



Ballater Flood Protection Scheme Preliminary Ecological Appraisal

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CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION.....	2
1.1 Background	2
1.2 Report Objectives	2
1.3 Terms, Conditions of Use and Limitations.....	2
2. LEGISLATION	3
2.1 The Conservation of Habitats and Species Regulations 2010	3
2.2 The Wildlife and Countryside Act 1981 (as amended)	4
2.3 The Protection of Badgers Act 1992	4
3. METHODOLOGY.....	5
3.1 Desk Based Assessment	5
3.2 Field Survey Method	5
4. RESULTS	11
4.1 Desk Survey Results.....	11
4.2 Field Survey Results - Habitats	12
4.2.1 Total Survey Area.....	12
4.2.2 River Dee	14
4.2.3 River Gairn	16
4.2.4 River Muick.....	17
4.2.5 Tullich Burn	18
4.3 Field Survey Results - Protected Species	18
4.3.1 Otter.....	19
4.3.2 Pine Marten and Wild Cat	19
4.3.3 Badger.....	19
4.3.4 Water Vole.....	19
4.3.5 Red Squirrel	19
4.3.6 Reptiles	19
4.3.7 Amphibians – Great Crested Newts.....	20
4.3.8 Bat Roost Potential.....	20
4.3.9 Freshwater Pearl Mussel and Fish.....	21
4.3.10 Birds	21
5. DISCUSSION AND RECOMMENDATIONS	22
5.1 Designated Sites and Habitat Assessment	22
5.2 Protected Species	22
5.3 Summary of Recommendations	25
6. REFERENCES.....	26

GLOSSARY

FIGURES

APPENDIX 1 – TARGET NOTES

EXECUTIVE SUMMARY

RPS Consulting Services Ltd was commissioned by Aberdeenshire Council to carry out a Preliminary Ecological Appraisal (PEA) of four watercourses in the Ballater area (central Ordnance Survey grid reference NO 37209 95918) located in the Cairngorms National Park. The surveys will inform the options appraisal for a Flood Protection Scheme to reduce the risk of flooding to properties in the Ballater area. The four major watercourses included in the assessment are the River Muick, River Gairn, River Dee and Tullich Burn, with reaches totalling approximately 20.5 km in length. Small tributaries of these which fall within the relevant survey boundaries were also assessed for the ecological receptors which they may support. The survey area comprises of a maximum 300 m buffer of the identified watercourses. The site location is presented in Figure 1.

The aim of the PEA was to identify the broad habitat types and dominant floral communities present, the presence of any legally protected habitats or habitats suitable for supporting protected species, to identify the presence of invasive plant species subject to legal control and to advise on the requirement of further ecological survey work. Additional survey work would then inform the options appraisal of the Flood Protection Scheme.

A thorough desk assessment was undertaken as part of the PEA. Historic records (within the last 10 years) were identified within 5 km of the survey area for the following species: otter, pine martin, wild cat, red squirrel, badger, Atlantic salmon, common lizard and freshwater pearl mussel. Additionally, a number of records of bird species which appear on Annex 1 of the EC Birds Directive were identified to be present in the search area.

The River Dee is designated as a Special Area of Conservation (SAC) with the qualifying species of Atlantic salmon, otter and freshwater pearl mussel. Six additional SACs are located within 5 km of the survey area. Three Special Protection Areas (SPAs) are located within 3 km of the survey area specifically designated for breeding birds including golden eagles, hen harrier, osprey and Scottish crossbill (all breeding). One of the SPAs (Muir of Dinnet) is also a Ramsar site of International importance to greylag goose. Collectively, SACs, SPAs and Ramsars form a network of Natura sites which are protected at the International level by the Habitats Directive. The Craigendarroch Site of Special Scientific Interest is located in the survey area on the north bank of the River Dee and is designated for upland oak woodland.

The habitats within the survey area comprise a mixture of farmland for grazing livestock and semi-natural and plantation broadleaved and coniferous woodland. These are deemed to be of relatively high ecological value. The town of Ballater is located in the centre of the survey area with residential properties and associated parking, road access, small parkland areas and gardens with scattered trees. There is potential for the following protected species within the survey area; otter, water vole, pine martin, wild cat, badgers, red squirrel, reptiles, bats, nesting birds, fish and freshwater pearl mussel.

Consequently, species-specific, Phase 2 surveys are recommended for otter, fish (particularly Atlantic salmon) and freshwater pearl mussel through consultation with SNH. Data could then be used to inform any Habitats Regulations Appraisal which may be necessary due to the location of the scheme within the River Dee SAC. The proximity of other Natura sites should also be carefully considered during the options appraisal process. It is recommended that prior to carrying out any construction work, targeted surveys are carried out for all protected species identified to be potentially present within the survey area.

1. INTRODUCTION

1.1 Background

RPS Consulting Services Ltd (RPS) was commissioned by Aberdeenshire Council to carry out a Preliminary Ecological Appraisal (PEA) of four watercourses in the Ballater area (central Ordnance Survey grid reference NO 37209 95918) to identify ecological receptors which they may support. The surveys will inform the options appraisal for a Flood Protection Scheme (FPS) to reduce the risk of flooding to properties in the Ballater area. The four major watercourses included in the assessment were the River Muick, River Gairn, River Dee and Tullich Burn, with reaches totalling approximately 20.5 km in length. Small tributaries of these which fell within the relevant survey boundaries were included in the assessment. The site location is presented in Figure 1.

1.2 Report Objectives

The key objectives of the PEA were:

- to identify the broad habitat types and dominant floral communities within the survey area;
- to identify the presence of any legally protected habitats listed within European or UK legislation;
- to identify the presence of habitats which might offer suitable niche requirements for legally protected fauna;
- to identify the presence of invasive non-native plant species subject to legal control; and
- to identify any requirement of further ecological survey work to inform the development process or subsequent options appraisal process to support Phase 2 of the Flood Protection Scheme.

1.3 Terms, Conditions of Use and Limitations

The following definition is used in this report:

- Survey area: an area encompassing the watercourses plus a 300 m buffer.

Despite the PEA being completed just outside the optimal time of year in terms of identifying plant species, it was still possible to determine and map the dominant habitat types present. It was not the purpose of the survey to carry out a targeted search for the presence of protected species or their resting places (objectives are listed in Section 1.2). The results of the survey are designed to inform the requirement for further, species specific surveys and should be treated as such.

The weather throughout the survey schedule was dry and mild, with the exception of some light rainfall on the last day. Some areas had restricted access due to damage inflicted during the storms in 2015/16. There was also restricted access due to private land/residential areas. These restrictions were not deemed to have a significant impact on the survey results.

2. LEGISLATION

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

2.1 The Conservation of Habitats and Species Regulations 2010

European protected habitats and species are defined under the European Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (otherwise known as the Habitats Directive). Protected habitats include heaths, flushes and mires, and protected species include otters (*Lutra lutra*), great crested newt (*Triturus cristatus*) and bats (all species) (*Chiroptera* spp.). The Habitats Directive is transposed into Scottish law through the Conservation of Habitats and Species Regulations 2010 and aims to maintain or restore European protected habitats and species listed in the relevant Annexes in a favourable conservation status.

2.1.1 Habitats

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

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

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

2.1.2 European Protected Species

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

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

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

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

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

2.2 The Wildlife and Countryside Act 1981 (as amended)

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

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

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

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

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

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

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

2.3 The Protection of Badgers Act 1992

Badgers are protected under the Protection of Badgers Act 1992. In Scotland, this legislation was updated by the Nature Conservation (Scotland) Act 2004, which makes it an offence to recklessly take, injure or kill a badger, or destroy, disturb or interfere with its sett. SNH interprets the legislation in such a way that any sett within an active badger territory is afforded legal protection, whether it shows signs of recent use or not. In addition, badgers are afforded protection from cruel ill-treatment. This has been defined to include preventing a badger access to its sett, as well as causing the loss of significant foraging resources within a badger territory.

A licence from SNH is required in cases of potential disturbance of badgers or damage or destruction of a badger sett as a result of work activities.

3. METHODOLOGY

3.1 Desk Based Assessment

A desk based review of biological records was carried out based on the standard best practice methodology provided by the Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidance for Preliminary Ecological Appraisal (CIEEM, 2013)¹.

The North East Scotland Biological Records Centre (NESBReC) were contacted on 26 September 2017 requesting records for all protected species and designated areas within 5 km of the survey area from the last 10 years.

Other sources of information included:

- aerial imagery which was studied prior to the survey to inform any areas of high sensitivity which might require additional survey effort during the site visit;
- SNH online database SNHi Sitelink² was consulted to identify the presence of any protected areas within 5 km of the site boundary (e.g. Sites of Special Scientific Interest (SSSI), Ramsar sites, SPAs and SACs);
- a request was made to SNH to release, under licence, data held regarding the location of known freshwater pearl mussel sites within the survey area;
- the Highland Raptor Study Group was contacted on 26 September 2017 to request records of raptors within 5 km of the survey area, however a response has yet to be received despite numerous attempts to contact the group;
- the River Dee Fisheries Trust was consulted regarding available fish data for the survey area.

3.2 Field Survey Method

A PEA survey was undertaken over two survey periods, 09 to 12 October 2017 and 30 to 31 October 2017 by experienced field ecologists. The methods of the various aspects of the survey are described in detail below. Any signs of the presence of protected species or species of conservation interest were recorded as Target Notes (TN) and are referenced as such (e.g. TNxx) throughout this report, with a detailed Target Note Record presented in Appendix 1, which also includes all GPS locations.

3.2.1 Habitats

The habitats within the survey area were mapped following the methodology described in the Joint Nature Conservation Committee's (JNCC) Handbook for Phase 1 habitat survey: a technique for environmental audit (JNCC, 2010). Furthermore, the survey also aimed to identify the presence of invasive species subject to legal control such as Japanese knotweed and giant hogweed.

Botanical nomenclature in this report follows that of Stace (2010).

3.2.2 Protected Species

Otter

All waterbodies, watercourses and minor ditches within the survey area, where access was permitted and where it was safe to do so, were assessed for their potential to support otters. Any incidental recordings of otter field signs were noted as described in Bang and

¹ www.cieem.net/guidance-on-preliminary-ecological-appraisal-gpea-

² gateway.snh.gov.uk/sitelink/index.jsp

Dahlstrøm (2001) and includes resting sites (e.g. holts and couches), spraints, prints and feeding remains. Descriptions of these and other field evidence terms are provided below.

- **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 due to the crepuscular nature of their foraging activities and may be used as natal or breeding sites. Otters may use holts permanently or temporarily;
- **Couches** - these are above ground resting sites. They may be partially sheltered, or fully exposed. Couches may be regularly used, especially in reedbeds and on in-stream islands. They have been known to be used as natal and breeding sites. Couches can be very difficult to identify, sometimes consisting of no more than an area of flattened grass or earth, and are best identified by the presence of other field signs (e.g. spraints). 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 can be used to mark territories, often 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 at 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 field signs can be used as anecdotal evidence to indicate the potential presence of otters within an area; however spraints and prints are the most reliably identifiable evidence of the species' presence.

Suitable otter habitats are varied; however they require an abundance of forage and prey including fish, amphibian, small mammal and invertebrate species. Refugia such as reed beds and areas of high grass are similarly important throughout an area. The interconnectivity between watercourses and waterbodies is an important factor in assessing the suitability of a site for otter potential. The species is a wide ranging forager and will often patrol a large territory in search of food. Territory size is dependent on food resources within an area, the population density within any particular area, and the sex of an individual. However, it is not uncommon for males to travel upwards of 16 km in the course of a night whilst foraging.

Pine Marten and Wild Cat

Pine marten and wild cat are notoriously difficult to survey for, as their scats (the most obvious field signs), are similar to those of fox and stoat when seen in the field. As such the surveys focussed on assessing the habitat suitability for these species. This typically includes mature woodland, including coniferous plantations, although they will forage in open habitats as well. In particular, the survey searched for areas which might hold suitable potential for denning sites including hollow trees, root plates, boulder piles or rocky outcrops. Pine marten and wild cat signs are described in Harris and Yalden (2008).

Badger

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

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

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

Water Vole

All watercourses, minor ditches and small waterbodies within the survey area, where access was permitted and where it was safe to do so, were assessed for their potential to support water voles. Habitat suitability criteria are based on information given in Strachan and Moorhouse (2011) and included the species' known preference for:

- slow flowing water;
- low water level fluctuation;
- banks suitable for burrowing;
- lush bank-side vegetation to provide food and shelter; and
- an absence of American mink (*Neovison vison*), a predator of water vole.

Any incidental recordings of water vole field signs were noted. Field signs which are indicative of the presence of water voles include:

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

Red Squirrel

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

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

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

Reptiles and Amphibians

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

Great Crested Newts

A great crested newt Habitat Suitability Assessment (HSA) was carried out on ponds within 300 m of the four main watercourses using the Habitat Suitability Index (HSI) developed by Oldham *et al.* (2000) and as described in ARG UK Advice Note 5 (2010). The HSI takes into account ten key habitat criteria which influence the presence or likely absence of great crested newts, including factors such the size, water quality, permanence, shading, and macrophyte cover of potential breeding ponds. The assessment also includes the quality of the surrounding terrestrial habitat which should ideally comprise a mosaic of rough grassland, scrub, and woodland, with opportunities for shelter and hibernation, as well as other potential breeding ponds. Ponds which support high densities of fish and/or waterfowl and those which are very shallow, dry-up regularly, or are polluted are generally considered to be unsuitable.

Each criterion is scored according to its suitability and the resulting HSI scores, which are between 0 and 1, provide an indication as to the likelihood of a pond's potential to support great crested newts. HSI scores are calculated as the geometric mean of the ten individual habitat suitability scores. In general, ponds with high scores are more likely to support great crested newts than those with low scores, although just because a pond achieves a poor HSI score does not necessarily mean that great crested newts will not be present.

The HSI score bands presented in Table 1 have been developed to provide a rough guide as to the likelihood of ponds supporting great crested newts based on their HSI scores.

HSI Score	Pond Suitability
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

Bats

The PEA included an assessment of the habitat within the survey area to support bat species for roosting, foraging or commuting. Habitats were categorised to be of negligible, low moderate or high suitability based on the roosting or commuting suitability criteria outlined in Table 2 to inform the requirement for follow up surveys.

Suitability	Description of Roosting Habitat	Foraging and Commuting Habitat
Negligible	Negligible habitat features on site not likely to be used by roosting bats.	Negligible habitat features on site not likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or un-vegetated streams, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.

TABLE 2 – BAT HABITAT SUITABILITY CRITERIA		
Suitability	Description of Roosting Habitat	Foraging and Commuting Habitat
	and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to its size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Site close to and connected to known roosts.

Notes:
From Bat Survey for Professional Ecologists: Good Practice Guidelines (3rd edn), (Collin, 2016).

Fish and Freshwater Pearl Mussel

Fish (Atlantic salmon) and freshwater pearl mussel (*Margaritifera margaritifera*) are qualifying features of the River Dee SAC. Given the timings of the survey and the well-studied nature of the catchment surrounding the proposed Flood Protection Scheme, consultation with the Local Fisheries Trust and NESBreC was undertaken to source the information they hold for both species. Information required to inform this PEA is habitat suitability for both spawning salmon and that to support freshwater pearl mussel (FWPM).

The habitat requirements for salmon are discussed by Scottish Environment Protection Agency (SEPA, 2015) and include:

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

The habitat favoured by FWPM is discussed in Skinner *et al* (2003) and include:

- good water quality – it is generally accepted that FWPM prefer oligotrophic conditions i.e. poor plant nutrients and high oxygen content;
- substrate – there is a requirement for areas of small sand stabilised with larger stones or boulders in fast flowing streams and rivers; and
- host fish stocks – the presence of salmon and sea trout is essential for the life cycle of the FWPM as during the larval stage the FWPM is attached to the gills of salmon and/or trout.

Birds

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

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

4. RESULTS

4.1 Desk Survey Results

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

TABLE 3 – HISTORICAL RECORDS OF PROTECTED SPECIES PRESENCE WITHIN 5 KM OF THE DEVELOPMENT SITE BETWEEN 2007 AND 2017				
Species Latin name	Species	Most recent record	Total no. of records	National conservation status
Birds				
Merlin	<i>Falco columbarius</i>	02/06/2010	2	ANNEX 1 – EC Birds Directive
Hen harrier	<i>Circus cyaneus</i>	21/08/2010	3	ANNEX 1 – EC Birds Directive
Osprey	<i>Pandion haliaetus</i>	02/05/2012	18	ANNEX 1 – EC Birds Directive
Common tern	<i>Sterna hirundo</i>	11/07/2009	6	ANNEX 1 – EC Birds Directive
Peregrine	<i>Falco peregrinus</i>	24/05/2015	4	ANNEX 1 – EC Birds Directive
Whooper swan	<i>Cygnus cygnus</i>	15/08/2008	4	ANNEX 1 – EC Birds Directive
Red kite	<i>Milvus milvus</i>	30/04/2011	2	ANNEX 1 – EC Birds Directive
White-tailed eagle	<i>Haliaeetus albicilla</i>	10/05/2009	1	ANNEX 1 – EC Birds Directive
Golden eagle	<i>Aquila chrysaetos</i>	13/11/2013	6	ANNEX 1 – EC Birds Directive
Short-eared owl	<i>Asio flammeus</i>	13/04/2009	2	ANNEX 1 – EC Birds Directive
Black-throated diver	<i>Gavia arctica</i>	19/05/2008	1	ANNEX 1 – EC Birds Directive
Marsh harrier	<i>Circus aeruginosus</i>	15/05/2010	1	ANNEX 1 – EC Birds Directive
Kingfisher	<i>Alcedo atthis</i>	15/10/2013	1	ANNEX 1 – EC Birds Directive
Golden plover	<i>Pluvialis apricaria</i>	28/04/2010	3	ANNEX 1 – EC Birds Directive
Western capercaillie	<i>Tetrao urogallus</i>	06/11/2013	25	ANNEX 1 – EC Birds Directive
Other Species				
Bats	<i>Chiroptera spp.</i>	02/08/2015	79	European Protected Species
Badger	<i>Meles meles</i>	11/04/2016	28	Protection of Badgers Act (1992)
Red squirrel	<i>Sciurus vulgaris</i>	07/10/2016	285	UK BAP list of Priority Species
Otter	<i>Lutra lutra</i>	13/09/2016	125	European Protected Species
Wild cat	<i>Felis silvestris</i>	01/09/2011	15	UK BAP list of Priority Species
Pine marten	<i>Martes martes</i>	20/05/2016	48	UK BAP list of Priority Species
Water vole	<i>Arvicola amphibius</i>	2015	1	UK BAP list of Priority Species
Atlantic salmon	<i>Salmo salar</i>	22/05/2010	20	UK BAP list of Priority Species
Common lizard	<i>Zootoca vivipara</i>	11/07/2014	24	UK BAP list of Priority Species
Slow worm	<i>Anguis fragilis</i>	15/08/2015	11	UK BAP list of Priority Species
Adder	<i>Vipera berus</i>	22/08/2015	18	UK BAP list of Priority Species
Common toad	<i>Bufo bufo</i>	16/07/2015	24	UK BAP list of Priority Species
Notes:				
No records of great crested newt (<i>Triturus cristatus</i>) or common frog (<i>Bufo bufo</i>) were identified during the desk assessment.				

The watercourses within the study area form part of the River Dee SAC whose qualifying features include otter, Atlantic salmon and FWPM. The survey area also overlaps with the Craighendarroch Site of Special Scientific Interest (SSSI), designated for upland oak woodland and alpine heath habitats. A number of other SSSIs and National Nature Reserves (NNRs) surround the catchment, with the study area located within the Cairngorm National Park.

Table 4 presents the results obtained when consulting the SNH database (SNHi Sitelink; <https://gateway.snh.gov.uk/sitelink/>) for designated sites within 5 km.

TABLE 4 – DESIGNATED SITES WITHIN 5 KM OF THE DEVELOPMENT SITE			
Name	Designation	Survey site proximity	Qualifying Species
River Dee	SAC	Within site	Atlantic salmon, otter, FWPM
Muir of Dinnet	SAC	1 km northeast	Breeding birds and dragonfly assemblages
Coyles of Muick	SAC	2 km southwest	Upland plant assemblages
Dinnet Oakwood	SAC	3 km east	Upland oak woodland
Glen Tanar	SAC	3 km southeast	Blanket bog, Caledonian forest, otter
The Maim	SAC	4 km west	Dry heath
Morven and Mullachdubh	SAC	4 km north	Juniper
Muir of Dinnet	SPA	1 km northeast	Breeding birds
Cairngorms Massif	SPA	1 km southeast and southwest	Golden eagle
Glen Tanar	SPA	3 km southeast	Capercaillie, hen harrier, osprey, Scottish crossbill (all breeding)
Muir of Dinnet	Ramsar	1 km northeast	Greylag goose
Craigendarroch	SSSI	Within site	Upland oak woodland and alpine heath
Muir of Dinnet	SSSI	1 km northeast	Breeding birds and dragonfly assemblages
Coyles of Muick	SSSI	2 km southwest	Upland plant assemblages
Crathie Wood	SSSI	3 km west	Invertebrate assemblages, juniper scrub, native pinewood
Dinnet Oakwood	SSSI	3 km east	Upland oak woodland
Glen Tanar	SSSI	3 km southeast	Capercaillie (breeding), fungi and invertebrate assemblages
Morven and Mullachdubh	SSSI	4 km north	Upland oak woodland and alpine heath
Muir of Dinnet	NNR	1 km northeast	Breeding birds and dragonfly assemblages
Glen Tanar	NNR	3 km southeast	Capercaillie (breeding), fungi and invertebrate assemblages
Dinnet Oakwood	NNR	3 km east	
Cairngorms	National Park	Within site	Atlantic salmon, otter, FWPM

Notes:

FWPM – Fresh Water Pearl Mussel; SSSI – Site of Special Scientific Interest; NNR – National Nature Reserve; SPA – Special Protection Area; SAC – Special Area of Conservation; Ramsar – Wetland of international importance.

4.2 Field Survey Results - Habitats

4.2.1 Total Survey Area

Field survey results for the habitat assessment and protected species surveys are outlined in the following sections. Habitats that are common to two or more river systems are discussed below. Further details of habitats specific to individual river systems are detailed in Sections 4.2.2 to 4.2.6 to facilitate the options appraisal process which is to follow. Target notes for ecological records are displayed in Table A1 in Appendix 1 which supplements mapped results in Figures 2.1 to 2.18.

A list of the habitats present within the survey area and the total area they occupy is shown in Table 5.

TABLE 5 – HABITATS PRESENT WITHIN THE SURVEY AREA	
Phase 1 Habitat Type	Area (ha)
Broadleaved woodland - semi-natural	151.89
Broadleaved woodland - plantation	20.35
Coniferous woodland - semi-natural	9.37
Coniferous woodland - plantation	221.13
Mixed woodland - semi-natural	116.18
Mixed woodland - plantation	24.76
Scrub - dense/continuous	5.90
Scrub - scattered	9.93
Coniferous Parkland/scattered trees	0.84
Neutral grassland - semi-improved	37.58
Improved grassland	158.35
Marsh/marshy grassland	18.68
Poor semi-improved grassland	157.17

TABLE 5 – HABITATS PRESENT WITHIN THE SURVEY AREA

Phase 1 Habitat Type	Area (ha)
Bracken - continuous	7.49
Other tall herb and fern - ruderal	3.64
Standing water	1.21
Running water - oligotrophic	78.97
Quarry	0.72
Cultivated/disturbed land - arable	1.44
Caravan site	5.74
Bare ground	19.77
Not accessed land	92.69
Road	28.31

Notes:

Areas are mapped in the field and then transferred to electronic format using ArcGIS. The areas are then calculated from the resulting shapefiles.

Coniferous Woodland – Plantation and Semi-natural

Large areas of the survey area comprised plantation and semi-natural coniferous woodland. These have very similar characteristics being dominated by mature Scots pine (*Pinus sylvestrus*), with small areas of Sitka spruce (*Picea sitchensis*) and Douglas fir (*Pseudotsuga menziesii*). The trees were generally of a uniform age with little understorey and a ground cover comprising bracken (*Pteridium aquilinum*), moss species, grass species, blaeberry (*Vaccinium myrtillus*) and bell heather (*Erica cinerea*) (TN01).

Broadleaved Woodland – Plantation and Semi-natural

There are a number of areas of semi-natural broadleaved woodland within the survey area. This woodland is dominated by mature birch species (*Betula spp.*) with little in the way of understorey. The ground cover comprises areas of bracken dense in places, common nettles (*Urtica dioica*) and occasional buttercups (*Ranunculus acris*) (TN02), ragwort (*Senecio jacobaea*) (TN03) and mosses including haircap moss (*Polytrichum commune*), feather moss (*Ptilium spp.*) and sphagnum (*Sphagnum spp.*) (TN04).

A narrow strip of riparian semi-natural broadleaved woodland lines the banks of the River Gairn, River Tulloch and Rive Muick. The River Dee also has a riparian strip of woodland however this can be limited in places where there has been flood damage. The riparian woodland is dominated by mature birch species, alder (*Alnus glutinosa*), rowan (*Sorbus aucuparia*), with occasional mature scots pine. Ground cover in the riparian woodland is dominated by woodrush (*Luzula sylvatica*) with grass and fern species. Occasional mature ash (*Fraxinus excelsior*) and sycamore (*Acer pseudoplatanus*) tree species were also noted (TN05).

Mixed Woodland – Plantation and Semi-natural

As with many of the woodlands within the survey area the semi-natural and plantation woodlands have many attributes in common being dominated by mature birch and Scots pine. With little in the way of understory with ground cover of bracken, woodrush with grass and moss species.

Grasslands

The majority of the grassland within the survey area was recoded as poor semi-improved grassland. These areas were noted to be heavily grazed by sheep and cattle and dominated by perennial rye grass (*Lolium perenne*). Some areas of neutral semi-improved grassland were also recoded (TN06). Areas of marshy grassland were dominated by purple moor-grass (*Molinia caerulea*) with soft rush (*Juncus effuses*) and bracken (TN07).

Scrub

Areas of continuous and scattered scrub can be found throughout the survey. These areas are dominated by gorse (*Ulex europaeus*) and broom (*Cytisus scoparius*).

Tall Ruderal

A single area of tall ruderal was recorded on the eastern side of the River Gairn and an area in the River Dee survey area. This area is dominated by great willowherb (*Epilobium hirsutum*) with nettles and occasional stands of bracken (TN08).

Bracken

As well as the bracken noted as ground cover in woodlands there are also small areas of dense continuous bracken. This was recorded along woodland rides (TN09 and TN10) and in discrete areas on the north and south banks of the River Dee (TN11).

Buildings, Roads and Hard-standings

The survey area also includes built-up areas such as the town, Ballater located in the centre of the survey area comprising a mix of residential and commercial buildings with associated roads, car parks, pavements and gardens. In the surrounding areas of Ballater a number of farm buildings and associated curtilage can be found. The main A93 bisects the survey area with smaller roads such as the A939 and B976 also within the area. There are also a number of single track roads and walking paths throughout the survey area.

4.2.2

River Dee

A list of the habitats present within the survey area of the River Dee catchment and the total area they occupy is shown in Table 6, as mapped on Figures 2.1 – 2.14.

TABLE 6 – HABITATS PRESENT WITHIN THE RIVER DEE CATCHMENT SURVEY AREA	
Phase 1 Habitat Type	Area (ha)
Broadleaved woodland - semi-natural	82.56
Broadleaved woodland - plantation	18.15
Coniferous woodland - semi-natural	7.02
Coniferous woodland - plantation	187.76
Mixed woodland - semi-natural	32.56
Mixed woodland - plantation	23.12
Scrub - dense/continuous	4.36
Scrub - scattered	9.55
Coniferous Parkland/scattered trees	0.84
Neutral grassland - semi-improved	25.36
Improved grassland	95.84
Marsh/marshy grassland	2.50
Poor semi-improved grassland	87.84
Bracken - continuous	5.58
Other tall herb and fern - ruderal	3.30
Standing water	1.08
Running water - oligotrophic	66.12
Caravan site	5.56
Bare ground	14.32
Not accessed land	75.49
Road	16.61

Notes:
Areas are mapped in the field and then transferred to electronic format using ArcGIS. The areas are then calculated from the resulting shapefiles.

Running Water

The River Dee the largest of the four main river systems in the survey area flowing from west to east, south of the main road A93 and the town of Ballater. The characteristics of

the River Dee can vary but generally it is relatively fast-flowing, approximately 30 m wide with varying depth depending on the character of the river at that location. The River Dee generally has a rocky bed with larger boulders protruding from the surface and very little noticeable instream vegetation. The height and features of the bank also vary i.e. in one area on the north bank of the River Dee rock cliffs were noted approximately 20 m high with semi-natural mixed woodland to the edge (TN12). In another location on the south bank, an area where there has been erosion exposing, what from a distance looks like, a sandy substrate with mature conifer plantation above (TN13).

Girnock Burn is a small tributary of the River Dee flowing south to north. The Girnock Burn varies in width between 3 and 5 m with a stone bed and no obvious instream vegetation (TN14). The Girnock Burn has banks with riparian woodland comprising birch species, alder, mature Scots pine and occasional sycamore. The ground cover is comprised of woodrush with grass species and occasional ferns.

Allt-na Creige Leith is a small tributary of the River Dee approximately 2 km to the west of Ballater flowing south to north. It is approximately 1 m wide with a riparian strip of woodland comprising sycamore and birch species. It has earth banks with vegetation dominated by woodrush and Dog's mercury (*Mercurialis perennis*) (TN15).

The Dalmochie Burn flows from south to north into the River Dee under the B976, through poor semi-improved grassland and then mixed woodland before entering the River Dee. The watercourse is shallow, no more than 30 cm deep in places, with a stone bed (TN16).

Brackley Burn runs from south to north into the River Dee to the south of Ballater near the Bridge of Muick. The watercourse is approximately 3 m wide and 0.5 m deep and fast flowing with a stone bed and boulders protruding. Coniferous and broadleaved trees line the banks; Scots pine and sycamore being the dominate species (TN17).

A small unnamed watercourse approximately 0.5 m wide runs west to east through broadleaved woodland into the River Dee approximately 500 m west of the River Gairn. Frequent alder and birch species are present on the banks with ground vegetation comprising sweet cicely (*Myrrhis odorata*), nettles, dock and grass species (TN18).

A small unnamed watercourse was identified running north from the B976 through semi-natural broadleaved woodland before entering the River Dee. The watercourse is shallow, no more than 30 cm deep, with a stone bed and clear, fast flowing water (TN19).

Culsten Burn flows north to south in to the River Dee approximately 3.5 km to the east of Ballater. It is generally 2 m wide and shallow with a stone, pebble and sand substrate. Riparian trees such as alder, willow and birch dominate the bank with grasses, bramble, rosebay willow herb and fern comprising the ground vegetation (TN20).

In addition to the habitats discussed above, the River Dee also comprises the following habitat.

Broadleaved Woodland - Semi-natural

Broadleaved woodland dominated by oak species with occasional Scots pine and birch species. The ground cover varies; it is dominated by woodrush and occasional stands of bracken between the north bank of the River Dee (TN21) while on the north of the A93 stretching onto Craigendarroch Hill the ground cover is dominated by moss species (TN22). Both of these areas are part of the Craigendarroch SSSI designated for upland oak woodland.

4.2.3 River Gairn

A list of the habitats present within the survey area of the River Gairn catchment and the total area they occupy is shown in Table 7.

TABLE 7 – HABITATS PRESENT WITHIN THE RIVER GAIRN CATCHMENT SURVEY AREA	
Phase 1 Habitat Type	Area (ha)
Broadleaved woodland - semi-natural	35.54
Coniferous woodland - semi-natural	0.10
Coniferous woodland - plantation	1.88
Scrub - dense/continuous	1.01
Scrub - scattered	0.38
Neutral grassland - semi-improved	6.04
Marsh/marshy grassland	5.68
Poor semi-improved grassland	62.55
Other tall herb and fern - ruderal	0.33
Running water - oligotrophic	4.47
Quarry	0.49
Cultivated/disturbed land - arable	1.44
Caravan site	0.18
Bare ground	1.16
Not accessed land	5.05
Road	5.61

Notes:
Areas are mapped in the field and then transferred to electronic format using ArcGIS. The areas are then calculated from the resulting shapefiles.

Running Water

River Gairn is a large tributary of the River Dee and flows north to south approximately 15 m wide and 0.5 m deep in places with a stone bed with large boulders on the banks and emerging from the river surface (TN23). The banks are lined with riparian woodland dominated by alder with an understorey of occasional gorse with ground cover of woodrush, grasses and fern species.

The Corrybeg Burn is less than 5 m wide and flows east to west approximately 500 m north of Gairn Bridge initially through poor semi-improved grassland with a small strip of riparian woodland dominated by birch species. Just before entering the River Gairn, the Corrybeg Burn flows through semi-natural broadleaved woodland (TN24).

Woodland and Scrub

The steep banks along the roadside on the east of the River Gairn were noted to be covered in birch species with some hazel (*Corylus avellana*). Ground cover includes dock species (*Rumex spp.*), grasses, meadowsweet (*Filipendula ulmaria*), common nettles, ragwort, hogweed (*Heracleum sphondylium*), and ferns (TN25).

Cultivated/Disturbed Land

A single area of cultivated land was noted on the eastern side of the River Gairn approximately 150 m from the river bank. There were no obvious signs of which crop species was to be planted.

Scree Slope

A scree slope is located above the semi-natural broadleaved woodland to the east of the River Gairn. Species noted in this area include scattered birch species, heather (*Calluna vulgaris*), bracken with occasional juniper (*Juniperus communis*) with blaeberry (*Vaccinium myrtillus*), mosses and occasional fern species (TN26).

4.2.4 River Muick

A list of the habitats present within the survey area of the River Muick catchment and the total area they occupy is shown in Table 8.

TABLE 8 – HABITATS PRESENT WITHIN THE RIVER MUICK CATCHMENT SURVEY AREA	
Phase 1 Habitat Type	Area (ha)
Broadleaved woodland - semi-natural	30.76
Broadleaved woodland - plantation	1.45
Coniferous woodland - semi-natural	2.25
Coniferous woodland - plantation	26.54
Mixed woodland - semi-natural	25.71
Mixed woodland - plantation	1.63
Scrub - dense/continuous	0.53
Neutral grassland - semi-improved	3.07
Improved grassland	37.38
Marsh/marshy grassland	10.51
Poor semi-improved grassland	5.27
Standing water	0.12
Running water - oligotrophic	6.25
Quarry	0.23
Bare ground	2.10
Not accessed land	4.27
Road	5.08

Notes:
Areas are mapped in the field and then transferred to electronic format using ArcGIS. The areas are then calculated from the resulting shapefiles.

Running Water

The River Muick flows south to north into the River Dee immediately south of Ballater. It varies in depth from 0.5 – 1 m deep and 10 m wide in places. It is generally fast-flowing with a river bed comprising stones and boulders with larger boulders situated on the banks and protruding from the river surface. The bridge over the river has been washed away during a flooding incident within the last few years and the access roads remain closed. Riparian trees such as birch, rowan, alder and willow (*Salix spp.*) line the banks. Occasional coniferous trees are also present (TN27).

Corrie Burn is a shallow watercourse, approximately 1 m wide which passes through Birkhall estate (only limited access was available for the survey) (TN28). It flows west to east through a variety of habitats including mixed semi-natural woodland and poor semi-improved grassland.

A further eight small un-named watercourses were noted within the survey area of the River Muick brief descriptions of which can be found below:

- Small watercourse approximately 1-2 m wide, approximately 30 cm deep and slow moving with dense grassy vegetation on banks with a rock bed and earth banks (TN29);
- Small watercourse approximately 1 m wide which appears to be the overflow from the fishing pond. Flows through mature semi-natural mixed woodland with banks dominated by grass species and occasional fern species (TN30);
- Small watercourse which is a tributary of the River Muick. It is slow moving, 1 – 2 m wide with a depth of over 30 cm and a gravel bed. The margins comprise dense rushes, surrounded by marshy grassland (TN31);
- Small watercourse flowing through grassland. Approximately 1 m wide with a depth of less than 30 cm deep. The watercourse is relatively fast flowing and the banks are heavily grazed by sheep with a wall/banking along the western bank (TN32);
- Small watercourse flowing through a field which appears to be mostly dry with a small flow before it meets another watercourse and joins the River Muick (TN33);

- Small watercourse approximately 1 m wide with a small amount of flowing water running along a field margin (TN34). Dense *Juncus effusus*, grass species and thistles grow along the banks;
- Small watercourse or ditch flowing along field margins. It is fenced off from cattle with some access for them to drink (TN35);
- Small watercourse or ditch flowing along field margins. The banks are densely vegetated with grass, fern and thistle species. A monitoring point/trap for small mammals was observed at the watercourse, but the target species was not obvious (TN36).

Spring

A possible spring was noted in a field to the east of the River Muick. The spring was noted to be feeding into the marshy grassland below which is dominated by *Juncus effusus* (TN37). The feature is situated approximately 250 m from the River Muick at a height above the river (approximately 10 m above). There is the potential for this to be resulting from a pure groundwater source or a combination of groundwater and surface water.

Invasive Non-Native Species (INNS)

Rhododendron ponticum was recorded in the survey area on both the east and west of the River Muick (TN38 and TN39). This species is often found in managed woodland.

4.2.5 Tullich Burn

A list of the habitats present within the survey area of the Tullich Burn catchment and the total area they occupy is shown in Table 9.

TABLE 9 – HABITATS PRESENT WITHIN THE TULLICH BURN CATCHMENT SURVEY AREA	
Phase 1 Habitat Type	Area (ha)
Broadleaved woodland - semi-natural	3.04
Broadleaved woodland - plantation	0.75
Coniferous woodland - plantation	4.94
Mixed woodland - semi-natural	57.91
Neutral grassland - semi-improved	3.12
Improved grassland	25.13
Poor semi-improved grassland	1.51
Bracken - continuous	1.91
Running water - oligotrophic	2.13
Bare ground	2.19
Not accessed land	7.88
Road	1.00

Notes:
Areas are mapped in the field and then transferred to electronic format using ArcGIS. The areas are then calculated from the resulting shapefiles.

Running Water

Tullich Burn is approximately 5 m wide and relatively shallow; no more than 1 m deep. The Burn has a rock bed and a riparian strip of woodland comprising alder and birch species with bracken and woodrush to banks (TN40).

4.3 Field Survey Results - Protected Species

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

4.3.1 Otter

Suitable habitat for otters was identified at the four main watercourses surveyed, and in addition, a number of smaller watercourses were noted to have the potential to support foraging or commuting otters. The River Dee, River Gairn, River Muick and Tullich Burn are fast-flowing rivers with a stone bed and larger boulders lining the banks and protruding from the surface. The banks are lined with riparian trees, some with exposed root systems. Such habitats are commonly used by otters as resting sites. Smaller watercourses, such as Dalmochie Burn, Culsten Burn and Brackley Burn are tributaries of the River Dee and also have high potential as otter foraging and commuting sites. No signs of otters were identified during the survey, though this is not considered to indicate the absence of the species.

4.3.2 Pine Marten and Wild Cat

All areas of mature woodland within the survey boundary can be considered as potential pine marten and wild cat habitat. Favourable habitat was identified in an area of mixed mature woodland close to the River Muick on the south of the site. The woodland is dominated by beech, birch, fir and cedar; many of the mature broadleaved and coniferous trees have cavities and holes suitable for pine marten dens.

4.3.3 Badger

No indicative evidence of badgers was discovered during the survey. However, the areas of woodland within the survey area are considered to offer moderate foraging and refuge habitat for this species (TN11). Sloped areas of coniferous or broadleaved woodland were noted frequently to have a dense understorey of bracken therefore making it difficult to detect signs of badger presence. These areas have good potential for badger sett building or foraging and therefore the potential for finding badgers on site is considered to be moderate.

4.3.4 Water Vole

Limited water vole habitat was identified in the survey area. The four main watercourses, River Dee, River Gairn, River Muick and the Tulloch Burn, are considered unsuitable for water voles due to the fast flowing water. There are a number of small watercourses/ditches within the survey area with dense vegetation comprising grass and fern species and soft rush, which provide suitable habitat for water vole (TN34 to TN36). However, these watercourses have limited connectivity to the wider environment. The potential presence of mink (TN41) and only one historic record of water vole from 2015 (Table 4) indicate the potential for finding water vole in the survey area is low.

4.3.5 Red Squirrel

Frequent patches of coniferous and broadleaved woodland were recorded throughout the survey area giving a high potential for the presence of red squirrel. Red squirrels frequently build tree-top resting sites in coniferous plantation woodland and whilst it is not possible to distinguish red squirrel dreys and feeding remains from those of grey squirrels, NESBReC has reported 285 sightings of red squirrel in the last 10 years. Consequently, it is considered highly likely that red squirrels are present in the area.

4.3.6 Reptiles

Piles of stone and stone walls have potential for use by reptiles for basking or as refugia. Rubble piles were noted in an area of disturbed ground previously used as a caravan park and defunct walls frequently line the field margins of grazing livestock around the site (TN42). Significant favourable undisturbed habitat for foraging reptiles is also present within the survey area and wider environment. Therefore the potential for reptiles, including adder and common lizard, in the survey area is considered to be high.

4.3.7 Amphibians – Great Crested Newts

The great crested newt Habitat Suitability Assessment (HSA) covered all ponds within 300 m of the four watercourses. Five ponds were discovered within the survey area. Full descriptions of these ponds and their HSI scores are presented in Table 10 (TN43 to 47)

TABLE 10 – SUMMARY OF GCN POND SUITABILITY			
Pond I.D.	Grid Ref.	Description	HSI Pond Suitability
A	NO 37341 95253	Moderately sized water body predominantly covered by macrophytes. Much submerged and emerged vegetation present and banks lined with occasional riparian trees such as birch, willow and alder. Occasional sitka spruce present. Pond surrounded by broadleaved woodland. No invertebrate netting carried out but adult dragonflies (<i>Aeshna spp.</i>) were abundant.	0.54 (Below Average)
B	NO 37329 95208	Large pond (>2000 m ²) with abundant emergent and submerged vegetation and occasional riparian trees such as willow and alder present around the pond edge. Patches of heather (<i>Calluna vulgaris</i>), Scots pine and sitka spruce also present. Broadleaved woodland is located around the pond within 50 m. Common reed (<i>Phragmites australis</i>) is abundant on the banks and the terrestrial habitat offers good suitability for GCN foraging and shelter. No invertebrate netting carried out, but water quality is good, with frequent dragonflies observed at the surface.	0.50 (Poor)
C	NO 38167 96629	Large pond (>2000 m ²) surrounded by semi-improved grassland with frequent tall ruderals adjacent to sewage works. Pond bed covered in dense layer of green algae with wading bird prints present in the sandy banks. No submerged or emergent vegetation. Fly-tipped metal items including culvert pipes and trailers are present in the water. Water quality is very poor.	0.13 (Poor)
D	NO 35749 93864	Large pond (>2000 m ²) surrounded by coniferous plantation woodland with frequent birch trees around the margins. The banks comprise grasses with 80% of the pond surface covered with emergent vegetation; abundant submerged vegetation also present. The pond is not shaded and water quality is moderate.	0.49 (Poor)
E	NO 36156 94364	Large pond (1900 m ²) with 50% of the surface area covered by reeds and water plantain (<i>Alisma plantago-aquatica</i>). Water quality is moderate with 10% of the surface shaded. The surrounding terrestrial habitat comprises mixed woodland. No obvious signs of fish or water fowl.	0.33 (Poor)

Whilst Ponds A, B, D and E exhibit features that would support great crested newts, such as abundant aquatic vegetation for egg laying and good surrounding terrestrial habitat for shelter and foraging, the geographical location of the ponds is unfavourable for this species. This is due to climate and altitude and the area being outside the species' recorded range. Notably, there are no records of the species' presence within 5 km of the survey area in the last 10 years (see Table 4). Pond C is unsuitable for great crested newts due to the dense algae cover and the lack of suitable submerged aquatic vegetation for egg laying.

4.3.8 Bat Roost Potential

During the survey, a number of trees (alive and dead) located within 100 m of the watercourses were identified to support features of moderate and high potential for roosting bats (TN48). Potential roosting features included the presence of rot holes, woodpecker holes and lifted bark.

Several residential houses and their associated out-buildings were noted within 100 m of the four main watercourses. Buildings of stone construction with concrete asbestos or slate roofing and soffits provide roosting potential for crevice dwelling bats (TN49).

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

4.3.9 Freshwater Pearl Mussel and Fish

FWPM site information is sensitive and information was made available to RPS Ecologists under a licence granted by SNH. Specific FWPM site information has not been included within the report, but will be utilised by the Ecologists to inform the options appraisal process. As a general description of habitat suitability for FWPM within the survey area, based on the information provided by SNH, it can be summarised that significant habitat change occurred throughout the catchment due to Storm Frank during the winter 2015/16. Surveys carried out for the Pearls in Peril project during November 2016 (SNH 2016) identified live FWPM populations within the River Dee. Evidence of FWPM deaths was noted potentially due to the habitat change. For instance, new cobble and boulder deposits within the River Dee around Ballater were found to have reduced habitat suitability for the species. This is likely to have been repeated elsewhere in the River Dee, though it is considered that pockets of FWPMs will have survived and may recover. The River Gairn is deemed to be generally unsuitable for FWPM and a reintroduction of the species in 2005 within the river is considered to have failed, though remnant individuals have survived. Both FWPM and Atlantic salmon are qualifying species of the River Dee SAC.

Spawning and nursery habitat for salmonids is available throughout the River Dee, River Muick and River Gairn systems and is considered to be present throughout the survey area. Update surveys have not been completed by the River Dee Fisheries Trust since 2016 to assess any changes after a storm system caused flooding and potential changes to the habitat. The River Dee as well as the lower reaches of the River Gairn and River Muick are too wide to allow quantitative electrofishing so it is not possible to gain accurate fish population data.

4.3.10 Birds

A number of bird species were observed within the survey area. Woodland birds observed included; magpie (*Pica pica*), blackbird (*Turdus merula*), rock dove (*Columba livia*), chaffinch (*Fringilla coelebs*), robin (*Erithacus rubecula*), pied wagtail (*Motacilla alba*) and buzzard (*Buteo buteo*). A small number of bird species were noted on the River Dee and its tributaries. These included a grey heron (*Ardea cinerea*), a dipper (*Cinclus cinclus*), and mallard (*Anas platyrhynchos*). A male hen harrier (*Circus cyaneus*) was seen on two occasions within 50 m of the River Dee (TN50). The woodland and scrub in the survey area (and, in the case of the hen harrier, the moorland adjacent) offer potential for breeding birds. The sand banks identified on the River Dee may offer nesting potential for sand martins (TN13).

5. DISCUSSION AND RECOMMENDATIONS

5.1 Designated Sites and Habitat Assessment

Habitats inside the survey area (within 300 m of the four main watercourses) comprise a mixture of farmland for grazing livestock and semi-natural and plantation broadleaved and coniferous woodland. The survey area centres on the town of Ballater, with residential properties and associated parking, road access, small parkland patches and gardens with scattered trees.

The habitats present within the survey area are deemed to be of relatively high ecological value in their own right but also as part of the wider environs:

- the River Dee is designated as an SAC with the qualifying species of Atlantic salmon, otter and FWPM;
- four other SACs have been identified within 5 km of the survey area;
- the Cairngorm Massif SPA, located approximately 1 km to the southeast and southwest of the survey area, has golden eagles as the qualifying species;
- two other SPAs were identified within 3 km of the survey area. The Muir of Dinnet SPA is designated for breeding birds and Glen Tanar is designated for Capercaillie, hen harrier, osprey and Scottish crossbill (all breeding);
- the Craighendarroch SSSI is located on the north bank of the River Dee and is designated for upland oak woodland; and
- the survey area is located within the Cairngorms National Park.

Given the possible importance of the habitats in the survey area for foraging and breeding habitat for qualifying species of Natura sites (SACs, SPAs and / or Ramsar sites) a HRA is likely to be required to ensure any plans do not have a negative impact on the favourable conservation status of any protected areas. It should be noted that HRA can be a lengthy process; therefore it is recommended that as much data-gathering and further discussion with SEPA and SNH takes place as early as possible.

There is the potential for the marshy grassland at TN37 (Figure 2.16) to be a Groundwater Dependent Terrestrial Ecosystem (GWDTE), however it has not been confirmed if the possible spring in this location is purely groundwater fed. Furthermore, the habitat in this area has not been mapped to NVC level. If any of the options considered for the scheme have the potential to impact on this location, it is recommended that an NVC is undertaken at TN37. These investigations should also be informed by hydrology/geological surveys to ascertain if the feature is a GWDTE and to assess likely impacts and recommendations.

5.2 Protected Species

While no evidence of protected species was found during the survey, habitat with the potential to support otter, water vole, pine marten, wild cat, badger, red squirrel, bats, reptiles, FWPM, fish and breeding birds was identified. The following sections discuss these species in turn and make recommendations for further surveys, as required. The potential for the site to support great crested newts is considered to be negligible and they are not considered further within this report.

Otter

The desk study results indicate that otters are present within the survey area and are likely to be utilising most of the watercourses within the catchment. Otters are a qualifying species of the River Dee SAC. As such, it is recommended that dedicated surveys for the presence and activity of otters are carried out prior to any works taking place. Furthermore, consultation with SNH is advised to determine if an Appropriate

Assessment, as part of the HRA process, is required for the species due to the location of the works within an SAC.

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

Pine Marten and Wild Cat

As previously discussed pine martin and wild cat field signs are difficult to distinguish from mustelid field signs. Given the suitability for the habitat to support both species it would be recommended that prior to work commencing, targeted surveys are carried out for both species and an impact assessment carried out for the proposed work on each species.

Badger

Additional targeted surveys are recommended prior to any work commencing in habitat suitable for supporting badgers. Although badger surveys can be carried out at any time of year it is recommended that surveys take place in early spring or late autumn when badgers are active but the vegetation is low enough that badger field signs are not obscured.

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

Water Vole

Although the potential for finding water vole in the survey area is deemed to be low, due to the lack of extensive suitable habitat and the potential presence of mink, their presence cannot be ruled out. Therefore it would be recommended that dedicated surveys for the presence of water voles are carried out prior to any works taking place.

Red Squirrel

Additional surveys are recommended to determine the location of any red squirrels dreys in the favourable woodland habitat across the survey area. If squirrel dreys are identified an exclusion zone of 50 m during the breeding season (February to September inclusive), should be instituted until the current status of the drey can be ascertained. Presence absence surveys should be carried out as per current guidance. Where squirrel dreys are not clearly visible from the ground and the ecologist needs to establish whether they are being used for breeding (i.e. non-invasive methods cannot be used), camera traps mounted on adjacent trees may be employed (under survey licence from SNH) as an alternative in suitable weather conditions and as per the current guidance. Where the above survey methods are inappropriate, inspection of squirrel dreys may be undertaken by tree climbing or cherry picker and endoscopic inspection (under survey Licence from SNH) to confirm the presence/absence of young squirrels.

Reptiles

Suitable habitat and a number of potential refugia and hibernacula for reptiles species was identified in the survey area. The desk study also identified the presence of common lizard, slow worm and adder. Given the likely presence of these species it is advised that if any work planned is to directly impact the potential refugia hibernacula features for reptiles that these should be dismantled under the supervision of a suitably experienced ecologist and relocated and recreated in an appropriate area in the vicinity of suitable habitat following the guidance provided in Edgar *et al.* (2010).

Bat Roost Potential

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

Fish and Fresh Water Pearl Mussel

Fish (Atlantic salmon) and FWPM are qualifying features of the River Dee SAC. The fish habitat survey information provided by the Dee Fisheries Trust for the survey area was collected before Storm Frank, i.e. before the winter of 2015/16. However, there is spawning and nursery habitat for salmonids throughout the survey area, on the main stem of the River Dee, the River Muick and the River Gairn. SEPA usually insist that quantitative electrofishing surveys are carried out if the information is to inform a CAR licence however, this is not an option for the main stem of the River Dee, or any other large watercourses (e.g. lower main stems of the Gairn and Muick tributaries) due to the width and depth of the rivers. A survey strategy for fish should be agreed with the consultees as an HRA for Atlantic salmon may be required due to the location of the site within the River Dee SAC.

FWPM are similarly listed as qualifying species of the River Dee SAC. As such, it is recommended that a survey strategy for FWPM across the survey area is prepared and discussed with SNH to identify where surveys are required. Potential FWPM habitat is available across the survey area and there is existing data available. An HRA for FWPM is likely to be required and should be discussed with SNH. Survey effort should be targeted to improve the understanding of FWPM populations across the catchment following the recent habitat change resulting from Storm Frank and to inform the Options Appraisal process, and should be robust enough to inform the HRA.

Measures to avoid disturbance and mortality of these species should be incorporated into the design. Minimising sediment release during the works will be key to avoid negative impacts on existing populations of both FWPM and Atlantic salmon. Similarly consideration of the timing of works is required to minimise sensitive periods in the life cycle of Atlantic salmon. Indirect impacts resulting from changes to the floodplain, such as hydrological changes to the river which may affect habitat need to be carefully considered.

Birds

If works are to be undertaken during the bird breeding season (generally considered to extend between March and August inclusive), breeding bird checks may be required

within the survey boundary prior to works commencing. If nests are identified and deemed to be active, a temporary pause of works, or a watching brief to identify species and monitor for any signs of disturbance during pipe installation works, may be required. Some bird species afford extra protection under Schedule 1 of the Wildlife and Countryside Act (1981) and would require an increased buffer area. It is not considered that works are likely to affect the conservation value of nearby SPAs (such as the Muir of Dinnet (which is also a Ramsar site), Cairngorms Massif and Glen Tanar SPAs), though this should be discussed with SNH to scope out the requirement for an HRA.

Invasive Non-Native Species

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

In Scotland the main legislation relating to the control of non-native species is the Wildlife and Countryside Act 1981 as amended by the Wildlife and Natural Environment (Scotland) Act 2011. Under this legislation it is the landowner or land manager's responsibility to prevent the planting or otherwise causing to grow in the wild of any non-native plant, or releasing of any non-native animal or spread of any non-native species out-with its native range. Infestations of *Rhododendron ponticum* can be controlled by cutting and burning or chemical spraying of stems. Contractors should follow guidance issued by the Forestry Commission³.

5.3 Summary of Recommendations

Species-specific, Phase 2 surveys are recommended for otter, fish (particularly Atlantic salmon) and freshwater pearl mussel through consultation with SNH. Data could then be used to inform any Habitats Regulations Appraisal which may be necessary due to the location of the scheme within the River Dee SAC. The proximity of other Natura sites should also be carefully considered during the options appraisal process. It is recommended that prior to carrying out any construction work, targeted surveys are undertaken for all protected species identified to be potentially present within the survey area.

³ [https://www.forestry.gov.uk/PDF/fcpg017.pdf/\\$FILE/fcpg017.pdf](https://www.forestry.gov.uk/PDF/fcpg017.pdf/$FILE/fcpg017.pdf)

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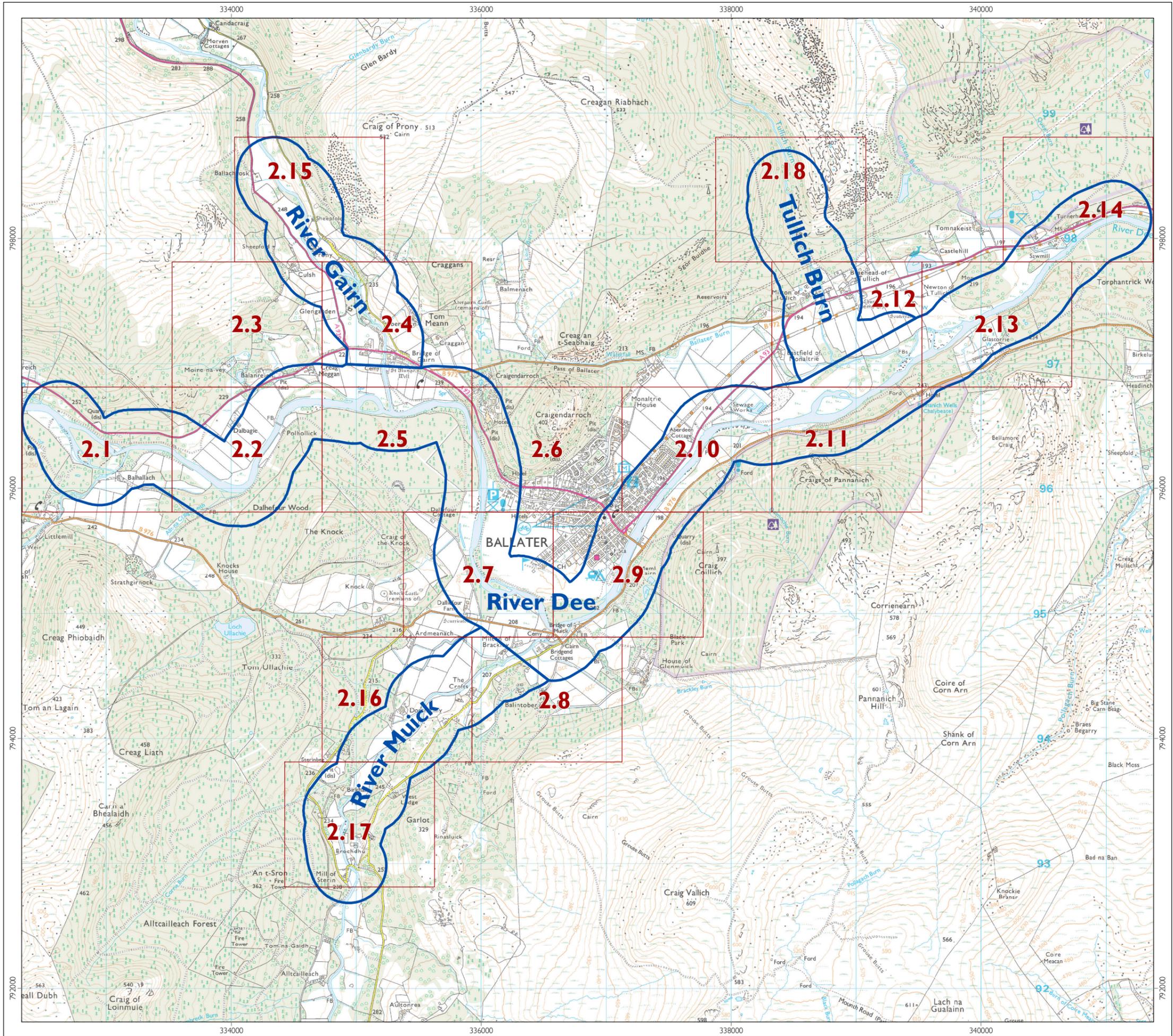
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GLOSSARY

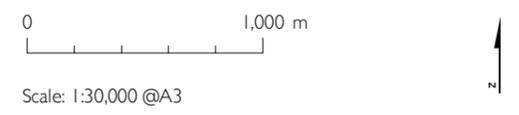
ARG UK - Amphibian and Reptile Groups of UK
CIEEM - Chartered Institute of Ecology and Environmental Management
FPS - Flood Protection Scheme
FWPM - Freshwater pearl mussel
GPS – Global Positioning System
GWDTE - Groundwater Dependent Terrestrial Ecosystem
HRA - Habitats Regulations Appraisal
HSA - Habitat Suitability Assessment
HSI - Habitat Suitability Index
INNS - Invasive non-native plant and animal species
JNCC - Joint Nature Conservation Committee's
NESBReC - North East Scotland Biological Records Centre
NNS - National Nature Reserves
PEA - Preliminary Ecological Appraisal
Ramsar site - Internationally Important Wetland
RPS - RPS Consulting Services Ltd
SAC - Special Area of Conservation
SEPA - Scottish Environment Protection Agency
SNH - Scottish Natural Heritage
SPA - Special Protection Areas
SSSI - Sites of Special Scientific Interest
TN - Target Note
UK BAP - UK Biodiversity Action Plan

FIGURES

Figure 1 – Site Location and Figure Index
Figure 2.1 – 2.18 – Field Survey Results



Legend
[Blue outline] Survey area
[Red outline] Figure index



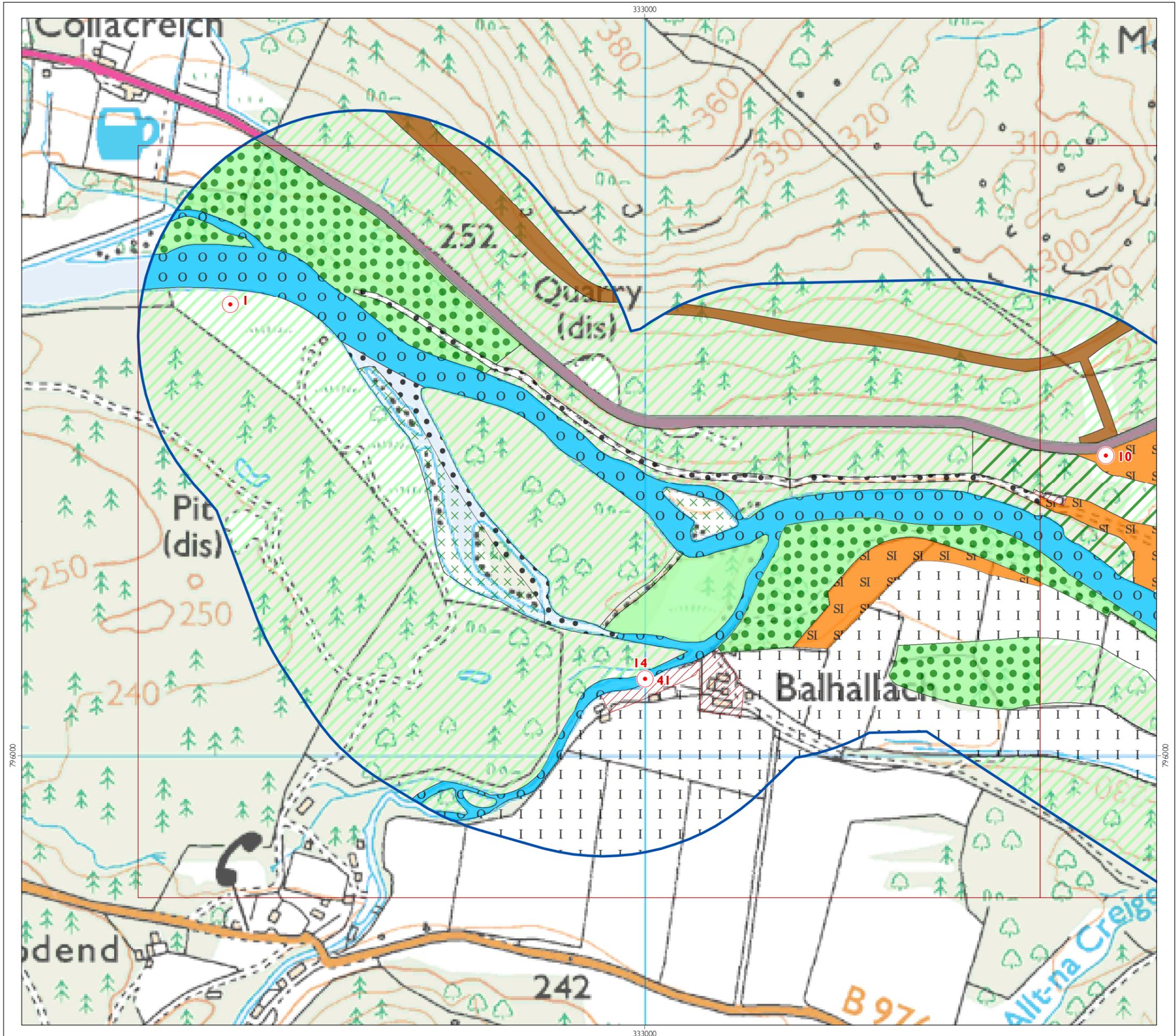
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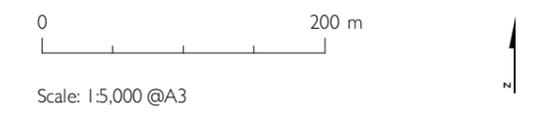
Site Location and Figure Index

Figure 1

Ballater Flood Protection Scheme,
Preliminary Ecological Appraisal



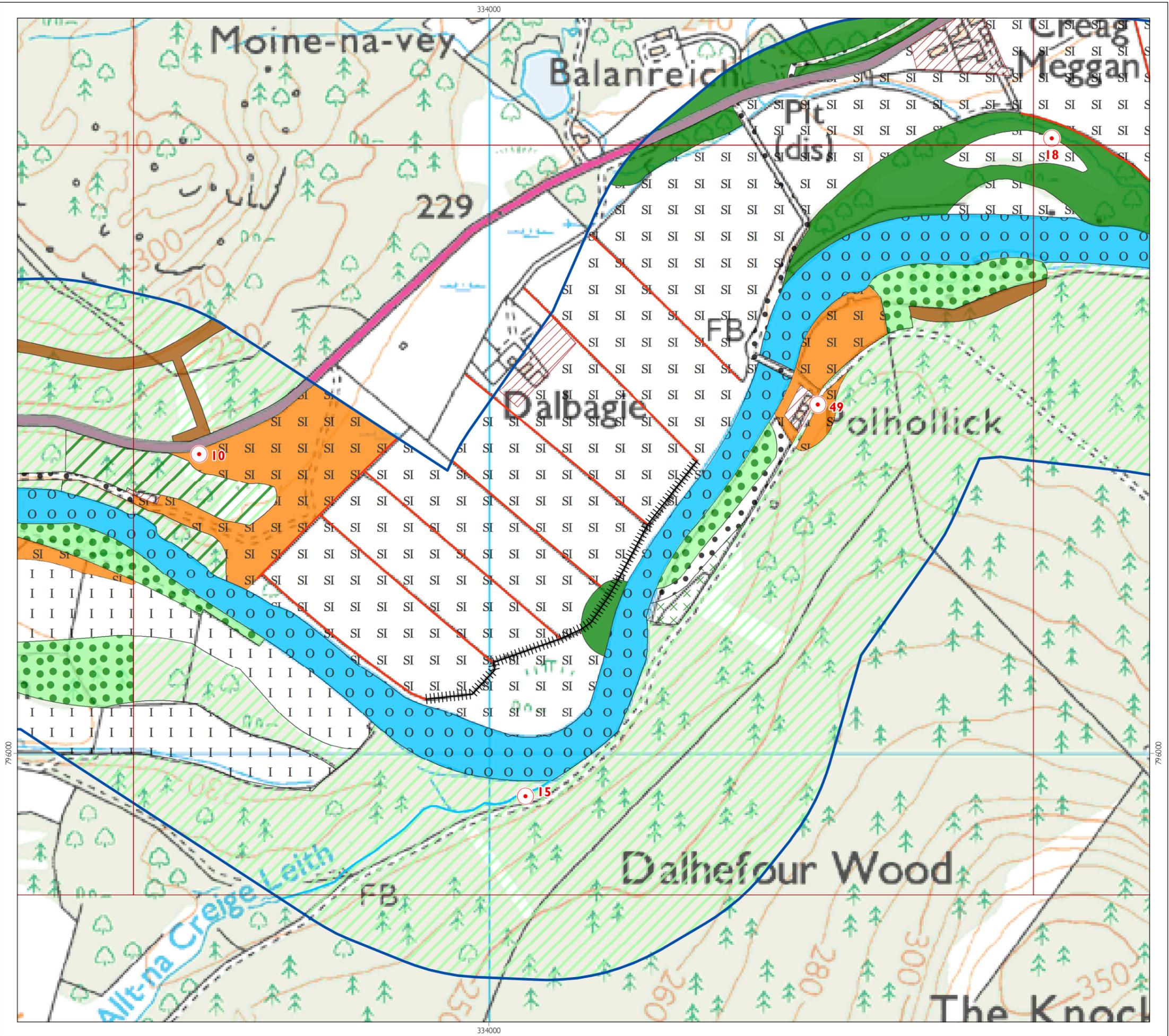
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 - A1.2.2 - Coniferous woodland - plantation
 - A1.3.1 - Mixed woodland - semi-natural
 - A1.3.2 - Mixed woodland - plantation
 - A2.2 - Scrub - scattered
 - B2.2 - Neutral grassland - semi-improved
 - B4 - Improved grassland
 - B6 - Poor semi-improved grassland
 - C1.1 - Bracken - continuous
 - G2.3 - Running water - oligotrophic
 - J4 - Bare ground
 - Not accessed land
 - Road
 - Target note



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Field Survey Results
 Figure 2.1
 Ballater Flood Protection Scheme,
 Preliminary Ecological Appraisal



Legend

- Survey area
- Figure index
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.2 - Coniferous woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.2 - Scrub - scattered
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- G2.3 - Running water - oligotrophic
- J4 - Bare ground
- Not accessed land
- Road
- G2 - Running water
- J2.4 - Fence
- J2.5 - Wall
- Target note



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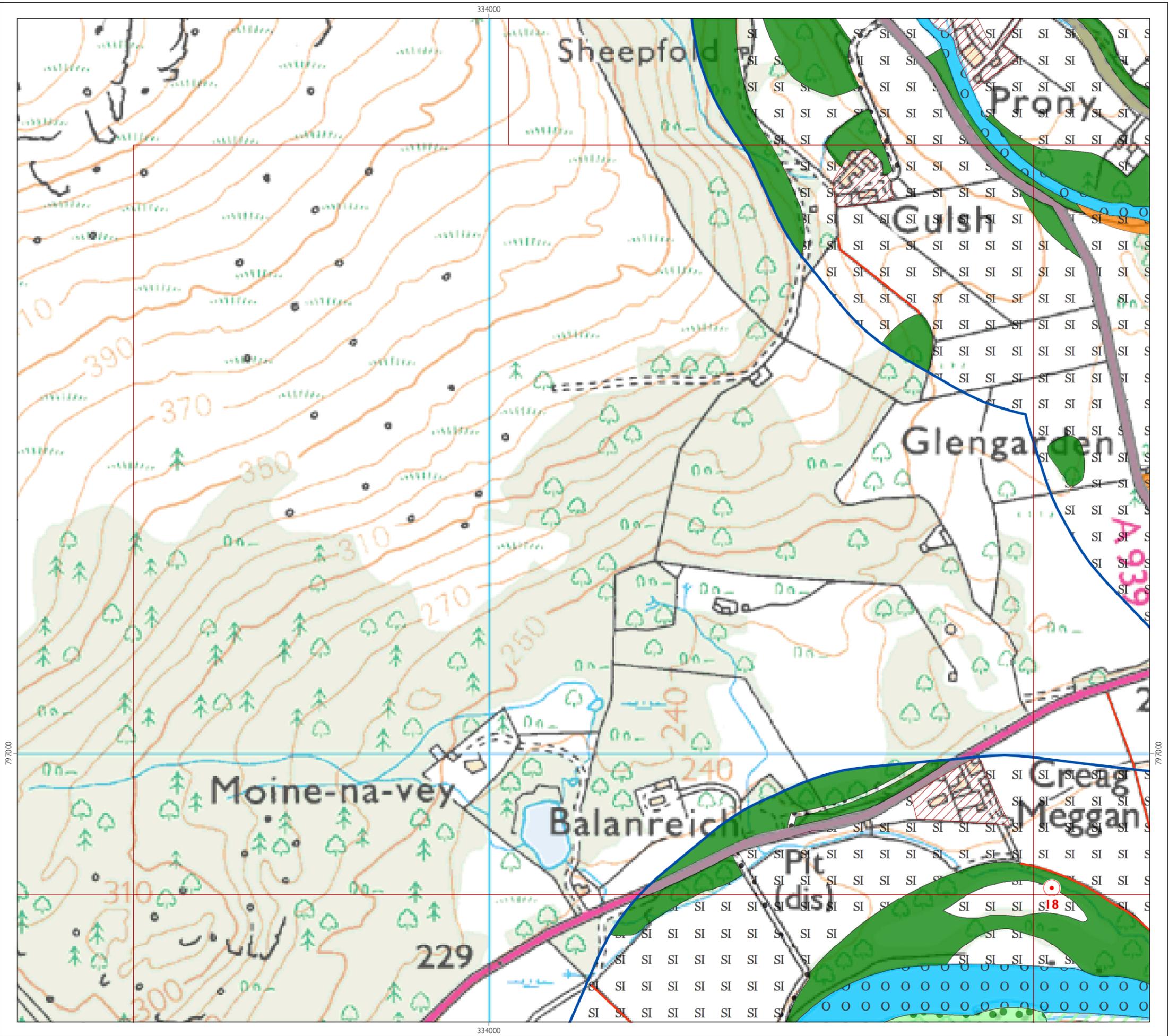
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Field Survey Results

Figure 2.2

Ballater Flood Protection Scheme,
 Preliminary Ecological Appraisal



Legend

- Survey area
- Figure index
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.2 - Coniferous woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- SI B2.2 - Neutral grassland - semi-improved
- B6 - Poor semi-improved grassland
- G2.3 - Running water - oligotrophic
- J4 - Bare ground
- Not accessed land
- Road
- J2.5 - Wall
- Target note



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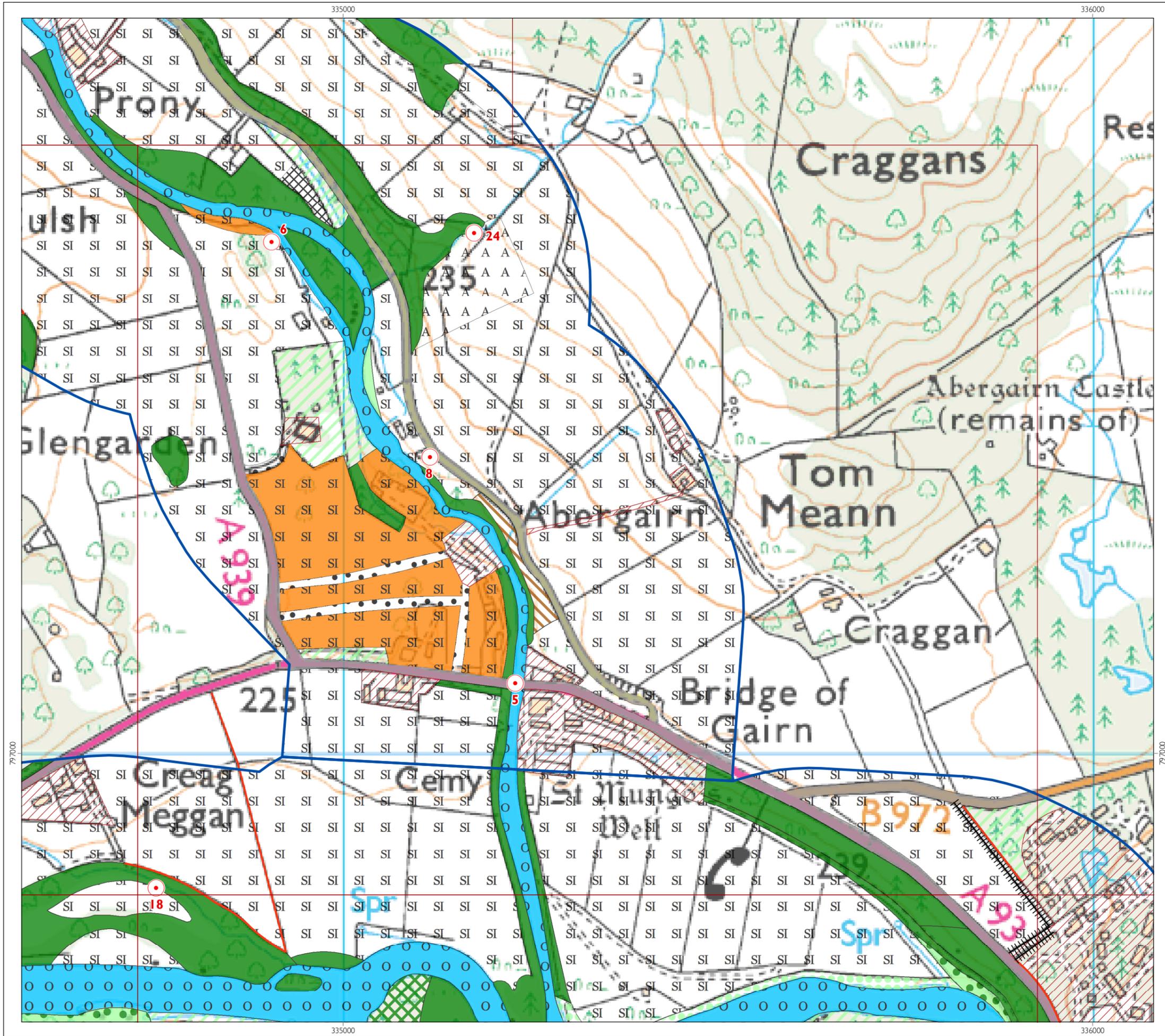
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Field Survey Results

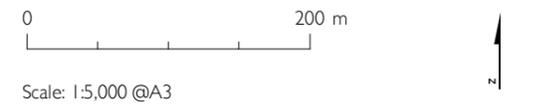
Figure 2.3

Ballater Flood Protection Scheme,
Preliminary Ecological Appraisal



Legend

- Survey area
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- A1.2.1 - Coniferous woodland - semi-natural
- A1.2.2 - Coniferous woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A2.1 - Scrub - dense/continuous
- A3.2 - Coniferous Parkland/scattered trees
- B2.2 - Neutral grassland - semi-improved
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- G2.3 - Running water - oligotrophic
- J1.1 - Cultivated/disturbed land - arable
- J3.4 - Caravan site
- J4 - Bare ground
- Not accessed land
- Road
- J2.4 - Fence
- J2.5 - Wall
- Target note



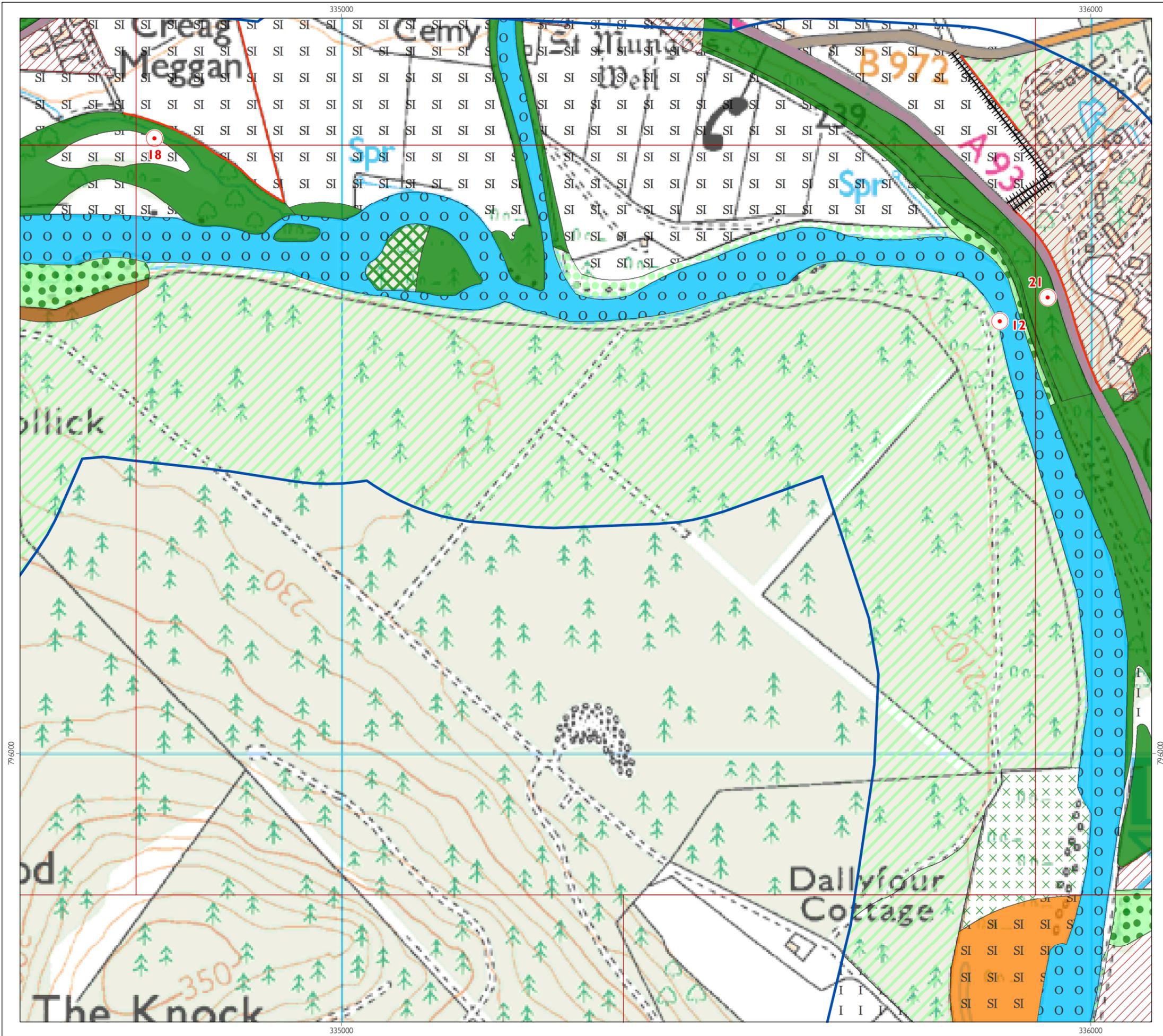
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Field Survey Results

Figure 2.4

Ballater Flood Protection Scheme,
Preliminary Ecological Appraisal



Legend

- Survey area
- Figure index
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.2 - Coniferous woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.2 - Coniferous Parkland/scattered trees
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- G2.3 - Running water - oligotrophic
- J4 - Bare ground
- Not accessed land
- Road
- J2.4 - Fence
- J2.5 - Wall
- Target note



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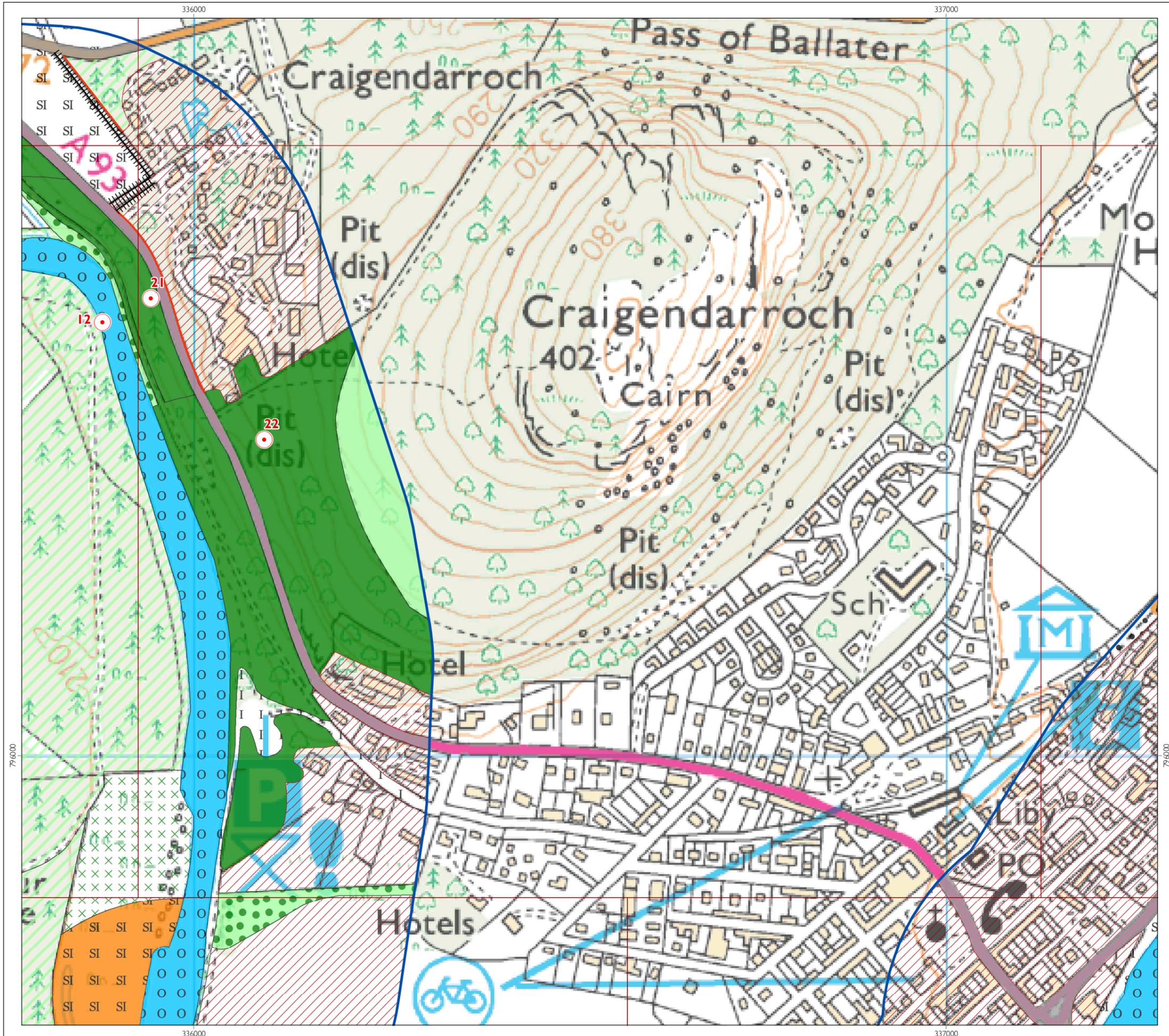
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Field Survey Results

Figure 2.5

Ballater Flood Protection Scheme,
Preliminary Ecological Appraisal



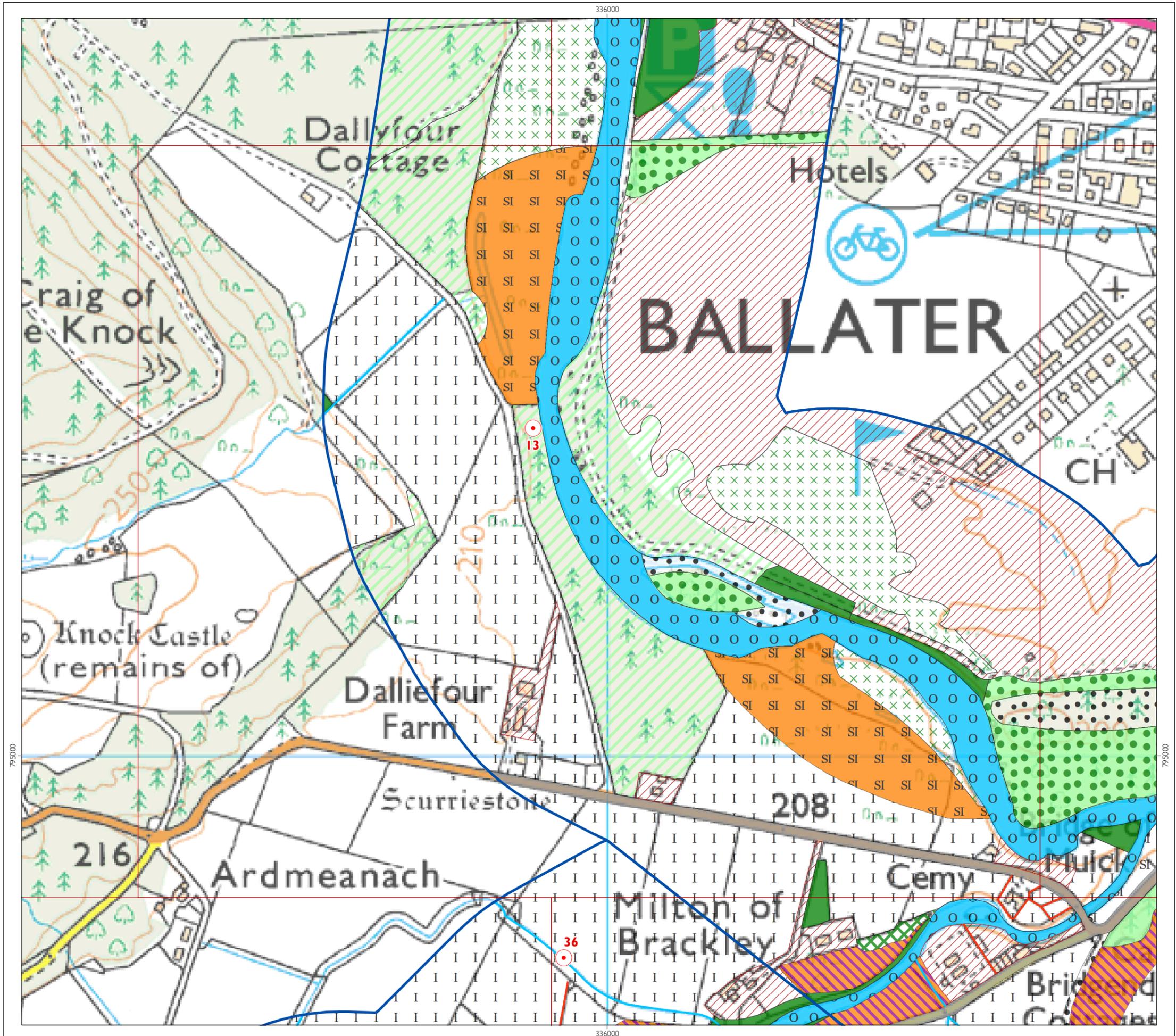
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 - A1.3.1 - Mixed woodland - semi-natural
 - A2.2 - Scrub - scattered
 - A3.2 - Coniferous Parkland/scattered trees
 - B2.2 - Neutral grassland - semi-improved
 - B4 - Improved grassland
 - B6 - Poor semi-improved grassland
 - G2.3 - Running water - oligotrophic
 - J4 - Bare ground
 - Not accessed land
 - Road
 - J2.4 - Fence
 - J2.5 - Wall
 - Target note



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Field Survey Results
Figure 2.6
Ballater Flood Protection Scheme,
Preliminary Ecological Appraisal



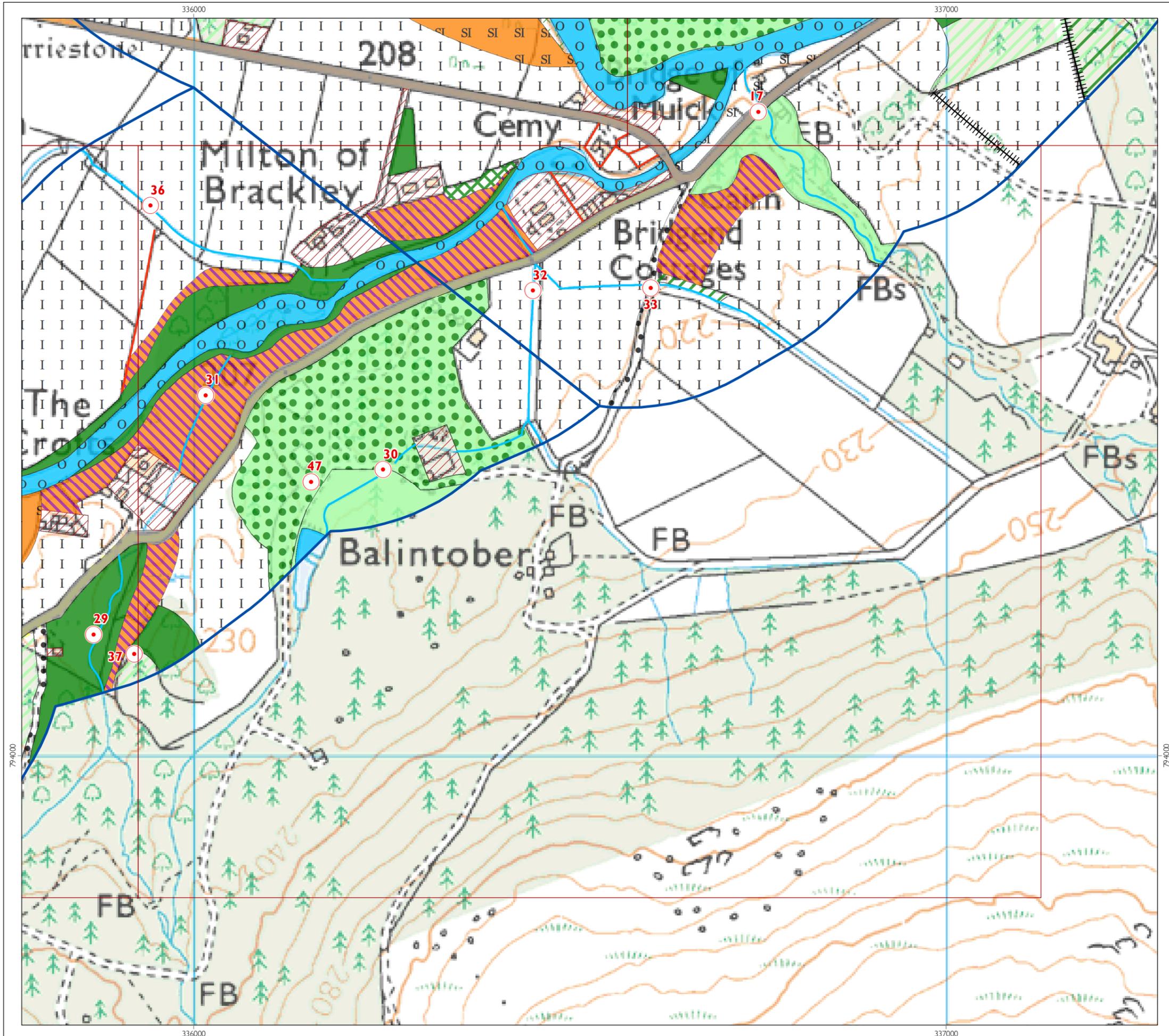
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 - A1.2.2 - Coniferous woodland - plantation
 - A1.3.1 - Mixed woodland - semi-natural
 - A2.1 - Scrub - dense/continuous
 - A2.2 - Scrub - scattered
 - B2.2 - Neutral grassland - semi-improved
 - B4 - Improved grassland
 - B5 - Marsh/marshy grassland
 - B6 - Poor semi-improved grassland
 - G2.3 - Running water - oligotrophic
 - J4 - Bare ground
 - Not accessed land
 - Road
 - G2 - Running water
 - J2.5 - Wall
 - Target note



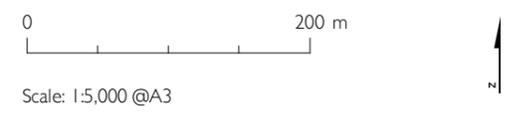
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Field Survey Results
Figure 2.7
Ballater Flood Protection Scheme,
Preliminary Ecological Appraisal



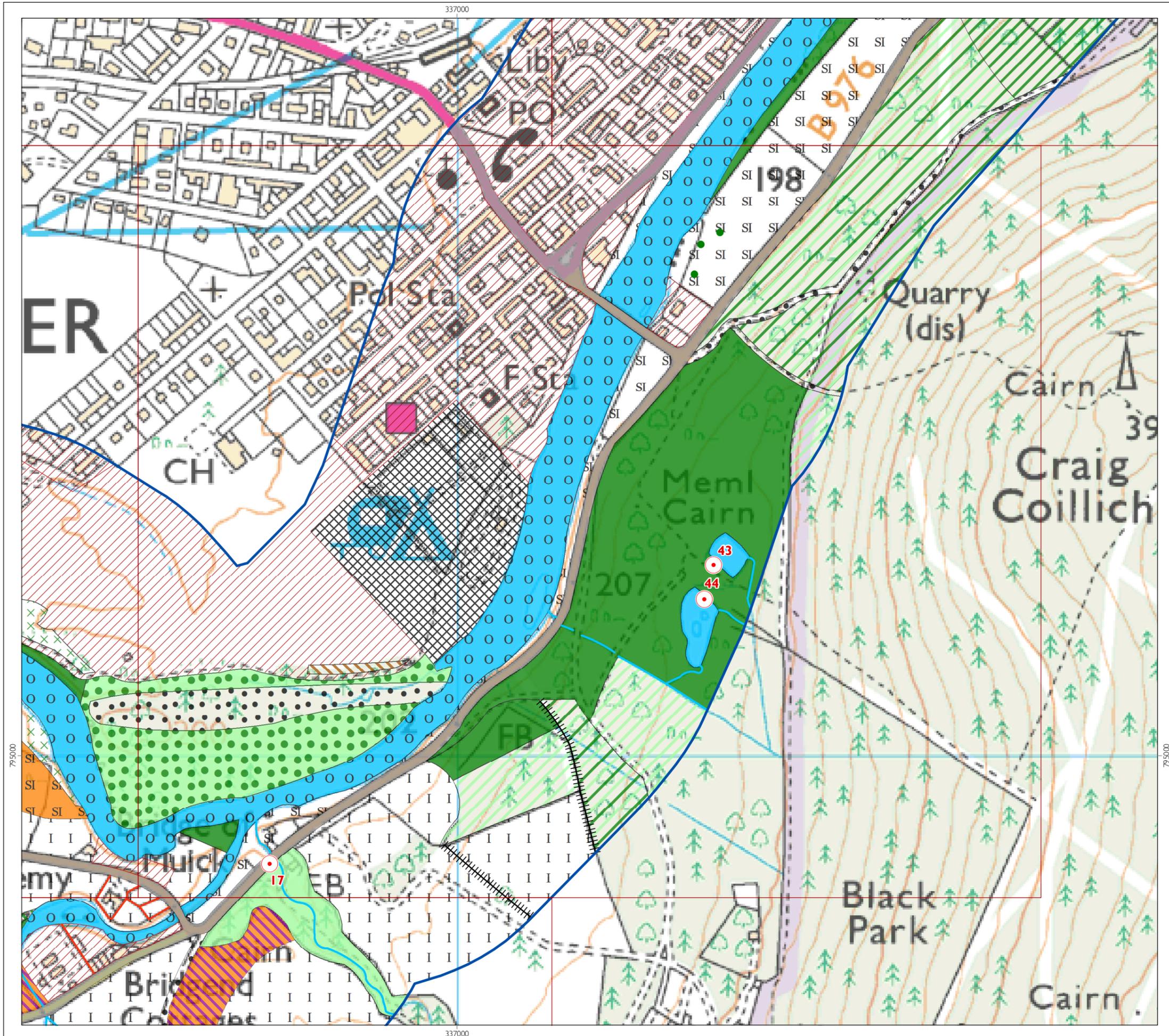
- Legend
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 - Figure index
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 - A1.1.2 - Broadleaved woodland - plantation
 - A1.2.1 - Coniferous woodland - semi-natural
 - A1.2.2 - Coniferous woodland - plantation
 - A1.3.1 - Mixed woodland - semi-natural
 - A1.3.2 - Mixed woodland - plantation
 - A2.1 - Scrub - dense/continuous
 - A2.2 - Scrub - scattered
 - B2.2 - Neutral grassland - semi-improved
 - B4 - Improved grassland
 - B5 - Marsh/marshy grassland
 - B6 - Poor semi-improved grassland
 - G1 - Standing water
 - G2.3 - Running water - oligotrophic
 - J4 - Bare ground
 - Not accessed land
 - Road
 - G2 - Running water
 - J2.4 - Fence
 - J2.5 - Wall
 - Target note



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Field Survey Results
Figure 2.8
Ballater Flood Protection Scheme,
Preliminary Ecological Appraisal



Legend

- Survey area
- Figure index
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.2.1 - Coniferous woodland - semi-natural
- A1.2.2 - Coniferous woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- G1 - Standing water
- G2.3 - Running water - oligotrophic
- J3.4 - Caravan site
- J4 - Bare ground
- Not accessed land
- Road
- G2 - Running water
- J2.4 - Fence
- J2.5 - Wall
- A3.1
- Target note

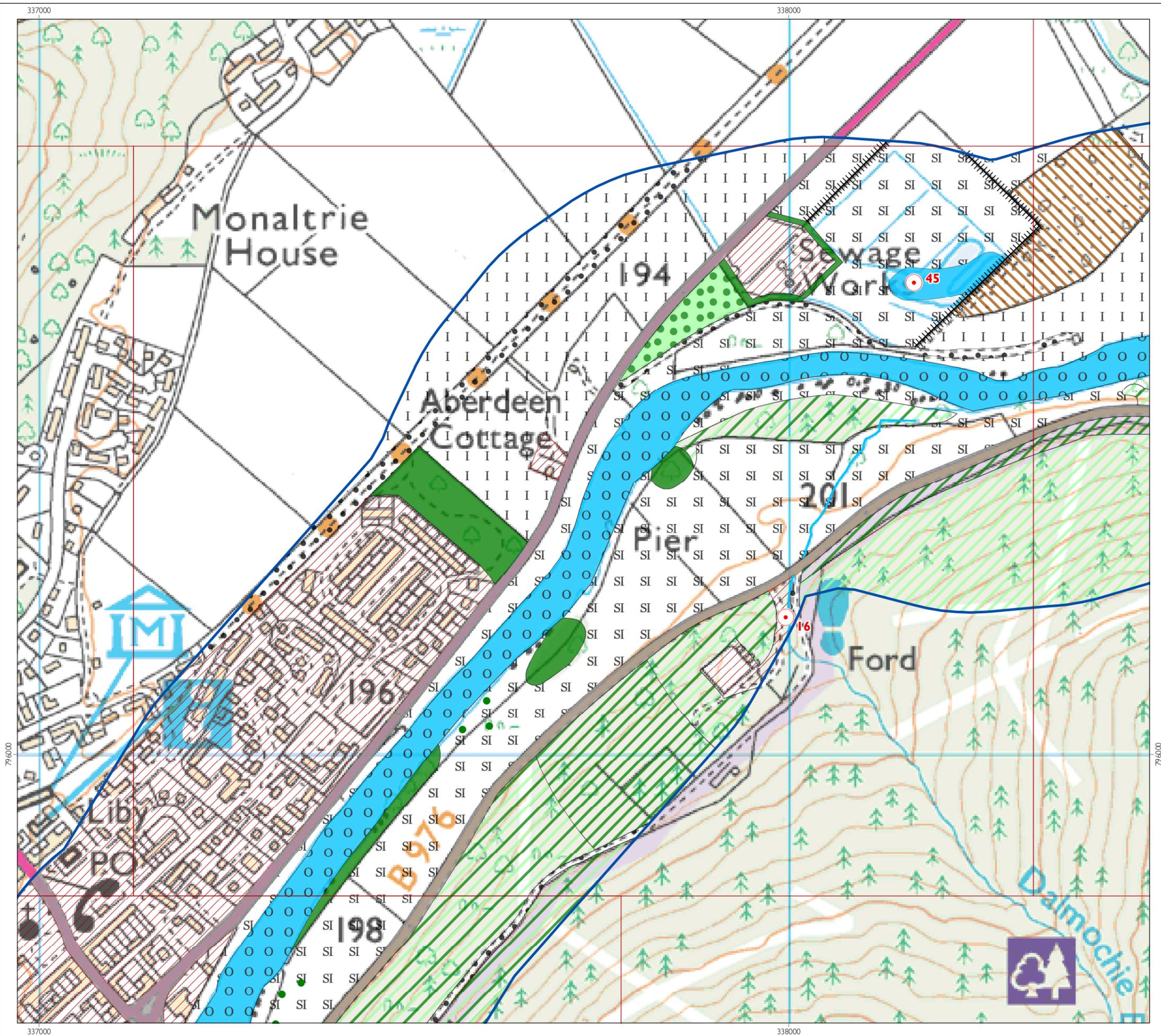
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Date: 01/02/2018 Job No: SEC8295 Rev: -
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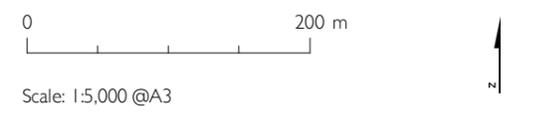
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Field Survey Results
 Figure 2.9
 Ballater Flood Protection Scheme,
 Preliminary Ecological Appraisal



Legend

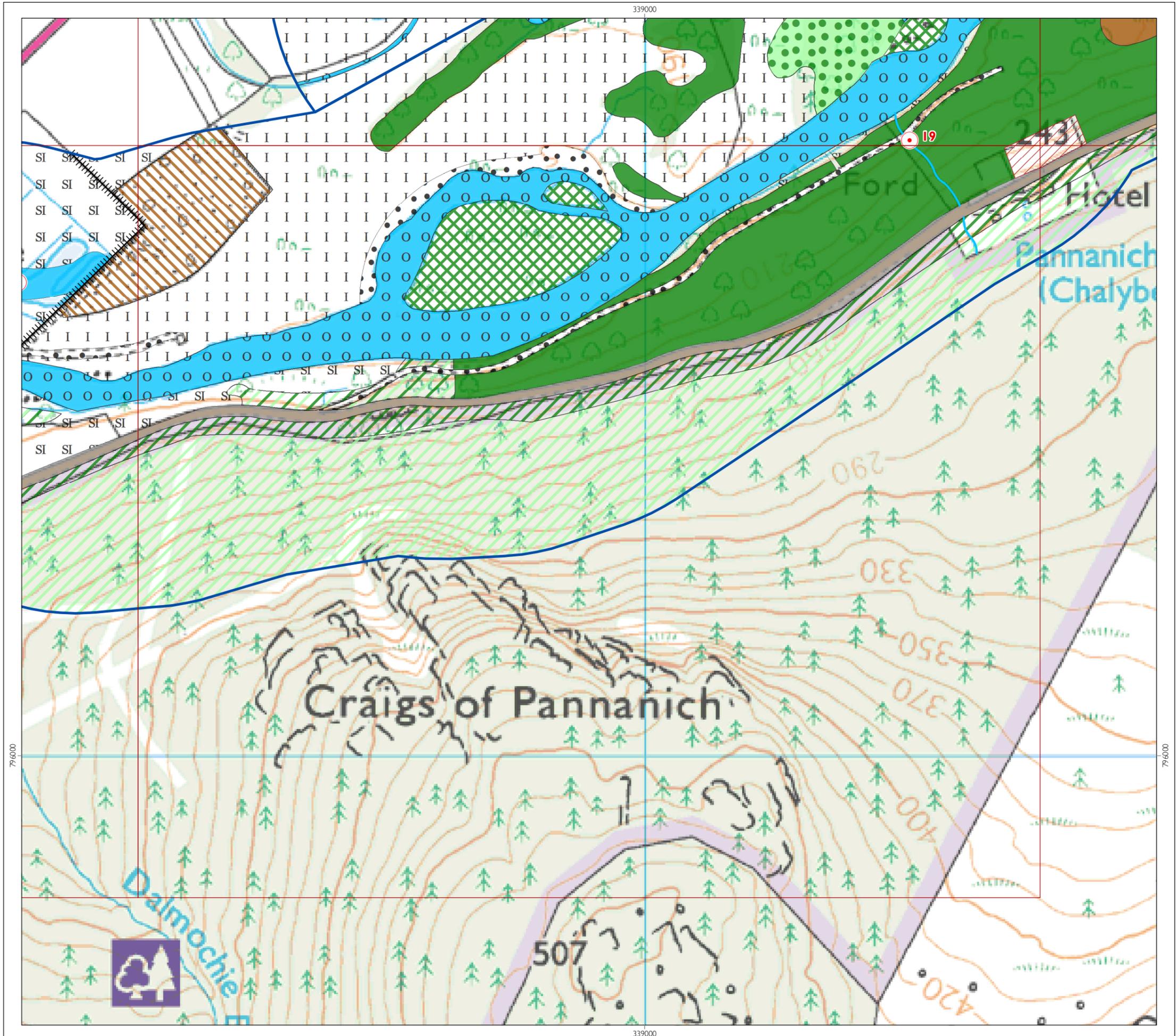
- Survey area
- Figure index
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.2.2 - Coniferous woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- B4 - Improved grassland
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- G1 - Standing water
- G2.3 - Running water - oligotrophic
- J4 - Bare ground
- Not accessed land
- Road
- G2 - Running water
- J2.4 - Fence
- A3.1
- Target note



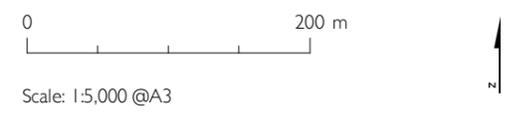
Date: 01/02/2018 Job No: SEC8295 Rev: -
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Field Survey Results
 Figure 2.10
 Ballater Flood Protection Scheme,
 Preliminary Ecological Appraisal



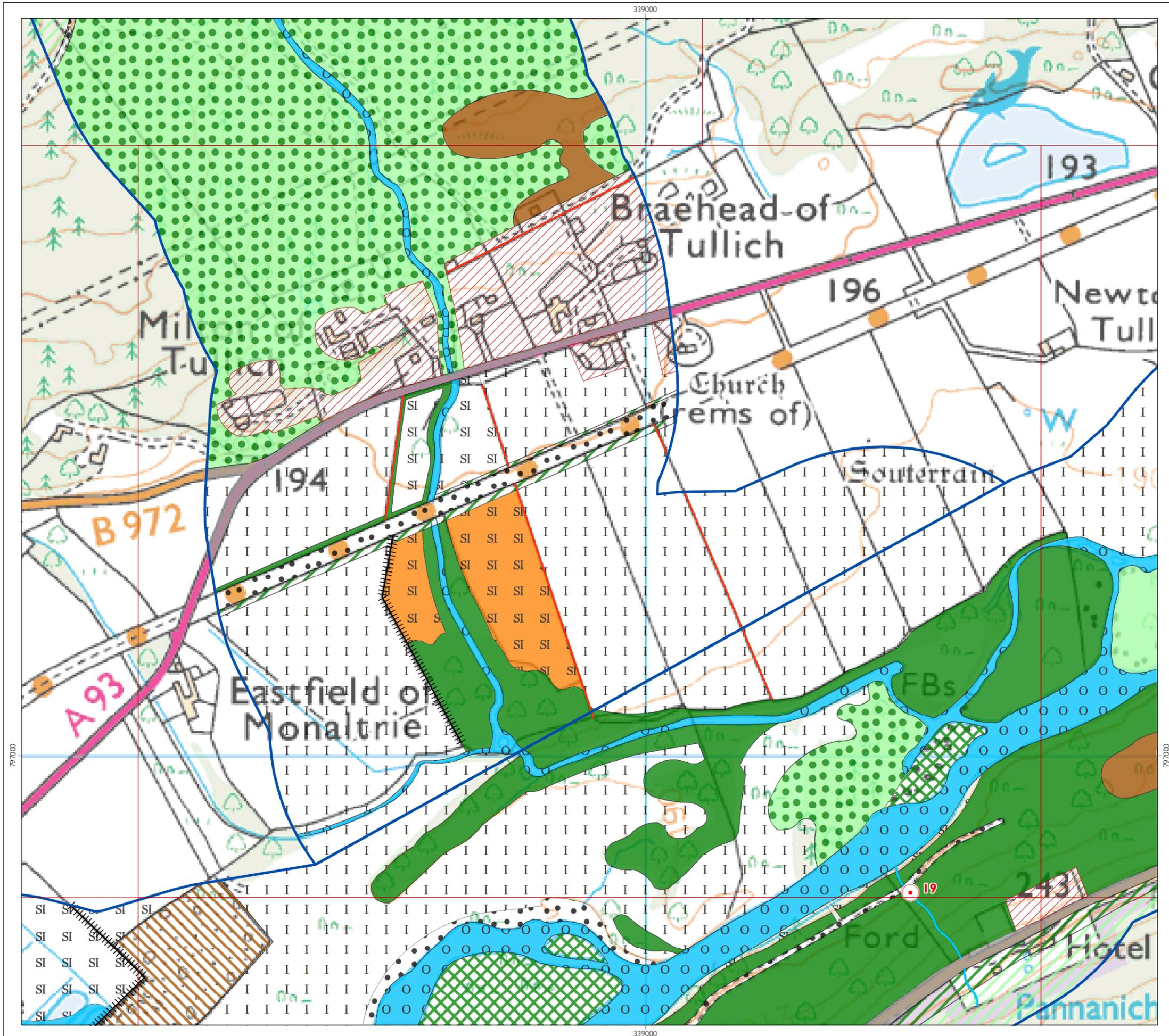
- Legend
- Survey area
 - Figure index
 - A1.1.1 - Broadleaved woodland - semi-natural
 - A1.1.2 - Broadleaved woodland - plantation
 - A1.2.2 - Coniferous woodland - plantation
 - A1.3.1 - Mixed woodland - semi-natural
 - A1.3.2 - Mixed woodland - plantation
 - A2.1 - Scrub - dense/continuous
 - B4 - Improved grassland
 - B6 - Poor semi-improved grassland
 - C1.1 - Bracken - continuous
 - C3.1 - Other tall herb and fern - ruderal
 - G1 - Standing water
 - G2.3 - Running water - oligotrophic
 - J4 - Bare ground
 - Not accessed land
 - Road
 - G2 - Running water
 - J2.4 - Fence
 - Target note



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Field Survey Results
 Figure 2.11
 Ballater Flood Protection Scheme,
 Preliminary Ecological Appraisal



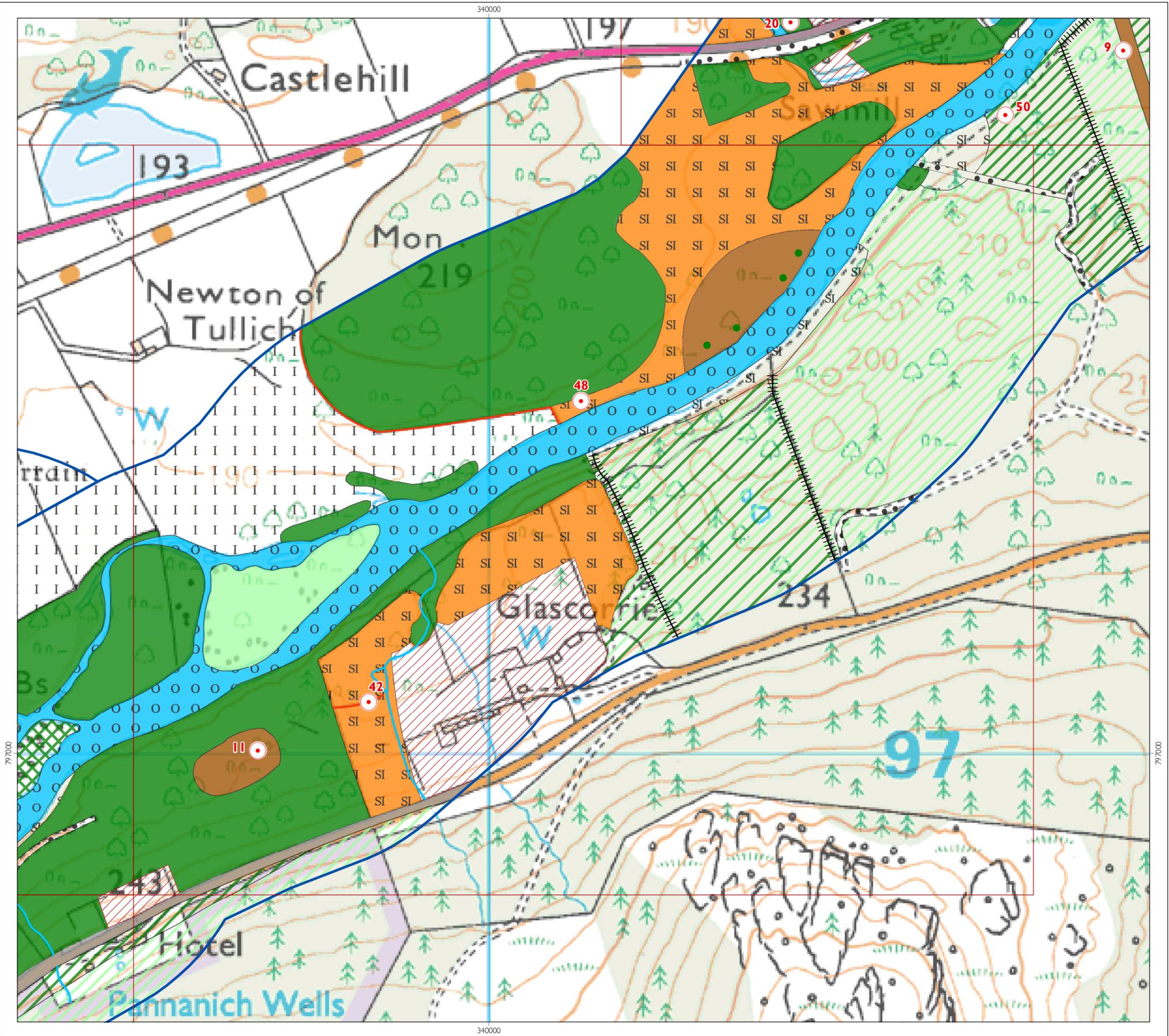
- Legend
- Survey area
 - Figure index
 - A1.1.1 - Broadleaved woodland - semi-natural
 - A1.1.2 - Broadleaved woodland - plantation
 - A1.2.1 - Coniferous woodland - semi-natural
 - A1.2.2 - Coniferous woodland - plantation
 - A1.3.1 - Mixed woodland - semi-natural
 - A2.1 - Scrub - dense/continuous
 - B2.2 - Neutral grassland - semi-improved
 - B4 - Improved grassland
 - B6 - Poor semi-improved grassland
 - C1.1 - Bracken - continuous
 - C3.1 - Other tall herb and fern - ruderal
 - G1 - Standing water
 - G2.3 - Running water - oligotrophic
 - J4 - Bare ground
 - Not accessed land
 - Road
 - G2 - Running water
 - J2.4 - Fence
 - J2.5 - Wall
 - Target note



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Field Survey Results
Figure 2.12
Ballater Flood Protection Scheme,
Preliminary Ecological Appraisal



Legend

- Survey area
- Figure index
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.2.1 - Coniferous woodland - semi-natural
- A1.2.2 - Coniferous woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B6 - Poor semi-improved grassland
- C1.1 - Bracken - continuous
- G2.3 - Running water - oligotrophic
- J4 - Bare ground
- Not accessed land
- Road
- G2 - Running water
- J2.4 - Fence
- J2.5 - Wall
- A3.1
- Target note



Scale: 1:5,000 @A3

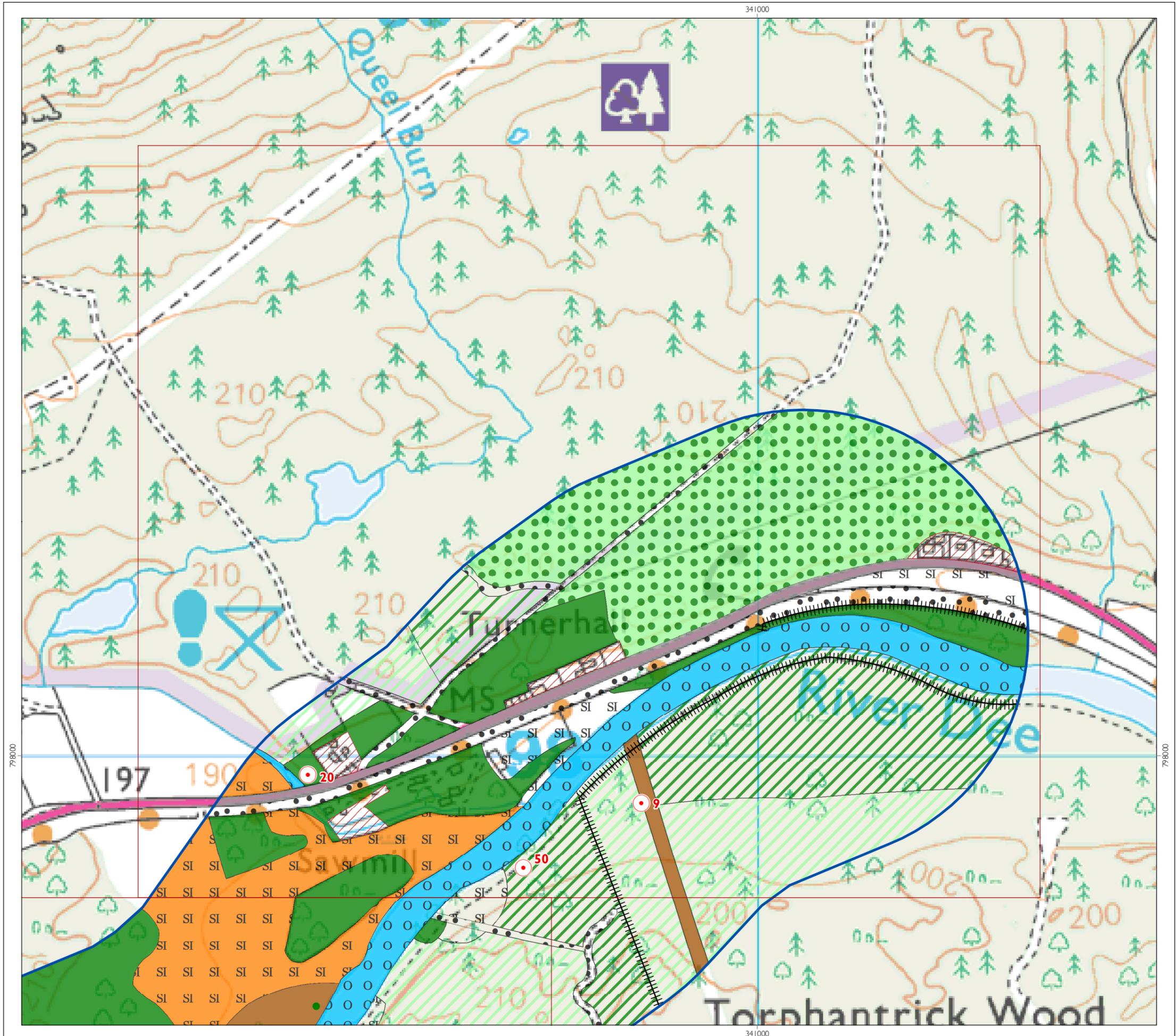
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Field Survey Results

Figure 2.13

Ballater Flood Protection Scheme,
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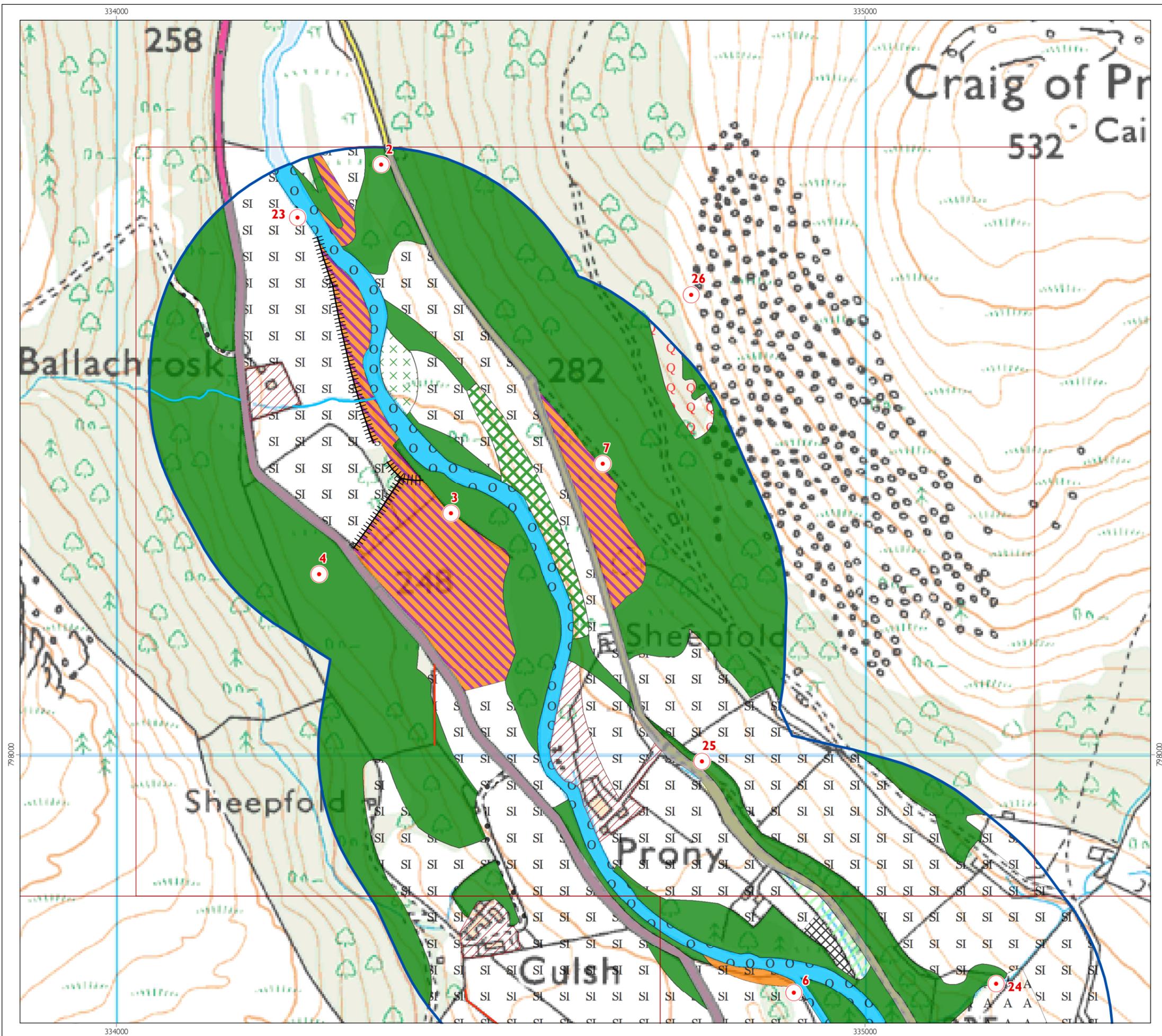
- Legend
- Survey area
 - Figure index
 - A1.1.1 - Broadleaved woodland - semi-natural
 - A1.1.2 - Broadleaved woodland - plantation
 - A1.2.2 - Coniferous woodland - plantation
 - A1.3.1 - Mixed woodland - semi-natural
 - A1.3.2 - Mixed woodland - plantation
 - B2.2 - Neutral grassland - semi-improved
 - B6 - Poor semi-improved grassland
 - C1.1 - Bracken - continuous
 - G2.3 - Running water - oligotrophic
 - J4 - Bare ground
 - Not accessed land
 - Road
 - J2.4 - Fence
 - A3.1
 - Target note



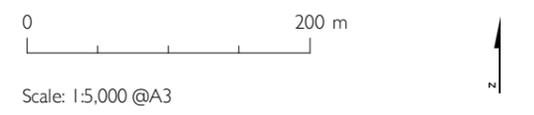
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Field Survey Results
Figure 2.14
Ballater Flood Protection Scheme,
Preliminary Ecological Appraisal



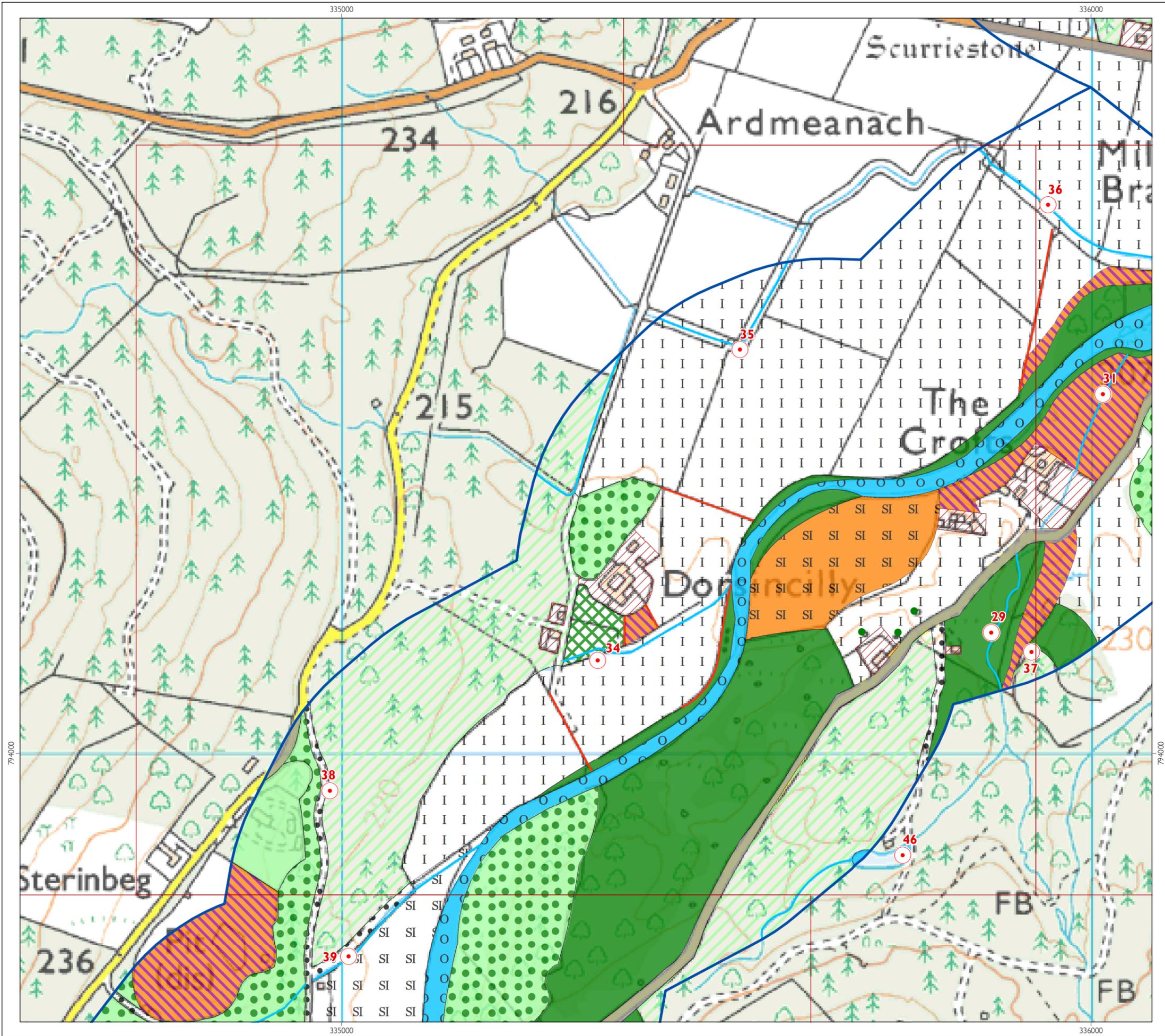
- Legend
- Survey area
 - Figure index
 - A1.1.1 - Broadleaved woodland - semi-natural
 - A1.2.2 - Coniferous woodland - plantation
 - A2.1 - Scrub - dense/continuous
 - A2.2 - Scrub - scattered
 - B2.2 - Neutral grassland - semi-improved
 - B5 - Marsh/marshy grassland
 - B6 - Poor semi-improved grassland
 - G2.3 - Running water - oligotrophic
 - I2.1 - Quarry
 - A A J1.1 - Cultivated/disturbed land - arable
 - J3.4 - Caravan site
 - J4 - Bare ground
 - Not accessed land
 - Road
 - G2 - Running water
 - J2.4 - Fence
 - J2.5 - Wall
 - Target note



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Field Survey Results
 Figure 2.15
 Ballater Flood Protection Scheme,
 Preliminary Ecological Appraisal



Legend

- Survey area
- Figure index
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.1 - Coniferous woodland - semi-natural
- A1.2.2 - Coniferous woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A2.1 - Scrub - dense/continuous
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- G1 - Standing water
- G2.3 - Running water - oligotrophic
- J4 - Bare ground
- Not accessed land
- Road
- G2 - Running water
- J2.5 - Wall
- A3.1
- Target note



Scale: 1:5,000 @A3

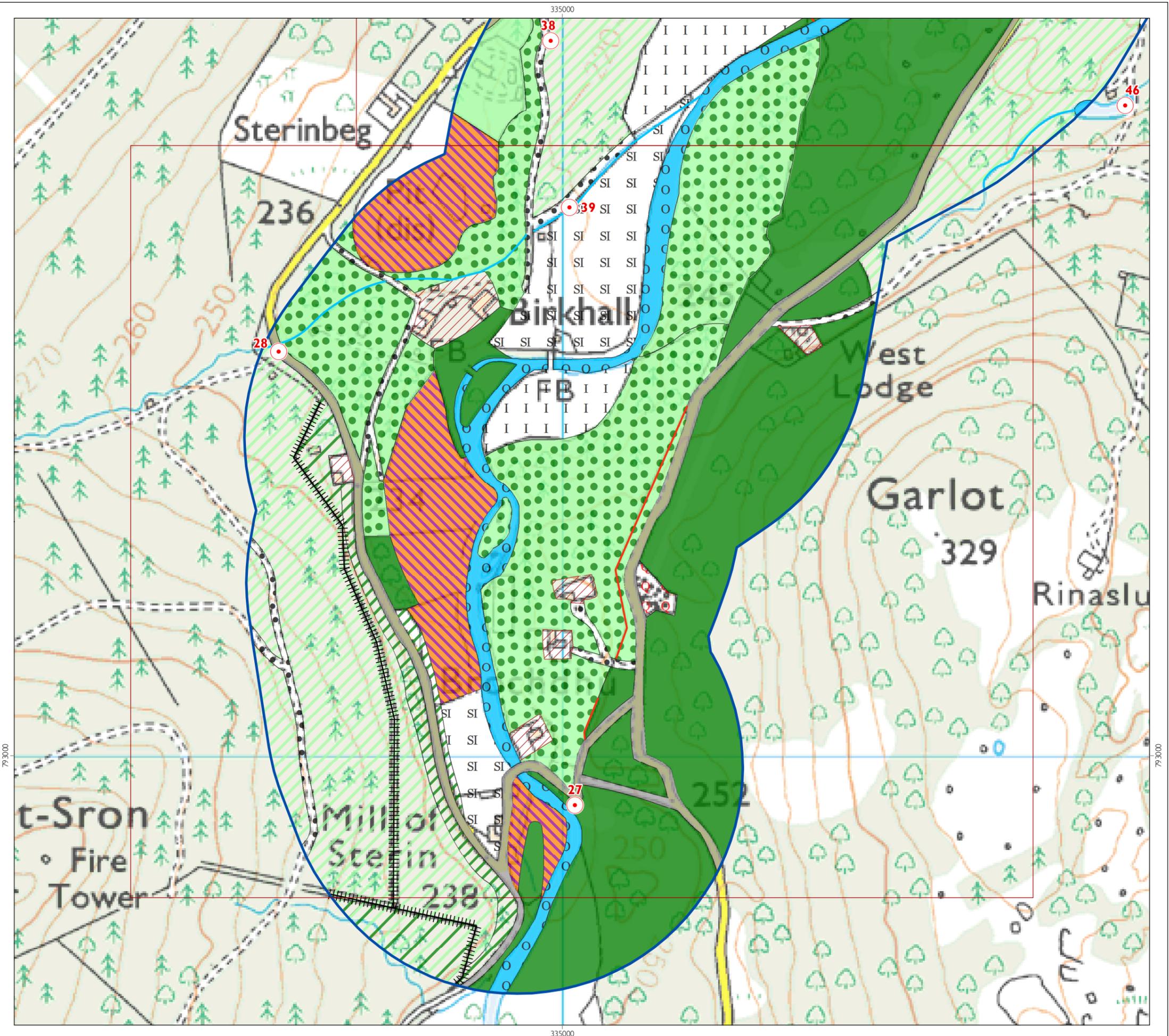
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Field Survey Results

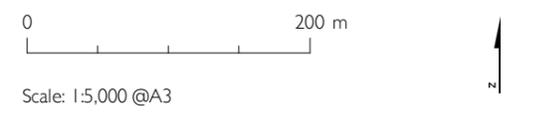
Figure 2.16

Ballater Flood Protection Scheme,
Preliminary Ecological Appraisal



Legend

- Survey area
- Figure index
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.2.1 - Coniferous woodland - semi-natural
- A1.2.2 - Coniferous woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- G1 - Standing water
- G2.3 - Running water - oligotrophic
- I2.1 - Quarry
- J4 - Bare ground
- Not accessed land
- Road
- G2 - Running water
- J2.4 - Fence
- J2.5 - Wall
- Target note



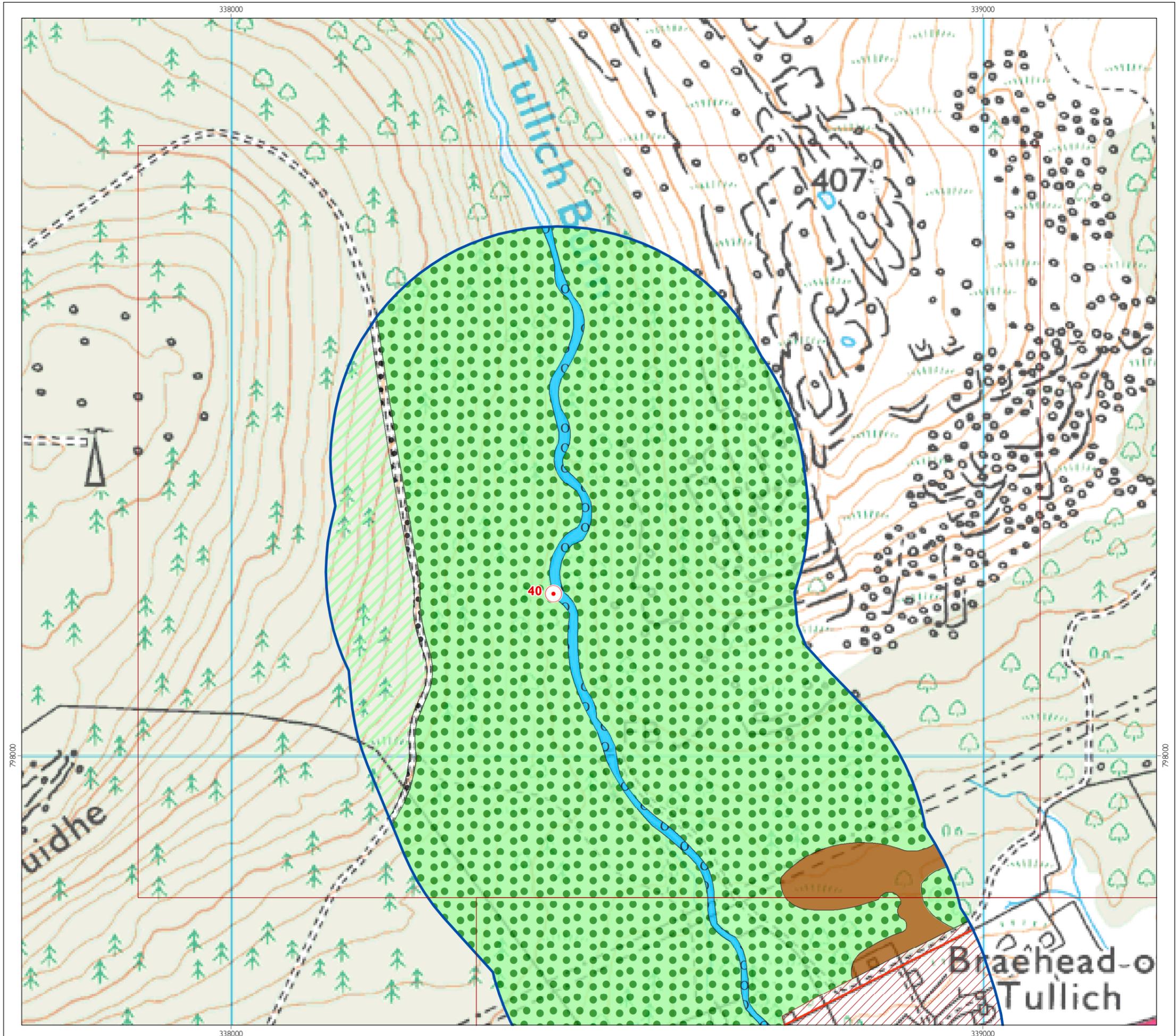
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Field Survey Results

Figure 2.17

Ballater Flood Protection Scheme,
 Preliminary Ecological Appraisal



- Legend
- Survey area
 - Figure index
 - A1.2.2 - Coniferous woodland - plantation
 - A1.3.1 - Mixed woodland - semi-natural
 - C1.1 - Bracken - continuous
 - G2.3 - Running water - oligotrophic
 - J4 - Bare ground
 - Not accessed land
 - J2.5 - Wall
 - Target note



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Field Survey Results
Figure 2.18
Ballater Flood Protection Scheme,
Preliminary Ecological Appraisal

APPENDIX 1 – TARGET NOTES

TN	Figure	Easting	Northing	Details	Photo Reference
01	2.1	332449	796600	Mature Scots pine plantation with ground cover of grasses and heather species. Extends up to the banks of the River Dee where the bank appears to be sandy with the river undercutting the bank. The river at this point appears to be fairly shallow with a rocky bottom and no obvious in-stream vegetation.	 <p>Photo 01 – South bank of the River Dee with conifer plantation to edge</p>
02	2.15	334354	798788	Woodland dominated by mature birch with ground cover of bracken, nettles, mosses and occasional buttercups. Grazing from sheep around area noted.	 <p>Photo 02 – Birch woodland</p>
03	2.15	334447	798322	Birch dominated semi-natural broadleaved woodland with a grazed grass understorey with occasional ragwort and patches of nettles and rush.	 <p>Photo 03 – Birch woodland with grazed understorey</p>
04	2.15	334271	798241	Birch dominated semi-natural broadleaved woodland with a dense bracken understorey on a slope. Potential badger sett building and foraging habitat. Frequent rabbit holes and droppings. Ground vegetation is frequently wet with occasional rushes haircap, feather and sphagnum mosses.	-

TN	Figure	Easting	Northing	Details	Photo Reference
05	2.4	335230	797093	Gairn Bridge. Riparian woodland with ash, sycamore, birch and alder found along the banks of the River Gairn.	 <p>Photo 04 – View from River Gairn bridge showing riparian woodland</p>
06	2.15	334905	797682	Neutral grassland field with occasional birch patches. Mammal tracks cross through it to the river bank, most likely rabbit as many rabbit holes are present in the road embankment that faces the field. The river bank has some mature broadleaved and coniferous trees with bat roosting potential.	-
07	2.15	334650	798388	Marshy grassland dominated by <i>Molinia</i> grass with some <i>Juncus effuses</i> and bracken under scattered birch spp. trees.	 <p>Photo 05 – Marshy grassland</p>
08	2.4	335116	797395	Tall ruderal dominated by rosebay willow herb with nettles and occasional stands of bracken.	 <p>Photo 06 – Example of tall ruderal</p>
09	2.14	340846	797937	Forest ride with dense bracken coverage provides badger foraging potential.	 <p>Photo 07 – Dense bracken in ride</p>

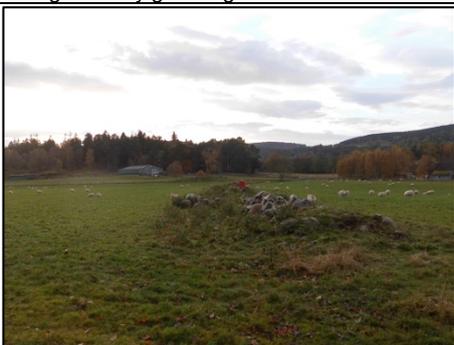
TN	Figure	Easting	Northing	Details	Photo Reference
10	2.2	333614	796399	Forest ride covered with dense bracken provides badger habitat potential.	 <p>Photo 08 – Dense bracken in ride</p>
11	2.13	339734	797044	Dense area of bracken on a slope within broadleaved woodland. Potential badger sett building and foraging habitat.	 <p>Photo 09 – Dense bracken</p>
12	2.5	335879	796576	Rock cliffs on the north bank of the River Dee with semi-natural mixed woodland to the edge. Scots pine plantation up to the southern bank of the River Dee.	 <p>Photo 10 – Cliffs along north bank of River Dee</p>
13	2.7	335902	795435	South bank of River Dee showing signs of erosion exposing sandy substrate. Conifer plantation to bank side. Potential sand martin habitat.	 <p>Photo 11 – South bank of River Dee</p>

TN	Figure	Easting	Northing	Details	Photo Reference
14	2.1	333001	796102	Girnock Burn has banks with riparian woodland comprising birch species, alder, mature scots pine and occasional sycamore. Ground cover of woodrush with grass species and occasional ferns. Girnock Burn varies in width between 3 and 5 m with no obvious instream vegetation with a stone bed. Potential foraging and commuting habitat for otters with potential for lie ups and couches. Mink raft noted in burn (see TN41)	 <p>Photo 12 – Girnock Burn</p>
15	2.2	334049	795943	Small watercourse not obvious on map with small number of broadleaved trees including sycamore and birch species. Approximately 1 m width with earth bank sides. Ground cover dominated by woodrush with some dog's mercury.	 <p>Photo 13 – Allt-na Creig Leith</p>
16	2.10	337996	796183	Dalmochie Burn runs under the main road and into the fields opposite. No water vole habitat potential but low otter habitat potential. Burn is shallow with a stone substrate and vegetated and tree-lined banks.	 <p>Photo 14 – Dalmochie Burn</p>
17	2.8	336751	794856	Brackley Burn is a 3m wide, 0.5m deep fast-flowing watercourse that terminates in the River Dee. The substrate comprises stones and boulders and both coniferous and broadleaved trees line the banks; Scots pine and sycamore dominate. There are frequent rocks on the banks. No water vole potential but high potential for otter habitat.	 <p>Photo 15 – Brackley Burn</p>

TN	Figure	Easting	Northing	Details	Photo Reference
18	2.4	334751	796820	Small watercourse with 0.5 m width running through broadleaved woodland. Slow flow and vegetated banks but low suitability for water vole. Frequent alder and birch on banks with ground vegetation comprising sweet cicely, nettles, dock and grasses.	 <p>Photo 16 – Unnamed watercourse</p>
19	2.12	339353	796818	Small watercourse running through woodland from main road down to River Dee. Shallow with stone substrate and clear, fast-flowing water. No water vole potential but potential otter commuting potential.	 <p>Photo 17 – Unnamed watercourse</p>
20	2.14	340388	797946	Culsten Burn is a 2m wide and shallow watercourse with a stone, pebble and sand substrate. Riparian trees such as alder, willow and birch dominate the bank with grasses, bramble, rosebay willow herb and fern comprising the ground vegetation. No water vole habitat potential as the banks are not suitable for burrowing. Watercourse suitable for otter habitat.	 <p>Photo 18 – Culsten Burn</p>
21	2.6	335943	796608	Semi-mature oak species woodland with very little understorey and ground cover dominated by woodrush with occasional stands of bracken.	 <p>Photo 19 – Oak woodland on banks of the River Dee</p>

TN	Figure	Easting	Northing	Details	Photo Reference
22	2.6	336094	796420	Mature oak species woodland with birch and Scots pine. Ground cover dominated by moss species.	 <p>Photo 20 – Mature oak woodland on Craigendarroch Hill</p>
23	2.15	334242	798717	River Gairn is approximately 15 m wide and 0.5 m deep at this point with a stone bed with large boulders on the banks and emerging from the river surface. The banks are lined with grasses, fern, gorse and alder. Potential for otter resting sites and foraging/commuting otters. Highland cows in fields adjacent with significant poaching on banks.	 <p>Photo 21 – River Gairn</p>
24	2.4	335175	797694	Corrybeg Burn is a small tributary of the River Gairn. Flows through poor semi-improved grassland with a small strip of riparian woodland. Just before entering the River Gairn, it flows through semi-natural broadleaved woodland.	 <p>Photo 22 – Semi-natural broadleaved woodland</p>
25	2.15	334751	797993	Steep banks along roadside with birch species, some hazel. Ground cover includes dock species, grasses, meadowsweet, nettles, ragwort, hogweed, ferns. Noticeable rabbit warrens along banking.	 <p>Photo 23 – Woodland along roadside</p>

TN	Figure	Easting	Northing	Details	Photo Reference
26	2.15	334768	798614	Scree slope with scattered birch species, heather, bracken with occasional juniper with blaeberreries, mosses and occasional fern species.	 <p>Photo 24 – Scree slope</p>
27	2.17	335017	792934	The River Muick is 0.5m to 1m deep at this point and fast-flowing. The river bed comprises stones and boulders with larger boulders situated on the banks and protruding from the river surface. The bridge over the river has been washed away during an historical flooding incident and the access roads remain closed. Riparian trees such as birch, rowan, alder and willow line the banks. Occasional coniferous trees are also present. High potential for otter habitat.	 <p>Photo 25 – River Muick and washed out bridge</p>
28	2.17	334623	793537	Corrie Burn is a shallow, 1m wide watercourse which passes through Birkhall estate (limited access). No water vole habitat potential and low otter habitat potential for foraging or commuting.	 <p>Photo 26 – Corrie Burn</p>
29	2.16	335867	794161	Small unnamed watercourse approximately 1-2 m wide, approximately 30 cm deep and slow moving with dense grassy vegetation on banks with rock bed, earth banks. Potential water vole habitat.	 <p>Photo 27 – Unnamed watercourse</p>

TN	Figure	Easting	Northing	Details	Photo Reference
30	2.8	336252	794380	Small unnamed watercourse approximately 1 m wide which appears to be the overflow from the fishing pond. Flows through mature semi-natural mixed woodland with banks dominated by grass species and occasional fern species.	 <p>Photo 28 – Unnamed watercourse from overflow from fishing pond</p>
31	2.8	336016	794479	Small unnamed watercourse which is a tributary of the River Muick; slow moving 1 – 2 m wide with depth over 30 cm and a gravel bed. Dense rushes, surrounded by marshy grassland.	 <p>Photo 29 – Unnamed watercourse with dense reed bank</p>
32	2.8	336451	794618	Small unnamed watercourse flowing through grassland. Approximately 1 m wide with a depth of less than 30 cm. Relatively fast flowing. Banks heavily grazed by sheep with a wall/banking along the western bank.	 <p>Photo 30 – Unnamed watercourse flowing through heavily grazed grassland</p>
33	2.8	336608	794622	Small unnamed watercourse flowing through field. Appears to be mostly dry with a small flow before it meets another watercourse and joins the River Muick.	 <p>Photo 31 – Unnamed watercourse, dry at time of survey</p>

TN	Figure	Easting	Northing	Details	Photo Reference
34	2.16	335342	794124	Small unnamed watercourse approximately 1 m wide with small amount of flowing water. Dense <i>juncus effuses</i> , grass species and thistles along the banks. Runs along field margin.	 <p>Photo 32 – Unnamed watercourse with dense vegetation</p>
35	2.16	335532	794538	Small unnamed watercourse flowing along field margins. Appears to be more of a ditch. Fenced off from cattle with some access for them to drink.	 <p>Photo 33 – Unnamed watercourse with dense vegetation</p>
36	2.8	335971	794769	Small watercourse flowing along field margins. Banks densely vegetated with grass species, fern and thistle species. More like a ditch. Monitoring point/trap for mammals but not sure what kind.	 <p>Photo 34 – Unnamed watercourse with dense vegetation</p>
37	2.16	335921	794135	Appears to be a spring feeding in to the marshy grassland below which is dominated by <i>juncus effuses</i> .	 <p>Photo 35 – Spring used to water livestock</p>
38	2.16	334985	793950	Area of <i>rhododendron ponticum</i> . Occasional stands of <i>rhododendron ponticum</i> noted in area of conifer plantation. Tree species noted include Scots pine, Douglas fir, cypress, silver fir and western hemlock. Some beech and birch species also noted.	-

TN	Figure	Easting	Northing	Details	Photo Reference
39	2.17	335010	793729	Area of <i>Rhododendron ponticum</i> a non-native invasive species.	 <p>Photo 36 – Areas of <i>Rhododendron Ponticum</i> in woodland along River Muick.</p>
40	2.18	338429	798215	Tulich Burn is approximately 5 m wide with a rock bed and a riparian strip of woodland comprising alder and birch species with bracken and woodrush on the banks. Potential for commuting and forging otters with habitat suitable for resting places such as couches and lie-ups.	 <p>Photo 37 – Tullich Burn</p>
41	2.1	333001	796102	Mink raft on Girnock Burn	 <p>Photo 38– Mink raft on Girnock burn</p>
42	2.13	339840	797068	Defunct stone wall running from east to west over field provides potential reptile refugia.	 <p>Photo 39 – Example of stone wall found throughout survey area</p>

TN	Figure	Easting	Northing	Details	Photo Reference
43	2.9	337341	795253	Pond A – great crested newt habitat suitability index carried out.	 <p>Photo 40 – Pond A</p>
44	2.9	337329	795208	Pond B – great crested newt habitat suitability index carried out.	 <p>Photo 41 – Pond B</p>
45	2.10	338167	796629	Pond C – great crested newt habitat suitability index carried out.	 <p>Photo 42 – Pond C</p>
46	2.16	335749	793864	Pond D – great crested newt habitat suitability index carried out.	 <p>Photo 43 – Pond D</p>

TN	Figure	Easting	Northing	Details	Photo Reference
47	2.8	336156	794364	Pond E – great crested newt habitat suitability index carried out.	 <p>Photo 44 – Pond E</p>
48	2.13	340123	797470	Mature birch tree with large knot hole within 20 m of river. Bat roosting potential.	 <p>Photo 45 – Mature birch tree with bat roosting potential</p>
49	2.2	334439	796465	Two single storey stone construction buildings with concrete asbestos roofs. Near River Dee and woodland edge. Bat roosting potential.	 <p>Photo 46 – Example of building found in survey area with bat roosting potential</p>
50	2.14	340689	797851	Male hen harrier observation; bird was flying overhead.	-