

## **Appendix 5 – Ecology**

### **5.1 Ecology Technical Report**



# **Lomond Banks**

## **Ecology Technical Report**

Produced for Flamingo Land Ltd

By Applied Ecology Ltd

March 2022

Document Information:

Version	Date	Version Details	Prepared by	Checked by	Approved by
1.0	02 March 2022	Final - issue	RAH/DS/KD	RAH/DS	RAH

Prepared for: Flamingo Land Ltd  
Title: Lomond Banks – Ecology Technical Report  
Project number: AELSC0501  
Document version: v1.0  
Document status: Final  
Document date: 02 March 2022

APPLIED ECOLOGY LTD

Hillington Park Innovation Centre  
1 Ainslie Road  
Glasgow  
G52 4RU

Tel: 0141 585 6378  
Email: [info@appliedecology.co.uk](mailto:info@appliedecology.co.uk)

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
	Background	1
	Purpose of this report	1
	Report qualification	1
<b>2</b>	<b>Designated Sites</b>	<b>4</b>
	Methodology	4
	Results	4
	Discussion	5
<b>3</b>	<b>Habitats and Flora</b>	<b>9</b>
	Methodology	9
	Results	10
	Discussion	17
<b>4</b>	<b>Otter</b>	<b>22</b>
	Methodology	22
	Results	22
	Discussion	24
<b>5</b>	<b>Water Vole</b>	<b>30</b>
	Methodology	30
	Results	30
	Discussion	31
<b>6</b>	<b>Badger</b>	<b>32</b>
	Methodology	32
	Results	33
	Discussion	34
<b>7</b>	<b>Red Squirrel</b>	<b>39</b>
	Methodology	39
	Results	41
	Discussion	42
<b>8</b>	<b>Pine Marten</b>	<b>49</b>
	Methodology	49
	Results	49
	Discussion	50
<b>9</b>	<b>Bats</b>	<b>52</b>
	Methodology	52



	Results	63
	Discussion	73
<b>10</b>	<b>Breeding Birds</b>	<b>97</b>
	Methodology	97
	Results	98
	Discussion	101
<b>11</b>	<b>Over-Wintering Birds</b>	<b>106</b>
	Methodology	106
	Results	107
	Discussion	109
<b>12</b>	<b>Conclusions</b>	<b>113</b>
	<b>Appendix A</b>	<b>114</b>
	List of Abbreviations Used in this Report	114
	<b>Appendix B</b>	<b>117</b>
	Scottish EUNIS Target Notes	117
	<b>Appendix C</b>	<b>122</b>
	Habitat Survey Photographs	122
	<b>Appendix D</b>	<b>131</b>
	Squirrel Feeding Station Results	131
	<b>Appendix E</b>	<b>134</b>
	Photographs from Building Bat Surveys (PRA and Activity Surveys)	134
	<b>Appendix F</b>	<b>144</b>
	Tree PRA Results	144
	<b>Appendix G</b>	<b>150</b>
	Photographs from the Ground Level Tree PRA	150
	<b>Appendix H</b>	<b>154</b>
	Building Activity Survey Results	154
	<b>Appendix I</b>	<b>166</b>
	Hibernation Survey Temperature Logger Data	166
	<b>Appendix J</b>	<b>172</b>
	Manual Transect Results	172
	<b>Appendix K</b>	<b>183</b>
	Summary of Static Monitoring	183
	<b>Appendix L</b>	<b>186</b>
	ECOBAT Bat Data	186



<b>Appendix K:</b>	<b>191</b>
Notes on breeding birds in 2021	191

## Tables

Table 3.1: Summary of Scottish EUNIS habitat types found within the Site.	14
Table 3.2: Summary value of habitat IEFs found within the Site.	16
Table 4.1: Otter survey target notes.	23
Table 6.1: Conventions used to classify badger setts.	33
Table 7.1: Summary of squirrel transect survey details.	39
Table 9.1: Categories of habitat suitability for bats (after Collins, 2016).	53
Table 9.2: Summary of survey details.	56
Table 9.3: Summary of hibernation survey details.	58
Table 9.4: Summary of manual transects.	59
Table 9.5: Static detector locations.	61
Table 9.6: Static detector deployment periods.	61
Table 9.7: Percentile scores and categorised level of bat activity (after NatureScot, 2019).	62
Table 9.8: Description of bat roosting suitability recorded in the PRA of buildings.	64
Table 9.9.: Hibernation static detector bat calls.	69
Table 9.10: Summary of passes per night (ppn) per location.	71
Table 9.11: Minimum times for first pass after sunset hh:mm:ss).	73
Table 9.12: Minimum times for last pass before sunrise hh:mm:ss).	73
Table 11.1: Summary of conservation status of over-wintering aquatic birds recorded at the Site.	108
Table 11.2: Results of over-wintering bird counts.	108

## Figures

Figure 1.1: Site location.	3
Figure 2.1: Sites designated for nature conservation.	8
Figure 3.1: Scottish EUNIS habitat map.	19
Figure 3.2: Location of bluebell stands.	20
Figure 3.3: Location of INNS.	21
Figure 4.1: Otter habitat target notes.	26
Figure 4.2: Selection of photographs from the otter survey.	27



Figure 6.1: Badger survey results.	36
Figure 6.2: Selection of photographs from the badger survey.	37
Figure 7.1: Red squirrel survey results.	45
Figure 7.2: Selection of photographs from the red squirrel survey.	46
Figure 7.3: NatureScot flow diagram for red squirrel assessment.	48
Figure 9.1: Building PRA results.	79
Figure 9.2: Tree PRA results – map 1	80
Figure 9.3: Tree PRA results – map 2	81
Figure 9.4: Tree PRA results – map 3	82
Figure 9.5: Tree PRA results – map 4	83
Figure 9.6: Bat activity survey strategy for Buildings A and B.	84
Figure 9.7: Bat activity survey strategy for Building C.	85
Figure 9.8: Roost locations.	86
Figure 9.9: Bat survey strategy – static monitoring and walked transects.	87
Figure 9.10: Walked transect results – May to October 2021.	88
Figure 9.11: Summary of static detector surveys – May 2021.	89
Figure 9.12: Summary of static detector surveys – June 2021.	90
Figure 9.13: Summary of static detector surveys – July 2021.	91
Figure 9.14: Summary of static detector surveys – August 2021.	92
Figure 9.15: Summary of static detector surveys – September 2021.	93
Figure 9.16: Summary of static detector surveys – October 2021.	94
Figure 9.17: Summary of static detector surveys – all months sampled in 2021.	95
Figure 9.18: Summary categorisation of sampling nights for each species or species group, according to local levels of bat activity.	96
Figure 9.19: Summary categorisation of sampling nights at each sampling location, according to local levels of bat activity.	96
Figure 10.1: Summary of breeding bird survey strategy.	103
Figure 10.2: Breeding bird survey results.	104
Figure 10.3: Heatmap of key bird areas in the breeding season.	105
Figure 11.1: Summary of winter bird survey strategy.	110
Figure 11.2: Over-wintering bird survey results.	111
Figure 11.3: Heatmap of key bird areas during the winter months.	112



# 1 Introduction

## Background

- 1.1 In April 2021 Applied Ecology Ltd (AEL) was commissioned by Flamingo Land Ltd to provide ecological support for proposals on land in Balloch, West Dunbartonshire ("the Site"), adjacent to the existing 'Loch Lomond Shores' development. A plan showing the location of the Site, which is also situated within the Loch Lomond and the Trossachs National Park (LLTNP) is provided in **Figure 1.1**.
- 1.2 The study was required in order to determine the likely ecological constraints associated with a proposal to construct a multi-purpose tourism facility, with associated infrastructure and landscaping (referred to herewith as "the Development"). Surveys for those constraints were needed to inform an Ecological Impact Assessment (EclA) evaluating the ecological impacts and effects arising from the proposals, and to identify the necessary mitigation, compensation or enhancement measures needed to ameliorate those.

## Purpose of this report

- 1.3 This report provides details of surveys undertaken on the Site between May 2021 and February 2022, including the methods used to collect primary and secondary data relating to ecological features on or near to the Site, a description of the survey results and an evaluation of the implications of these findings for the Development.
- 1.4 These data will be used in the EclA presented in Chapter 6 (Ecology) of the Environmental Impact Assessment Report (EIAR) for the proposed Development.

## Report qualification

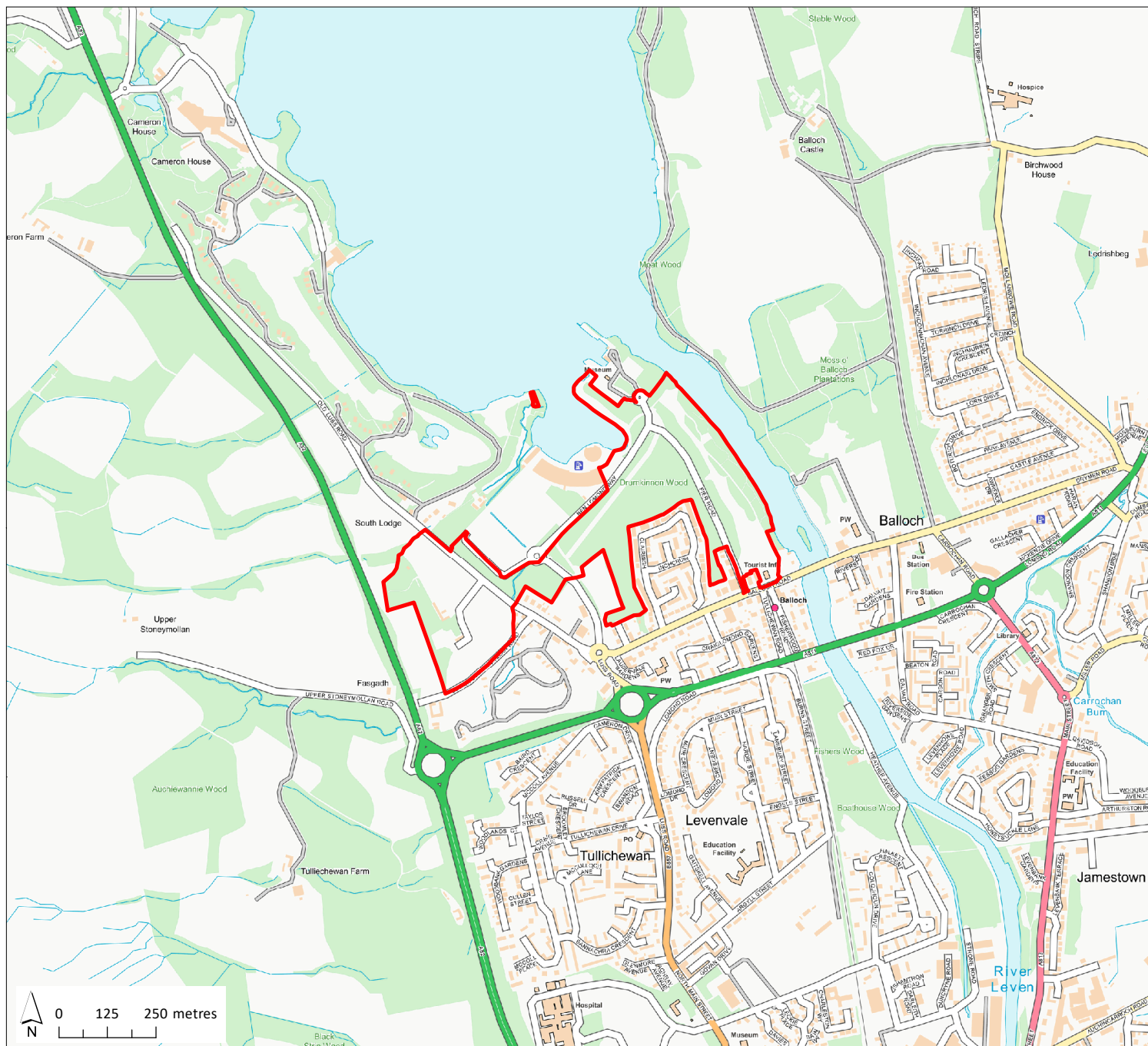
- 1.5 The surveys described here were undertaken in accordance with the best practice methodologies current at the time of commissioning. Site circumstances, scientific knowledge or methodological requirements can change during the course of a project, and these external factors may impact on the scope of subsequent work requirements.
- 1.6 All survey work and reporting was undertaken by experienced and qualified ecologists in accordance with the Code of Professional Conduct of the Chartered Institute of Ecology and Environmental Management (CIEEM) and BS 42020:2013 (Biodiversity). The work was undertaken during the Covid-19 pandemic, following all Scottish Government rules regarding social distancing and other protection measures to be taken by businesses operating at that time.
- 1.7 All ecological surveys have an expected validity period, owing to the tendency of the natural environment to change over time. This validity period varies from feature to feature, and is also dependent on the degree of change in a site's management and overall landscape ecology. Where the potential for change is considered to be relevant to the Site, this is highlighted in the appropriate section.





- 1.8 This report does not purport to provide detailed, specialist legal advice. Where legislation is referenced, the reader should consult the original legal text, and/or the advice of a qualified environmental lawyer.





## Lomond Banks

### Site Location

 Site boundary

**Figure 1.1**

**Map Scale @ A4: 1:15,000**

Surveyed by: -

Survey date: -

Drawn by: RAH

Checked by: DS

Status: Final



## 2 Designated Sites

### Methodology

- 2.1 Details of nearby statutory sites designated for nature conservation were obtained from the NatureScot Natural Spaces website<sup>1</sup> and plotted in a Geographical Information System (GIS). Sites listed on the NatureScot Ancient Woodland Inventory (AWI) were also obtained from this source and plotted in GIS.
- 2.2 The location and extent of West Dunbartonshire Council's non-statutory sites for nature conservation, known as Local Nature Conservation Sites (LNCs), were searched for in the 2020 Proposed Local Development Plan (LDP)<sup>2</sup>, and were subsequently plotted in GIS if they fell within 2 km of the Site. At the time of writing, the adoption status of some of these LNCs was not clear.

### Results

- 2.3 A map showing the location of statutory and non-statutory sites in the vicinity of the Site is provided in **Figure 2.1**.

#### Statutory designations

- 2.4 There was one statutory nature conservation site within 2 km of the Site, namely the **Boturich Woodlands Site of Special Scientific Interest (SSSI)**, 1.3 km to the north. The SSSI designation is related to a mosaic of broad-leaved woodland, open areas of rough grassland and scattered scrub.
- 2.5 Although located 8 km to the north of the Site and therefore not shown on **Figure 2.1**, qualifying interests of the **Endrick Water SAC** are linked with the Site through the connectivity presented by Loch Lomond and the River Leven. The Endrick Water is both nationally and internationally important for its population of river lamprey *Lampetra fluviatilis* and brook lamprey *L. planeri*. These two lamprey species are the primary reasons for the selection of this site as an SAC, although Atlantic salmon *Salmo salar* is also present and listed as a qualifying feature.

#### Non-statutory designations

- 2.6 Ten non-statutory LNCs were located within 2 km of the Site. Part of the **River Leven Corridor LNC** sits partially within, and adjacent to, the Site along its eastern boundary. The remaining LNCs were located a considerable distance away, or had no direct connectivity with the Site. Although in close proximity to the Site (100 m to the south-west), **Stonemallan Road Woodland LNC** is separated from the Site boundary by the A82 and therefore shared no connecting features.

---

<sup>1</sup> <https://sitelink.nature.scot/home>. Accessed November 2021.

<sup>2</sup> [https://wdcweb.blob.core.windows.net/wdc-public-live-media/4319308/wdc\\_ldp2\\_2020\\_web-26.pdf](https://wdcweb.blob.core.windows.net/wdc-public-live-media/4319308/wdc_ldp2_2020_web-26.pdf). Accessed November 2021.



## Ancient Woodland Inventory

- 2.7 A number of areas listed on the Ancient Woodland Inventory were present within 2 km of the Site, including two areas within the Site boundary. Drumkinnon Wood in the centre of the Site, and the area of woodland around Woodbank House in the west of the Site, are listed on the AWI as long-established ancient woodlands of plantation origin. Although likely historically planted, both these areas of woodland now have characteristics of well-established semi-natural woodland.
- 2.8 The boundary of the Boathouse section of the Site (separate from the main part of the Site, to the north) also partially contained woodland listed on the AWI as long-established woodland of plantation origin. However, during the surveys described in **Chapter 3**, it was found that this area actually contained early successional scrub woodland, and that the longer-established woodland ran along its boundary.

## Discussion

### Statutory designations

- 2.9 The Boturich Woodlands SSSI is considered to be an Important Ecological Feature (IEF) of national importance. Although no direct impacts on this designated site are anticipated, indirect impacts from increased visitor numbers to the area will be considered as part of the EclA.
- 2.10 The Endrick Water SAC is considered to be an IEF of International importance. No direct impacts on this site are anticipated as a result of the Development, due to the separation distance between the SAC and the Site. However, qualifying aquatic features of the SAC use the River Leven as a migratory corridor between the SAC and the sea. Therefore, disturbance impacts on the River Leven have the potential to affect SAC qualifying features. Indirect impacts on the SAC, will therefore be considered in full as part of the EclA, and in a shadow Habitat Regulations Assessment (HRA).

### Non-statutory designations

- 2.11 The majority of the LNCSs within 2 km of the Site are separated from the Site by a considerable distance, or do not share any immediate connecting features. However, the River Leven Corridor LNCS, located along the eastern boundary, will be affected either directly or indirectly by the Development. As a non-statutory designation, the LNCS is considered to be a Council level IEF, and will be considered in full in the EclA.
- 2.12 LNCSs in West Dunbartonshire are covered by the 2020 Proposed Local Development Plan Policy ENV1. Policy ENV1 states that:

*“There will be a strong presumption against development where it would compromise the overall integrity of Local Biodiversity Sites, Tree Preservation Orders and ancient and long established woodland sites...”*

*Development that adversely affects the integrity of sites designated for nature conservation or harms protected species will not be permitted except:...*



*d) Local Nature Conservation Sites and Local Nature Reserves, where adverse effects are offset or compensated in a way that adequately maintains the integrity of the interests affected and maintains the involvement of people.”*

## Ancient woodland

- 2.13 The woodland within the Site listed on the AWI is ancient woodland of long-established plantation origins. This means that woodland has persisted at this location since at least 1750, and likely longer than this. This does not necessarily mean that trees within the Site are ancient or veteran specimens *per se*, but that there has been a continuity of woodland cover since the date thresholds set for the inventory. As a result of this longevity, ancient woodland sites are associated with unique and complex communities of plants, fungi, soil biota, and insects and other animal species, and are hence priorities for conservation. Generally, AWI sites are usually considered to be IEFs of at least **Council** level importance.
- 2.14 Ancient Woodland within the Site will be affected either directly (development within the Woodbank woodland) or indirectly (increased pressures from higher visitor numbers within Drumkinnon Wood and woodland adjacent to the Boathouse). Ancient Woodland will therefore need to be considered in full in the EcIA.
- 2.15 Loch Lomond and Trossachs National Park Authority (LLTNPA) Trees and Woodland Strategy<sup>3</sup> references Ancient Woodland, where it states:
- “Ancient woodland (woodland since at least 1860) should be a focus of enhancement and restoration efforts such as herbivore management and invasive species control due to their high level of biodiversity. These woodlands form important core areas of any woodland habitat networks”*
- 2.16 Ancient woodland is included in the Habitat Action Plan for woodland within the Dunbartonshire Local Biodiversity Action Plan (LBAP)<sup>4</sup> which aims to maintain the ancient woodland resource in the area. Ancient Woodland is also a material consideration for planning in the 2020 proposed Local Development Plan (Policy ENV1 and ENV4). Under ENV1 it states:
- “Development that adversely affects non-designated habitats identified in the Dunbartonshire Local Biodiversity Action Plan will be assessed against the level of net impacts. In all instances, the Council will require development proposals to have regard to safeguarding features of nature conservation value including woodlands, hedgerows, lochs, ponds, watercourses, wetlands, wildlife corridors and geological features.”*
- 2.17 Policy ENV4 specifically references Ancient Woodland and states:
- “Developments that involve the loss or fragmentation of long-established woodland; woodlands of high conservation value (including categories 1b, 2b and 3 on SNH<sup>5</sup> Ancient Woodlands Inventory and woodlands identified in Forestry Commission Native Woodland Survey of Scotland); and those area covered by a provisional or confirmed tree preservation*

<sup>3</sup> [https://www.lochlomond-trossachs.org/wp-content/uploads/2019/11/Trees\\_woodland\\_2019\\_2039.pdf](https://www.lochlomond-trossachs.org/wp-content/uploads/2019/11/Trees_woodland_2019_2039.pdf). Accessed November 2021.

<sup>4</sup> [https://www.west-dunbarton.gov.uk/media/3197361/biodiversity\\_plan\\_2010\\_final.pdf](https://www.west-dunbarton.gov.uk/media/3197361/biodiversity_plan_2010_final.pdf). Accessed November 2021.

<sup>5</sup> Scottish Natural Heritage (SNH) is now known as NatureScot.

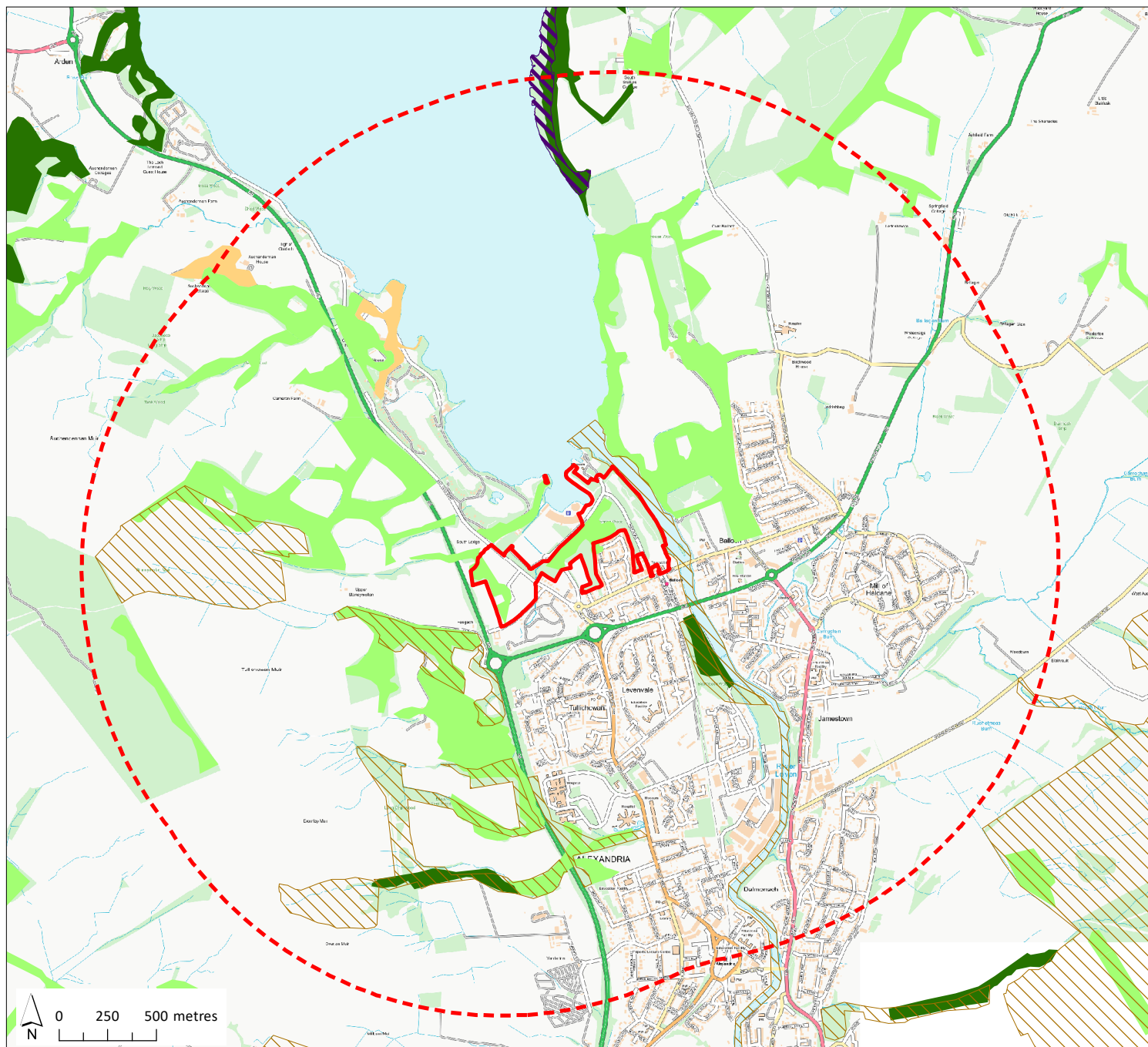


*order, will only be supported where any significant adverse effects are clearly outweighed by significant social or economic benefits and, where:*

- *Measures can be taken to conserve the nature conservation interest through planning conditions; and/or*
- *The conservation interest loss can be compensated for by habitat creation or site enhancement elsewhere by planning agreements or conditions.”*







## Lomond Banks

### Designated Sites

- Site boundary
- 2 km from Site boundary
- SSSI
- LNCS

### Ancient Woodland Inventory:

- Ancient (of semi-natural origin)
- Long-Established (of plantation origin)
- Other (on Roy map)

SSSI and AWI data Copyright NatureScot.  
Contains Ordnance Survey data © Crown copyright  
and database right (2022).

Ancient Woodland data may exclude some woodlands  
present on 1st Edition OS maps.

**Figure 2.1**

**Map Scale @ A4: 1:30,000**

Surveyed by: -

Survey date: -

Drawn by: DS

Checked by: RAH

Status: Final



## 3 Habitats and Flora

### Methodology

#### Pre-existing data records

- 3.1 Pre-existing biological data records were sourced from the Glasgow Museums Resource Centre (GMRC), for the Study Area and a 2 km buffer. A large number of records were subsequently supplied, and were reduced to those dated within the last 10 years.
- 3.2 Pre-existing survey data from ecology work completed by Envirocentre<sup>6</sup> in 2017 were also reviewed.

#### Scottish EUNIS habitat survey

- 3.3 NatureScot has now adopted EUNIS, the European Nature Information System, as the standard habitat classification scheme for terrestrial habitat data and mapping in Scotland<sup>7</sup>. As a result, the old JNCC Phase 1 Habitat Survey (JNCC, 2010<sup>8</sup>) is being phased out, to be replaced by the new Scottish EUNIS system. On 26 May 2021, 03 June 2021 and 09 June 2021, the habitat survey of the Site was therefore undertaken using Scottish EUNIS, during which all habitats present within the Site were classified and mapped according to the standard EUNIS categories. Target notes were used to describe areas of both typical and unique botanical character. Habitat patches were mapped as polygon features, and if sufficient space on the map linear features (such as walls and fences) as lines where this provided added value. Point features were recorded where there were notable isolated trees or scrub. Plant species abundance was noted using the DAFOR<sup>9</sup> system, and the minimum mappable unit (MMU) was 10 x 10 m except where features marked on the base map allowed mapping to be more precise.
- 3.4 The habitat map was subsequently digitised using GIS.
- 3.5 The standard habitat survey approach was "extended" to include a search for invasive non-native species (INNS) and also consideration of whether or not the habitats recorded should be classified as Groundwater Dependent Terrestrial Ecosystems (GWDTEs).

#### Survey limitations

- 3.6 The survey was carried out within the core botanical survey season and there were no significant restrictions to access. There were therefore no notable limitations to the study.

---

<sup>6</sup> **Envirocentre (2018)** *West Riverside, Balloch – Phase 1 Habitat Survey*. Unpublished contract report for TSL Contractors Limited. May 2018.

<sup>7</sup> **Strachan, I.M. (2017)** *Manual of terrestrial EUNIS habitats in Scotland*. Version 2. Scottish Natural Heritage Commissioned Report No. 766.

<sup>8</sup> **JNCC (2010)** *Handbook for Phase 1 Habitat Survey – A technique for Environmental Audit*. JNCC, Peterborough.

<sup>9</sup> DAFOR: whereby species occurrence may be classified as being **d**ominant, **a**bundant, **f**requent, **o**ccasional or **r**are. Rare in the context of a DAFOR score should not be confused with species rarity in the more widely accepted meaning of general scarcity.





## Results

### Pre-existing data records

- 3.7 No notable flora records were returned within the GMRC records search. A subsequent record search on databases available did return records of notable species within the Site but none were licensed for commercial use. However, all such records were with respect to species which were subsequently located and mapped during the 2021 field surveys, and therefore are reported below under those auspices.

### Scottish EUNIS habitat survey

- 3.8 The Scottish EUNIS habitat map is shown in **Figure 3.1**. A summary of the habitats recorded within the Site is provided in **Table 3.1** below, and target notes can be found in **Appendix B**. A selection of habitat survey photographs can be found in **Appendix C**.
- 3.9 The mosaic of habitats within the Site were fragmented and poorly connected as a result of pre-existing roads, car parks and the buildings at Loch Lomond Shores.

### Woodland

- 3.10 Over half of the Site was classified as some form of woodland, the vast majority of which was **mixed broad-leaved woodland**.
- 3.11 The northern section of Drumkinnon Wood in the centre of the Site (TN1 and TN4) was listed as ancient woodland of plantation origin and had clear signs of historic planting, with mature beech *Fagus sylvatica* along the top of the western slope. Other species frequently found included mature sycamore *Acer pseudoplatanus*, mature oak *Quercus robur*, birch *Betula* sp., larch *Larix decidua* and occasional lime *Tilia x europaea* and yew *Taxus baccata*. Conifer species included Scot's pine *Pinus sylvestris*, Douglas fir *Pseudotsuga menziesii*, and cedar *Cedrus* sp.. The lower canopy here contained hazel *Corylus avellana*, hawthorn *Crataegus monogyna* and holly *Ilex aquifolium*. Dense regeneration of sycamore saplings occurred along sloped ground.
- 3.12 The ground layer in this section of woodland had been impacted by worn paths and mountain biking trails. Despite this, dominant native bluebell *Hyacinthoides non-scripta* occurred along slopes, alongside species of fern, red campion *Silene dioica*, wood sorrel *Oxalis acetosella*, dog's mercury *Mercurialis perennis*, pink purslane *Claytonia sibirica*, and bramble *Rubus fruticosus* agg.. Other frequently recorded species included wood avens *Geum urbanum*, wood speedwell *Veronica montana*, greater woodrush *Luzula sylvatica* and herb Robert *Geranium robertianum*. Areas of more disturbed ground tended to be dominated by species such as common nettle *Urtica dioica*, cleavers *Galium aparine* and bramble. Common ivy *Hedera helix* was locally abundant in places.
- 3.13 The centre of Drumkinnon Wood (TN6) was the most diverse in terms of both the canopy and ground layer, and more closely resembled ancient woodland of semi-natural origin. The canopy was dominated by birch, sycamore, oak, willow *Salix* sp. and occasional wych elm *Ulmus glabra*. Large mature oaks were scattered throughout this section of the woodland. Hawthorn was frequent in the lower canopy as well as occasional rowan *Sorbus aucuparia* and locally abundant honeysuckle *Lonicera periclymenum*. An impressive carpet of native bluebell occurred throughout. Where native bluebell had not formed dense



carpets, it was continuous as the dominant species albeit at a lower density. Other locally dominant species included red campion, pink purslane and enchanter's nightshade *Circaea lutetiana*. Wood avens, common figwort *Scrophularia nodosa*, creeping buttercup *Ranunculus repens* and cleavers were all frequent. Opposite-leaved golden saxifrage *Chrysosplenium oppositifolium* was locally abundant in wetter areas, and common nettle, rosebay willowherb *Chamaenerion angustifolium* and dense bracken *Pteridium aquilinum* were found adjacent to previous disturbed ground.

- 3.14 Non ancient woodland sections of Drumkinnon Wood were present in the far south (TN9 and TN10). These areas appeared younger in structure with evidence in places of past tree planting. There was as high level of dumping of garden waste due to the proximity of residential back gardens. Woodland around TN9 had naturally regenerating oak, sycamore, birch and willow. Shading in places had reduced the density of the ground flora, but native bluebell was still dominant throughout. Other species included ferns, common comfrey *Symphytum officinale*, wood avens, red campion, enchanter's nightshade, honeysuckle, common nettle, Welsh poppy *Papaver cambricum*, hedge woundwort *Stachys sylvatica* and bramble. The far southern end of the woodland had evidence of garden escapee plants such as *Cotoneaster* sp. and Spanish bluebell *Hyacinthoides hispanica*.
- 3.15 The section of Drumkinnon Wood in the far south-west corner (TN10) had ash *Fraxinus excelsior* and hazel that had been planted as part of screening at the roadside. The remainder of this section of woodland had a semi-natural canopy of sycamore, oak, birch and wych elm. Ash trees here appeared to be infected with dieback. The ground layer was dominated by bluebells with hybrid/Spanish bluebell more dominant further south. Common nettle, ferns, cleavers, creeping buttercup, red campion, wood avens, Welsh poppy and bramble all occurred frequently. In the far south-western corner of this area, the woodland was predominantly of more recent plantation origin, and difficult to access due to dense bramble.
- 3.16 At Riverside, in the far east of the Site, two strips of mixed broad-leaved woodland lined both sides of an open area of recreational grassland. Both these strips were younger in structure but were still established woodland habitats. The far eastern section (TN18) included a network of formal footpaths adjacent to the River Leven. Sycamore, birch, ash and wych elm were dominant here, with occasional beech. Hazel and hawthorn and holly were frequent in the lower canopy. The ground flora was highly shaded in places and was dominated by ferns and common nettle. More species-rich ground flora occurred in patches throughout, with wood avens, enchanter's nightshade, common comfrey, creeping buttercup, cleavers and herb-Robert all commonly found. Dense patches of bramble occurred along the slope adjacent to the River Leven.
- 3.17 On the eastern side of Pier Road, the strip of woodland had a similar structure to TN18, with birch, sycamore, oak and wych elm all frequent. Goat willow *Salix caprea* was dominant along the northern edge, and hazel, hawthorn, elder *Sambucus nigra* and rowan comprised the lower canopy. The ground layer was again highly shaded in places and was limited to ferns, common nettle and regenerating tree saplings. A more species-rich ground flora was evident elsewhere with bluebell (dominated by hybrid/Spanish), dog's mercury, wood avens, pink purslane and red campion. Common figwort and Welsh poppy were found occasionally. Common nettle, creeping buttercup and wild strawberry *Fragaria vesca* were locally abundant along the northern edge adjacent to the open grassland.



- 3.18 On the eastern side of Old Luss Road, north of the woodland south of the Ben Lomond Way roundabout, an isolated section of broad-leaved mixed woodland extended eastwards. At TN22 and TN23, wetter conditions associated with the burn had led to dominant goat willow, sycamore, oak and alder *Alnus glutinosa*. The ground flora was species-rich, with ferns, native bluebell, greater woodrush, common comfrey, woodruff *Galium odoratum*, red campion, Welsh poppy, wood avens and herb Robert. Opposite-leaved golden saxifrage was locally abundant at the side of the burn. In the north-east corner of this woodland (TN25), within the woodland south of the Ben Lomond Way roundabout adjacent to Ben Lomond Way, a distinctive area of older established woodland was contained within a fenced boundary. There were sizeable specimens of beech, oak, sycamore and ash. A carpet of dense native bluebell (with occasional hybrid bluebell) comprised the majority of the ground layer.
- 3.19 In the far west of the Site, the woodland around Woodbank House was also classified as mixed broad-leaved woodland. This was an ancient woodland of plantation origin, but largely now supported a semi-natural canopy. Large mature oaks were dominant along with sycamore, ash, yew, birch and lime. Wild cherry *Prunus avium* was found frequently on the lower slopes, as well as occasional elder and rowan. The majority of the sloped ground layer in the south of the woodland was covered in extremely dense rhododendron *Rhododendron* sp. or cherry laurel *Prunus laurocerasus*. The upper slopes of the woodland here had retained a richer ground flora with a carpet of native bluebell, wood sorrel and ferns. Dense bamboo *Pseudosasa* sp. created an impenetrable corridor along a dry ditch in the centre of the woodland (TN34).
- 3.20 The far north of this section of woodland (TN35) was judged to be the highest quality of the woodland in this part of the Site, in terms of its structure and ground flora. Sizeable mature oaks dominated here, but regenerating sycamore still occurred frequently. The ground layer had an impressive carpet of dense native bluebell extending down the slope, alongside wood sorrel, greater stitchwort *Stellaria holostea*, pink purslane, fringe cups *Tellima grandiflora* and occasional pignut *Conopodium majus* and common figwort. Wild garlic *Allium ursinum* was locally abundant along the northern edge. Rhododendron occurred less frequently but scattered stands were still visible. As described above, the previous historic landscaping associated with Woodbank House had led to invasive rhododendron and bamboo taking over large parts of this woodland area; the eastern fringe of the woodland still retained a number of large ornamental conifer tree species that were assumed to have been planted as part of the original Woodbank House gardens.
- 3.21 In terms of other woodland types recorded, pockets of **broad-leaved plantation woodland** occurred throughout the Site, mainly associated with small areas of landscaping around the Pierhead area of the Site. These tended to be young densely planted stands of a species mix which included alder, oak, wych elm, rowan, willow and ash. There was also frequent lodgepole pine *Pinus contorta*, but not in high enough density to be classed as mixed plantation.
- 3.22 A strip of **mixed plantation woodland** did however occur along the eastern side of Old Luss Road (TN21) with planted larch and elm as a clearly separate habitat from the adjacent broad-leaved plantation associated with the Lomond Shores car park, and more natural mixed broad-leaved woodland further south.



- 3.23 The old Boathouse area in the outlier section of the Site boundary contained early successional regenerating **scrub woodland**, with dominant alder, birch and goat willow. A section of long-established plantation woodland occurred along the southern side of this habitat, with mature oaks and sycamore. The ground flora of the scrub woodland indicated wetter conditions with the presence of meadowsweet *Filipendula ulmaria* and common valerian *Valeriana officinalis*, alongside the alder and willow trees. Other species included creeping buttercup, bramble, fringe cups and red campion.

### Scrub

- 3.24 Patches of scrub were confined to the west of the Site. At TN30, a line of **mixed scrub** and trees had formed along the existing avenue to Woodbank House, at the field boundary. Dense bramble flanked rhododendron, and leylandii *Cupressus × leylandii*, common laburnum *Laburnum anagyroides* and wild cherry were also scattered throughout this area. At TN36, patches of mixed scrub surrounded the existing ruined buildings, and bramble was the most common species here, with scattered cherry laurel and rhododendron. Within the open grassland field in the far south of the Site, patches of dense **bramble scrub** occurred, as well as a strip of willow trees along the existing watercourse which was classified as **willow scrub**. The southern boundary here was also lined with bramble and wild privet *Ligustrum vulgare* mixed scrub, interspersed with hawthorn, sycamore and beech trees.

### Grasslands

- 3.25 During the habitat survey in June 2021, the large field around Woodbank House in the west of the Site was overgrown, unmown and assumed to be an area previously used for grazing. It was therefore classified as **abandoned pasture**. In the northern section of the field, at TN27, the grassland mix was relatively species-rich and dominated by a number of grass species such as Yorkshire fog *Holcus lanatus*, meadow foxtail *Alopecurus pratensis*, red fescue *Festuca rubra* and sweet vernal-grass *Anthoxanthum odoratum*. Timothy *Phleum pratense* was frequent. Dominant forb species included creeping buttercup, meadow buttercup *Ranunculus acris*, common sorrel *Rumex acetosa*, germander speedwell *Veronica chamaedrys*, black medick *Medicago lupulina* and ribwort plantain *Plantago lanceolata*. Broad-leaved dock *Rumex obtusifolius* was locally abundant along the eastern boundary. A single elder shrub occurred within the centre of the field. Further south, at TN28, slightly wetter conditions had led to soft rush *Juncus effusus* being frequent throughout, but no other indicators of marshy grassland were found. Dominant grasses here were Yorkshire fog, sweet vernal-grass and meadow foxtail. Cock's-foot *Dactylis glomerata* was also frequent. Common sorrel, ribwort plantain, creeping buttercup and meadow buttercup were the dominant forbs, alongside frequent germander speedwell, common knapweed *Centaurea nigra*, common hogweed *Heracleum sphondylium* and smooth lady's-mantle *Alchemilla glabra*. Common spotted orchid *Dactylorhiza fuchsii* was found occasionally. Two large mature ash trees occurred within the south-western section of the field. During bat activity surveys in July 2021, it was noted that these fields had been mown.
- 3.26 The only other grasslands within the Site were landscaped areas of mown **amenity grassland**, associated with the adjacent Loch Lomond Shores development, and one large area of recreational amenity grassland space in the Riverside section of the Site. This latter area was heavily used by dog walkers and the general public, and comprised red fescue,



Yorkshire fog and rough meadow-grass *Poa trivialis*. Forb species included creeping buttercup, ribwort plantain, greater plantain *Plantago major*, daisy *Bellis perennis*, white clover *Trifolium repens* and black medick.

### ***Disturbed and other habitats***

- 3.27 Small areas of disturbed ground had led to the formation of areas of **anthropogenic herb stands**/tall ruderal habitats including the wayleave through Drumkinnon Wood associated with the INEOS pipeline, which was dominated by native bluebell along with rosebay willowherb, bramble and bracken. In the west of the Site, a strip of rosebay willowherb, creeping thistle *Cirsium arvense* and common nettle ran along the eastern edge of the Woodbank woodland.
- 3.28 The artificial shoreline at Pierhead in the north-west of the Site was classified as **bare ground**, along with areas of previously cleared ground associated with the INEOS pipeline in Drumkinnon Wood, and play areas. The section of open water in the east of the Site was labelled **surface standing water**.
- 3.29 The derelict structures associated with Woodbank House and the existing visitor information building the far south-east were labelled **buildings**, and roads, car parking and path networks as **hard standing**.

**Table 3.1: Summary of Scottish EUNIS habitat types found within the Site.**

Habitat type	Area within Site (ha)	% of Site
C1: Surface standing water	0.07	0.3
E2.13 Abandoned pasture	4.09	15.7
E2.6: Amenity grassland	2.44	9.4
E5.1: Anthropogenic herb stands	0.40	1.5
F3.1: Mixed scrub	0.48	1.8
F3.13: Bramble scrub	0.16	0.6
F9.2: Willow scrub	0.03	0.1
G1.A: Mixed broad-leaved woodland	13.08	50.3
G1.C: Broad-leaved plantation woodland	1.45	5.6
G4.F: Mixed plantation woodland	0.42	1.6
G5.61: Scrub woodland	0.04	0.1
H5.3: Bare ground	0.60	2.3
J1: Buildings	0.09	0.3
J4: Hard standing	2.69	10.3
<b>Total</b>	<b>26.02</b>	<b>100.0</b>

### ***Linear features***

- 3.30 There were a number of species-poor **managed native hedgerows** across the Site, presumed to have been planted as part of the landscaping works at Loch Lomond Shores. These enclosed the whole of Drumkinnon Wood and other woodland areas, and comprised either hawthorn or beech.



- 3.31 In the west of the Site, a **line of trees** was located along the field boundary at Old Luss Road, dominated by mature lime. Along the far south-western boundary, there was a line of mature oaks.
- 3.32 Small watercourses in the Site were categorised as **flowing water**, and a **dry ditch** intersected the Woodbank woodland.
- 3.33 Old Luss Road was lined with stone **walls** on either side of the pavement.

## Notable flora

### *Native bluebell*

- 3.34 The Site contained a number of woodland areas with dense carpets of native bluebell, as shown in **Figure 3.2**. Drumkinnon Wood had the most widespread coverage of bluebell, primarily of the native species except for the southern extensions of the woodland. The ancient woodland around Woodbank House also had large areas of dense native bluebell however, the lower slopes had been impacted by the dense rhododendron and bamboo cover. The upper slopes, and in particular the northern section of the woodland, had widespread native bluebell as the dominant species in the ground layer.

### *Invasive non-native species (INNS)*

- 3.35 A number of INNS were recorded across the Site, as shown in **Figure 3.3**.
- 3.36 Patchy areas of hybrid/Spanish bluebell were noted in the southern sections of Drumkinnon Wood, as well as within both sections in the Riverside area of the Site. These rarely formed continuous carpets, and tended to be more interspersed with other ground flora species.
- 3.37 In the west of the Site, dense rhododendron occurred through most of the woodland around Woodbank House, as well as dense areas of cherry laurel and bamboo. A patch of Himalayan balsam *Impatiens glandulifera* was also recorded within the southern end of the woodland here, as well as along the burn in woodland adjacent to Old Luss Road.
- 3.38 Scattered patches of Japanese knotweed *Fallopia japonica* occurred in the woodland in the far south-east of the Site, as well as a larger, more dense patch within woodland in the centre of the Site. Cotoneaster was found in small areas throughout the Site. There was also one area of variegated yellow archangel *Lamium galeobdolon* subsp. *argenteum* within woodland to the east of Old Luss Road. A single patch of snowberry *Symphoricarpos albus* was recorded in the far eastern part of the Site.





**Table 3.2: Summary value of habitat IEFs found within the Site.**

Habitat type	Area within Site (ha)	Level of importance	Rationale
C1: Surface standing water	0.07 (0.3 %)	Local	Commonplace habitat but important as part of a large, notable features within the wider ecological landscape.
E2.13: Abandoned pasture	4.09 (15.7 %)	Local	Commonplace habitat but relatively species-rich when unmown, providing linkages between areas of lower value, and therefore important within the wider ecological mosaic.
E2.6: Amenity grassland	2.44 (9.4 %)	< Site	Low value, commonplace habitat.
E5.1: Anthropogenic herb stands	0.40 (1.5 %)	Site	Commonplace habitat but important as a connecting feature within the Site ecological landscape.
F3.1: Mixed scrub	0.48 (1.8 %)	Local	Commonplace habitat important to the mosaic of habitats associated with adjacent woodland, and important as a connecting feature within the overall ecological landscape, associated with open grassland habitat.
F3.13: Bramble scrub	0.16 (0.6 %)	Site	Small areas of commonplace habitat but important as a connecting feature within the overall Site ecological landscape.
F9.2: Willow scrub	0.03 (0.1 %)	Site	Small area of commonplace habitat but important as a connecting feature within the Site ecological landscape.
G1.A: Mixed broad-leaved woodland	13.08 (50.3 %)	Council	Woodland habitat included within the LBAP. Important as a connecting feature within the overall ecological landscape and contain diverse ground flora, as well as many mature trees.
G1.C: Broad-leaved plantation woodland	1.45 (5.6 %)	Site	Commonplace fragmented habitat of low value due to previous formal landscaping. May be important refuge for nesting birds.
G4.F: Mixed plantation woodland	0.42 (1.6 %)	Site	Commonplace habitat of lower value, but important as a connecting feature within the overall ecological landscape.
G5.61: Scrub woodland	0.04 (0.1 %)	Site	Commonplace successional habitat but important as a connecting feature within the overall ecological landscape.
H5.3: Bare ground	0.60 (2.3 %)	< Site	Low value, commonplace habitat.
J1: Buildings	0.09 (0.3 %)	Site	Commonplace habitat but provides various ecological niches for lichens and bryophytes due to derelict state. (Value for bats is covered in Chapter 9.)
J4: Hard standing	2.69 (10.3 %)	< Site	Low value, commonplace habitat.
Linear features	Level of importance		Rationale
C2.3 Flowing water	Site		Commonplace habitat and relatively poor in structure and low suitability for protected species, but important as a connecting feature within the overall ecological landscape.
FA.2: Managed native hedgerow	Site		Commonplace habitat and species-poor as a result of previous formal landscaping. Important as a connecting feature within the overall ecological landscape.
G5.1: Line of trees	Local		Mature, long-standing habitats in the west of the Site likely to be originally of plantation origin but now important as a connecting feature within the overall ecological landscape.



## Discussion

### Valuing habitat and flora

- 3.39 A summary of the value (see Chapter 6 of the EIA-R for criteria for the determination of IEFs) of the habitats recorded within the Site is provided in **Table 3.2** below.
- 3.40 **Table 3.2** shows that the majority of the habitats on the Site would in isolation be considered to be of **Site** or **Less than Site** ecological value. However, there are a number of IEFs considered to be of **Local** importance, primarily those associated with mixed scrub, species-rich grassland, lines of trees and field margins. Areas of mixed broad-leaved woodland within the Site contained ancient woodland or were associated with the River Leven SINC and vegetation along the river corridor, were considered to be a **Council** level IEF.
- 3.41 No habitats within the Site were considered to be GWDTEs, and GWDTEs will not be considered as IEFs in the EcIA. In addition, habitats valued as being Site or less than Site importance will not be considered as IEFs in the context of the EcIA.

### Native bluebell

- 3.42 Native bluebell is included as a priority species in the Dunbartonshire LBAP<sup>10</sup>.
- 3.43 No built development is proposed within Drumkinnon Wood, but increased visitor numbers to the woodland could impact on areas of native bluebell. In the west of the Site, proposed development will directly impact on known carpets of dense native bluebell in the Woodbank woodland and the woodland south of the Ben Lomond Way roundabout. Due to being a Council level IEF, direct and indirect impacts on native bluebell will be considered in full in the EcIA.

### Invasive non-native species (INNS)

#### *Relevant legislation*

- 3.44 Non-native species are covered in Scotland by clauses within the Wildlife and Natural Environment (Scotland) Act (2011) ("WANE Act"), which superseded non-native legislation previously contained within the Wildlife and Countryside Act (1981, as amended). This legislation states that it is an offence to plant any named invasive species in the wild in locations that are outwith its native range. Current legal interpretation is that this applies whether planting/propagation has occurred intentionally or unintentionally.

#### *INNS at Lomond Banks*

- 3.45 Due to the widespread and dense coverage of INNS at the Site, the majority of which are covered under current legislation (Spanish bluebell, rhododendron, Himalayan balsam, Japanese knotweed, cotoneaster and variegated yellow archangel) an INNS eradication programme will be required as part of the Development. It is recommended that:

<sup>10</sup> [https://www.west-dunbarton.gov.uk/media/3197361/biodiversity\\_plan\\_2010\\_final.pdf](https://www.west-dunbarton.gov.uk/media/3197361/biodiversity_plan_2010_final.pdf) Accessed January 2022.





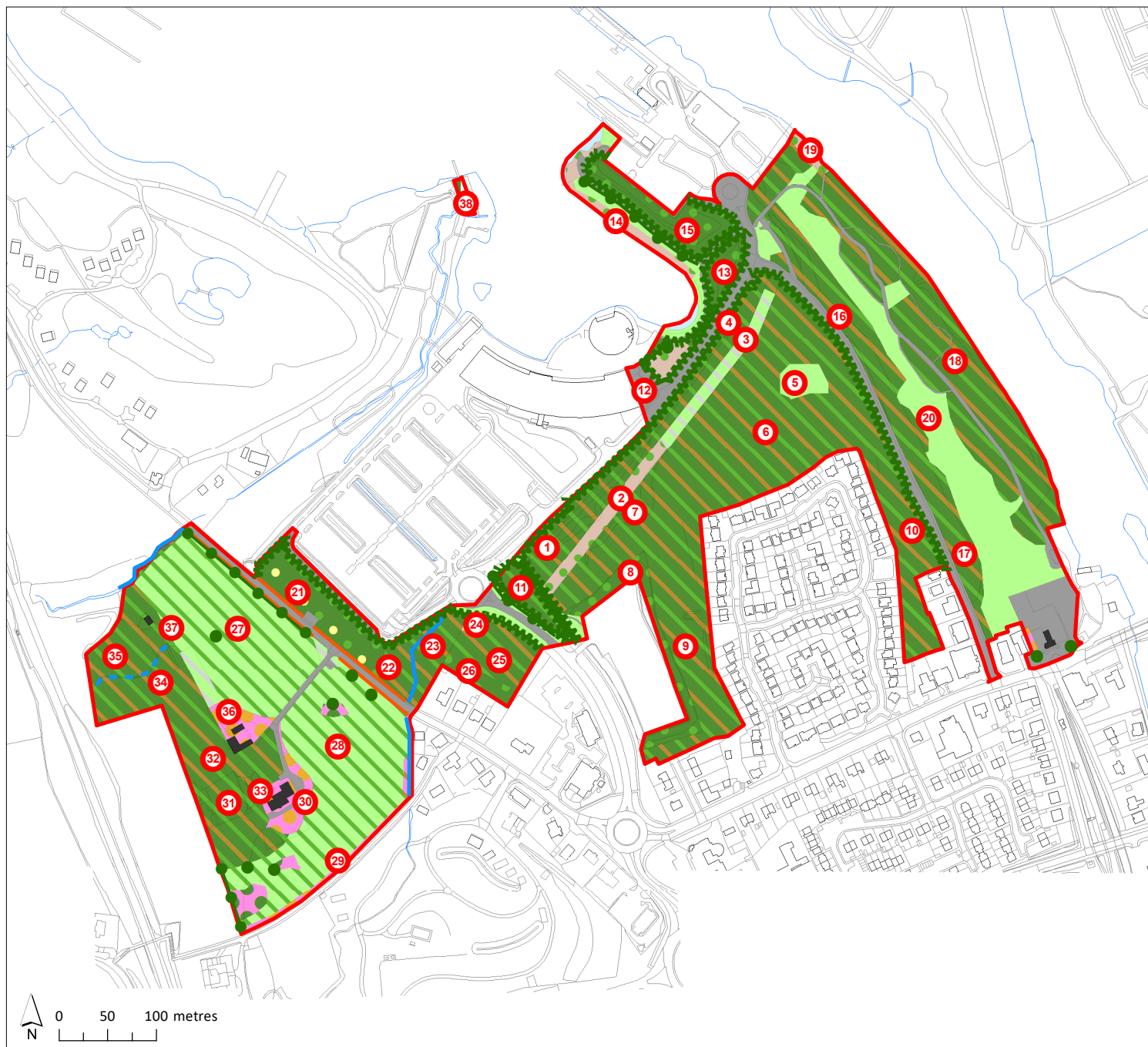
- a qualified specialist contractor is commissioned to devise and execute an INNS eradication programme. This should include plans for the removal of areas directly impacted by the proposed Development, but also a wider eradication programme for the Site due to the current extent of colonisation. This is particularly relevant to the Woodbank woodland where removal of INNS may allow the ancient woodland ground flora to recover. Removal of INNS within Ancient Woodland is a specific aim of the LLTNPA Tress and Woodland Strategy, as previously discussed;
- treatment measures must be suitable for use in proximity to watercourses, and if herbicides are proposed this may require an authorisation under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (“CAR”). SEPA has recently produced new guidance in this respect<sup>11</sup>;

- 3.46 The Code of Practice on Non-Native Species (Scottish Government, 2012)<sup>12</sup> should be adhered to throughout any INNS removal programme, and in addition to any legislative requirements, any soil that may contain non-native plant material should also be moved in line with this good practice guidance.
- 3.47 A detailed method statement pertaining to the removal of INNS and site biosecurity should be produced by the contractor. This will inform all relevant parties of their responsibilities and provide a framework for safely working on a site with INNS present. In addition, the eradication programme should include monitoring for subsequent years following the treatment to assess the effectiveness of measures employed and to retreat any areas where additional measures are needed.
- 3.48 Although cherry laurel, bamboo and snowberry are considered as pernicious as other INNS, it is also recommended that these are formally removed from the Site. Dense areas of bamboo and cherry laurel have colonised the ancient woodland around Woodbank House and shaded out the ground layer. Removal of these INNS would be a positive management step for the overall functioning of the ancient woodland.

<sup>11</sup> <https://www.sepa.org.uk/media/532108/wat-sg-18.pdf> Accessed November 2021.

<sup>12</sup> **Scottish Government (2012)** *Code of Practice on Non-Native Species*. Made by the Scottish Ministers under Section 14c of the Wildlife and Countryside Act, 1981.





## Lomond Banks

### Scottish EUNIS Habitat Map

- Site boundary**
- Habitats:**
- C1: Surface standing water
  - E2.13 Abandoned pasture
  - E2.6: Amenity grassland
  - E5.1: Anthropogenic herb stands
  - F3.1: Mixed scrub
  - F3.13: Bramble scrub
  - F9.2: Willow scrub
  - G1.A: Mixed broad-leaved woodland
  - G1.C: Broad-leaved plantation woodland
  - G4.F: Mixed plantation woodland
  - G5.61: Scrub woodland
  - H5.3: Bare ground
  - J1: Buildings
  - J4: Hard standing
  - C2.3: Flowing water
  - C2.5: Dry ditch/temporary flowing water
  - FA.2: Managed native hedgerow
  - G5.1: Line of trees
  - Stone wall
  - Individual tree
  - Target note

**Figure 3.1**

**Map Scale @ A4: 1:6,000**

Surveyed by: AEL

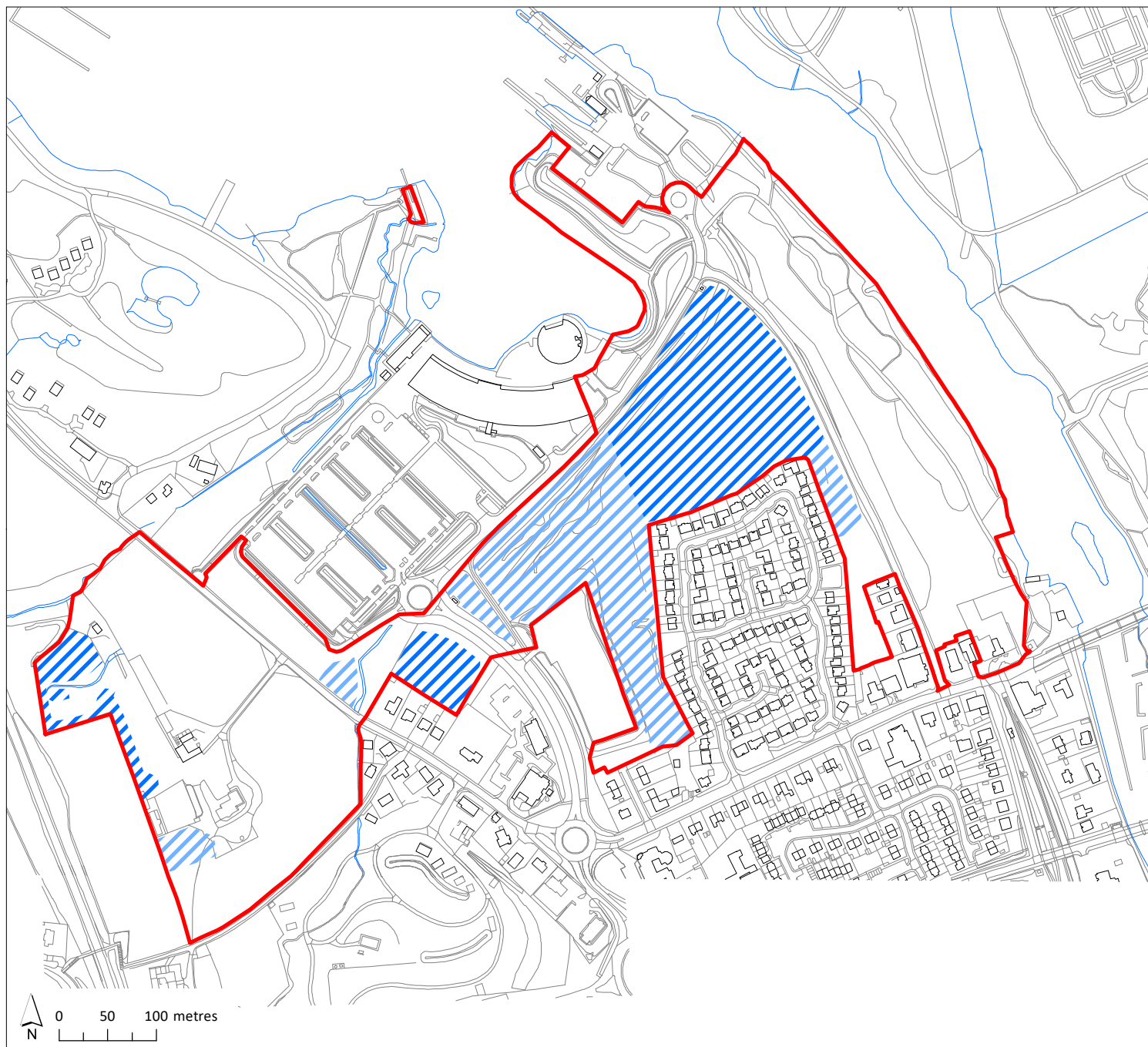
Survey date: May 2021

Drawn by: DS

Checked by: RAH

Status: Final





## Lomond Banks

### Native Bluebell Areas

- Site boundary
- Bluebell areas:**
  - Dense native bluebell
  - Continuous dominant native bluebell

**Figure 3.2**

**Map Scale @ A4: 1:6,000**

Surveyed by: AEL

Survey date: May 2021

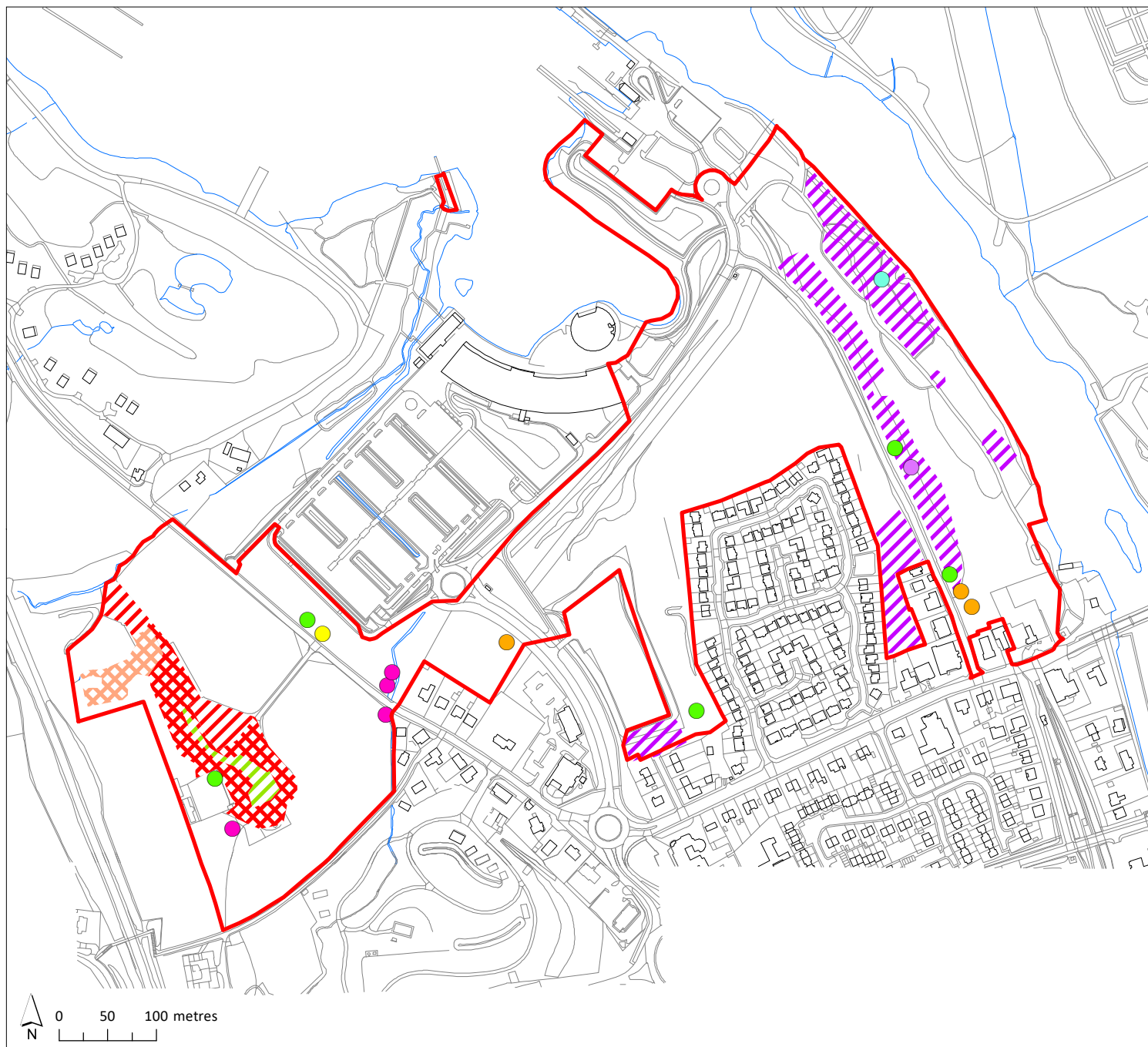
Drawn by: DS

Checked by: RAH

Status: Final







## Lomond Banks

### INNS Locations

  Site boundary

#### Patches of INNS:

- Patch of Japanese knotweed
- Patch of cotoneaster
- Patch of Himalayan balsam
- Patch of rhododendron
- Patch of snowberry
- Patch of variegated yellow archangel

#### More extensive INNS:

- Dense rhododendron
- Dense bamboo
- Scattered rhododendron
- Scattered cherry laurel
- Patchy mosaic of hybrid/Spanish bluebell

**Figure 3.3**

**Map Scale @ A4: 1:6,000**

Surveyed by: AEL

Survey date: May 2021

Drawn by: DS

Checked by: RAH

Status: Final



## 4 Otter

### Methodology

#### Pre-existing data records

- 4.1 Pre-existing biological data records were sourced from GMRC, for the Study Area and a 2 km buffer. A large number of records were subsequently supplied, and were reduced to those dated within the last 10 years.
- 4.2 Pre-existing survey data from ecology surveys completed by Envirocentre<sup>13</sup> in 2017 were also reviewed.

#### Field survey

- 4.3 On 30 June 2021, a formal otter survey was conducted for the Site and a 200 m buffer of this, where access allowed. The survey followed the guidance provided by NatureScot<sup>14</sup>, comprising searches for field signs, including spraints, confirmed shelters<sup>15</sup>, feeding remains, slides, prints and tracks.
- 4.4 All signs of otter activity were noted, both from within the watercourse and along the banks, and their locations recorded using a hand-held GPS. Survey findings were subsequently digitised in GIS.

#### Survey limitations

- 4.5 Otters do not hibernate, and their survey can be undertaken at any time of the year. However, it is best attempted after 4-5 rain free days, when water levels are lower and there is less likelihood that signs of the species' presence will have been washed away.
- 4.6 The survey reported here was undertaken during a period of dry weather, and water levels were low. All stretches of watercourses within the Study Area were accessible and therefore there were no significant limitations to the survey.

### Results

#### Pre-existing data records

- 4.7 A single record for a dead otter dating from 2014 was included in the results of the data search, located north of Duck Bay Marina, 2 km north of the Site. No signs of otter were identified during surveys undertaken by Envirocentre in 2017.

---

<sup>13</sup> **Envirocentre (2018)** *West Riverside, Balloch – Otter and Water Vole Survey*. Unpublished contract report for TSL Contractors Limited. February 2018.

<sup>14</sup> <https://www.nature.scot/doc/standing-advice-planning-consultations-otters> accessed March 2021.

<sup>15</sup> Otter home ranges can be extensive and will include various cavities below ground known as holts and above ground shelters. The latter includes couches in vegetation and hovers in cavities under overhanging banks or between boulders (Green *et al.*, 1994).



## Field survey

- 4.8 The results of the otter survey are described below. Target notes are provided in **Table 4.1** and displayed in **Figure 4.1**. A selection of survey photographs is provided in **Figure 4.2**.

**Table 4.1: Otter survey target notes.**

Target note	Description	Suitability for otter
A	Watercourse c. 1.5 m wide, with shallow banks and a bedrock base covered by a wire mesh. Very low waterline at the time of the survey. Culverted under field and under road at Old Luss Road. High stone banks further upstream by the caravan park in the south-west of the study Area. No instream vegetation.	No suitable resting sites, but potential for commuting and foraging otter.
B	Ditch in car park that was part of a SUDs system. Very overgrown, with concrete culverts at either end and a wire mesh covering the stone base.	No suitable resting sites and heavily disturbed by car park. Unlikely to be used by commuting otter.
C	Rocky watercourse that was dry at time of survey. Wire mesh covered base and banks in places. Heavily disturbed by public footpaths nearby and aerial pathways above associated with leisure activities.	No suitable resting sites and heavily disturbed by the public. Possible foraging and commuting route.
D	Small watercourse on the eastern side of the River Leven. At entry to the Leven the watercourse becomes wider with very shallow earth banks. Upstream had stone base and banks. No instream vegetation.	No suitable resting sites, but possible foraging and commuting route for otter.
E	Small ditch entering the eastern side of the River Leven. Ditch was dry at the time of the survey.	No suitable resting sites and heavily disturbed by the public. Unlikely to be used by otter for commuting.
F	Rocky narrow watercourse that flowed through woodland. Almost fully dry at time of survey. Overhanging trees made access difficult but banks were mostly shallow, with wire covering the base and banks.	No suitable resting sites but possible commuting route for otter.
G	Rock armour and sandy beach shoreline around Lomond Shores. Highly disturbed by members of the public.	No suitable resting sites. Shore area has the potential to be used by foraging and commuting otter, but is less likely due to the level of disturbance.
H	Western side of the River Leven along the boundary of the Site. Overhanging tree roots in places as well as gravel shoreline. Area heavily disturbed by the public and boats within the marina area.  Eastern side of the River Leven was marshy and heavily disturbed by nearby paths. No overhanging tree roots or other suitable resting sites.	Potential resting sites where there are overhanging tree roots along the western side of the Leven, but no signs found. Possible commuting and foraging route, but general area is heavily disturbed.

- 4.9 Overall, no signs of otter were found within the Site or wider Study Area. The majority of watercourses were lacking in any suitable features for otter resting sites, the exception being the western shoreline of the River Leven where occasional overhanging tree roots were noted. However, no signs of otter use were recorded here and the general area was heavily disturbed by the public and boats within the marina. The remainder of the watercourses that flowed through the Site could potentially have offered otter commuting



and foraging routes, but human disturbance levels meant that overall these areas were sub-optimal for the species.

## Discussion

### Relevant legislation

- 4.10 The otter is a European Protected Species (EPS), protected by the Conservation (Natural Habitats, etc.) Regulations 1994, as translated into domestic legislation post-Brexit and via the Wildlife and Countryside Act 1981 (as amended). This legislation collectively makes it an offence to capture, harass, injure or kill an otter; obstruct access to, damage or destroy a breeding site or resting place of an otter; disturb an otter in such a way as is likely to affect their distribution or abundance, disturb otter in such a way as is likely to impair their ability to survive or breed, or disturb an otter while it is occupying a structure or place which it uses for shelter or protection. Each of these actions is considered to be an offence whether the action is deliberate or reckless, except in the case of damaging or destroying a breeding site or resting place, which is a strict liability offence i.e., there is no defence for destroying a breeding site or resting place.
- 4.11 A licence is required for all developments that will affect otter. Disturbance is defined by NatureScot as any new effect occurring within a minimum of 30 m of an otter shelter. This distance is likely to increase for activities with a higher potential for disturbance, such as blasting or track-laying, or in remote locations or where the shelter in question is regarded as being high-status. If breeding is suspected, NatureScot may request a non-intervention zone of 100-200 m, or that work be suspended pending further investigation<sup>16</sup>. Otters are inquisitive animals and are known to habituate to a range of disturbances. They are, however, often particularly intolerant of dogs.

### Otter at Lomond Banks

- 4.12 Otter are known to use the shores of Loch Lomond in areas north of the Study Area. However, the survey described here indicated that otter were unlikely to be present within the Site, and habitat within the Site and the wider Study Area only offered potential commuting and foraging routes. The majority of these locations were classed as sub-optimal due to high levels of disturbance. Higher quality foraging and commuting habitat was identified along the western side of the River Leven, but this was also heavily disturbed by boats from the marina and general public.
- 4.13 At this time, there are therefore no specific licensing issues associated with otter, and the Site is considered to be of **Site** level importance for the species at best. However, given the level of protection afforded to otter, the species should be considered to be an IEF in the EcIA, and to avoid disturbance the following good practice measures should be adhered to during the construction phase:
- a watching brief for the occurrence of otter field signs should be kept by an Ecological Clerk of Works (ECow), who will advise regarding appropriate action should the species be found or suspected to be present during the works;

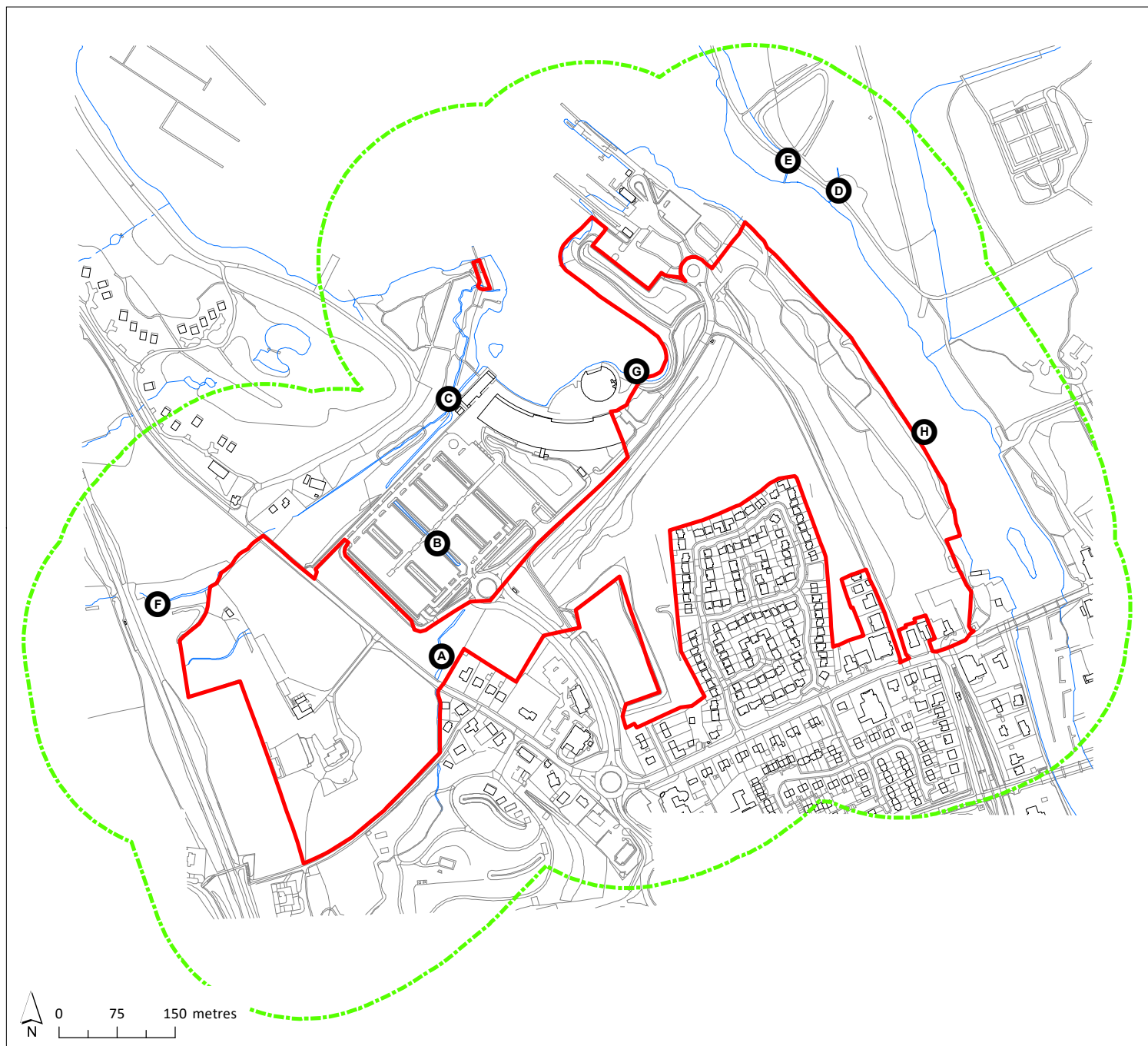
<sup>16</sup> <https://www.nature.scot/sites/default/files/2020-06/Species%20Planning%20Advice%20-%20Otter.pdf> accessed March 2021.



- general good practice measures for working in and near to watercourses must be adhered to, for example, silt interception traps will be provided to minimise unchecked contaminated run-off. A pollution prevention and sediment control plan should be written and implemented for the works;
- fuels and other chemicals must be stored securely as far as practicable from any watercourse, and preferably over 50 m away;
- appropriate wash-out/wash-down facilities will be available for vehicles and machinery which will not discharge into the watercourses;
- trenches and excavations will be covered at the end of each working day, or will include ramps, and stored pipes will be capped (or stored vertically), to prevent entrapment of animals. During longer periods of Site shut down, trenches and excavations will be infilled or covered;
- machinery left on-site overnight must be carefully checked each morning for the potential presence of resting up otters;
- in the unlikely event of any Site activity being carried out during the hours of darkness, machinery and floodlights will be directed away from watercourses, ensuring wherever possible an unlit corridor of 10 m;
- the use of heavy machinery should be limited to avoid the period two hours before and after dawn and dusk during the months of March to October inclusive, and one hour before and after dawn/dusk during the months of November to February inclusive. This is because these are the times of day when otter will be most active on the nearby watercourses.







## Lomond Banks

### Otter Survey Results

- Site boundary
- 200 m from Site boundary
- Otter habitat target note

**Figure 4.1**

**Map Scale @ A4: 1:7,500**

Surveyed by: AEL

Survey date: June 2021

Drawn by: DS

Checked by: RAH

Status: Final



**Figure 4.2: Selection of photographs from the otter survey.**



(a) Watercourse referenced as target note A.



(b) Watercourse referenced as target note B.



(c) Watercourse referenced as target note C.





(d) Watercourse referenced as target note D.



(e) Watercourse referenced as target note E.



(f) Shore-edge referenced as target note G.



(g) Overhanging tree root along the western side of the River Leven that had potential as an otter resting site. No signs of otter use was found and the area was heavily disturbed by boats and people.



(h) Gravel shoreline along the western side of the River Leven, referenced as target note H.



## 5 Water Vole

### Methodology

#### Pre-existing data records

- 5.1 Pre-existing biological data records were sourced from GMRC, for the Study Area and a 2 km buffer. A large number of records were subsequently supplied, and were reduced to those dated within the last 10 years.
- 5.2 Pre-existing survey data from ecology surveys completed by Envirocentre in 2017 were also reviewed.

#### Field survey

- 5.3 On 30 June 2021, a formal water vole survey was conducted for the Site and a 50 m buffer of this (the “Study Area”). The survey followed national survey guidance<sup>17,18</sup> and comprised searches of the ditch system for water vole signs, including feeding stations, latrines, footprints, burrows and runs, as well as sightings of voles.
- 5.4 Any signs or potential signs of water vole were noted, and their location recorded using a hand-held GPS. Survey findings were subsequently digitised in GIS.

#### Survey limitations

- 5.5 The survey was undertaken at the appropriate time of year, when water levels were low, suitable for identifying recent signs of water vole. All sections of watercourses within the Study Area were accessible and there were therefore no limitations to the survey.

### Results

#### Pre-existing data records

- 5.6 No water vole records were found within the data search results. No suitability or signs of water vole were identified during surveys undertaken by Envirocentre in 2017.

#### Field survey

- 5.7 Only a small number of watercourses ran through the Site, or along the boundaries (see **Figure 4.1** in previous chapter), and all were all judged to be unsuitable for water vole. The burn referenced at point A on **Figure 4.1** had sloping soft banks in places, but was lacking in suitable bank vegetation, as well as having no in-stream vegetation for foraging or cover. In addition, there was debris netting along the floor of the burn. Ditches at location B were slow flowing and associated with a drainage system within the main car park of Lomond Shores. Although some sections provided suitable vole burrowing habitat within the soft

<sup>17</sup> <https://www.nature.scot/standing-advice-planning-consultations-water-voles> accessed March 2021.

<sup>18</sup> Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.





banks, and had good in-stream vegetation, the location of the ditches were within a busy car park, with hard standing on all sides, and this significantly decreased the suitability for water vole overall. The watercourse at location F in the south-west of the Site was a rocky burn with no suitable banks for burrowing and therefore unsuitable for water vole. The remainder of waterbodies within the Study Area were either shoreline or areas of rock armour, with no suitable habitat for water vole.

## Discussion

### Relevant legislation

- 5.8 The water vole is protected by the Wildlife and Countryside Act (1981, as amended) and the Nature Conservation (Scotland) Act (2004). It is an offence intentionally or recklessly to disturb a water vole in its place of shelter, or to intentionally or recklessly damage, destroy or obstruct access to a shelter. Both these Acts have been amended by the Wildlife and Natural Environment (Scotland) Act (2011), known as the WANE Act. Sections 18(2)(a) and (b) of the WANE Act insert a licensable purpose into section 16 of the Wildlife and Countryside Act. NatureScot can therefore licence the disturbance of water vole (including destruction of burrows) for reasons of social, economic and environmental significance, provided there is no satisfactory alternative.

### Water vole at Lomond Banks

- 5.9 Water vole were judged to be absent from the Site and Study Area and there was limited habitat suitability to suggest that the Site could become colonised in the future.
- 5.10 For the purposes of the EclA, water vole is not considered to be an IEF needing to be included in the assessment.



## 6 Badger

### Methodology

#### Pre-existing data records

- 6.1 Pre-existing biological data records were sourced from GMRC, for the Study Area and a 2 km buffer. A large number of records were subsequently supplied, and were reduced to those dated within the last 10 years.
- 6.2 A request to Scottish Badgers was also made for any records within 2 km of the Study Area.
- 6.3 Pre-existing survey data from ecology surveys completed by Envirocentre<sup>19</sup> in 2017 were also reviewed.

#### Field survey

- 6.4 On 30 June 2021 and 01 July 2021, searches for badger field signs were undertaken for the Site and a 100 m buffer of this where access allowed (“the Study Area”), as per the survey guidelines provided by Scottish Badgers<sup>20</sup>. Features such as setts, latrines and dung pits, badger hair, footprints, trails and evidence of foraging were all searched for<sup>21</sup>.
- 6.5 The survey concentrated on areas potentially suitable for sett excavation, including woodland habitats, their margins and embankments. All badger signs, confirmed or potential, were noted and their locations recorded using a hand-held GPS. Any relevant survey findings were subsequently digitised in GIS.

#### Categorisation of badger setts

- 6.6 Whilst badger setts are usually categorised according to their present use and appearance, this can be dynamic, particularly with regard to the prevalence of supplementary setts and the fact that their status is able to change over relatively short periods of time. The conventions shown in **Table 6.1** were used to describe setts.
- 6.7 In addition to sett classification, the level of badger activity is conventionally recorded for each sett by classifying each sett entrance hole according to one of three categories, as follows:
  - well-used: an entrance free of leaf-litter and showing recent signs of excavation;
  - partly-used: an entrance with some debris and leaf-litter but also showing some signs of recent digging;
  - disused: an entrance with debris and leaf-litter partially obscuring the hole, with no recent signs of digging, or a hole that exhibits the characteristics of a badger sett

<sup>19</sup> **Envirocentre (2018)** *West Riverside, Balloch – Protected Species Survey*. Unpublished contract report for TSL Contractors Limited. February 2018.

<sup>20</sup> **Scottish Badgers (2018)** *Surveying for Badgers: Good Practice Guidelines*. Online publication at [www.scottishbadgers.org.uk](http://www.scottishbadgers.org.uk)

<sup>21</sup> **Harris, S., Cresswell, P. & Jefferies, D. (1989)** *Surveying for Badgers*. Occasional Publication of the Mammal Society No. 9. Mammal Society, Bristol.



entrance hole (large and D-shaped entrance and old spoil piles at the entrance), but with no other signs of badger activity.

**Table 6.1: Conventions used to classify badger setts.**

Sett type	Characteristics
Main	The continuously used breeding and over-wintering sett for a social group of badgers. Only one main sett will exist in each social group's territory and will be relatively centrally located within the group's range. Several holes with large spoil heaps and obvious paths between sett entrances.
Annex	Linked by well-used paths to the main sett but not connected underground and not continuously used. Normally less than 150 m from the main sett, comprising several holes. May not be in use all the time, even if the main sett is very active.
Subsidiary	Distant from the main sett. Several entrances but with no well-used paths connecting to a main sett, and used only seasonally.
Outlier	Distant from main sett. Small, with one or two entrances only. Used for short periods sporadically, with no obvious well-used paths connecting to other setts. Little spoil outside holes.

### *Potential limitations of the badger survey*

- 6.8 Badger surveys can be undertaken at any time of year, although the optimal times are March-June and September-November when badgers are particularly active but vegetation is lower. Badger latrines are reliably maintained by badgers in early spring, and at other times of year can be harder to locate. The survey was therefore undertaken just outside the optimal summer window, and when vegetation heights were greater, although the majority of suitable habitats could still be searched fully. The exception to this was a small section of the woodland around Woodbank House which had dense bamboo and rhododendron. These areas would be dense with this type of vegetation all year round and therefore the timing of the survey was not judged to be a limitation in this instance. A full assessment of the area adjacent to these dense patches of vegetation was undertaken, noting signs in close proximity to these or mammal paths leading into inaccessible areas. There were therefore no significant limitations to the survey.

## Results

### **Pre-existing data records**

- 6.9 No badger records were found within the data search results. This included direct communication with Scottish Badgers, who confirmed a general absence of data records for the Site and wider area<sup>22</sup>. No badger signs were identified during surveys undertaken by Envirocentre in 2017.

### **Field survey**

- 6.10 The results of the badger survey are described below and target notes are provided in **Table 6.2** and displayed in **Figure 6.1**. A selection of survey photographs is provided in **Figure 6.2**.

<sup>22</sup> Email correspondence between AEL and Emily Platt/Scottish Badgers dated 29 June 2021.





- 6.11 No badger setts were identified during the survey.
- 6.12 The woodland slopes within Drumkinnon Wood were noted as offering potential habitat for sett creation. However, this woodland was isolated with poor connectivity due to the surrounding Loch Lomond Shores development. The woodland was also fenced in on all sides by dense hedgerows. In addition, there was a high level of disturbance from dog walkers and the general public throughout Drumkinnon Wood. A series of mammal holes were found in this section of the Site, both within Drumkinnon Wood and the adjacent strip of trees to the east of Old Pier Road. The majority of these were judged to be too small for badger and most likely used by rabbit which are known to be present in this part of the Site.
- 6.13 The woodland around Woodbank House had steep sided slopes that would be suitable for sett creation. This woodland also had connectivity with additional sections of woodland and grassland fields to the north. Not all areas of the woodland in the west of the Site were accessible due to the dense bamboo and rhododendron cover. However, no signs of badger were found within the wider woodland and no notable mammal paths were found entering inaccessible areas.
- 6.14 Signs of badger foraging were identified in the open field in the west of the Site, with 'snuffle holes' visible in areas of grassland.

**Table 6.2: Badger target notes.**

Target note	Grid reference	Sign	Comments
1	238074 681982	Foraging	Badger foraging signs in the corner of field.
2	238569 682005	Mammal holes	At least six old burrows large enough for rabbits. The burrows had become infilled with soil and leaves.
3	238495 682054	Mammal holes	A hole that was too small for badger, with sandy spoil on embankment beneath the roots of a tree. The tunnel extended back at least 1 m in an upwards direction.
4	238517 682015	Mammal holes	Two old excavated tunnels on a collapsed embankment infilled with sand and entrances completely eroded away. Too small for badger.
5	238796 682255	Mammal holes	Three holes with spoil heaps. Too small for badger and no signs found. Most likely rabbit due as presence of species in the area.
6	238782 682225	Mammal holes	Two holes one of which was large enough for badger. However, no signs of badger and most likely rabbit due to location by the roadside and known presence of rabbit in the area.
7	238441 681907	Mammal holes	Disused rabbit warren within area of Japanese knotweed.
8	238808 682123	Mammal holes	Two small mammal holes with rabbit droppings at entrance. Too small to be used by badger.

## Discussion

### Relevant legislation

- 6.15 The badger and its setts are protected in Scotland by the Protection of Badgers Act 1992 (as amended) and strengthened by the Wildlife and Natural Environment (Scotland) Act (2011).



This makes it illegal to wilfully kill, injure or take a badger, or attempt to do so, cruelly ill-treat a badger, interfere with a sett by damaging it or any part of it, destroying it, obstructing access to it or disturbing a badger while it is occupying a sett.

- 6.16 NatureScot is responsible for issuing licences under the Badgers Act for the purpose of development. Generally, it is considered that development using heavy machinery within at least 30 m of a badger sett entrance could result in disturbance and would therefore be licensable.

### **Badger at Lomond Banks**

- 6.17 Badger foraging activity was confirmed in the west of the Site, with badgers likely accessing the Site from higher quality, connected habitat to the north and north-west. The majority of the woodland cover in the Site was judged to be unsuitable for badger sett creation, primarily due to high levels of disturbance from humans and dogs within Drumkinnon Wood and in the woodland areas in the far east of the Site. Wooded slopes around Woodbank House offered the best habitat for sett creation within the Site but no setts were found. However, badger were utilising the adjacent field for foraging.
- 6.18 At this time, there are therefore no specific licensing issues associated with badger, and the Site is considered to be at best of **Site** level importance for the species. However, given the frequenting of habitats within the west of the Site by badger, the species should be considered to be an IEF in the EclA, and to avoid disturbance the following good practice measures should be adhered to during the construction phase:
- a pre-commencement survey for badger should be undertaken no earlier than 3-6 months before commencement, within the Site and 100 m buffer, with particular focus on woodland in the west of the Site;
  - a watching brief for the occurrence of badger field signs should be kept by an ECoW, who will advise regarding appropriate action should the species be found or suspected to be present during the works. Where a potential and/or previously unknown sett is identified, all works will stop within a distance considered suitable to prevent damage or disturbance to the structure (at least 30 m). The area should not be approached by any site personnel until the ECoW has been informed of the suspected sett location and has confirmed whether or not it is a badger sett and any necessary mitigation and licensing requirements;
  - trenches and excavations will be covered at the end of each working day, or will include ramps, and stored pipes will be capped (or stored vertically), to prevent entrapment of animals. During longer periods of Site shut down, trenches and excavations will be infilled or covered;
  - in the unlikely event of any Site activity being carried out during the hours of darkness, machinery and floodlights will be directed away from woodland edges.



## Lomond Banks

### Badger Survey Results

- Site Boundary
- 100 m from Site boundary

#### Field signs recorded:

- ▲ Badger foraging
- Mammal holes

**Figure 6.1**

**Map Scale @ A4: 1:7,500**

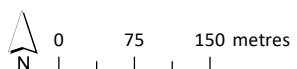
Surveyed by: AEL

Survey date: June - July 2021

Drawn by: DS

Checked by: RAH

Status: Final





**Figure 6.2: Selection of photographs from the badger survey.**



(a) Badger foraging evidence found in the west of the Site, described in TN1.



(b) Grassland field in the west of the Site where evidence of badger foraging was found.



(c) Mammal hole suspected to be previously used by rabbit, found within Drumkinnon Wood and described in TN3.



(d) Mammal hole suspected to be used by rabbit, found in the east of the Site and described in TN6.



## 7 Red Squirrel

### Methodology

#### Pre-existing data records

- 7.1 Pre-existing biological data records were sourced from GMRC, for the Study Area and a 2 km buffer. A large number of records were subsequently supplied, and were reduced to those dated within the last 10 years.
- 7.2 Saving Scotland's Red Squirrels (SSRS) maintain a database of sightings of both grey and red squirrels. This was searched for records within the Study Area and 2 km buffer dated within the last 10 years.
- 7.3 Pre-existing survey data from ecology surveys completed by Envirocentre<sup>23</sup> in 2017 were also reviewed.

#### Initial walkover – July 2021

- 7.4 On 07 July 2021, an initial survey of woodland within the study area was undertaken, to search for signs of red squirrel. Trees were inspected from ground-level, using binoculars if necessary, for squirrel dreys. Feeding signs were also recorded, namely the remains of pine cones, acorns or hazelnuts with the characteristic marks of having been eaten by squirrels.

#### Walked transects – January/February 2022

- 7.5 Walked transects were undertaken over a series of mornings, as shown in **Table 7.1**, as close to first light as possible, to locate active squirrels. These were in line with guidance from NatureScot<sup>24</sup> and were undertaken in the winter months when foliage cover was at its lowest. Line transects were undertaken throughout all areas of woodland cover across the Site.

**Table 7.1: Summary of squirrel transect survey details.**

Date	Sunrise	Start time	Weather <sup>25</sup>
11 January 2022	08:41	08:25	Rain: 0; Cloud cover: 2; Wind speed: 1; Temp: 5 °C
20 January 2022	08:31	08:15	Rain: 0; Cloud cover: 1; Wind speed: 1; Temp: 2 °C
02 February 2022	08:12	08:00	Rain: 0; Cloud cover: 8; Wind speed: 2; Temp: 8 °C

<sup>23</sup> **Envirocentre (2018)** West Riverside, Balloch – Protected Species Survey. Unpublished contract report for TSL Contractors Limited. February 2018.

<sup>24</sup> <https://www.nature.scot/doc/standing-advice-planning-consultations-red-squirrels> accessed November 2021.

<sup>25</sup> Key to weather conditions summary: Rain = 0-4 (0 = dry); Cloud cover = (in eighths); Wind speed = 0 (calm) to 12 (hurricane); Temp = Temperature (°C)





## Camera trap monitoring of feeder stations – January/February 2022

- 7.6 Squirrel feeder boxes and camera traps were initially placed at four locations, two within Drumkinnon Wood and two within the Woodbank woodland, as shown in **Figure 7.1**:
- Location 1 within the central area of Drumkinnon Wood;
  - Location 2 in the south-western corner of Drumkinnon Wood;
  - Location 3 in the southern end of the Woodbank woodland;
  - Location 4 in the northern end of the Woodbank woodland.
- 7.7 After ten days of deployment, the squirrel feeders were checked and refilled if necessary. During this visit the camera trap videos were reviewed, and it was revealed that the feeder box at Location 2 had been emptied soon after the initial deployment. When combining this activity with other sightings during transect surveys, it was determined that grey squirrels were highly active in this part of the Site, and this feeder was moved to a fifth location (Location 5) after cleaning and disinfecting. The feeder boxes at Locations 1, 3 and 4 were in place for 22 days between 11 January 2022 and 02 February 2022. Location 2 was in place for 10 days and Location 5 was deployed for 12 days but the camera trap failed here after only one day of deployment (see below). All feeder stations were disinfected before deployment and prior to being refilled.
- 7.8 Camera traps were deployed alongside the feeders on adjacent trees facing the feeder boxes. These were also checked after 10 days to replace the batteries if necessary and download the files recorded in the first half of the deployment.

### *Survey limitations*

- 7.9 Squirrel dreys are difficult to find in dense tree cover. The initial walkover in July was undertaken when trees were coming into full foliage, and a considerable number of trees were covered in dense ivy. Some trees therefore could not be inspected fully and the timing of this initial survey was thus not optimal. However, further surveys were undertaken in the winter months allowing for a more complete inspection for dreys, and to confirm observations made earlier in the year.
- 7.10 Feeder station monitoring should ideally be carried out at the end of winter/beginning of spring when food resources are at their lowest, increasing the likelihood that squirrels will visit the feeding stations. However, due to the time constraints of the commission this was not possible, and deployment of cameras was instead undertaken in the middle of winter. The timing of the survey was therefore not optimal, given that squirrels in the area were likely still to have some food stores available. However, in areas where squirrels were recorded, they were found to be using the feeders regularly. Therefore, this sub-optimal survey timing was not considered to be a significant limitation.
- 7.11 The dreys and feeding signs of red and grey squirrels are very similar and cannot be distinguished visually. The walked transects and monitoring of feeding stations was undertaken to establish presence/absence of red squirrels with as much certainty as possible, in order to address this limitation.
- 7.12 When the camera trap was deployed at Location 5, it was displaying 50 % battery remaining and therefore new batteries were inserted. However, for reasons that are not clear, the camera failed after only a single day of deployment. The feeder station at this location was



empty on retrieval and but there no images for what species of squirrel had emptied the feeder. This did present some limitations to the interpretation of results for Location 5, and this is discussed in more detail below.

## Results

### Pre-existing data records

- 7.13 One record of red squirrel was supplied by GMRC, dating from 2019 and located from behind the National Park Centre, 500 m south-east of the Site.
- 7.14 SSRS database had no confirmed red squirrel sightings within any parts of the Site. However, the database contained a large number of sightings of red squirrel within the wider area, most notably consistently directly across the River Leven from the Site, within Balloch Country Park. Red squirrel have also been consistently recorded in recent years within woodland along Stoneymollan Road, 200 m to the south-west of the Site and across the A82. The closest record to the Site was a recent red squirrel sighting submitted in July 2021, 150 m south of the Woodbank section of the Site. A second sighting within close proximity to the Site was submitted in 2015 directly south of the Site at Balloch train station. Both of these records appeared to be outliers in terms of the general trend of recorded red squirrel sightings in the area.
- 7.15 There were many records of grey squirrel sightings within the SSRS database for both Drumkinnon Wood and the Boathouse area of the Site, the most recent of which was February 2021.

### Field survey

#### *Initial walkover – July 2021*

- 7.16 All areas of woodland in the Site predominantly comprised broad-leaved trees, but within Drumkinnon Wood and the Woodbank woodland there were scattered patches of conifer species which provided a better food source for red squirrel. Woodland areas throughout the Site were generally fragmented as a result of existing development and infrastructure, but the Woodbank woodland in the west of the Site had better connectivity to the wider landscape.
- 7.17 No red squirrels were seen during the initial walkover, but grey squirrels were seen on two occasions within the Woodbank woodland. The location of these are shown in **Figure 7.1**.
- 7.18 Dense foliage and ivy growth obscured inspection of many tree canopies at the time of the initial walkover. It was considered likely that further dreys would be present which were not visible from ground level.

#### *Walked transects – January/February 2022*

- 7.19 **On 11 January 2022, there was a sighting of a pair of red squirrel during the walked transects.** Two red squirrels were observed moving through a strip of larch trees in a narrow woodland area between Old Luss Road and the Loch Lomond Shores car park. The squirrels were seen grooming and feeding within the trees before moving north. No other sightings of red squirrel were recorded on any subsequent transects.



- 7.20 A total of eight grey squirrel sightings were recorded across the three transects, two during the first transect, three during the second transect and three during the third transect. Sightings were concentrated around the northern end of the Woodbank woodland and in the east of the Site within the southern end of Drumkinnon Wood and adjacent strip of woodland to the east of Pier Road. A single sighting of a grey squirrel was made on the last transect in the woodland south of the Ben Lomond Way roundabout, close to the only drey recorded in this area. This sighting is important in the context of the camera failure at this location (see earlier).
- 7.21 Dreys were noted throughout the Site, with the highest number within the Woodbank woodland (see **Figure 7.1**). No dreys were found in close proximity to the Boathouse area of the Site, but a network of dreys were visible further west within the woodland containing the aerial adventure ropes course.

### ***Camera trap monitoring of feeder stations – January/February 2022***

- 7.22 Full results of the feeding stations monitoring can be found in **Appendix D**.
- 7.23 **No red squirrels were recorded visiting any of the feeder stations.**
- 7.24 Grey squirrel activity varied across the feeder locations. At Location 1, no squirrel activity was recorded during the entire deployment period. Location 2 had high grey squirrel activity immediately on deployment, with at least two grey squirrels repeatedly collecting food and emptying the feeder within a few days of deployment. Location 3 saw low levels of grey squirrel activity up until 22 January 2022 when grey squirrels were then recorded repeatedly visiting the feeder until it was empty. Location 4 had sporadic clips of grey squirrel, with a more concentrated period between 26-28 January 2022 when a grey squirrel repeatedly visited the feeder. Location 5 suffered a camera failure but the feeder was empty when it was retrieved on 02 February 2022.
- 7.25 Other species recorded on the cameras included roe deer at Location 3, and a variety of bird species across all locations including blue tit, coal tit, great tit, chaffinch, robin, blackbird, nuthatch and great spotted woodpecker.

## **Discussion**

### **Relevant legislation**

- 7.26 Red squirrel is protected by the Wildlife and Countryside Act 1981 (as amended) and the Nature Conservation (Scotland) Act 2004, against intentional or reckless killing, injury or taking (capturing), damaging, destroying or obstructing access to any structure or place which a red squirrel uses for shelter or protection, or disturbance while it is occupying a structure or place which it uses for that purpose. In 2011, both of these Acts were amended by the Wildlife and Natural Environment (Scotland) Act 2011 (known as the WANE Act). NatureScot can therefore license disturbance of red squirrel (including removal of dreys) for over-riding reasons of social, economic and environmental reasons provided there is no satisfactory alternative. The distance at which disturbance to a red squirrel drey may occur is variable, depending on the activity and whether or not breeding is suspected.



- 7.27 The red squirrel population is in decline in the UK and has been replaced over most of England, Wales and central and south-east Scotland by the non-native grey squirrel. Red squirrel is primarily a conifer specialist and population densities are highest in stands containing conifer tree species of a variety of ages and with reliable cone crops.

### **Red squirrel at Lomond Banks**

- 7.28 When combining the various findings from surveys undertaken, grey squirrel were found to be abundant and frequent within the Woodbank woodland and the southern end of Drumkinnon Wood. The sightings of grey squirrels were also close by to the dreys recorded in the woodland south of the Ben Lomond Way roundabout and the Riverside area of the Site. A notable lack of grey squirrel activity was recorded in the centre of Drumkinnon Wood, both during the transects and at the feeder station deployed there.
- 7.29 A single sighting of two red squirrels within a narrow woodland strip along Old Luss Road was notable given that there were no previous records of red squirrels within any parts of the Site. There were no dreys in the immediate area surrounding the location of the red squirrel sighting, but a single drey was located in the southern end of the woodland block south of the Ben Lomond Way roundabout. Unfortunately, the Location 5 feeder station camera failed, but a grey squirrel was observed in a tree close to this drey during the walked transects. Other dreys recorded were in areas where higher levels of grey squirrel activity were recorded, either during the transects or on the camera traps, with the exception of the centre of Drumkinnon Wood where there was seemingly no squirrel activity.
- 7.30 It was considered likely that the majority, if not all, of the dreys within the Site were being used by grey squirrels rather than by reds, and that the red squirrels sighted were vagrant reds occasionally moving in from areas to the north for feeding within the larch trees along this section of woodland. The absence of red squirrel from the feeder stations further supports this. The section of woodland where the sighting took place was relatively isolated and fragmented, and only included a single drey to the south, but there was connectivity with woodland cover to the north. Nevertheless, it is not possible to confirm conclusively that all dreys within the Site were being used by grey squirrels, and therefore in line with NatureScot guidance, in areas where both red and grey squirrels have been recorded all dreys should be treated as if they are protected, unless it can be demonstrated beyond reasonable doubt that the drey is only being used by grey squirrels.
- 7.31 In the Riverside section of the Site and the southern end of Drumkinnon Wood, grey squirrels were consistently observed in areas close to dreys. In the context of the surrounding habitat, it was presumed that this part of the Site did not support red squirrel.
- 7.32 The woodland block south of the Ben Lomond Way roundabout only contained a single drey, where a grey squirrel was observed in close proximity during the walked transects. However, this drey was within the same woodland strip as the red squirrel sighting. Grey squirrels were frequently recorded within the Woodbank woodland, both during transects and at feeder stations. There was a substantial network of dreys within this woodland and habitat here was better connected to the wider area, including being in relatively close proximity to the red squirrel sighting.



7.33 Red squirrel is a highly mobile species, and can move into areas within a short timeframe. Red squirrel should therefore be considered a **Council** level IEF in the EcIA, and the following measures will be required:

- in line with NatureScot guidance, for all development proposals where red squirrels are a consideration, pre-construction surveys for dreys in the woodland south of the Ben Lomond Way roundabout and Woodbank areas of the Site should be completed no earlier than 3 months before the start of works. At this time, no such surveys are considered to be required for Riverside and Drumkinnon Wood (see above);
- also in line with NatureScot guidance, if impacts on potential red squirrel dreys are unavoidable, dedicated surveys will be required for these features. This should include any dreys within 50 m of works within the woodland south of the Ben Lomond Way roundabout and the Woodbank woodland. This will involve watches on each drey over three mornings at dawn, either using surveyors or through the licensed use of camera traps. This should be completed during the breeding season (February-September);
- if pre-construction surveys determine that red squirrels are occupying any dreys within the Site, then all dreys within 50 m of the works would potentially represent licensable features. Works within this 50 m disturbance zone should be avoided during the squirrel breeding season, in line with NatureScot guidance, reduced to 5 m outwith the breeding season. Removal of a red squirrel drey could only occur under licence from NatureScot.

7.34 The red squirrel sighting made in 2022 should be submitted to the SSRS database.



## Lomond Banks

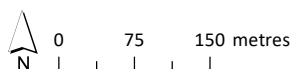
### Red Squirrel Survey Results

- Site boundary
  - 50 m from Site boundary
  - ★ Feeder station
- Transect results:**
- Red squirrel sighting
  - Grey squirrel sighting
  - ▲ Drey

**Figure 7.1**

**Map Scale @ A4: 1:7,500**

Surveyed by: DS
Survey date: January - February 2022
Drawn by: DS
Checked by: RAH
Status: Final





**Figure 7.2: Selection of photographs from the red squirrel survey.**



(a) Grey squirrel recorded at Location 2 feeder station.



(b) Two grey squirrels recorded at Location 3 feeder station (one on the feeder and one at ground level).



(c) Grey squirrel recorded at Location 4 feeder.



(d) Red squirrel sighting during walked transect.



(e) Grey squirrel sighting in tree during initial walkover in July 2021.

Figure 7.3: NatureScot flow diagram for red squirrel assessment.

