

FEARNA STORAGE

Fearna Pumped Storage Hydro Scheme EIA Report

Appendix 9.1 – Tree Survey Report

February 2025



Quality Information

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1. Executive Summary

The tree survey examined the potential impact of the construction of the Proposed Development on trees over 10cm dbh, the possible felling of which would not otherwise be covered by Long Term Forest Plans or Land Management Plans. The findings of the tree survey enable an assessment to be made of the impacts of the Proposed Development upon individual trees and upon areas of ancient woodland and Caledonian pinewood habitats in particular. The findings will enable the developers to minimise these impacts during construction through micro-siting of infrastructure - such as lay-bys and road widening - to avoid mature and veteran native trees as far as possible. Nonetheless it is likely that construction of the Proposed Development will result in removal of individual trees and in significant forestry impacts including woodland removal as covered in more detail in the forestry section of the Environmental Impact Assessment.

- The tree survey recorded and mapped the location of 5211 individual trees over 10cm dbh which were considered likely to be affected by the construction footprint of the Proposed Development. Of these mapped trees 3193 (61%) were native tree species and 2018 (39%) were non-native tree species.
- The construction of the Proposed Development and the Southern Access Route is likely to result in the loss of up to 6.98 ha of ancient woodland habitat and 3.51 ha of non-native plantation forestry in the sections covered by this appendix.
- The new A87 junction, new bridge and new section of road at the eastern end of the SAR is likely to result in the loss of up to 2.73 ha of ancient woodland and PAWS (Plantation on Ancient Woodland Site) and may require felling of around 475 native trees and 700 non-native trees over 10cm in diameter.
- The upgrade of the road from the existing A87 junction to the Coire Glas exit (approximately 3km) is likely to result in the loss of around 3.03 ha of ancient woodland and PAWS, and may require felling of up to 1190 trees over 10cm diameter.
- The upgrade of the road from the Coire Glas exit to the eastern boundary of Kingie Forest is likely to result in the loss of up to 0.92 ha of ancient woodland and PAWS, and 0.86 ha of other forest land as a result of the installation or upgrade of up to 85 laybys. This may require felling of around 269 trees over 10cm diameter.
- The upgrade of the road from the western edge of Kingie Estate forestry to the western end of the SAR at the proposed Fearn PSH upper reservoir is likely to result in the loss of up to 0.3 ha of ancient woodland and PAWS, and may require felling of up to 24 trees over 10cm diameter.
- The extension of the Poulay Quarry is likely to result in felling 2.65 ha of the existing mature and pole-stage Lodgepole pine crop currently scheduled for felling in the 2023-2027 phase under the active FLS Land Management Plan. It will result in the loss of 0 ha of ancient woodland and PAWS, but will involve the loss of 1.5 ha of the Caledonian Pine buffer zone, and is likely to require felling of around 6000 - 7000 trees with an estimated timber volume of 200 to 300 tonnes.
- The construction of the Site Compound is likely to result in the loss of up to 0 ha of ancient woodland and PAWS, and is likely to require felling of 0 trees over 10cm diameter. If the area of the compound is re-instated to semi-natural vegetation, such as a mixture of wet heath, blanket bog, native woodland and peatland-edge woodland, on completion of the construction project it is likely that there will be no net loss of forest and woodland habitats in this study area in the medium term.

2. Introduction

This Appendix provides details of a preliminary tree survey carried out to inform an assessment of the potential effects of the construction of the Proposed Development on trees and woodland habitats which would not otherwise be covered by Long Term Forest Plans or Land Management Plans (see also Appendix 2 Long term Forest Plan amendments).

The survey focuses upon the potential impacts upon trees of the construction of the Southern Access Route (SAR) for the Fearn Pumped Storage Hydro scheme, which will involve the upgrade and widening of around 25 km of existing forest road, as well as the construction of around 4.5 km of new road, a new access onto the A87, the construction of three bridges (crossing the River Garry, the River Kingie and the Garrygualach), the extension of an existing quarry, and the creation of a substantial site compound within the FLS Glengarry forest block.

This assessment has been carried out by Upland Forestry Ltd with input and advice from Chris Pasteur and Fraser Allinson on behalf of Gilkes Fearn Hydro Ltd.

3. Scope of Assessment, Methodology and Approach

3.1 Study Area 1: Southern Access Route - New A87 Junction and bridge

The Study Area encompasses the survey area boundary provided by Gilkes Hydro Ltd for the proposed new A87 junction and new bridge across the River Garry (upstream of the existing bridge and forest road entrance) along with an upgraded section of road to the south of the proposed new bridge and connecting to the existing main access road and proposed Southern Access Route (SAR), as shown on Map 1.

The survey area covers 3.72 ha in total, all of which is wooded and shown as ancient woodland on the Ancient Woodland Inventory and/or shown as native woodland or Plantation on Ancient Woodland Site (PAWS) on the Native Woodland Survey of Scotland (NWSS) dataset, with the exception of the river gorge itself and the existing forest road surface.

The current survey recorded and mapped all trees over 10cm diameter at breast height (dbh) within the survey area, with the exception of two areas of dense mature non-native conifer blocks in which total tree numbers were estimated by measuring average tree spacing and stocking density. Trees were mapped within the 5m buffer zone relative to the current forest road surface using a bespoke field GIS system on Samsung tablets. Tree dbh estimation was calibrated at regular intervals using a standard dbh tape, and estimation of distance from the edge of the track was calibrated at regular intervals using a 30m loggers tape. Additional data was also collected on tree species, estimated diameter (cm) and life stage (using broad categories based on dbh: <20cm pole-immature, 20-50cm mature or >50cm veteran).

It should be noted that this section of the proposed Southern Access Route has been approved and consented separately as part of the SSE Coire Glas Project, with works anticipated to commence in 2025. They are included within this study only to cover the possibility that the Coire Glas Project does not go ahead as currently planned.

3.2 Study Area 2: Southern Access Route - Existing A87 junction to Coire Glas access road

The Study Area encompasses the area of a proposed forest road upgrade in this section of the SAR. It includes the existing forest track surface plus a 5m buffer on either side of the track, and extends from the existing junction of the forest road with the A87 in the east, to the junction for the Coire Glas exit from the forest road in the west (at NH 264 005) a total length of around 2894 metres. No further information was provided by the developers regarding the location of possible laybys or passing places.

The current survey recorded and mapped all trees over 10cm diameter at breast height (dbh) within the 5m buffer zone from the existing track. Trees were mapped within the 5m buffer zone relative to the current forest road surface using a bespoke field GIS system on Samsung tablets. Tree dbh estimation was calibrated at regular intervals using a standard dbh tape, and estimation of distance from the edge of the track was calibrated at regular intervals using a 30m loggers tape. Additional data was also collected on tree species, estimated diameter (cm) and life stage (using broad categories based on dbh: <20cm pole-immature, 20-50cm mature or >50cm veteran).

It should be noted that this section of the proposed Southern Access Route has been approved and consented separately as part of the SSE Coire Glas Project, with works anticipated to commence in 2025. They are included within this study only to cover the possibility that the Coire Glas Project does not go ahead as currently planned.

3.3 Study Area 3: Proposed SAR from Coire Glas access road to Kingie Forest

The Study Area encompasses the area of a proposed forest road upgrade in this section of the SAR. It includes the existing forest track surface plus a 5m buffer on either side of the track for most of the route, with a wider 10m buffer used to map trees for approximately 25m either side of proposed layby locations (which were provided as mapped points by the developers). The survey area extends from the junction for the Coire Glas exit from the forest road in the east (at NH 264 005) to the western edge of the National Forest Estate (NFE) at NH 099 001, a total length of around 19.5 kilometres.

The current survey recorded and mapped all trees over 10cm diameter at breast height (dbh) within the 5m buffer zone from the existing track (10m buffer zone around proposed layby locations). Trees were mapped within the buffer zones relative to the current forest road surface using a bespoke field GIS system on Samsung tablets. Tree dbh estimation was calibrated at regular intervals using a standard dbh tape, and estimation of distance from the edge of the track was calibrated at regular intervals using a 30m loggers tape. Additional data was also collected on tree species, estimated diameter (cm) and life stage (using broad categories based on dbh: <20cm pole-immature, 20-50cm mature or >50cm veteran).

3.4 Study Area 4: Proposed SAR Kingie Estate forest block to the western end of the SAR

The study area encompasses the area of proposed new road construction from the western boundary of the Kingie Estate forest block (NH088 013) to the western end of the SAR at the proposed Fearn PSH upper reservoir (NH 048 038 approx). Trees over 10cm dbh were surveyed where they occurred within an approximate 10m buffer of the centreline of the drawings of the Proposed Development provided by the developer.

Trees were mapped within the survey zone using a bespoke field GIS system on Samsung tablets. Tree dbh estimation was calibrated at regular intervals using a standard dbh tape. Additional data was also collected on tree species, estimated diameter (cm) and life stage (using broad categories based on dbh: <20cm pole-immature, 20-50cm mature or >50cm veteran).

3.5 Study Area 5: Proposed extension to Pouлары Quarry

The study area encompasses the area of plantation forestry (Lodgepole pine) around a proposed extension to the existing Forestry and Land Scotland (FLS) quarry at Pouлары NN 144 993. The proposed area of felling and woodland removal has been aligned with existing rides and watercourses to create a windfirm edge where possible.

3.6 Study Area 6: Proposed Main Site Compound

The study area encompasses the area of a proposed new site compound to be developed on an area of partially restocked conifers (Sitka spruce) at NN 127 995. The compound would be established early in the main construction programme, or potentially as part of a separate enabling works contract in advance of the main construction contract. It is envisaged that existing vegetation and soils would be cleared, with the compound being established on three level terraces covering a gross area of around 50 ha. The construction footprint of the compound would be restored to semi-natural vegetation and woodland on completion of the construction of the Proposed Development.

4. Results - Baseline Conditions in early 2025

4.1 Summary and Overview

The tree survey recorded and mapped the location of 5211 individual trees over 10cm dbh which were considered likely to be affected by the construction footprint of the Proposed Development. Of these mapped trees 3193 (61%) were native tree species and 2018 (39%) were non-native tree species.

4.2 Study Area 1: New A87 Junction and bridge

The entire 3.71 ha site is wooded and is largely shown as ancient woodland on the Ancient Woodland Inventory (AWI) and is shown as native woodland or Plantation on Ancient Woodland Site (PAWS) on the Native Woodland Survey of Scotland (NWSS) dataset. If we subtract the approximate areas of the existing minor forest track west of the river (0.89 ha) and the approximate area of the river corridor (0.09 ha) then the gross area of loss of ancient woodland habitat is 2.73 ha, of which 1.89 ha is currently afforested with non-native conifers (Sitka spruce). See also Map 1 below.

The tree survey mapped 474 trees which were over 10cm dbh within existing native woodland habitats and alongside the existing track within the survey area provided. The most common tree species occurring was birch (55%), followed by Sitka spruce (20%) and rowan (10%) with other species including Scots pine, oak, grey willow, eared willow, common alder, aspen, juniper, beech, Western Hemlock and fir. The trees mapped included 27 trees in the largest diameter class (>50cm) of a variety of species including oak, Scots pine, birch, rowan, Sitka spruce, Norway spruce and larch. There were also 203 trees in the mature/intermediate class (20-50cm dbh) and 242 trees in the smallest/pole-immature category (>10<20cm). See also Map 1 below.

The survey estimated the presence of around 700 non-native Sitka spruce within two blocks of plantation on ancient woodland sites (PAWS). The block of Sitka on the north side of the river is notable for the presence of older large diameter high-volume trees, with many of the Sitka being 30m tall or more, and with some wind-throw occurring in the stand. The block to the south of the river appears to be younger trees with much lower overall volume, possibly second rotation, and it has received a partial thinning.

4.3 Study Area 2: Southern Access Route - Existing A87 junction to Coire Glas access road

The gross survey area of the existing road plus 5m buffer on each side covers 4.45 ha, of which the existing track surface covers around 1.42 ha, giving a net woodland area in this section of 3.03 ha. The entire length of this section of proposed road upgrade is wooded and is shown as ancient woodland on the Ancient Woodland Inventory and/or shown as native woodland or Plantation on Ancient Woodland Site (PAWS) on the Native Woodland Survey of Scotland (NWSS) dataset. Around 74% of the proposed road upgrade (2142m) is also located within the buffer zone of the Caledonian Pinewood Inventory site for Glengarry Pinewood.

The tree survey mapped 1190 trees which were over 10cm dbh within the 5m buffer on the existing track within the survey area. Of these mapped trees 677 (57%) were native tree species and 513 (43%) were non-native tree species. An example of the tree survey data collected for this section of the SAR is shown on Figures 2a and 2b below.

The most common tree species occurring was birch (30%), followed by Norway spruce (20%), Sitka spruce (10%) and rowan (8%) with other species including Scots pine (6%), oak, grey willow, eared willow, common alder, aspen, juniper, hazel, holly, bird cherry, sycamore, beech, Western Hemlock and fir. The trees mapped included 143 trees in the largest diameter class (>50cm) of a variety of species including oak, Scots pine, birch, rowan, Sitka spruce, Norway spruce and larch. There were also 534 trees in the mature/intermediate class (20-50cm dbh) and 512 trees in the smallest/pole-immature category (>10<20cm).

4.4 Study Area 3: Proposed SAR from Coire Glas access road to Kingie Forest

The gross survey area covers 31.06 ha, of which the existing track surface covers around 9.96 ha, giving a net woodland area in this section of 21.1 ha. Seven segments of this section of proposed road upgrade are shown as ancient woodland on the Ancient Woodland Inventory and/or are shown as native woodland or Plantation on Ancient Woodland Site (PAWS) on the Native Woodland Survey of Scotland (NWSS) dataset. Around 11.7 ha (36 %) of the survey area is located within ancient woodland and/or NWSS/PAWS, with the remainder occurring on other forest land or internal open ground within the FLS Glengarry site. Around 60 % of the survey area in this section is also located within the buffer zone of the Caledonian Pinewood Inventory site for Glengarry Pinewood.

The developers have indicated that this section of the SAR will require the upgrade or installation of 85 laybys the construction footprint of which will typically be 55 metres long by 3.8 metres wide (30m at full width with tapered ends), giving an overall area of the footprint of each layby of around 209 square metres or 0.0209 ha. If multiplied by the number of laybys this gives an estimated area of woodland removal of 1.78 ha along the full length of this section of the SAR. If we assume that the total area of new laybys will cover 8.4% of the area surveyed, we calculate that this will involve felling an equivalent ratio of the trees surveyed - which is around 269 trees over 10cm dbh.

Of these 85 laybys, 44 occur within woodland shown as ancient woodland on the Ancient Woodland Inventory and/or are shown as native woodland or Plantation on Ancient Woodland Site (PAWS) on the Native Woodland Survey of Scotland (NWSS) dataset. This indicates that around 0.92 ha of woodland removal will occur within ancient woodland or other native woodland habitats, with 0.86 ha occurring on other forest land.

The tree survey mapped 3196 trees which were over 10cm dbh within the 5m buffer on the existing track (10m buffer around laybys) within the survey area. Of these mapped trees 1995 (62%) were native tree species and 1201 (38%) were non-native tree species. An example of the tree survey data collected for this section of the SAR is shown on Figures 3a (below) and in Appendix 9.2 of the main EIA.

The most common tree species occurring was birch (38%), followed by Sitka spruce (26%), Scots pine (15%) and Lodgepole pine (10%) with other species including rowan, grey willow, eared willow, common alder, aspen, juniper, larch and Western Hemlock. The trees mapped included 60 trees in the largest diameter class (>50cm) – these were mainly Scots pine and include a significant number of veteran trees and 'granny pines'. There were also 1062 trees in the mature/intermediate class (20-50cm dbh) and 2072 trees in the smallest/pole-immature category (>10<20cm).

4.5 Study Area 4: Proposed SAR from Kingie Estate forest block to the western end of the SAR

No areas of native woodland were shown on the Ancient Woodland Inventory or the Native Woodland Survey of Scotland maps within the area surveyed. A total of 24 trees over 10cm dbh were mapped and surveyed, these occurring as part of six small stands (or 'ghost woodlands'), typically associated with watercourses and riparian areas, as shown on Figure 4 below. If the construction footprint cannot be adjusted to avoid these small groups of trees, there may be a loss of around 0.3 ha of existing fragmented native woodland, as shown on Figure 4 below.

The most common tree species occurring was alder (57%) followed by birch (21%), rowan (12%), holly (5%) and eared willow (5%). The trees mapped included 10 trees in the largest diameter class (>50cm) – these included a notable veteran holly as well as alder, birch and rowan. There were also 11 trees in the mature/intermediate class (20-50cm dbh) and 3 trees in the smallest/pole-immature category (>10<20cm).

These trees in many cases represent some of the most fragmented and threatened remnants of formerly more extensive woodlands and wood pasture habitats and could represent valuable seed-sources for woodland expansion by natural regeneration in these areas. One group in particular – located west of the powerhouse where the upper track diverges from the public road – would merit protection, retention and expansion if possible as an example of a remnant Upland Mixed Ashwood or Wood Pasture BAP Priority Habitat containing veteran holly and alder on better soils.

4.6 Study Area 5: Proposed extension to Poulary Quarry

No areas of native woodland were shown on the Ancient Woodland Inventory or the Native Woodland Survey of Scotland maps within the area surveyed. The quarry is right on the western edge of the wider CPI buffer zone for the Glengarry pinewood, and 1.5 ha of the proposed woodland removal is within the CPI buffer zone with the remaining 1.15 ha being outside the CPI buffer zone, as shown on Figure 5 below.

The total area of woodland removal is 2.65 ha and consists entirely of a mature crop of Lodgepole pine. The proposed extension to the quarry is likely to require felling of around 6000 -7000 trees with an estimated timber volume of 200 to 300 tonnes. The crop is scheduled for felling during the current phase (2023-2027) according to the active Land Management Plan for Glengarry Forest, and we envisage that the timber will be harvested and extracted using conventional methods, with timber sold by FLS into conventional markets.

4.7 Study Area 6: Proposed site compound

No areas of native woodland were shown on the Ancient Woodland Inventory or the Native Woodland Survey of Scotland maps within the area surveyed, and the main Site Compound is outside the Caledonian Pinewood Inventory buffer zone. The site appears to largely consist largely of open ground resulting from recently clear-felling of commercial conifers, along with small areas of checked conifers and small areas which have been partially restocked with Sitka spruce and which are now 2-3m tall. The soils appear to be very peaty in places and the site also includes a number of small watercourses.

The construction of the Site Compound is likely to result in the loss of up to 0 ha of ancient woodland and PAWS, and is likely to require felling of no trees over 10cm diameter. If the area of the compound is re-instated to semi-natural vegetation, such as a mixture of wet heath, blanket bog, native woodland and peatland-edge woodland, on completion of the construction project it is likely that there will be no net loss of forest and woodland habitats in this study area in the medium term.

5. Discussion and Recommendations

The construction of the Proposed Development and the Southern Access Route is likely to result in the loss of up to 6.98 ha of ancient woodland habitat and 3.51 ha of non-native plantation forestry in the sections covered by this appendix and may also have a significant impact upon a variety of protected species which occur in the vicinity.

The findings of the Tree Survey outlined in this document will allow the impacts upon trees over 10cm dbh to be minimised during the detailed design process, however a full Tree Survey to BS:5839 and Tree Protection Plans should be carried out prior to construction activity within identified areas of ancient semi-natural woodland, with the aim of minimising impacts on mature and veteran native trees and retaining these as far as possible.

The impacts of tree felling upon protected species and in particular upon bats, red squirrels and birds should be carefully considered with appropriate survey and licencing in place if disturbance is considered likely to occur to these species or to the roosts, nests, dreys and structures which these species may use and which are likely to occur in a proportion of the trees within the survey area.

Map 1: Proposed A87 New Junction and Bridge. Tree Survey for Gilkes Fearnha PSH Ltd.

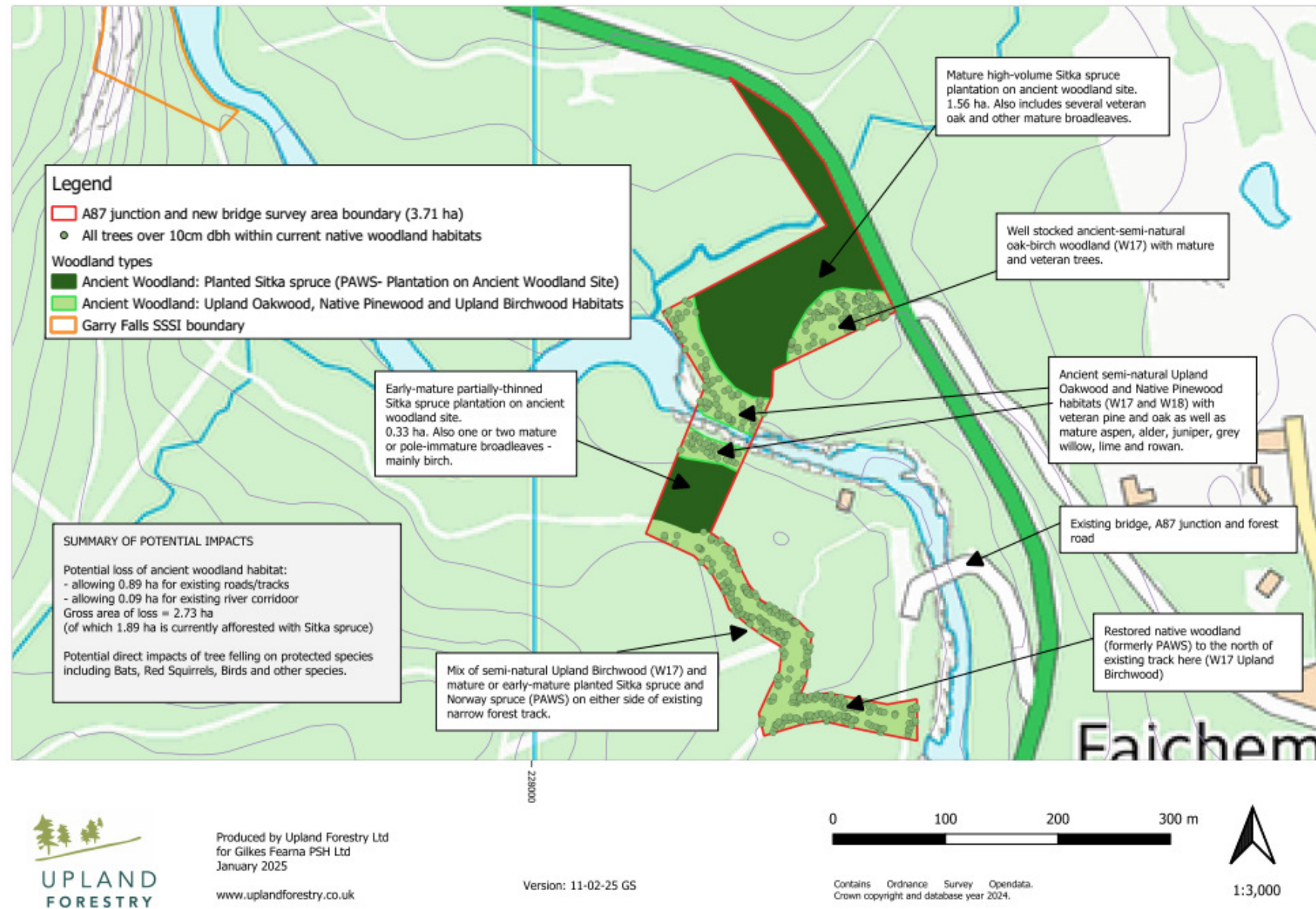


Figure 2a: Tree Survey for SAR A87 junction to Coire Glas exit for Fearn PSH Ltd.
Overview Map

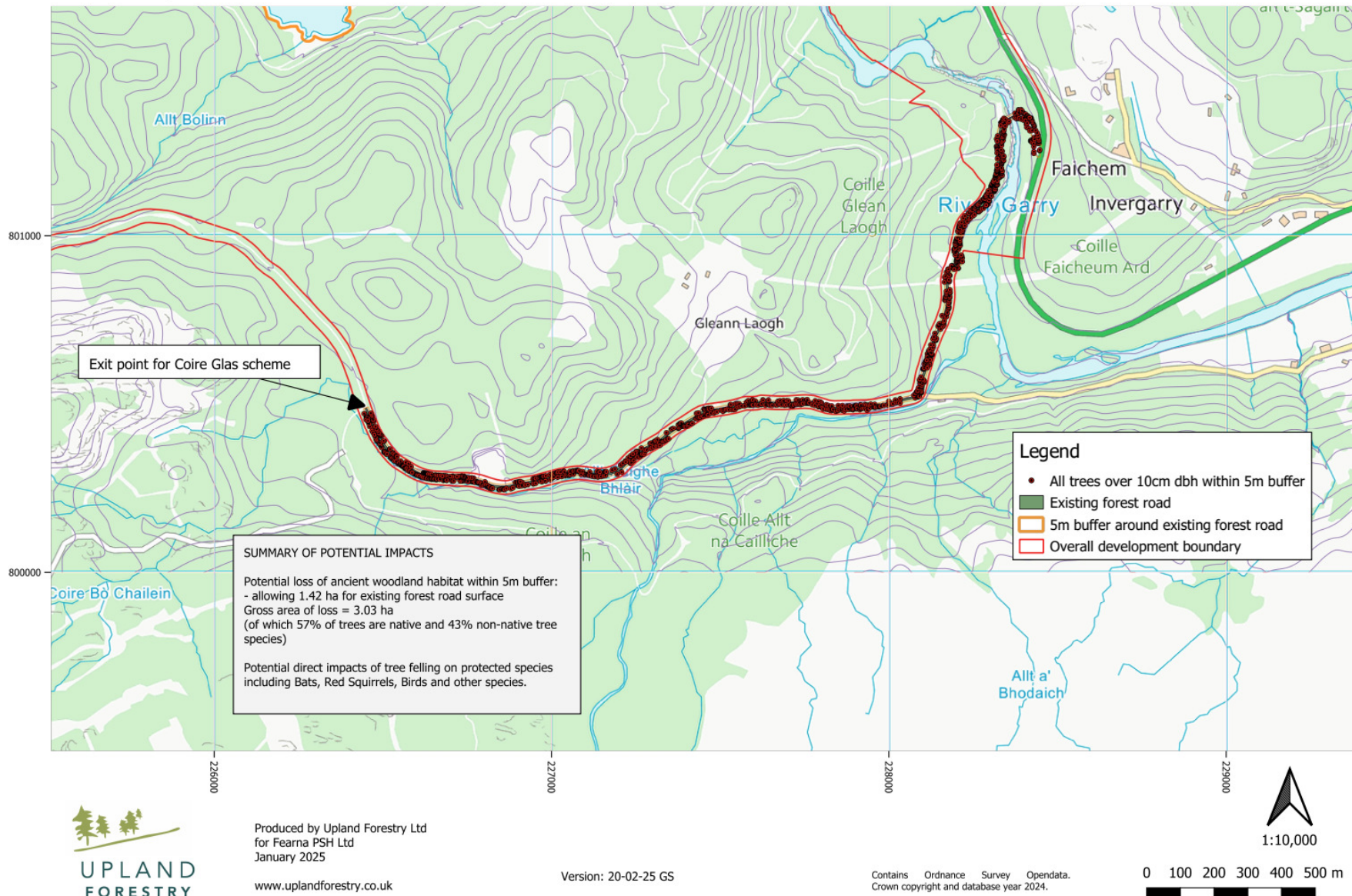


Figure 2b: Tree Survey for SAR A87 junction to Coire Glas exit for Fearn PSN Ltd.
Example map showing locations of trees >10cm dbh at western end of this section

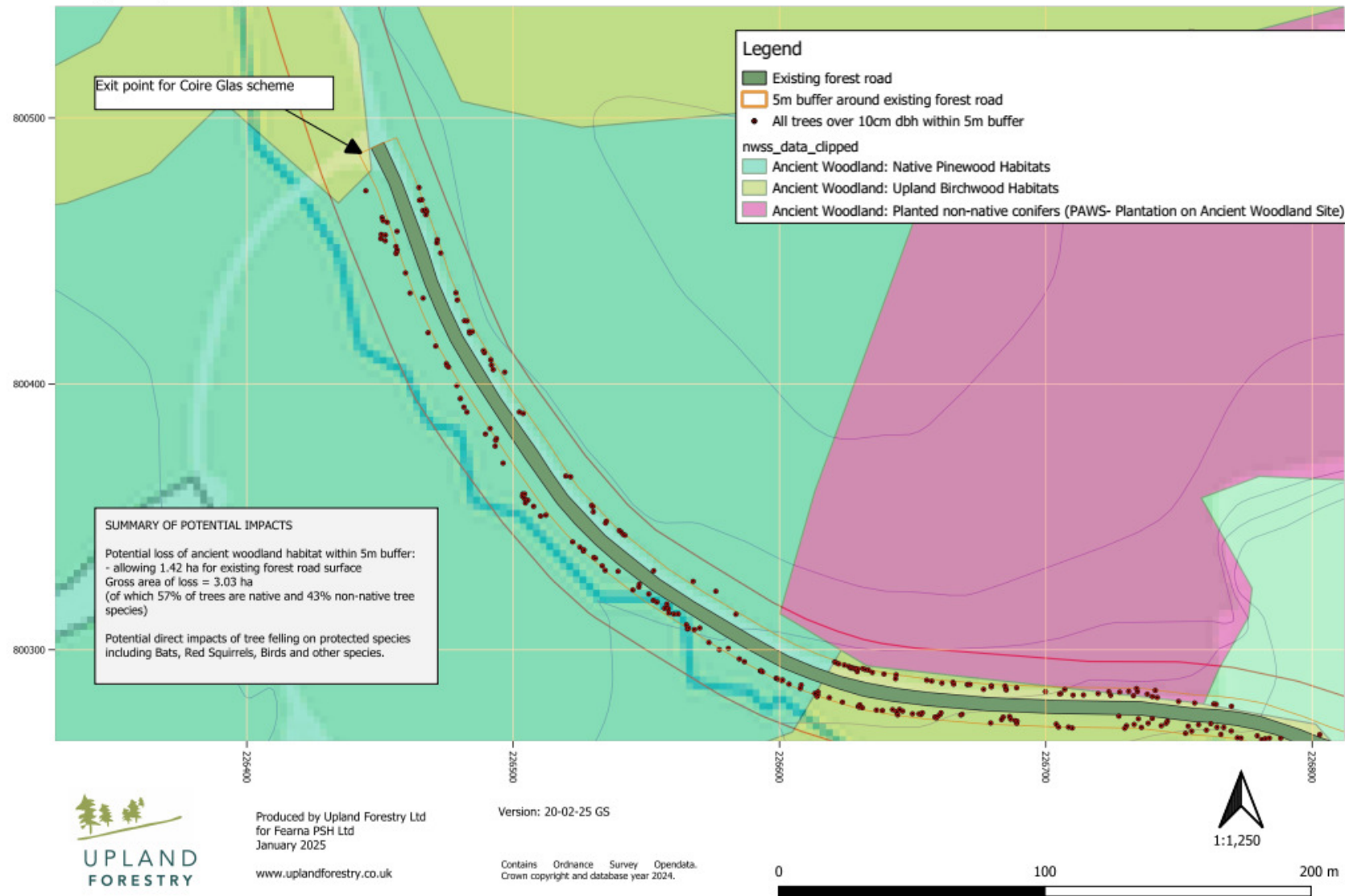


Figure 3a: Tree Survey for SAR Coire Glas exit to eastern edge of Glen Kingie forest for Fearnna PSH Ltd.
Overview Map

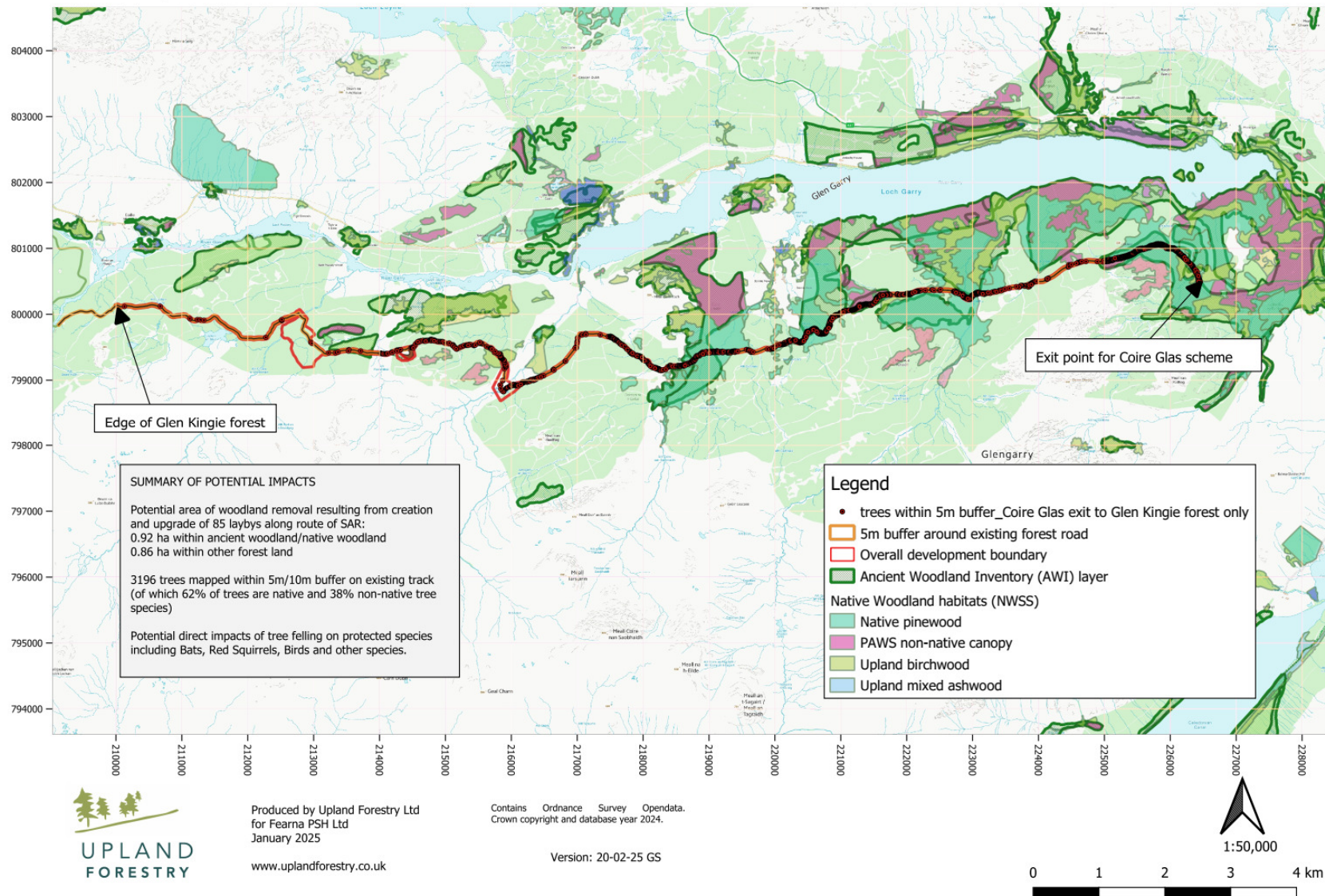


Figure 4: Tree Survey for SAR western edge of Kingie Estate forest to upper dam for Fearn PSH Ltd.
Overview Map

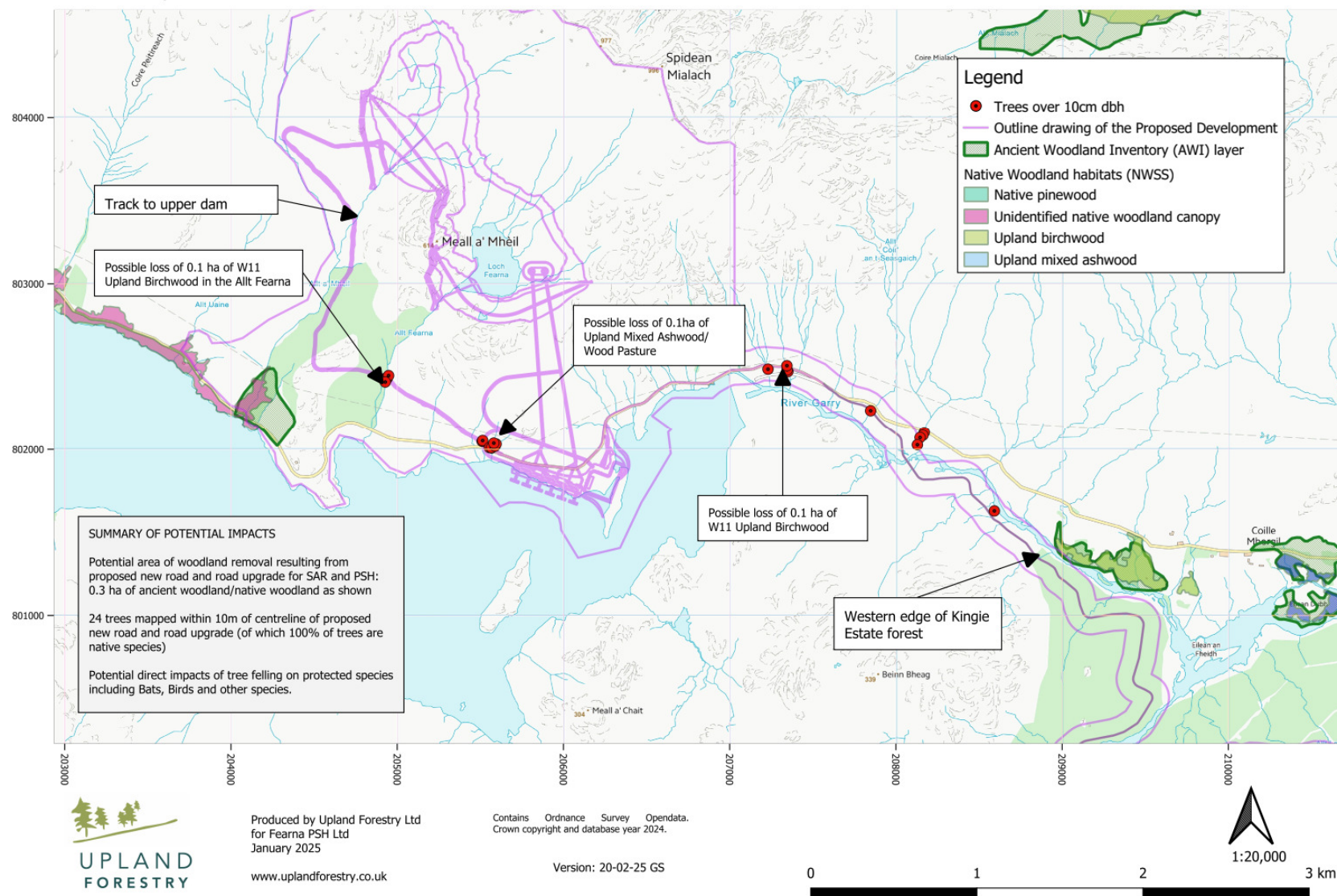


Figure 5: Map showing proposed removal of Lodgepole pine surrounding existing Pouлары Quarry

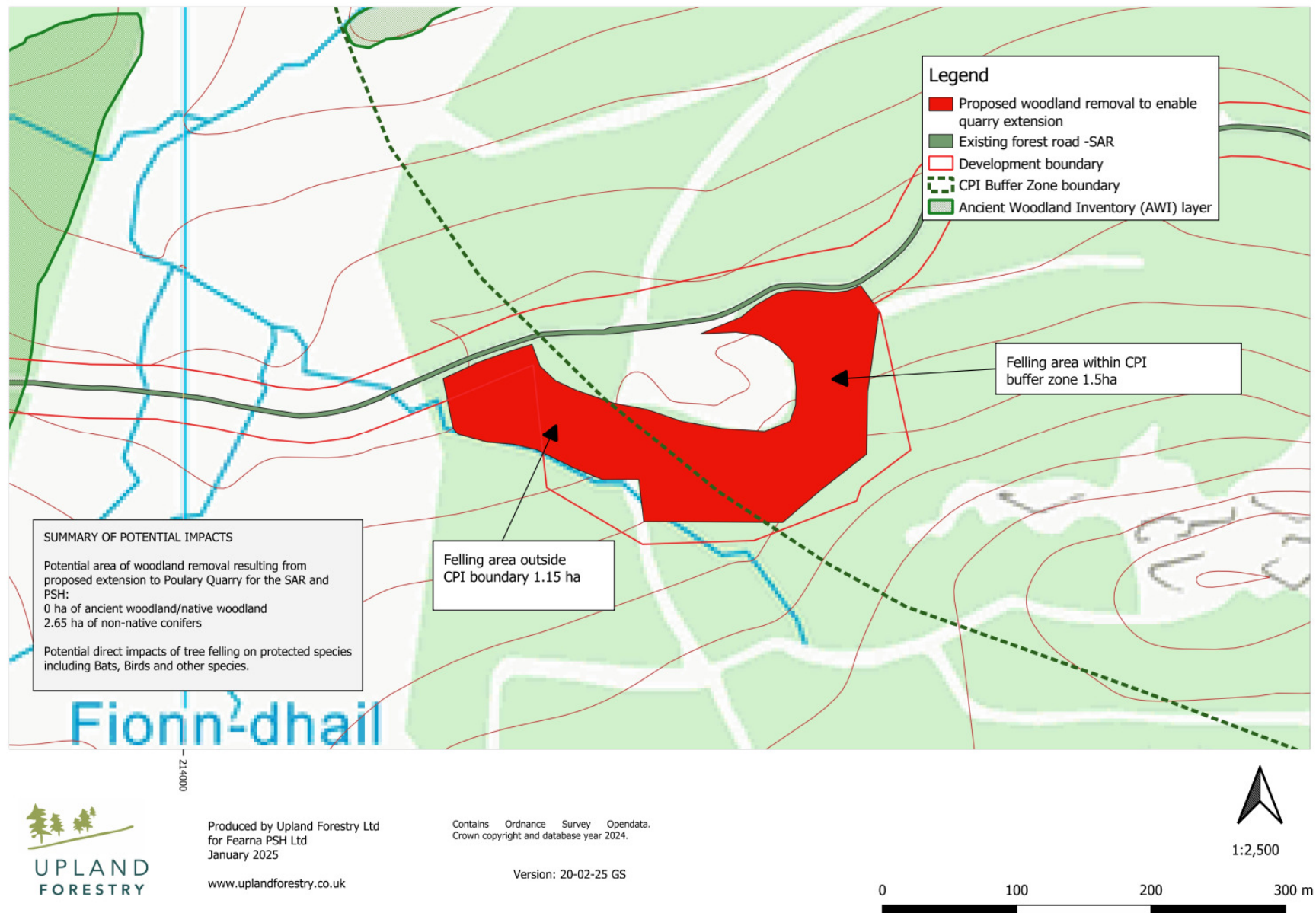


Figure 6: Map showing proposed location of Main Site Compound

