Urquhart Bay Wood SAC: Response to NatureScot Further Advice on the North-Eastern Lobe ("NEL")

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Prepared for: Glen Earrach Energy Ltd

Date: 22 June 2026

1. Purpose of this note

This note is submitted by WestGlen Consult on behalf of Glen Earrach Energy Ltd ("the Applicant") to accompany the habitat assessment of the north-eastern lobe ("the NEL") of Urquhart Bay Wood Special Area of Conservation ("the SAC") prepared by Dr Andy McMullen of Botanæco, which is provided as Appendix A. It addresses the remaining matter relating to the SAC: the potential for increased growing-season waterlogging in the NEL, and whether that could give rise to a pathway to vegetation change affecting the qualifying alluvial alder woodland on floodplains feature.

This note does not reopen, and is not intended to reopen, the wider SAC substrate and erosion assessments set out in the Applicant's response of 6 May 2026 ("the May 2026 response"). Those assessments are unaffected by the work reported here. The purpose of this note is to explain why, on the evidence now available, the residual NEL matter does not alter the conclusion of no adverse effect on the integrity of the SAC.

The assessment applies the precautionary approach required for Habitats Regulations Appraisal: the conclusion of no adverse effect on integrity is reached only where, on the basis of the best available scientific evidence and in the light of the site-specific survey now undertaken, no reasonable scientific doubt remains as to the absence of such an effect. This note and the appended assessment are structured to demonstrate that standard is met in respect of the residual NEL matter.

2. Position following previous submissions and the May 2026 discussions

The May 2026 response addressed the two matters raised in NatureScot's further advice: substrate porosity and growing-season waterlogging across the lower elevation SAC margin, and potential wave-driven erosional retreat of the vegetated margin under the proposed regime. Within that response, the NEL was identified as a distinctive part of the SAC, different in character from the general near-shoreline frontage to the south.

The May 2026 response concluded that the wider lower elevation SAC margin is a heterogeneous, alluvially influenced environment with active and relict coarse-bedded channels, local fine-grained deposits, and hydraulic connectivity with Loch Ness. It did not support the presence of laterally extensive impeded drainage across the general SAC frontage. However, as set out in Section 4.9 of the May 2026 response, the NEL, representing under 5% of the SAC by area, includes a low-lying wetland area set behind a locally variable-elevation loch-facing margin, with localised wetland vegetation including mapped S28 *Phalaris arundinacea* reed canary-grass swamp. It is not currently reworked by the active Enrick and Coiltie alluvial system, having been separated from active fluvial processes following historical river engineering before construction of the Caledonian Canal. It was therefore identified as the part of the SAC where local slower drainage and wetland development may be materially relevant.

The ecological implications of assuming localised slower drainage in the NEL were considered in Appendix B to that response.

Following submission of the May 2026 response and subsequent discussion with NatureScot, the Applicant has focused further work on this NEL. This is consistent with the position set out in the May 2026 response: that the NEL warrants separate treatment but should not be taken as representative of the drainage behaviour or substrate character of the wider SAC frontage.

This note, together with the appended habitat assessment by Dr Andy McMullen, provides that further focused assessment. It considers whether, on the precautionary assumption that localised lower-permeability substrate and slower drainage may occur in the NEL, the proposed regime would cause loss of qualifying alluvial alderwood such that the integrity of the SAC would be adversely affected.

3. Further field investigation of the NEL

Following the May 2026 response, the Applicant undertook further targeted field investigation of the NEL through two linked strands: a geomorphological walkover by Dr Hamish Moir, supported by a programme of shallow hand-probing, sampling, field drainage observation and historical map review by WestGlen Consult. The purpose was not to produce a formal geotechnical or hydrogeological characterisation, but to establish a more detailed knowledge of the character of the sector and to further develop the understanding set out in the May 2026 response. The work

supports the interpretation that the NEL is a complex and heterogeneous environment, and allows its principal features to be described as follows. These observations are used as field indicators of local ground character and hydrological setting; they are not presented as a formal geotechnical, hydrogeological or soil-classification exercise. The fieldwork informs the description of the NEL set out below, but the conclusion on site integrity rests on the specialist ecological assessment in Appendix A, which proceeds on the precautionary assumption that slower drainage may occur locally.

In the north of the NEL, Dr Moir identified the drainage burn entering the north-western corner as most likely representing the former northern channel of the River Enrick, indicated by the large rounded cobbles still present in its bed, as shown in Figure 1. This is consistent with the wider historical interpretation of the area as a former floodplain of the Enrick prior to its diversion. It is further supported by the Roy Military Survey (c. 1750) which, although not accurately georeferenced, clearly shows the Coiltie–Enrick channel running along the northern edge of the Urquhart Bay alluvial fan.

Figure 1 - Cobbles visible in channel bed at NW of the NEL

Hand-probing in the northern section met relatively shallow refusal at several points, consistent with the presence of coarse palaeochannel material at shallow depth. From the north-western corner, water from this burn progresses towards the loch margin through a combination of surface-water channels, connected pools and areas of standing water. While the burn itself runs on the coarse palaeochannel material noted above, the connected pools and standing water away from the channel are associated with deeper, softer and less permeable material. These features were present even following the extended dry spell in mid-May 2026, indicating persistent wetness and local surface-water connectivity across the northern part of the NEL. This wetter northern area corresponds to the productive W7b alder woodland described in Appendix A.

Along the western perimeter, the artificial dyke or bank feature forms locally higher and drier ground. At the opposite side of the NEL, along the fringe on the loch-facing margin, sampling encountered granular, sandier material, consistent with a degree of local hydraulic connection to Loch Ness at the immediate shoreline.

The central part of the NEL, within which the mapped S28 reed canary-grass swamp lies, was associated with deeper, softer and less permeable material at depth, similar to that beneath the standing-water areas in the north, but without the through-flowing surface water observed in the north. Towards the south, the ground becomes more undulating and is more representative of the wider southern SAC frontage, corresponding to the W7 woodland character described in Appendix A rather than the wetter W7b of the north.

The historical map sequence for the sector adds useful context. The mapping shown in Figure 2 indicates that, on the loch side of the dyke feature, this part of the SAC appears to have been historically cleared farmland, with woodland largely confined to the fringes to the north, south and along the loch margin. Over the period of record, spanning approximately two centuries, this cleared central ground has been progressively encroached upon by woodland from those fringes, with the open ground reducing over time. The present-day S28 swamp represents the remaining open area within that long-term process of woodland establishment. This is consistent with a sector on a trajectory of woodland persistence and expansion rather than decline.

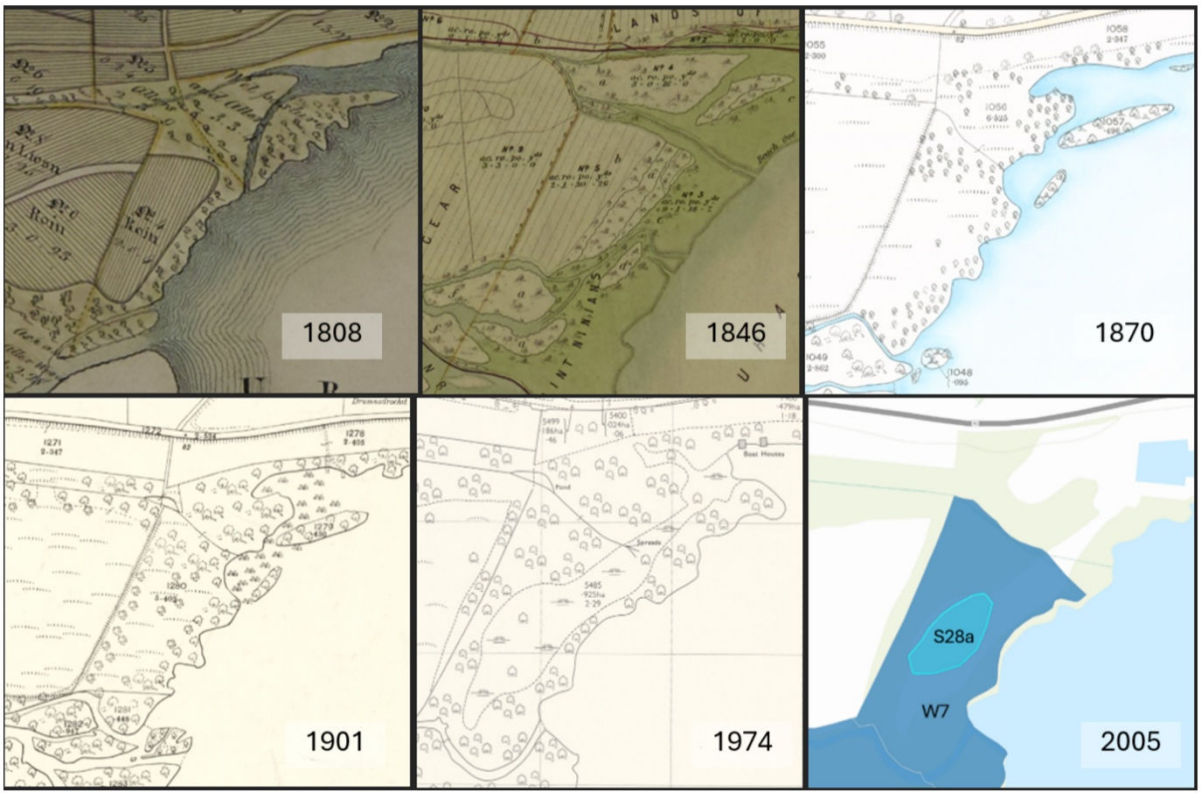

Figure 2 - Progressive map series showing change in the north-eastern sector of Urquhart Bay Woods, arranged left to right in two rows. The 1808 plan shows much of the present north-eastern sector as farmland "Roin 4", with only a marginal lochside fringe described as wet pasture and alder. The 1846 plan still shows the central area as farmland rather than woodland. By 1870, the Ordnance Survey mapping (published in 1893) shows the area remaining largely open, with woodland mainly at the margins, encroaching to the north. By 1901, trees are shown extending further into the area, although the central zone remains relatively open. By 1974, woodland has spread more widely across the sector, interspersed with mapped wetland or marsh symbols. The 2005 SNH habitat survey then identifies the remaining open central area of S28a within surrounding woodland. This can be compared with the up-to-date mapping provided in Appendix A by Dr McMullen.

Permissions and acknowledgements: The 1808 and 1846 Seafield Estate map extracts are reproduced by permission of The Earl of Seafield. The Ordnance Survey map extracts are reproduced with the permission of the National Library of Scotland

from digital images supplied under order maps513011: Inverness-shire, Mainland XXIX.12 (Combined), 1893; Inverness-shire, Mainland XXIX.12, 1903; and NH5229-A, 1:2,500, 1975. The 2005 habitat survey extract is reproduced from the relevant SNH survey report and online NVC Habitat Polygons. Figure contains modified map data.

Taken together, the field investigation confirms that the NEL is genuinely complex and heterogeneous. The evidence on sub-surface sediment tends to indicate a degree of hydraulic conductivity through the NEL, albeit less than that observed along the SAC frontage to the south, rather than uniformly impeded drainage. Consistent with NatureScot's requested approach, and with the distinctive character identified in the May 2026 response, the assessment proceeds on the precautionary assumption that localised lower-permeability substrate with consequent slower drainage may be present in parts of the NEL. Importantly, the appended ecological assessment is built on that same precautionary assumption, so the conclusion of no adverse effect does not depend on demonstrating that the NEL is free-draining. The determining question is ecological and is addressed below.

4. Specialist ecological assessment by Dr McMullen

The specialist ecological assessment has been undertaken by Dr Andy McMullen, Principal Botanist and Director of Botanæco Ltd. Dr McMullen holds a PhD from the University of Southampton in palaeoecology and the conservation management of lowland raised bogs, and a BSc in Botany from the University of Glasgow, and has practised as a professional consultant botanist for around two decades, including senior posts at EnviroCentre, LUC and MacArthur Green before establishing his own practice in 2015. National Vegetation Classification (NVC) survey and the assessment of Groundwater Dependent Terrestrial Ecosystems (GWDTE) (the dependency of vegetation on its water regime) are core specialisms, underpinned by a long-standing research background in peatland and wetland palaeoecology that bears directly on reading the composition, condition and trajectory of wet woodland of the kind present in the NEL. He routinely undertakes Ecological Impact Assessment and Habitats Regulations Appraisal, including Appropriate Assessment, and recently led the habitat, vegetation and GWDTE components of the HRA for re-routing the West Highland Way through the Loch Lomond Woods SAC. His clients include NatureScot (formerly Scottish Natural Heritage), SEPA, Scottish Forestry, Forestry and Land Scotland, the Scottish Government and the Cairngorms National Park Authority.

As set out above, the matter that determines the outcome is ecological: if localised lower-permeability substrate is present, would the proposed regime (the cumulative hydrological impact on loch levels, as set out in earlier documents, most recently the May 2026 submission) cause loss of qualifying alluvial alderwood such that the integrity of the SAC would be adversely affected? This is addressed in the report in Appendix A, following a habitat-focused survey of the NEL on 9 June 2026.

The existing baseline is a wetter expression of the qualifying W7 alder woodland, mapped as W7b across the northern part of the NEL and W7 in the slightly more elevated south, with S28 reed canary-grass swamp occupying the larger canopy openings. There is a field-observed gradient from very waterlogged conditions in the north to less-waterlogged but still mesic conditions in the south, and wetland species are already strongly represented in the field layer. The S28 swamp is present as openings within the W7 wooded sector, consistent with the dynamic woodland and swamp mosaic rather than indicating woodland decline.

The assessment finds that alder regeneration in the NEL is currently limited by shade, not by waterlogging. Alder is a flood-tolerant pioneer species: it colonises open, wet ground readily but cannot regenerate from seed beneath an established canopy, and it persists instead by regrowth from established trees, in a process akin to self-coppicing. The young alders recorded during the survey were all in open or canopy-gap conditions, consistent with this ecology. The established alder population is accordingly resilient, with its persistence not dependent on successful seedling recruitment in any given spring period. However, the current trajectory, absent the scheme, is one of increasing bird cherry and sycamore recruitment, which over time would tend to supplement and partially replace the alder and ash canopy.

On the basis of both the field survey and the flood-tolerance literature, the assessment finds that increased waterlogging would not remove alder from the woodland, nor result in loss of the qualifying alluvial alderwood feature, and is likely to favour alder's persistence relative to less flood-tolerant competing species. Established alder

is documented in the literature as being in the highest flood-tolerance class. Perhaps even more instructive, the survey records mature alder persisting in the wettest ground in the very northernmost waterlogged section of the NEL, providing direct site-specific evidence of resilience to persistent inundation and waterlogging. The two lines of evidence, the published literature and the site-specific observations, point the same way - no negative impact to existing alder is anticipated as a result of the modified water regime. Bird cherry and sycamore, the species currently regenerating most vigorously, are of high and very low flood tolerance respectively, so wetter conditions would relieve rather than intensify pressure on the qualifying species. The predicted field-layer response is expansion of the wetter species already present, with either maintenance of the existing W7 or potentially a shift from this less distinctive W7 towards wetter W7b-type vegetation outside the most northerly area where this is already present. Any such change would be a compositional adjustment within the qualifying wet woodland, not structural de-vegetation or loss of qualifying woodland.

The appended assessment also addresses regeneration in the most open ground where alder seedling establishment might be possible given the lack of shading in these areas. The modified water regime is not expected to increase drought risk during the seedling establishment window and would, if anything, tend to maintain moisture availability. In addition, wetter conditions are likely to favour alder relative to less flood-tolerant species, particularly sycamore. This does not assume widespread alder seedling recruitment, but it does mean the modified regime is not expected to disadvantage alder regeneration relative to the current trajectory. Additionally, willow provides a complementary woody regeneration pathway. Willow is one of the most flood-tolerant woody components of the Urquhart Bay Wood wet woodland mosaic, alongside alder. Grey willow is already recorded in the NEL by the appended report, including encroaching on the open swamp, and is classed, with white willow, among the most waterlogging-tolerant woody species present. The Applicant's earlier ecological assessments further cite willow as capable of germinating in very wet conditions, including while submerged.

Retention of woody cover in the wettest ground therefore rests on three independent supports, not one: the established alder persists through self-coppicing irrespective of seedling success; seedling establishment, where it occurs, is favoured rather than harmed by reduced competition and reduction of drought risk; and willow provides a further flood-tolerant regeneration pathway. Together, these lines of evidence support the conclusion that loss of woody cover by this pathway is not reasonably foreseeable. This is consistent with the predicted alder-to-willow compositional shift identified in earlier submissions as an acceptable response in the wetter parts of the SAC. Any such shift would represent compositional adjustment within the qualifying wet woodland mosaic, rather than loss of the qualifying feature.

The one associated consideration, already noted in prior submissions, is that willow is more palatable than alder to deer, sheep and cattle. Herbivore pressure is an existing management matter for the site. Should localised willow recruitment become more important in the wetter areas, browsing can be monitored and managed through the proposed Grazing and Browsing Management Plan. This provides additional assurance and does not alter the ecological conclusion.

5. Relationship to the previous upper-bound test

Appendix B to the May 2026 response considered an extreme upper-bound case in which continuous impermeable material was assumed across the dominant elevation bands of the NEL, and in which impeded drainage was assumed to prevent tree regeneration entirely as a bounding assumption. On that basis only, Appendix B calculated that approximately 1.49 ha of alluvial alderwood, some 4% of the qualifying habitat, could in principle convert to open swamp. Appendix B was clear that this was not the predicted outcome.

The habitat assessment appended to this submission directly addresses the ecological assumption at the centre of that upper-bound case: whether increased waterlogging would prevent tree regeneration and convert woodland to open swamp. It concludes that this conversion mechanism is not predicted to occur.

This conclusion does not rest on prediction alone. The NEL already supports well-developed, productive W7b alder woodland under persistently wet ground conditions in its northern part, fed by the existing burn and, as the appended assessment notes and Dr Moir’s field observations support, likely by groundwater contribution from the

slope above. This is direct, present-day evidence that sustained wetness is compatible with the qualifying woodland here, and with its most vigorous expression currently recorded within the NEL.

Figure 3 - Standing water within the W7b alder woodland of the northern NEL, with established tree stems rooted in and around persistently inundated ground.

The conversion mechanism on which the upper-bound case depended, waterlogging preventing tree regeneration and driving conversion to open swamp, is therefore not supported by the existing state of the site itself. The predicted response is therefore not woodland loss, but retention of wet woodland, with compositional adjustment of the field layer and woody component within the existing wet woodland and swamp mosaic.

No revised percentage loss calculation is therefore presented, because the specialist ecological assessment does not predict loss of qualifying alluvial alderwood extent by this pathway. The swamp, wetter W7b woodland and willow components that the assessment anticipates are all recognised parts of the dynamic qualifying habitat mosaic.

6. Conservation objectives and conclusion

Drawing the package together with respect to the conservation objectives for the SAC:

Extent:

No loss of qualifying alluvial alderwood extent is predicted.

Structure:

The established wet woodland structure is expected to be retained and woody cover maintained, through established alder persisting by self-coppicing and willow providing a flood-tolerant woody component in the wettest ground.

Function:

The dynamic wet woodland and swamp mosaic is expected to be retained, and the predicted field-layer adjustment towards wetter species remains within the natural functioning of the feature, as recognised in the Conservation Advice Package for the SAC.

Deterioration:

No deterioration of the qualifying habitat by vegetation loss arising from growing-season waterlogging is predicted.

The assessment has proceeded on a precautionary basis that localised lower-permeability substrate may occur in parts of the NEL, with associated slower drainage. Even on that basis, the proposed regime is not predicted to result in an adverse effect on the integrity of Urquhart Bay Wood SAC by way of growing-season waterlogging.

Because, on this precautionary basis, the assessment assumes, rather than seeks to disprove, the presence of localised lower-permeability substrate and slower drainage, the conclusion of no adverse effect does not depend on any question of substrate or drainage. It depends only on the ecological response of the qualifying feature to increased wetness, which the survey and the literature address directly and consistently. The conclusion is therefore robust to the substrate uncertainty that prompted NatureScot's further advice.

The overall conclusion of no adverse effect reached in the February, March and May 2026 submissions is unchanged. On the current site-specific ecological evidence, the realistic predicted outcome is retention of qualifying wet woodland, with compositional adjustment within the existing wet woodland and swamp mosaic, rather than loss of qualifying habitat.

The integrity determination remains a matter for the competent authority on the basis of the totality of the Habitats Regulations Appraisal evidence.

7. Documents enclosed and status of supporting material

The following is enclosed with this note:

Appendix A: Dr Andy McMullen (Botanæco), *Urquhart Bay Wood Habitat Assessment* [final version, June 2026].

The field investigation records described in Section 3, including the probing log, sampling photographs, drainage observations and supporting mapping, are retained by WestGlen Consult as background field records. The submitted assessment relies on the specialist ecological judgement in Appendix A, which proceeds on the precautionary substrate assumption, and these background records are available to NatureScot on request.

Appendix A: Urquhart Bay Wood Habitat Assessment

Report prepared by Dr Andy McMullen, Botanæco

Urquhart Bay Wood

Habitat assessment

Status:	Final 1.1
Date:	22/06/2026
Prepared by:	Dr Andy McMullen
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Please note: • This report is designed for viewing on a screen. It can be printed legibly at A4 although formatting is at A3, the scale for printing if full map resolution is required.
• Pressing the 'Alt' + ' ◂ ' keys will return the page view to a followed hyperlink.

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Summary

Summation: A potential increase in waterlogging associated with the pumped storage, hydroelectric generation schemes would maintain the qualifying alluvial woodland of the NEL, with reorganisation of the feature rather than its loss.

This report describes the results of a habitat-focused survey & assessment of the north-eastern lobe of the Urquhart Bay Wood Special Area of Conservation, on the shore of Loch Ness, 1.5 km east of Drumnadrochit.

The **aim** of the report is to describe the current habitat baseline and the likely ecological effect(s) of hydrological changes associated with a pumped storage hydroelectric generation scheme.

The **Urquhart Bay Wood Special Area of Conservation** (SAC) is associated with the Annex I habitat 'alder woodland on floodplains'. Baseline survey & assessment has established that the north-eastern lobe of Urquhart Bay Wood has a distinct character within the SAC because it is low-lying & wet; and is isolated from the rest of the system.

The **key issue** identified for the SAC woodland in the north-eastern lobe is the potential for increased waterlogging during the recurrent cycles of loch level raising & lowering that are associated with the pumped storage hydroelectric schemes proposed for Loch Ness. The resulting, possible increase in waterlogging could then be a pathway to deleterious vegetation change within the SAC.

There is a **gradual** transition from very waterlogged conditions in the north of the north-eastern lobe of the SAC, to less-waterlogged but still mesic conditions in its south.

Two woodland and one swamp **NVC community** are identified by the survey:

- W7b alder - ash - yellow pimpernel woodland, remote sedge - marsh thistle sub-community
- W7 alder - ash - yellow pimpernel woodland
- S28 reed canary-grass tall-herb fen.

Wetland species are strongly represented within the floristic assemblage of the field layer.

Woodland regeneration is dominated by bird cherry & sycamore and there are several young alders.

Invasive species are present in the south and there is a concentration on the shore in the southeast.

Alder regeneration is currently limited by shade.

The **current trajectory of change** appears to be eventual replacement of the current canopy (alder & ash especially) with bird cherry & sycamore.

An increase in waterlogging is anticipated to have the following effects:

- No change to the current alder population that is already limited in its regeneration by shade.
- Expansion of the distinctive, wetland field layer species, with localised compositional change in the currently less-waterlogged & less distinctive areas towards wetter W7b-type vegetation.
- A reduction of alder seedling/sapling competition with vigorous bird cherry & sycamore regeneration.

View within the centre of the Urquhart Bay Wood. All photographs taken on the 9th June, 2026.

1 Introduction

Remit

1.1 This report describes the results of a habitat-focused survey & assessment of the north-eastern lobe of the Urquhart Bay Wood Special Area of Conservation (**SAC**), on the shore of Loch Ness, around 1.5 km east of Drumnadrochit.

Aim & objectives

1.2 The aim of the report is to describe the current habitat baseline and the likely, ecological effect(s) of hydrological changes associated with a pumped storage, hydroelectric generation scheme, by meeting the following objectives:

- Development of a floristic & vegetation baseline.
- Identification of ongoing processes & trajectories of change.
- Identification of likely changes to the current situation through hydrological changes linked to the hydroelectric scheme.

The site

1.3 The Urquhart Bay Wood SAC (also designated as a Site of Special Scientific Interest) is associated with the Annex I habitat: 91E0 Alluvial forests with alder & ash[1] ('alder woodland on floodplains'). It has developed on an alluvial delta, at the confluence of the Rivers Enrick and Coiltie, where they flow into Loch Ness. Extensive alluvial forest dominated by alder is located on the waterlogged ground associated with historical river channels and there are transitions, on slightly elevated surfaces, to better-drained, broad-leaved woodland containing ash, alder, wild cherry, rowan, wych elm, white willow & bird cherry. There are also minor areas of swamp.

1.4 Baseline survey & assessment of the SAC for the hydroelectric generation scheme has established that the north-eastern sector of Urquhart Bay Wood SAC has a distinct character within the SAC:

- It is low-lying & wetter.
- It is not reworked by the active Enrick-Coiltie alluvial system (due to historic river diversions pre-dating the Caledonian Canal).
- It appears to have been separated from the active alluvial system following artificial river diversion sometime before construction of the Caledonian Canal (i.e. pre 1820s).

1.5 Furthermore, due to a lack of appropriate exposures, it has not been possible to rule out the presence of an underlying, low-permeability, fine-grained substrate which could impede drainage. There are regulatory concerns that drainage impedance could result in enhanced waterlogging and in undesirable vegetation change, in relation to the conservation objectives for the SAC. These are:

- To ensure that the qualifying feature of Urquhart Bay Wood is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.
- To ensure that the integrity of Urquhart Bay Wood is restored by meeting the following objectives for the qualifying feature.
  - Maintain the extent and distribution of the habitat within the site.
  - Restore the structure, function and supporting processes of the habitat.
  - Restore the distribution and viability of typical species of the habitat.

The key issue

1.6 The key issue identified for the SAC woodland in the north-eastern lobe is the potential for increased waterlogging, if impermeable substrate is present below the woodland. If it is present, this substrate could limit drainage during the recurrent cycles of loch level raising & lowering that are associated with the pumped storage schemes. The resulting, possible increase in waterlogging could then be a pathway to deleterious vegetation change. Any change that reduces the extent, structure & function of the designated alder woodland would undermine the above-bulleted objectives for the SAC.

[1] Urquhart Bay Wood SAC details are available at https://sitelink.nature.scot/site/8406. Accessed 10/06/2026.

2 Approach

2.1 In this section, the approach to the survey & assessment is described.

Survey boundary & buffers

2.2 The survey area is defined in Map 1 *et seq*. It is defined by the SAC boundary and the limit of anticipated change in the northeastern sector. This limit of anticipated change is associated with slightly higher, better-drained ground in the south of the north-eastern lobe (and see Map 2).

Desk study

2.3 A desk study is undertaken to identify habitat designations, especially Sitelink[2], to identify nature conservation designations. In addition, a review of prior surveys & submissions has been undertaken (as provided by Glen Earrach Energy Limited and as available via the Energy Consents Unit portal[3]).

Survey

2.4 A survey was undertaken on the 9th of June, 2026, by Dr Andy McMullen, Principal Botanist at Botanæco. There are three elements to the survey:

- 'National Vegetation Classification' (NVC) of vegetation within the habitats.
- Appraisal of the current floristics & structures (e.g. presence/absence of certain species or structures such as a shrub canopy).
- Appraisal of the physical environment (e.g. topography, water flow, etc).

2.5 The data from these is mapped & described; and supplemented by field assessment of habitat/vegetation condition & groundwater dependency. The methods are described in the following sections.

National Vegetation Classification

2.6 The National Vegetation Classification (NVC) is necessary for identifying habitats/plant communities of relevance to modern legislation (such as Annex I of the Habitats Directive, or GWDTE of the Water Framework Directive). It is therefore the primary system to which vegetation (& habitat) is related within this report, for the purposes of identification, mapping & description.

2.7 Vegetation is identified, mapped & described according to *British Plant Communities*[4] in accordance with the *NVC Users Handbook*[5]. This involves walking the site on a route determined by topography/viewpoints and the need to sample distinctive areas. Boundaries are mapped onto rectified aerial photographs overlain with contours & other physical features. A single vegetation community, or a mosaic or transition of two or more communities, is identified within a boundary, depending upon the scale & patterning of the habitat/vegetation.

Floristic description

2.8 In this section, the approach to describing floristic biodiversity is described.

Floristic biodiversity: species richness, evenness & distinctiveness

2.9 Biodiversity is defined as the variation in genes, species & interactions in an area. In order to describe the biodiversity of habitats & vegetation, the following measures are used on a three-point scale (high, medium/moderate & low):

- Species richness is a measure of the number of species
- Evenness is a measure of how equally the species are distributed.
- Distinctiveness is a measure of how much the habitat contributes to biodiversity.

2.10 Species richness relates the number of species and by inference: the number of genes & interactions. Evenness relates how many of the interactions are dominated by small number of species, or a single species, and is often indicative of habitat condition, for example: invasive species (e.g. bracken) create 'uneven' vegetation because of their exclusive dominance. Some habitats are naturally species poor but these are usually distinctive, such as reedbeds, that are dominated by a single grass but are rare in the landscape, and they host notable species. As such, distinctiveness is broadly a measure of naturalness &/or rarity.

2.11 Use of species richness, evenness & distinctiveness as measures of habitat/vegetation biodiversity therefore aids appraisal of habitat/vegetation composition, condition & ecological importance.

Quantification of species abundance

2.12 Plant species abundance within habitats/vegetation is semi-quantified using the DAFOR scale. This scale broadly relates abundance/cover as follows:

[2] SiteLink data, including mapping & site documentation available at https://sitelink.nature.scot/home. Accessed 10/06/2026.

[3] Glen Earrach details on the Energy Consents Unit portal are here: https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00005121. Accessed 10/06/2026.

[4] Rodwell, J.S. 1991-2000. *British plant communities*. 5 Volumes. Cambridge University Press.

[5] Rodwell, J.S. 2006. *NVC Users' Handbook*. Available at http://jncc.defra.gov.uk/page-3724. Accessed 10/06/2026.

- **D**ominant: 76 % to 100 % cover
- **A**bundant: 51 % to 75 % cover
- **F**requent: 26 % to 50 % cover
- **O**ccasional: 11 % to 25 % cover
- **R**are: 0 % to 10 % cover.

Alder regeneration

2.13 As the regeneration of alder maintains the alder woodland character of the SAC, a specific survey for its saplings & young trees was undertaken during the site visit. A series of west-east transects spaced approximately 30 m apart was walked, to locate alder saplings & young trees. Regrowth from established trunks or collapsed boughs was not included - only that of individual & evidently young, alder trees or saplings.

Notable species

2.14 Notable species are included in nature conservation designations & listings. The 2016 JNCC spreadsheet of taxa designations[6] defines these species and is the main point of reference. Species are referred to as 'notable' to avoid confusion with the use of 'rare' in the DAFOR scale (see Quantification of species abundance).

Nomenclature

2.15 Standardised vernacular names are used for the vascular plants (ferns, herbs & trees). Scientific names (italicised within the text) are used for the moss, liverwort & lichen species because although vernacular names are now in existence, they are not in general usage. This approach assists discrimination of the plant groups and avoids long, tedious lists of vernacular & scientific names. The standard checklists for the names are employed[7].

Survey accuracy

2.16 A number of factors affect the precision with which boundaries and communities can be mapped. These include:

- GPS error.
- Georectification errors in the aerial photography used for base-mapping.
- Gradual transitions between habitats & vegetation that are poorly-defined with a simple line.
- Transitional habitats & vegetation similar to two or more habitats or NVC communities.

2.17 Furthermore, the fit of vegetation to the published NVC communities is often imperfect and the closest approximation is therefore adopted (with explanation in the habitat/vegetation descriptions in the Habitats & vegetation baseline). Surveying in Scotland also has the added limitation that NVC sampling was weighted towards England, so the published descriptions, and even community titles, are not always directly applicable (for example: eponymous species may not be present in Scotland).

Additional background

2.18 Additional background on the approaches employed are available on the Botanæco blog at the following links:

General survey

- Using a mobile device on ecological surveys
- Setting up a speedy, mobile GIS using QField
- Habitat survey kit
- Approaches to survey
- Semi-automating vegetation data entry.

Habitats & vegetation

- Conserving relict species assemblages
- A way to describe vegetation
- Fitting Phase 1 habitats & NVC communities to their designations.

Peat & peatlands

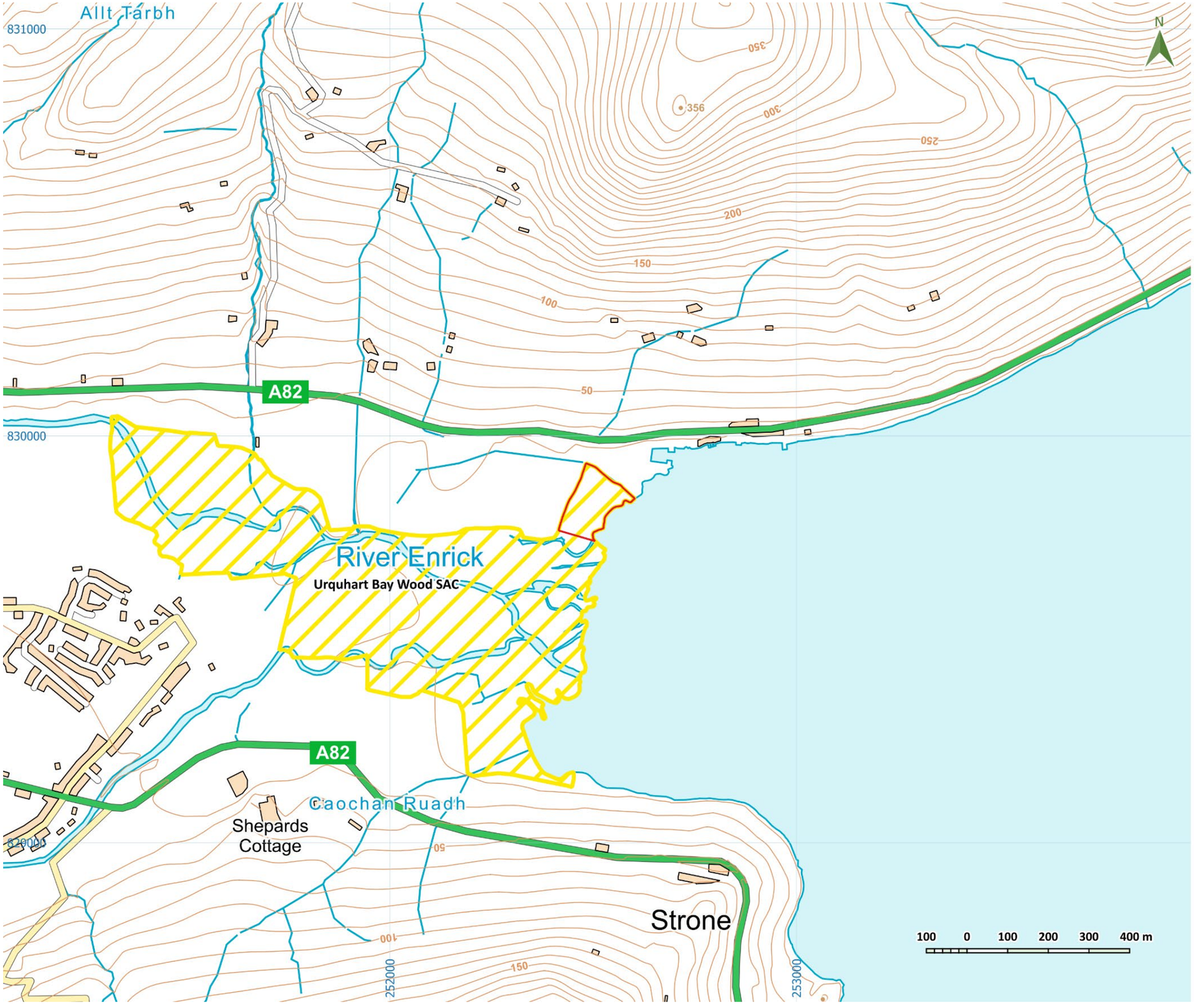
- Peat depth survey - a modern approach
- Confusion over peat depth & other mire sediment types
- Peatland Condition Assessment.

GWDTE

- GWDTE: a field guide
- A contribution to the risk-based assessment of GWDTE
- GWDTE 2: A quick guide to GWDTE
- GWDTE I: Go with the flow on survey.

[6] JNCC spreadsheet of taxa designations & further information available at: http://jncc.defra.gov.uk/page-3408. Accessed 10/06/2026.

[7] BSBI *List of British & Irish Vascular Plants & Stoneworts*, for higher plants, available at https://bsbi.org/taxon-lists. For mosses and liverworts, the *Census Catalogue of British and Irish Bryophytes 2021* available at https://www.britishbryologicalsociety.org.uk/publications/census-catalogue/. Accessed 10/06/2026.



Map 1:
Physical features.

Urquhart Bay Wood SAC

Physical features

Legend

Assessment boundary

Statutory designation

Special Area of Conservation

Physical features

Point height (m)

Contour (10 m)

Building

Primary Road

Minor Road

Waterbody

Watercourse

Scale: 1:10,000 at A3

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N

Map 2:
Habitats, vegetation & alder regeneration.

Urquhart Bay Wood SAC

Habitats & alder regeneration

Legend

Assessment boundary

Habitats & NVC community

Broadleaved woodland

Swamp

Alder regeneration

Alder regeneration

Alder relative size

Scale: 1:1,000 at A3

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3 Baseline

3.1 In this section, the habitat baseline of the site is described in relation to its general characteristics, designations, habitats, vegetation communities & notable plant species.

General description

3.2 There is a gradual transition from very waterlogged conditions in the north of the north-eastern lobe (**NEL**) of the SAC to less-waterlogged but still mesic conditions in its south. This gradation is broadly related to the altitude above loch level (*c*. 16 m a.s.l.), as well as to the presence of an active watercourse across the northern end of the NEL. In the south of the NEL, the ground rises gently to become more water-shedding. Although there is no marked discontinuity in the variation across the NEL, there is a diffuse zone of transition in the south that is indicated by the boundary of the two main, W7 NVC communities (see Map 2).

National Vegetation Classification

3.3 In this section of the report, the vegetation of the NEL is described by habitat.

Woodland

3.4 Two woodland NVC communities are identified within the NEL by the survey:

- W7b alder - ash - yellow pimpernel woodland, remote sedge - marsh thistle sub-community
- W7 alder - ash - yellow pimpernel woodland.

3.5 The W7b remote sedge - marsh thistle sub-community is extensive across the northern, 1.43 ha of the NEL. It is associated with a canopy of dominant to abundant alder in the canopy, alongside frequent to occasional: ash, bird cherry & sycamore. Rowan, white willow & wild cherry are rare. Grey willow and more rarely, goat willow, form a patchy shrub layer, especially around the fringes of the woodland canopy.

3.6 In the field layer below the canopy, hemlock water-dropwort is variably dominant to occasional (see Image 1 & Image 2); meadowsweet is abundant to occasional; and there is frequent to occasional: blackcurrant, broad buckler-fern, broad-leaved dock, creeping bent, creeping buttercup, creeping forget-me-not, creeping soft-bent, flag iris, giant horsetail, Himalayan balsam, lady fern, male fern, marsh bedstraw, marsh hawksbeard, marsh-marigold, reed canary-grass, remote sedge & tufted hair-grass. There is also rare: bluebell, bogbean, bramble, false brome, marsh cinquefoil, ragged robin, water avens, wood anemone & yellow pimpernel.

Image 1: Dominant hemlock water-dropwort at the northern end of the NEL.

Image 2: Even mix of species in the field layer in the centre of the NEL.

3.7 The generally tall & productive growth of the herbs in the field layer (e.g. Image 2) limits the cover of the bryophyte layer and the number of species, but the following are patchily present: *Atrichum undulatum*, *Brachythecium rivulare*, *Brachythecium rutabulum*, *Calliergonella cuspidata*, *Kindbergia praelonga*, *Mnium hornum*, *Rhytidiadelphus triquetrus* & *Thuidium tamariscinum*.

3.8 Towards the south of the NEL, the subtle rise of topography coincides with less waterlogged but still mesic conditions that are associated with the less distinctly wetland assemblage of the W7 community, rather than with any specific sub-community. However, affinity to the W7b community remains apparent although elements of the 'grassy', W7c tufted hair-grass sub-community and of the W9 upland ashwood community are also present.

Image 3: Frequent bird cherry & sycamore saplings in the south of the NEL.

3.9 The canopy within the W7 area is much less scrubby than that to the north (within the W7b area) because the alders are less frequent and are less multi-stemmed. Instead, there is a greater cover of the other tree species (ash, sycamore, etc) in less waterlogged conditions. In the field layer, there is abundant to frequent: creeping bent, creeping soft-bent, creeping buttercup, Himalayan balsam, marsh-marigold & reed canary-grass; with occasional bluebells, broad-leaved dock, cleavers, field horsetail, greater stitchwort, great wood-rush, male fern, nettles, pignut, remote sedge, soft-rush & sorrel. Bird cherry & sycamore, saplings & seedlings are frequent (see Image 3).

Swamp

3.10 Swamp habitat is present in two larger openings within the tree canopy. There are more minor openings associated with swamp habitat too but these are not mapped (because of their small size - less than 5 m in any dimension).

3.11 The swamp habitat is identified as the S28 reed canary-grass tall-herb fen. Within this community, there is a tall sward (to around 1 m) with a relatively even mix of abundant reed canary-grass, creeping buttercup & meadowsweet; with occasional: bladder sedge, creeping forget-me-not, marsh bedstraw, marsh-marigold, valerian & water horsetail. This assemblage does not closely match any of the sub-communities, so the swamp is mapped at the community (rather than sub-community) level.

Image 4: S28 swamp vegetation.

3.12 The areas of swamp habitat are evidently low lying and waterlogged. They appear to be being slowly encroached upon, by grey willow, from the wooded edges and this interpretation is supported further by review of historical aerial imagery in Google Earth (dated: 06/2016, 04/2019, 04/2021, 07/2021 & 07/2023).

Floristics

3.13 Floristic variation within the W7b vegetation is most apparent from north to south. In the north, there is a tall, productive sward of hemlock water-dropwort, to around 1.8 m height (albeit with considerable variation). Southward, the dominance of hemlock water-dropwort and the height of the sward diminishes; so, the vegetation becomes more even in its composition and the sward height is reduced to around 1.0 m (albeit with considerable variation).

3.14 The elevated level of productivity associated with the tall sward of hemlock water-dropwort is suspected to be linked to fertilising alluvium deposited by the watercourse along the northern edge of the NEL. Some further enrichment is likely because at least some of the water intercepted by the watercourse is suspected to be groundwater that has made its way down the slope above, where it too will have been enriched, by contact with the mineral substrate.

3.15 Although much of the water within the watercourse is conducted west-east, along the northern boundary of the SAC, a proportion spills over and is directed southward, through the NEL. Its passage soon becomes challenging to follow, as it bifurcates and is lost below & among, vegetation & leaf litter cover.

3.16 Dominance of the hemlock water-dropwort limits the evenness of the vegetation in the north of the NEL (see Image 1). However, the species-richness & distinctiveness remains relatively high, even if no other species occurs with such uneven abundance as the hemlock water-dropwort. Through the centre of the NEL there is a more even assemblage within the vegetation, and no one, clearly dominant species (see Image 2). Instead, there is a very variable, species-rich & distinctly wetland composition related to the microtopography - wetland species are extensive & collectively dominant in depressions; and there are minor, elevated areas of drier substrate, in which species such as tufted hair-grass, and even bluebell, are rooted.

3.17 Towards the south, there is a subtle but significant rise of the topography across the boundary between the W7 & W7b communities illustrated in Map 2. Conditions remain mesic across this rise but the substrate is much less waterlogged than to the north. Within the associated area of W7, evenness is high but species-richness & distinctiveness diminish because the most wetland elements of W7b are absent or scarce, so a smaller number of common & widespread, generic species are prevalent instead (e.g. creeping bent, creeping soft-bent, creeping buttercup & Himalayan balsam). Furthermore, there is considerable intrusion of the invasive species, Himalayan balsam, and to a lesser extent: broad-leaved dock, ground elder & sycamore - these are well-established at location '7' in Map 2. Broad-leaved dock is a 'weedy', native species that is atypical in the woodland context and has the potential for vigorous spread once established. Although sycamore is not strictly native, and it can behave invasively, it is increasingly recognised as a 'naturalised' species within our woodlands.

Alder & woodland canopy regeneration

3.18 Woodland canopy regeneration is ongoing throughout the NEL and in the south especially, within the W7 area. Here, bird cherry & sycamore are establishing vigorously, and occasionally forming small patches that are likely to result in thickets that suppress the underlying field layer. This process of thicket formation is already apparent here & there, throughout the NEL, especially where the cherry &/or sycamore regeneration is establishing alongside mature alders &/or grey willow.

3.19 Sapling or immature alders are much rarer than those of bird cherry or sycamore: only eight young alders, less than 10 m in height were recorded during the survey. These are all saplings or individual, young trees, rather than regrowth from established trunks. Their distribution & height is illustrated in Map 2 and in the Appendix, where they are labelled as locations '1' to '6'. These young trees range in height from 2.5 m to 10 m, as specified in the Appendix.

3.20 All but one of the young alders are established within open swamp habitat; and the one exception is established within a minor clearing. No young alders were encountered below established canopy although recent regrowth from established trunks (fallen, standing, broken &/or decayed) was encountered, even in deep shade.

Invasive species

3.21 Observations were made on the following invasive species, one of which is native:

- **Sycamore** is frequently establishing throughout the NEL and in especially the south (in the W7 area).
- **Himalayan balsam** is scattered throughout the NEL but is especially abundant within the southern, W7 area. It is likely to become dominant here.
- **Japanese knotweed** & **ground elder** have established along the shore, where they are likely to have been introduced as washed-up debris - see location 7 in Map 2.
- **Broadleaved dock** is a native species that is atypical for the W7 alder woodland habitat. It is established throughout the south especially, where it is patchily frequent.

4 Assessment

Alder regeneration

4.1 Although there is widespread regeneration from established alders that are fallen, standing or broken, throughout the NEL, the only obviously young alders & saplings are consistently associated with the open areas of swamp habitat, or in one case, a smaller opening in the tree canopy. This observation is consistent with alder's pioneer strategy that involves:

- Prolific seeding.
- Rapid colonisation of bare ground.
- Fast initial growth.
- Intolerance of shade.
- A short life span (≈150 years)[8].

4.2 As a result of this pioneer strategy, and the intolerance of shade especially, it has long been considered practically impossible for alder to regenerate below a woodland canopy[9]. It is therefore predictable that sapling/young alders are only associated with breaks in the tree canopy, and especially, the large openings occupied by swamp habitat.

4.3 The waterlogged conditions associated with the swamp, and throughout the NEL more generally, are evidently not an impediment to the germination & growth of alder. It is strongly characterised & widely recognised as a 'wetland tree' and is able to persist in wetlands because of an ability to conduct oxygen down to its rooting zone, that is then able to function aerobically/'normally'[10,11]; the formation of adventitious roots; and metabolic mechanisms to cope with, avoid & recover from, anoxic injury[12]. In fact, in a ranking of 65 Central European tree & shrub species, alder was placed in the highest, "very high flooding tolerance class"[12]. Consequently, continued waterlogging is more likely to sustain the cover of alder, than result in its loss, especially when it is currently at risk of being replaced by bird cherry & sycamore. This conclusion is further supported by direct site evidence: well-developed W7b alder woodland is already present, and luxuriant, in the persistently wet ground conditions across the northern NEL, demonstrating that sustained wet conditions support rather than diminish the alder woodland here.

4.4 In spite of the resilience of the mature tree, seedlings can be more sensitive to changes. For example, the seedlings will only establish on soil which remains continuously moist for 20 days to 30 days, in the period April to June, and periods of drought during this critical period will result in failed germination[9]. Alder seedlings are also known to be very sensitive to shading and to require a high light intensity to establish. They are also liable to damage by late frosts & frost heave[13].

4.5 At present, it is apparent within the NEL that alder regeneration is largely related to regrowth from the bases & fallen or broken boughs of established trees. Regeneration from seed is evidently limited, especially when the current, small number of alder saplings & young trees is compared to the vigorous establishment of bird cherry & sycamore saplings.

Trajectory of change

4.6 At present, the vigorous regeneration of bird cherry & sycamore suggests that in time, the alder and other trees currently in the canopy, will be supplemented, and at least partially replaced, by these two species.

4.7 In the field layer below the canopy, the current abundance of Himalayan balsam in the south of the NEL suggests that it will continue to spread. This will reduce the evenness & distinctiveness; and in time, the species-richness of the field layer. Broad-leaved dock & ground elder also pose a currently minor threat to the distinctiveness of the woodland field layer in the south of the NEL but they will be limited to the drier areas, when or if they do spread.

4.8 The ongoing changes to the canopy & field layers identified above will develop over the medium to long-term (≈ decades), if nothing else changes. They will result in considerable change to the current tree canopy, especially when the ash dieback is also considered alongside replacement of the pioneer alder - ash & alder will both be largely displaced by the vigorous bird cherry & sycamore regeneration.

4.9 Although ash has been partially displaced by dieback, there is considerable survival & regeneration by the affected trees.

4.10 The alder population also appears to be resilient. As a pioneer species with a relatively short canopy lifespan, many of the existing alder trees are mature, with numerous fallen boughs & trunks. However, there is invariably active regrowth from epicormic buds on the remaining trunk bases, &/or from the collapsed boughs. Consequently, the alder population is evidently able to persist, through self-coppicing, even if regeneration from seed is currently very limited.

[8] White, J. and Gibbs, J.N. 2000. The value of alders to Britain. *Quarterly Journal of Forestry*. 94: 23-28.

[9] McVean, D.N. 1953. Biological Flora of the British Isles No.37.: *Alnus glutinosa* (L.) Gaertn. *Journal of Ecology* 41: 447-466.

[10] Thomas, P. 2000 *Trees: their natural history*. Cambridge University Press, Cambridge.

[11] Dittert, K., Wötzel, J. & Sattelmacher, B. 2006. Responses of *Alnus glutinosa* to anaerobic conditions - mechanisms and rate of oxygen flux into the roots. *Plant Biology* 8: 212-223.

[12] Glenz, C., Schlaepfer, R., Iorgulesco, I. & Kienast, F. 2006. Flooding tolerance of Central European tree and shrub species. *Forest Ecology and Management* 235: 1–13.

[13] Hendry, S. & Elliot, M. 2024. *Investigation into the causes of Alder* (Alnus glutinosa) *mortality in Scotland*: Project Final Report. PHC2021/07. Scotland's Centre of Expertise for Plant Health (PHC). DOI: https://doi.org/10.5281/zenodo.14187112.

Anticipated change related to the hydroelectric scheme

4.11 The primary concern related to the pumped storage scheme is the potential presence of impervious sediment below the NEL that could, if present, reduce drainage & ultimately, have the potential to increase waterlogging during the rise & fall of the loch level associated with hydroelectric generation cycles. This effect has been identified by drying & inundation event analyses for the seasonal, variable weir operational scenario for all of the pumped storage hydroelectric generation schemes (Glen Earrach, Loch Kemp, Loch na Cathrach & Foyers)[14].

4.12 This assessment proceeds on a precautionary basis. It is not necessary to determine the extent to which impervious sediment is present, nor to quantify the magnitude of any resulting change in drainage or waterlogging, because the assessment assumes that increased waterlogging occurs and considers its ecological consequences on that basis. The relevant question for the integrity of the qualifying feature is therefore not the degree of waterlogging change, but whether increased waterlogging would cause loss of the qualifying alluvial alderwood. That question is addressed below.

4.13 Across the greater part of the NEL, under the W7b vegetation, it is anticipated that any increase in waterlogging will result in the following:

- No change to the current alder population that is already limited in its regeneration by shade.
- A likely reduction of alder seedling/sapling competition with vigorous bird cherry & sycamore regeneration.
- Expansion of the distinctive, wetland field layer species, with localised compositional change in the currently less-waterlogged & less distinctive, W7 areas, towards wetter, W7b-type vegetation. As both W7 and W7b constitute the qualifying alluvial alderwood at this SAC, this represents compositional change within the qualifying feature rather than a loss of qualifying habitat.

4.14 No impact on the established alder trees is assumed because these have the capacity to endure wetter conditions, such as through the development of adventitious roots or through metabolic changes. The potential for recruitment from seed is more challenging to establish. As noted above, the seedlings will only establish on soil which remains continuously moist for 20 to 30 days, in the period April to June[9]. The proposed regime is not expected to increase drought risk during this establishment window; if anything, the recurrent wetting associated with the pumped storage schemes, together with water retention by the seasonal variable weir, would tend to maintain moisture availability in the lower NEL during dry spring conditions.

4.15 The woodland already appears to be at a stage where alder regeneration is very limited, and there is no recent recruitment (of saplings less than 2.5 m height, for example). Shade alone is sufficient to explain the current failure of alder regeneration - all of the young trees are in open conditions. Secondarily: competition with vigorous bird cherry & sycamore seedlings/saplings, especially in the south; and competition with the tall, herbaceous growth of the field layer more generally, are also likely to limit alder establishment from seed. Consequently, as noted above, most of the alder regeneration is from established trees, in a process akin to self-coppicing. This response is not prevented by the current, wet ground conditions, as it can be observed both on the loch margin and in the wetter northern sector.

4.16 If anything, increased waterlogging may improve the relative position of alder seedlings, by reducing competition with the bird cherry & sycamore seedlings. The flooding tolerance of these latter trees is respectively classed as 'high' & 'very low', in contrast to alder's 'very high' tolerance[12]. Consequently, increased waterlogging is likely to favour alder and potentially limit further expansion of the sycamore especially. Increased waterlogging will therefore likely slow the ongoing trajectory of change, that currently appears likely to replace the current canopy of alder, ash, etc, with bird cherry & sycamore.

4.17 Grey willow & white willow (the latter occurring rarely within the NEL) will be advantaged by any increase in waterlogging because they too are classed as having a 'very high' tolerance to waterlogging[12] and the former can currently be seen to be spreading into the margins of the swamp habitat in the NEL. These two species, and the grey willow especially, will therefore be able to maintain woodland cover across the NEL, under the increased waterlogging assumed on the precautionary basis of this assessment.

4.18 Ash is one of the characteristic species of the qualifying woodland, and its future in the canopy is more uncertain than that of alder. It is already affected by ash dieback but the affected trees within the NEL remain persistent, albeit with gappy crowns.

4.19 Ash has an intermediate tolerance to flooding[12]. Consequently, on the locally raised, better-drained ground in the south of the NEL, within the W7 area, it is expected to persist. Across the wetter ground, and on the precautionary assumption of increased waterlogging more widely, ash is less likely to regenerate successfully, and the more flood-tolerant alder and willow already present in the NEL would likely be favoured in its place. This change in canopy composition is consistent with the W7-to-W7b transition described above, rather than with any predicted loss of woodland.

4.20 The W7b field layer in the north of the NEL includes a diverse assemblage of species that is likely to be resilient to changes in waterlogging because of the range of strategies available within the vegetation. As a result, any increase in waterlogging is likely to result in an expansion of the most distinctly wetland species within the current assemblage (e.g. marsh-marigold, meadowsweet, reed canary-grass, etc.). These species are even able to tolerate standing water. Consequently, the effect of increased waterlogging will be reorganisation of the field layer assemblage and not its loss.

4.21 In the south of the NEL, across the W7 area, any increase in waterlogging will not be as impactful as to the north (under W7b) because of the slight increase in altitude & drainage potential. However, any increase in waterlogging here is likely to result in a shift to W7b-type vegetation

[14] Glen Earrach Energy 2026. Urquhart Bay Wood SAC: Additional Information Submission: Ecological Summary and Supporting Technical Analyses.

under more distinctly waterlogged conditions than are currently present. This will favour the more distinctively, wetland species among the assemblage and reduce the fertile conditions that allow for productive, invasive species to rapidly spread.

Summation

4.22 A potential increase in waterlogging associated with the pumped storage, hydroelectric generation schemes would maintain the qualifying alluvial woodland of the NEL, with reorganisation of the feature rather than its loss.

5 Conclusions

5.1 There is a **gradual** transition from very waterlogged conditions in the north of the north-eastern lobe of the SAC, to less-waterlogged but still mesic conditions in its south.

5.2 Two woodland and one swamp **NVC community** are identified by the survey:

- W7b alder - ash - yellow pimpernel woodland, remote sedge - marsh thistle sub-community
- W7 alder - ash - yellow pimpernel woodland
- S28 reed canary-grass tall-herb fen.

5.3 **Wetland species** are strongly represented within the floristic assemblage of the field layer.

5.4 **Woodland regeneration** is dominated by bird cherry & sycamore and there are several sapling/young alders.

5.5 **Invasive species** are present in the south and there is a concentration on the shore in the southeast.

5.6 **Alder regeneration** is currently limited by shade.

5.7 The **current trajectory of change** appears to be eventual replacement of the current canopy (alder & ash especially) with bird cherry & sycamore.

5.8 On the basis of the field evidence and flood-tolerance literature, **an increase in waterlogging** is anticipated to have the following effects:

- No change to the current alder population that is already limited in its regeneration by shade.
- Expansion of the distinctive, wetland field layer species, with localised compositional change in the currently less-waterlogged & less distinctive areas towards wetter W7b-type vegetation.
- A likely reduction of alder seedling/sapling competition with vigorous bird cherry & sycamore regeneration.

Appendix

Alder saplings / young trees

Location 1

Co-ordinates: 252458 829829 | **Height:** 8 m

Co-ordinates: 252458 829829 | **Height:** 10 m

Location 2

Co-ordinates: 252540 829830 | **Height:** 6 m

Location 3

Co-ordinates: 252504 829801 | **Height:** 3 m

Image not available.

Location 4	
Co-ordinates: 252500 829800	**Height:** 4 m

Location 5	
Co-ordinates: 252484 829795	**Height:** 3 m

Location 6	
Co-ordinates: 252484 829792	**Height:** 2.5 m