland (M25 *Molinia caerulea* mire), it is considered there is some scope for scattered or variable density planting of native broadleaved trees at low densities (<560 stems/ha), typically dominated by Willow species and other species suitable for wetter ground conditions.

PROTECTED SPECIES

No signs or sightings of protected species were recorded through the course of field surveys. As such, there is considered to be negligible impact of the proposed planting on protected species.

The establishment of woodland may provide long-term benefit to several protected species, including Pine marten, Red squirrel which will utilise wooded areas for foraging and shelter.

ORNITHOLOGY

No Schedule 1/Annex 1 species were recorded displaying breeding behaviour within the proposed new planting area through the course of ornithological field surveys. Peregrine was recorded regularly within the survey area, hunting and overflying, most regularly in the vicinity of The Speiran.

Seven red-listed species held breeding territory or territories within the site – Black grouse, Crossbill, Curlew, Lapwing, Mistle thrush, Skylark and Whinchat. In addition, nine amber-listed species – Black-headed gull, Kestrel, Mallard, Meadow pipit, Oystercatcher, Snipe, Teal, Wigeon and Willow warbler were recorded as holding breeding territories within the survey area.

Locations of sensitive bird species territories are mapped on Figure 5 (Confidential), Appendix 1.

BLACK GROUSE

Black grouse individuals were recorded displaying at a single location within the survey area. Individuals were also recorded incidentally during the course of MBBS surveys. Black grouse appear to hold territories, based around the lek site, to the east of the survey area.

Black grouse will feed, nest and lek in native woodland, which provides a mosaic of small scale habitats. Black grouse will also use young conifer plantations (before the tree canopy closes). Whether in a plantation or semi-natural woodland, trees can benefit black grouse, especially when the woodlands are young and tree density is not too high. Mature plantations can be homogenous and have minimal value for black grouse, leaving open ground, wide rides and leaving sparse tree cover at the forest edge to encourage ground vegetation can all help to create a plantation which is more suitable for black grouse.

Collisions with deer fences is a significant cause of black grouse mortality. Any new fencing required for the new planting scheme at North Logiealmond should be marked to reduce collisions by black grouse. Orange barrier netting has been proven to reduce collisions, though other methods are also used and now recommended (e.g. wooden droppers and full or half-height chestnut paling).

WADERS

Waders such as curlew and lapwing have large territories and require open grassland and moorland habitats. As the trees begin to mature, habitat availability for waders will reduce and there will be a permanent loss of habitat for waders such as curlew over the site. The current planting design incorporates open ground which will retain some important suitable habitats (flushes and mires) for waders.

OTHER SPECIES

Whilst all other species are considered of low conservation value, it is compulsory to comply with relevant wildlife legislation for all bird species, as described above.

Potential impacts resulting from the proposed new planting scheme include the following:

- Disturbance to, or destruction of birds' nests within the area during the planting; and
- Loss of foraging and nesting habitat for breeding bird species.

Direct mortality and disturbance to breeding birds during the planting of the scheme is considered to be low due to the works being planned to take place outwith the breeding bird season (mid-March to end of July inclusive).

RECOMMENDATIONS

To limit potential impacts on ornithological features across the site and maximise potential benefits to ornithological receptors within the site, the best practice mitigation measures detailed below are proposed.

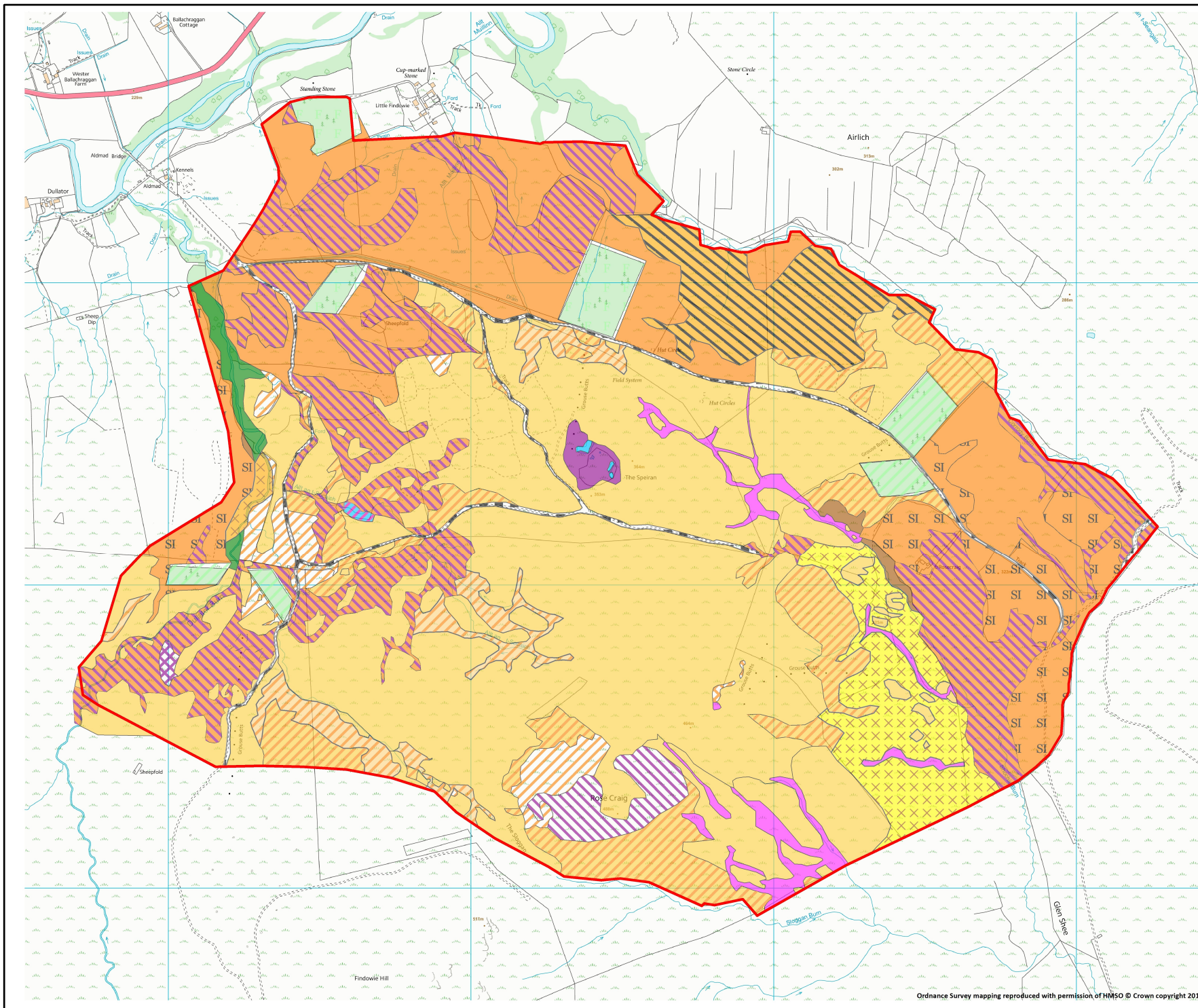
- Planting design will incorporate designed open ground and low-density native woodland within 200m of observed Black grouse lek sites. The lek site itself will be unplanted within 50m of the current lek location. Tree species planted in these areas will be limited to native species including Scot's pine, Downy birch, Willow species and Rowan. Connectivity of open ground and native woodland should be provided between the lek locations, and as a result 200m buffer zones may be modified in shape to provide best woodland design.
- Black grouse individuals (male and female) were observed to utilise the site and may be at risk of collision with new fencing. Fence-marking for black grouse should be incorporated into new fencing required to enclose the proposed planting site, as per recommendations in FC Technical Guidance Note 19 – Fence marking to reduce grouse collisions (2012).
- Current planting design incorporates open ground which will retain some important suitable habitat for waders (peatland, bog pools and flushes) as well as providing an important element of mosaic habitat, alongside new native woodland, for black grouse.
- Planting design will incorporate designed open ground and low-density/fragmented woodland areas near The Speiran to retain suitability for breeding wildfowl, waders and gulls, as well as the suitability for hunting Peregrine.
- Works (e.g. mounding) should be timed to take place outwith the bird breeding season (late March to the end of July inclusive) to avoid disturbance or potential destruction of wild birds' nests.

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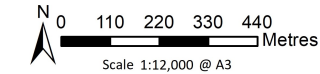
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Figure 1



- Key**
- Proposal Boundary
 - Phase 1 Habitat**
 - Access track
 - Acid grassland - unimproved
 - Acid grassland/Bracken mosaic
 - Acid/marshy grassland
 - Blanket bog
 - Bracken - continuous
 - Broadleaved woodland - semi-natural
 - Calcareous grassland - unimproved
 - Coniferous woodland - plantation
 - Coniferous woodland - recently-felled plantation
 - Dry dwarf shrub heath - acid
 - Dry heath/acid grassland mosaic
 - Dry modified bog
 - Flush and spring - acid flush
 - Heath/Bracken mosaic
 - Marsh/marshy grassland
 - Neutral grassland - semi-improved
 - Neutral grassland - unimproved
 - Neutral/marshy grassland
 - Standing water
 - Standing water/Acid flush
 - Wet modified bog



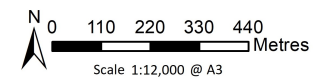
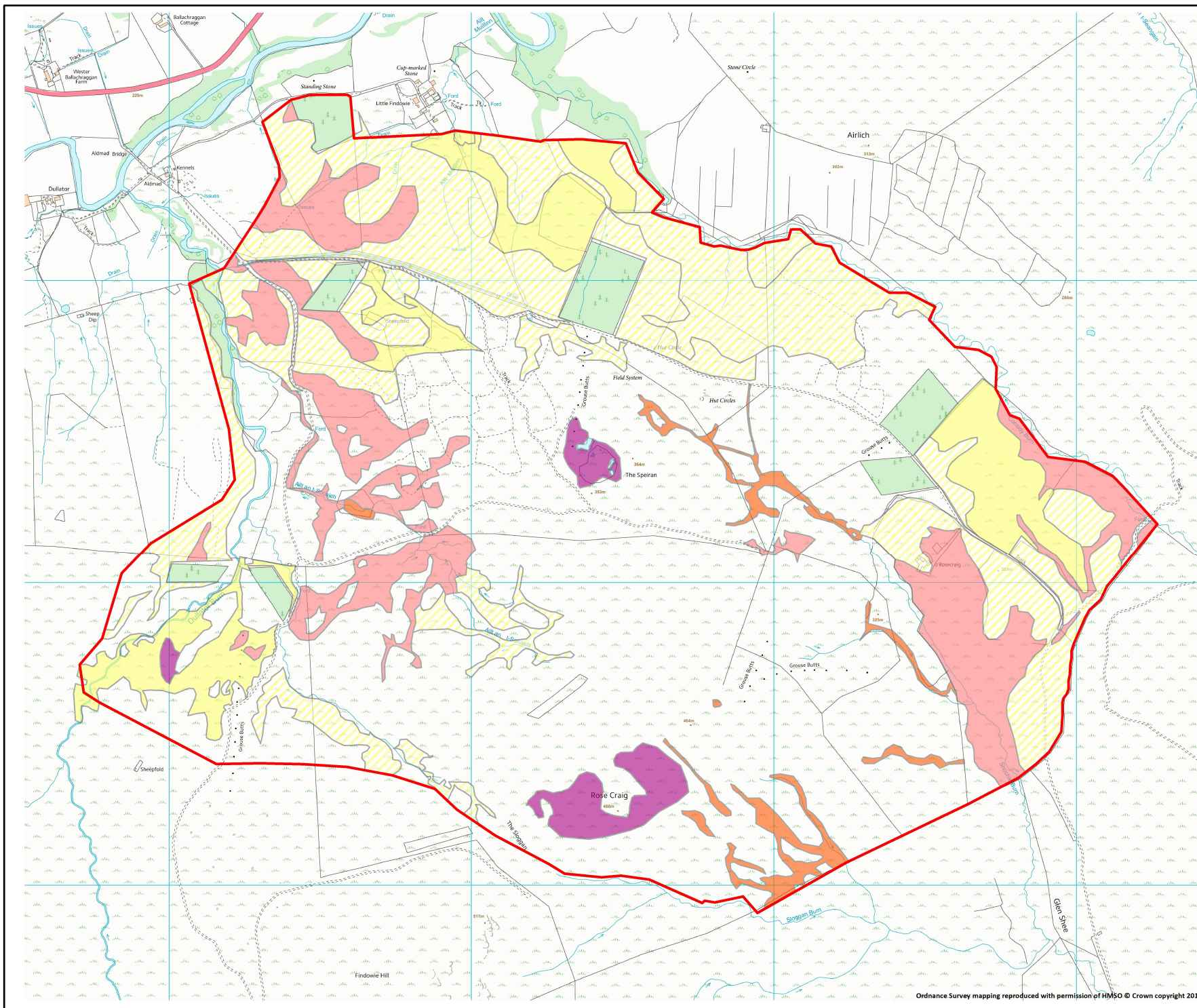
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Title Habitat Survey				
Drwg No.	Date	Rev.	Drwn.	App'd
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Blairbeg Consulting Ltd				

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Figure 2

Key

- Proposal Boundary
- GWDE Category**
- High
- Moderate-High
- Moderate
- Low-Moderate
- Peatland



Client

Project **North Logiealmond
New Woodland Proposal**

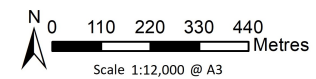
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Figure 3

- Key**
- Proposal Boundary
 - Planting Suitability**
 - Suitable
 - Mostly suitable
 - Limited
 - Very limited
 - No



Client

Project **North Logiealmond
New Woodland Proposal**

Title **Planting Suitability**

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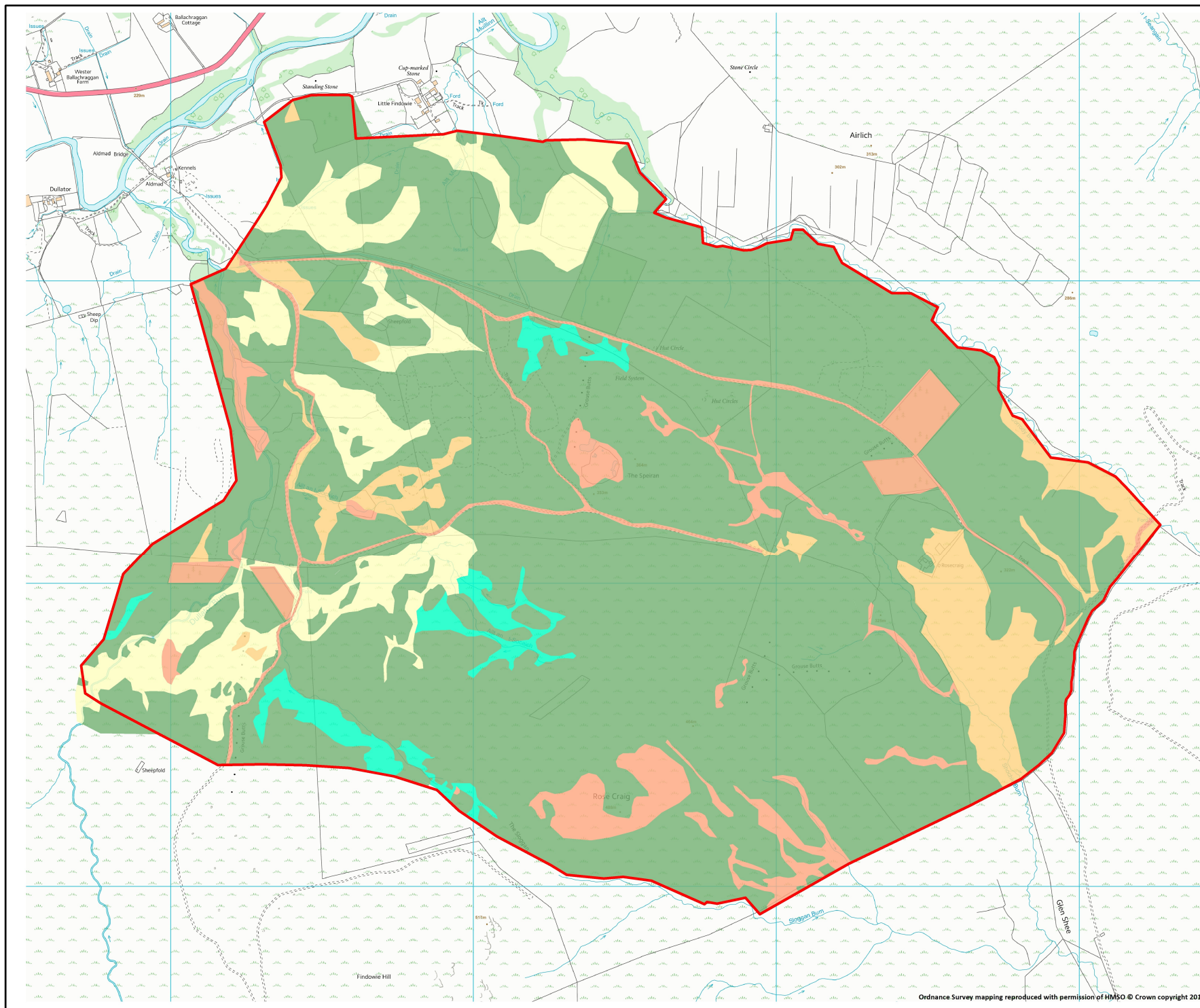
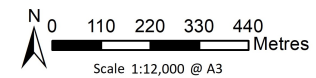


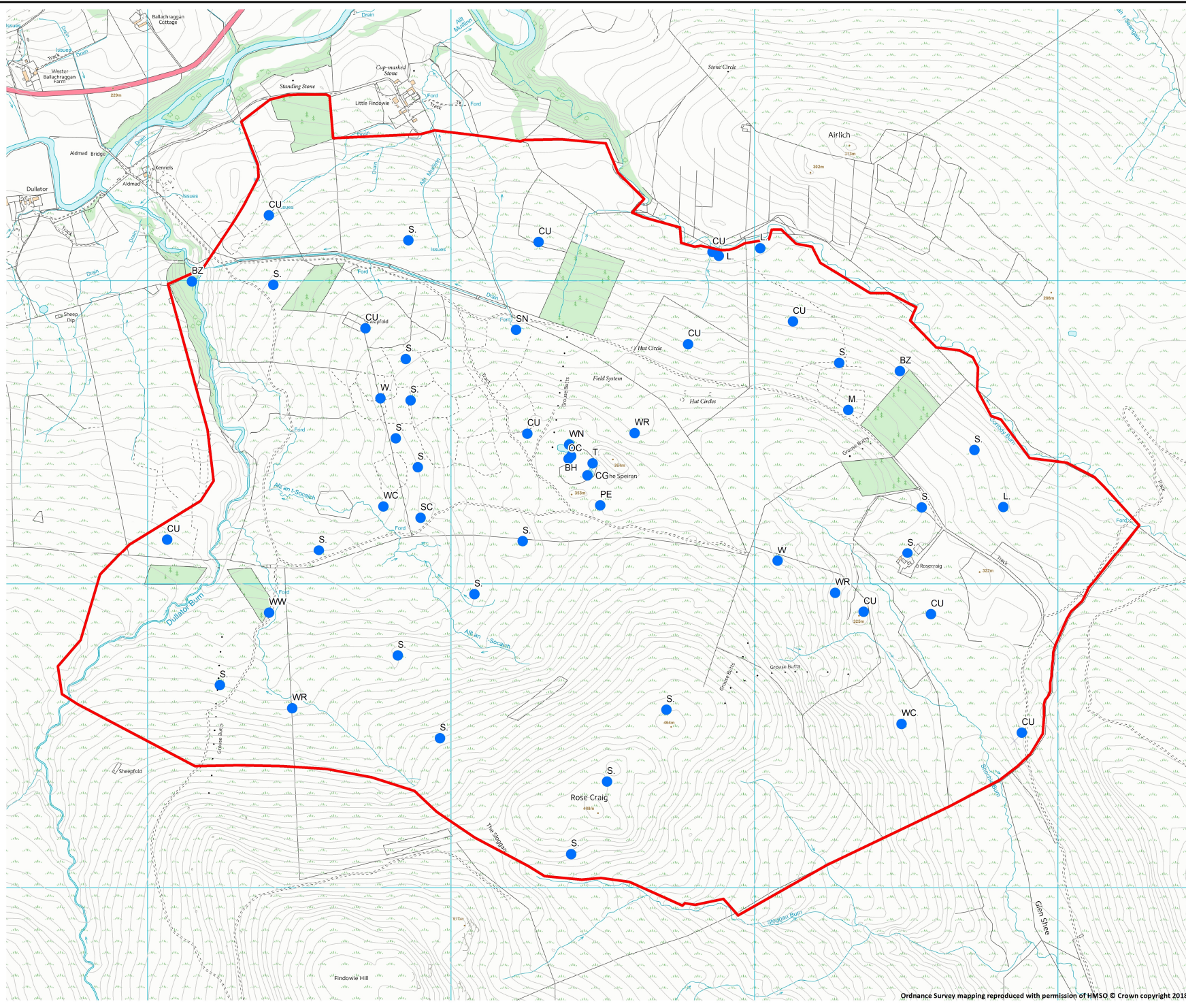
Figure 4a

Key
▭ Proposal Boundary
● Bird Survey Visit 1

- BK Black grouse
- BH Black-headed gull
- BZ Buzzard
- CG Canada goose
- CR Crossbill sp.
- CU Curlew
- K Kestrel
- L Lapwing
- M Mistle thrush
- MA Mallard
- MP Meadow pipit
- OC Oystercatcher
- PE Peregrine
- RN Raven
- S Skylark
- SC Stonechat
- SE Short-eared owl
- SN Snipe
- T Teal
- W Wheatear
- WC Whinchat
- WN Wigeon
- WR Wren
- WW Willow warbler

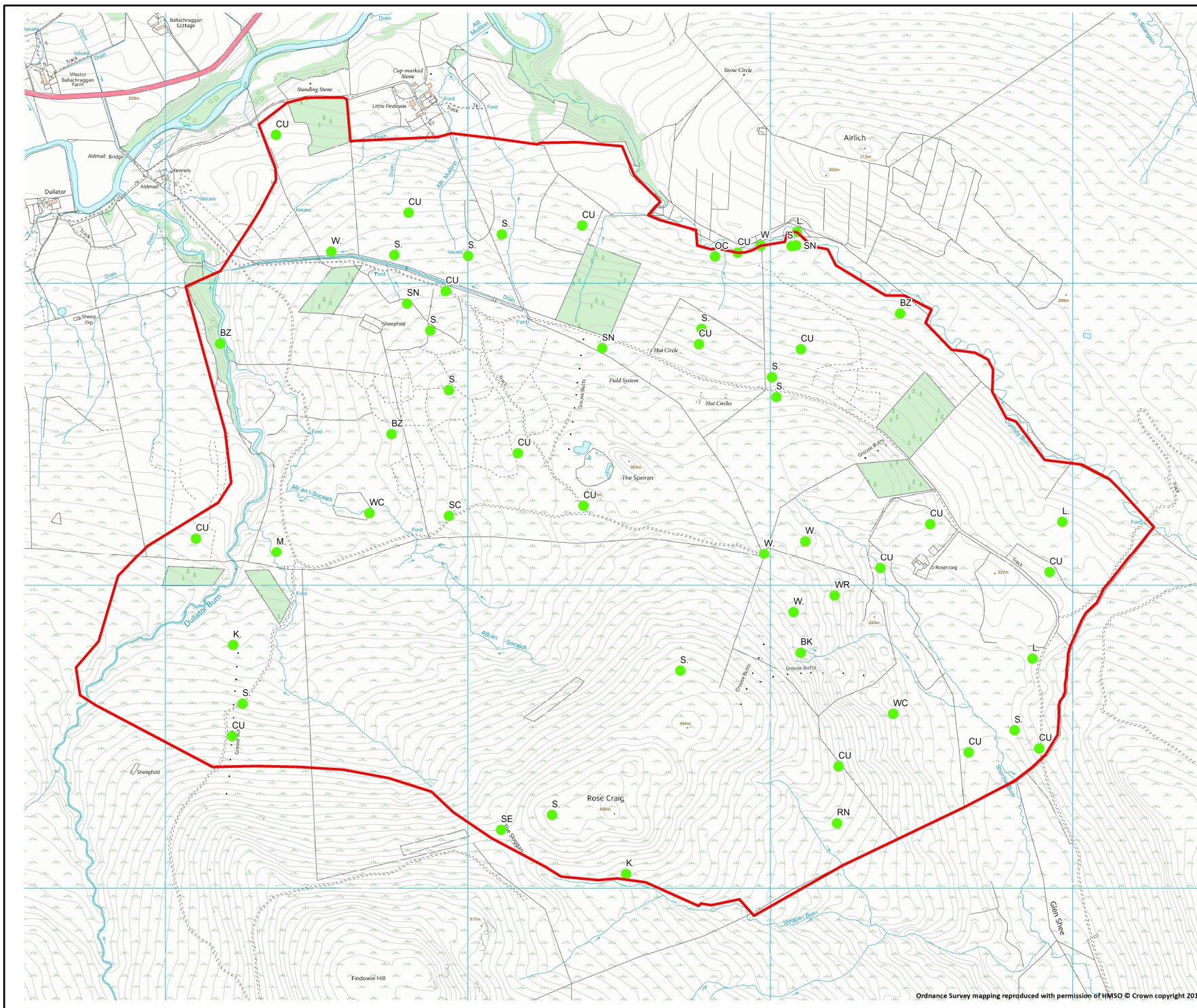


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Title Bird Survey Registrations Visit 1				
Drwg No.	Date	Rev.	Drwn.	App'd
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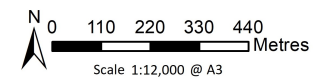
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Figure 4b



- Key**
- ▭ Proposal Boundary
 - Bird Survey Visit 2

- BK Black grouse
- BH Black-headed gull
- BZ Buzzard
- CG Canada goose
- CR Crossbill sp.
- CU Curlew
- K Kestrel
- L Lapwing
- M Mistle thrush
- MA Mallard
- MP Meadow pipit
- OC Oystercatcher
- PE Peregrine
- RN Raven
- S Skylark
- SC Stonechat
- SE Short-eared owl
- SN Snipe
- T Teal
- W Wheatear
- WC Whinchat
- WN Wigeon
- WR Wren
- WW Willow warbler

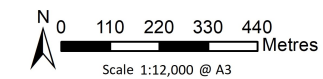


Client				
Project North Logiealmond New Woodland Proposal				
Title Bird Survey Registrations Visit 2				
Drwg No.	Date	Rev.	Drwn.	App'd
1	24/07/19	1	AF	

Figure 4c

- Key**
- ▭ Proposal Boundary
 - Bird Survey Visit 3

- BK Black grouse
- BH Black-headed gull
- BZ Buzzard
- CG Canada goose
- CR Crossbill sp.
- CU Curlew
- K Kestrel
- L Lapwing
- M Mistle thrush
- MA Mallard
- MP Meadow pipit
- OC Oystercatcher
- PE Peregrine
- RN Raven
- S Skylark
- SC Stonechat
- SE Short-eared owl
- SN Snipe
- T Teal
- W Wheatear
- WC Whinchat
- WN Wigeon
- WR Wren
- WW Willow warbler



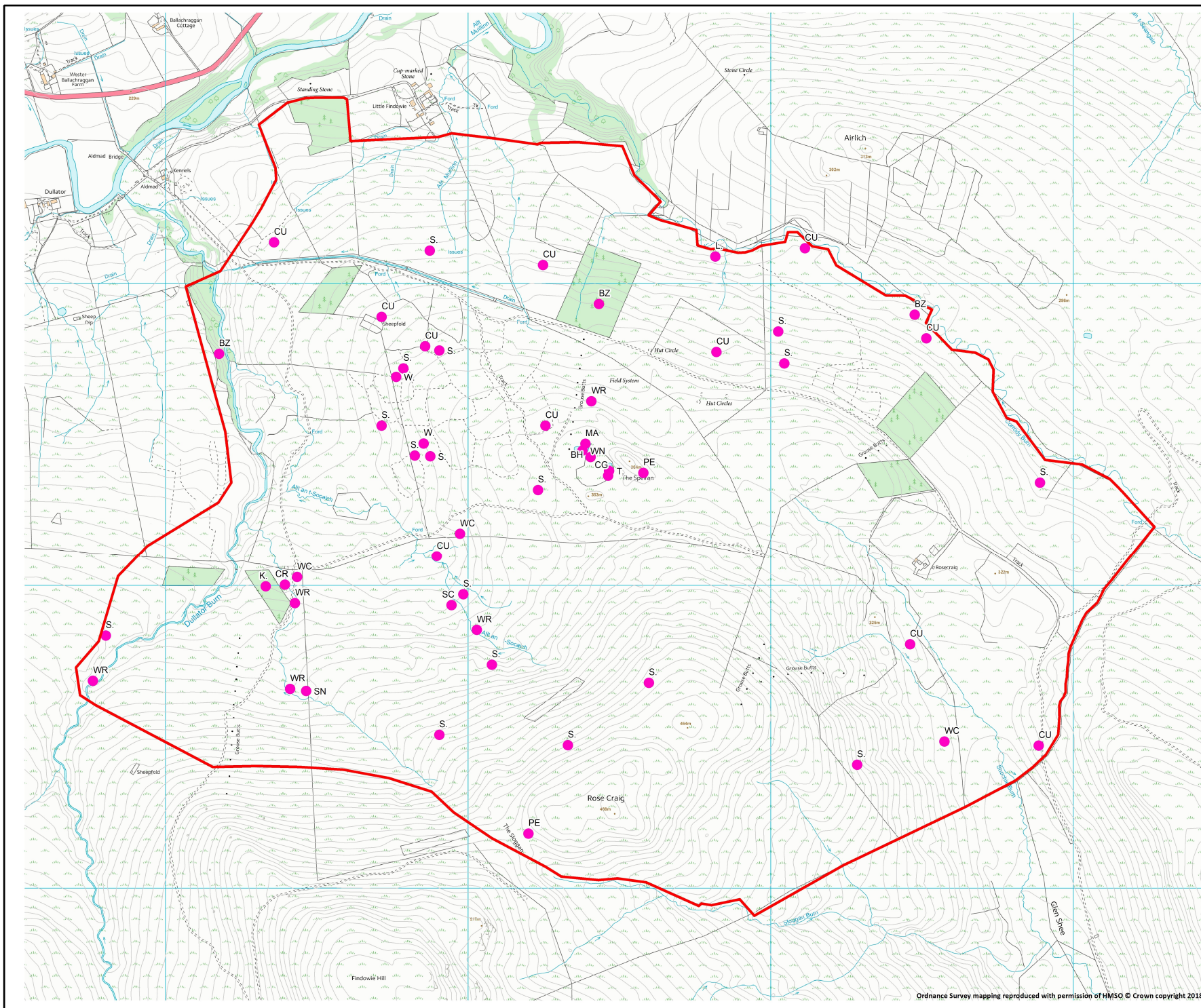
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Project **North Logiealmond
New Woodland Proposal**

Title **Bird Survey Registrations
Visit 3**

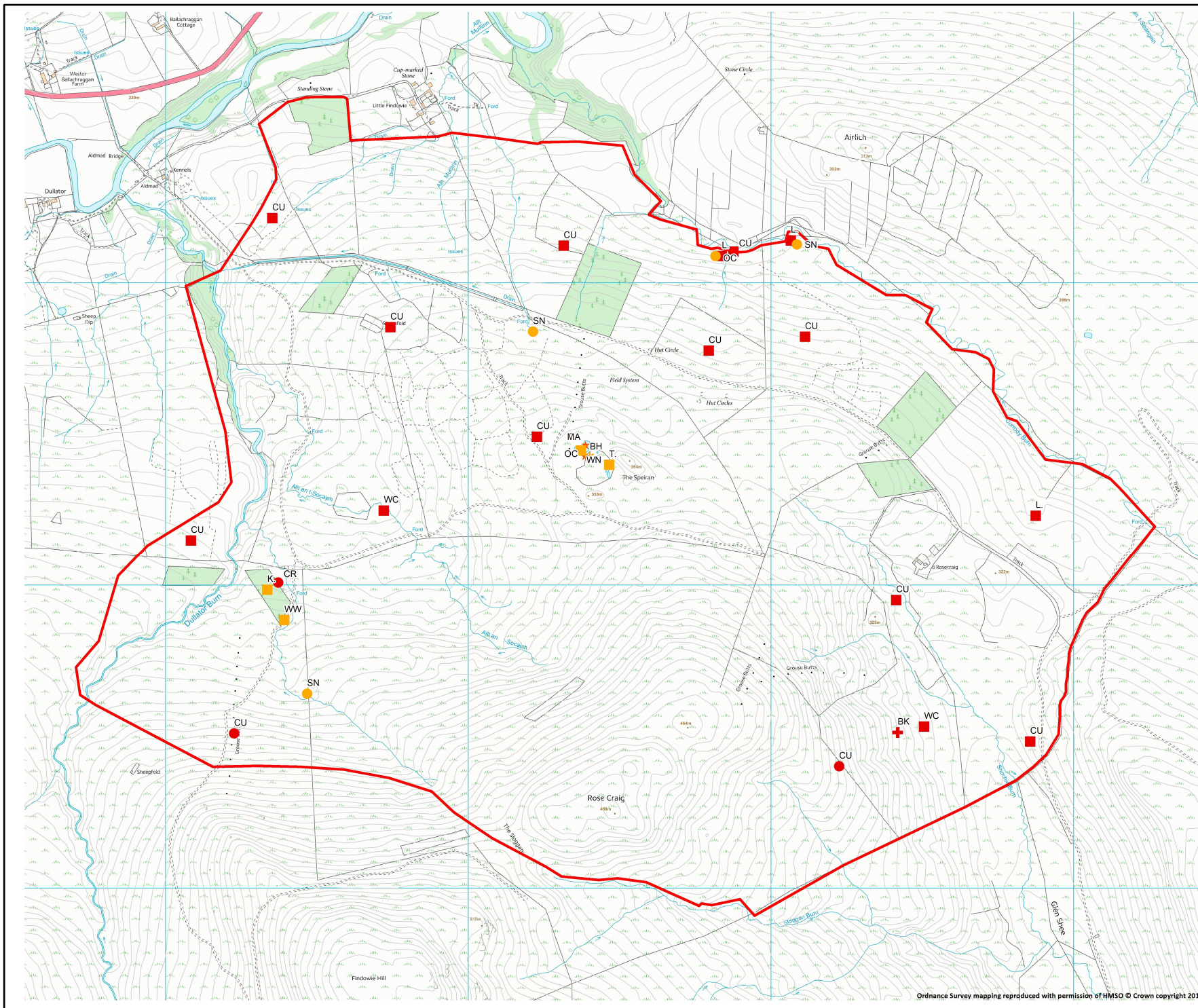
Drwg No.	Date	Rev.	Drwn.	App'd
1	24/07/19	1	AF	

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Figure 5



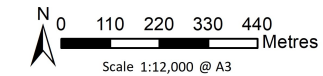
Key
 Proposal Boundary

Birds of Conservation Concern

List, Territory

- + Red, Lek
- Red, Probable
- Red, Possible
- ✱ Amber, Colony
- ★ Amber, Confirmed
- Amber, Probable
- Amber, Possible

- BK Black grouse
- BH Black-headed gull
- CR Crossbill sp.
- CU Curlew
- K Kestrel
- L Lapwing
- MA Mallard
- OC Oystercatcher
- SN Snipe
- T Teal
- WC Whinchat
- WN Wigeon
- WW Willow warbler



Client

Project **North Logiealmond
New Woodland Proposal**

Title **Birds of Conservation Concern
Territory Locations**

Drwg No.	Date	Rev.	Drwn.	App'd
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Figure 6

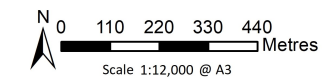
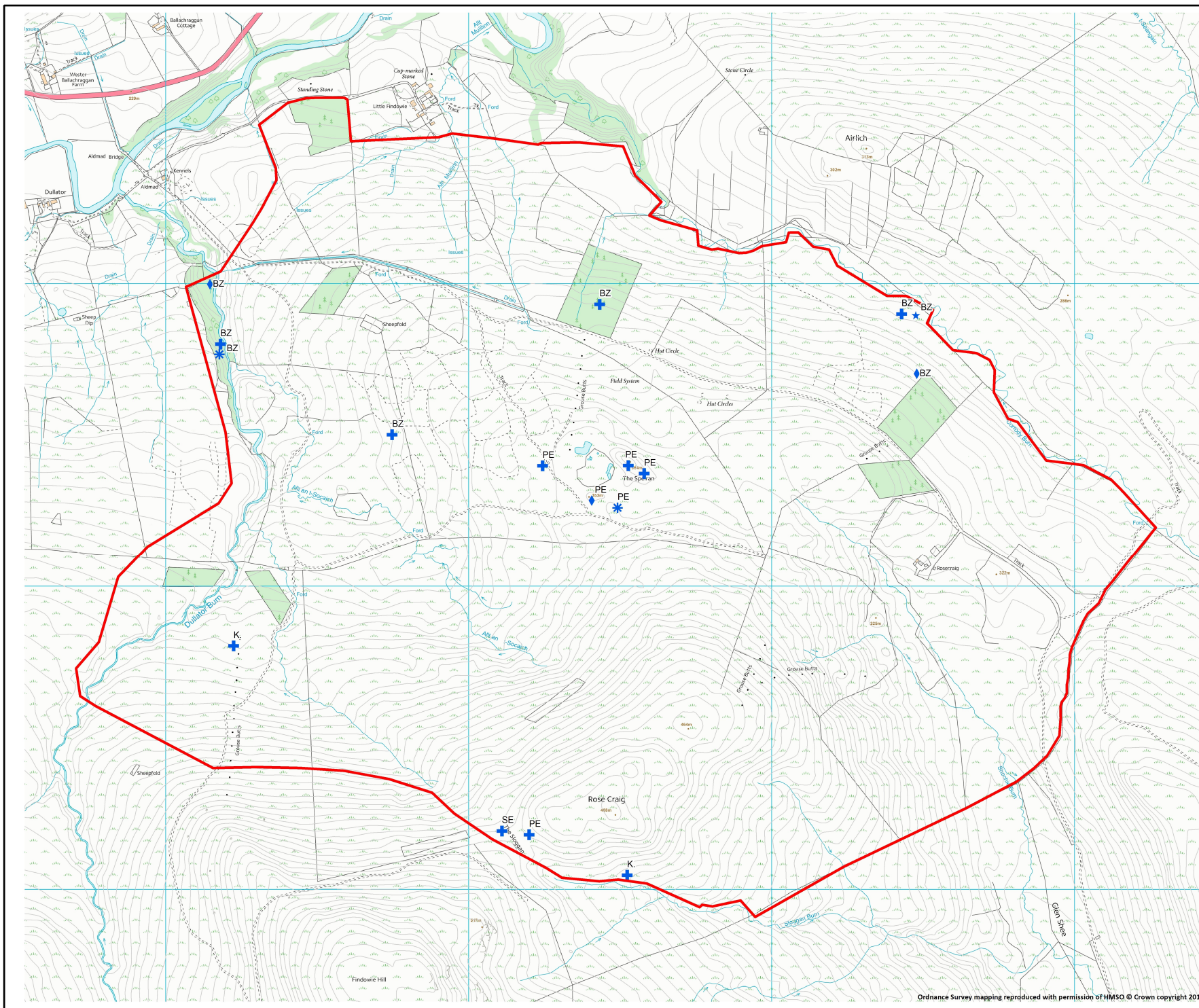
Key

Proposal Boundary
 Raptor and Owl Summary

Behaviour

- ✱ Alarm
- ◆ Call
- ★ Display
- + Flying

- BZ Buzzard
- K Kestrel
- PE Peregrine
- SE Short-eared owl



Client

Project **North Logiealmond
New Woodland Proposal**

Title **Raptor and Owl Summary
Registrations**

Drwg No.	Date	Rev.	Drwn.	App'd
1	24/07/19	1	AF	

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