FLS Glen Prosen: Summary of Baseline Surveys undertaken 2022 to 2025

Survey title	Purpose	Methods (including coverage)	Results summary	Implications for planning and management
BIRDS				
Raptor Vantage Point (VP) Flight Activity Surveys	Establish raptor species present and land use by raptors and raven across the areas of potential land use change within the new acquisition.	Survey followed the methods described in NatureScot guidance (SNH, 2017, *Recommended bird survey methods to inform impact assessment of onshore wind farms*, version 2) and adapted to follow the breeding season only and focused on raptors and ravens. Twelve VP's were established across the site to maximise visual coverage. Each VP was subject to two three-hour long watches between mid-April and early-June in 2023 and 2024 with a minimum of 3 weeks between visits to the same VP. All raptors and raven sightings were recorded geographically, along with flight-lines and behaviours where possible.	Surveys identified 11 species of raptor and owl, including raven using the site. Five of the species are Schedule 1 species. Two other species, both Schedule 1, were also recorded incidentally outside of the flight activity surveys. Although not the aim of the surveys, they did identify several active breeding territories for six of the species, two of which are Schedule 1. Incidental records also identified breeding sites for a further three species on the edge of the site in the Glen Prosen plantation. The flight activity surveys identified the site as being well used by generalist raptors for foraging and hunting, along with a few localised areas that appear important for vole hunting specialists. With regards to open habitat dependant raptors and owls, the surveys identified potentially important foraging habitats along with several areas that are important for breeding.	The results of the flight activity surveys will be used to inform habitat restoration and woodland creation planning to ensure important breeding sites remain viable for specialist moorland breeding raptors and owls. Results will be used to plan and retain integral hunting habitat and prey resources for moorland raptors and owls. This will enable planning and management to maximise biodiversity through the retention of open habitat specialist predators and prey, whilst increasing habitat for generalists and woodland specialists.

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Black Grouse Surveys	Establish black grouse lek locations and monitor numbers of males lekking across the site	Using information passed on by the previous estate staff all previously known lek sites are surveyed concurrently twice each year during the second half of April. Additional cold searching is also carried out by FLS Environment or RSPB staff to check all suitable habitat below 500m elevation for any new leks, as per RSPB best practice. Surveyors are in position at least 1 hour before dawn and remain in place for a minimum of three hours. Numbers of displaying males are recorded throughout the survey to establish the maximum number of displaying males at each lek. Any movements are recorded with number of birds, time and direction noted to enable comparisons between leks to ensure birds are not double counted for an overall site population estimate.	Surveys have identified several leks. Two leks were previously unrecorded, one previously recorded lek was not active between 2023 and 2025 and one lek has moved a significant distance to a new location. Overall, once adjusted for movements between leks, numbers for 2023 - 2025 are stable and in the mid - high range of the numbers passed on from the estate's previous counts.	The black grouse survey results will be used to direct proactive habitat improvements like drain-blocking, cattle grazing or sward cutting to maintain the six stable lek locations. The information will also be used to inform woodland creation planning to maximise habitats for black grouse conservation.
Breeding Bird Surveys	Establish baseline data for breeding birds across the site	The Brown & Shepherd methodology as adapted by Calladine was used to estimate upland breeding bird populations. The site is divided into 500 x 500 metre squares with each square covered with a *constant effort transect survey* covering all areas of the square to within 100 meters. Running for two years (2023 & 2024) the method requires four visits each year between mid-April and early-July with a minimum 7 days between visits to the same square. All birds seen or heard are recorded using British Trust for Ornithology (BTO) codes for species and behaviour. Breeding territories are identified if: birds are	The BBS recorded 88 species of birds over the two survey seasons. This included seven wader species, five of which are confirmed as breeding with a sixth suspected but not confirmed. Twelve species of raptor and owl (inc. raven) were recorded during BBS surveys with five (inc. raven) confirmed as breeding in at least one of the years, and a further two species showing breeding behaviour and later confirmed as breeding outside the survey area. With regards to passerines, 52 species were recorded, 21 confirmed as breeding in at least one of the years, and a further 23 recorded displaying breeding behaviour but without	The BBS results can be further analysed to identify any species of conservation concern with significant breeding presence across the site, or important prey species for species of conservation concern. Once their habitat needs, habitat retention and /or restoration areas have been identified, the land management plan can help to improve, maintain or enhance these species. The data can also be used to identify specific management activities needed, e.g. cattle grazing to maintain sward heights. Furthermore, the results act as a baseline of bird diversity across the site that can be used to measure biodiversity changes in relation to the evolving landscape.

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		recorded displaying or singing; carrying nesting material or food; nests are found with eggs or young; and/ or adults repeatedly alarm call, perform distraction or territorial displays. Territories were considered confirmed if any of these behaviours was observed in similar locations on more than one visit. For waders, population estimates are made from collating all visit maps, with pairs displaying any breeding behaviour being considered the same pair if recorded within 1km of records from any other visit map. However, this is known to produce a slight underestimate of breeding wader pairs. For very common species like meadow pipit, presence was recorded and displayed as a heat map rather than a breeding territory map.	territories confirmed. Five species of gamebirds were recorded, three of which are native, one species was confirmed as breeding during BBS, a second suspected as breeding in both years and the third suspected breeding in the second year only.	
High Altitude Dotterel and Ptarmigan surveys	Specific surveys for high altitude breeding specialists that the Brown and Shepherd method is unsuited to.	Species specific transect surveys for Dotterel and Ptarmigan (Gilbert et al, 1998). Two visits covering within 100m of all habitat over 700m in altitude. Visit 1 in May, visit 2 in June. Recording any sightings of Dotterel and Ptarmigan, along with any behaviours to identify potential breeding birds.	Ptarmigan were recorded during the specialist surveys: twice in April 2024 during the 1st BBS visits, one record was of a single bird and the second record was of a pair recorded as 'probable breeding'. No birds were seen on subsequent visits to confirm any breeding. Dotterel were not recorded during any of the species-specific surveys nor the general BBS surveys. However, there was a casual record of a small group of birds on high ground in May 2024. The habitat is not particularly suitable for this species; the sighting was still early in the year for nesting and no breeding behaviour was recorded. In summary,	Consider ptarmigan nesting habitat when planning any additional visitor access on the high ground. Ensure fences are marked to prevent any bird strike on high ground.

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			there may be very small numbers of breeding ptarmigan on site in some years. There is no evidence of dotterel breeding on site.	
Two-year RSPB Research Bird Surveys	FLS proposals at Glen Prosen are representative of restoration of some upland sites across Scotland. Such changes may lead to long-term shifts in bird species and communities. The survey aims to create baseline data for open moorland prior to largescale habitat restoration and woodland creation, that can be repeated and analysed during and after restoration to help understand the change	The survey methodology uses point counts, where a surveyor stays stationary for a timed 10 minutes and records all birds seen or heard. The survey area was split into a 500-metre grid of 138 survey points. Each point is visited twice during the year with an early visit between mid-April and the end of May and a late visit between the June and mid-July and is repeated for two years (2024 and 2025). The method also records habitat features within a radius of 50m from each survey point looking at abundance, species and height of trees. The data is then analysed with juveniles of the year excluded, to calculate density estimates and indices of abundance of breeding adults and can be analysed over time linked to variation in habitat during woodland creation.	Awaiting final report.	This survey is not designed to influence planning and management but to record and be part of a baseline set of data that can be analysed against future changes. However, the data will provide locations of sensitive species with specific habitat requirements alongside the BBS data which may be used to support decisions made from analysis of the BBS data.

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Two-year RSPB Research Wader Surveys	The survey aims to create baseline data to analyse and understand changes to wader communities around native woodland creation and habitat restoration and land management change.	Because point counts are not optimal for surveying waders, additional wader surveys using the best practice O'Brian & Smith and / or Brown & Shepherd transect survey methods depending on the habitat in the survey area. An area of 847 hectares was identified as suitable wader habitat following 2023 surveys and information passed on by the previous land managers. The O'Brian & Smith method was used in enclosed fields covering the ground transects to within 100 meters of all habitat, on unenclosed land the Brown & Shepherd method was used surveying parallel transects 200 meters apart. Three surveys visits are completed each year with first visit between mid-April and early-May, second visit between early-May and early-June and the third visit between early-June and the end of June each year (2024 & 2025). All waders are recorded along with relevant behavioural codes.	No official results available yet. Raw data recorded five wader species on site. Interrogation of the 2024 data for curlews identified an estimated five breeding territories in the areas consistent with the BBS of 2023 and 2024.	This survey is not designed to influence planning and management, but to record a baseline set of data that can be analysed against future changes. However, the data will provide locations of sensitive species with specific habitat requirements alongside the BBS data which may be used to support decisions made from analysis of the BBS data regarding wader conservation on site.
Golden Eagle Topographical (GET) Model	Identify areas of potential use by golden eagles across the site.	The GET model provides a simple map of space use by golden eagles. Utilising GPS telemetry records from across Scotland three topographical variables- slope, altitude, and distance from a ridge – are used to model golden eagle use. The model is visualised by 50m contours, with each contour given a standardised preference index (SPI) value from the three variables. The SPI values range from 1 to 10 (1 indicating the lowest predicted use and 10 the highest).	The GET model test has not yet been fully analysed, but most of the site shows a SPI of 6 or above, due to its altitude and relatively narrow and steep sided valleys.	Used in conjunction with the raptor vantage point data and alongside *FC Information Note - Golden Eagles and New Native Woodland in Scotland* to help plan suitable new native woodland planting and manage areas of high importance for golden eagles.

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		Scores of 6 or above are generally considered as preferred golden eagle habitat.		
MAMMALS				
Bats Activity Monitoring	Establish a baseline of peak season bat activity prior to landscape change	Static bat recorders at six fixed locations were selected to include key foraging, roosting and commuting habitats using five *Titley Chorus* recorders along the full length of the site at a range of altitudes from 260m-625m. Recorders were in location for two weeks and set to record continuously from 30 minutes before sunset to 30 minutes after sunrise to measure the number and time of bat passes.	Five species were recorded on site: common pipistrelle, soprano pipistrelle, Daubenton's bat, Natterer's bat, and brown long-eared bat. Soprano pipistrelle was recorded at every location and was the most numerous bat, common pipistrelle was also recorded at all locations and was the second most recorded bat. *Myotis sp*. were recorded across the site at all locations except the highest and most exposed location. The majority of Myotis passes are assigned to Daubenton's with a smaller number assigned to Natterer's in addition to several that could not be assigned to either species with confidence. Both *Myotis* species were recorded along the length of the Prosen Water, a single brown long-eared bat was detected at the southern end of the site. Using the known average time after sunset for each species against the time of first recorded for each species the likelihood of local roosts was assessed with potential roost areas identified for all species except brown long-eared bat.	Despite the habitat in much of the site being of low suitability for foraging and commuting bats, bats were recorded regularly at all monitoring locations, and bat foraging and commuting will be considered during the planning and management of the site. In particular, the areas identified as having potential roosts nearby will be fully considered. Roost features will be identified and retained. Riparian woodland creation will enhance foraging and commuting habitats and connectivity for all species of bat recorded on site and in time may produce suitable roosting habitats. Additionally, sites could be identified for installing bat boxes to increase roosting opportunities.

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Bat Habitat Assessment	Assess current habitat suitability for bats across the site	Habitat assessment following the Bat Conservation Trust guidelines (Collins, 2023) to determine suitability of the habitats on site for foraging and commuting bats.	In general, most of the habitats present on site are open and exposed with few suitable commuting and foraging features present. However, the southern end of the site with mature native woodland remnants is much more suitable. Habitats in the north and west of the site are assessed as being of LOW suitability for bats. Habitats to the south of the site, particularly those along the Prosen Water are assessed as MODERATE moving to HIGH suitability for foraging and commuting bats.	Habitat suitability assessment will be taken into consideration during planning and management. Areas identified as highly or moderately suitable and the features that make them so, will be protected and enhanced and will help focus the needs for further surveys depending on proposed management
Mountain Hare Survey	To assess the mountain hare population in potential future woodland creation enclosures, to consider the impact on this golden eagle prey species.	The suggested survey method from the NatureScot Research Report No. 1022 was used, and involved a post-sunset walkover survey along transects within the phase 1 woodland creation area (a subset of the site at 510ha with 16km of transects walked), using thermal imagery binoculars/scopes, stopping ever 70m to scan for mountain hares.	Two mountain hares sighted during walkover.	One time survey showed very low hare numbers in phase one woodland creation area. This was backed up by ranger observations over the previous five months, suggesting an overall population density of the post breeding population using the Mountain Hare index of 0.125 per km. This would suggest minimal impact of the woodland creation on this golden eagle prey species.

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Deer count survey	To estimate deer density over the Deer Management Group (DMG) area that includes FLS Glen Prosen to inform progress towards target densities	Helicopter count undertaken on a clear day in March 2022 and 2025 across DMG area. Groups of red deer located, recorded with GPS, photographed, then counted by stag/ hind, and estimates per sq km made by estate boundary and across the whole area.	The on-the-day deer count on FLS Glen Prosen, and FLS Glen Doll was zero in the 2025 count. The estimated deer density across the DMG area had however remained unchanged at 15 deer per sq km, above the DMG reduction target of 10 deer per sq km.	The results show that the FLS deer management activity is effective in reducing the daily presence of deer on the site, however due to the mobile nature of red deer in this area, and FLS commitments to reduce deer densities on site below that required by the DMG as a whole, the survey underlines the need to implement fencing and other measures to reduce and maintain a very low deer population needed for woodland establishment.
OTHER SPECIES & TAXA				
Terrestrial invertebrate survey	Terrestrial invertebrate surveys were undertaken between May and July 2024 to provide baseline data prior to ecological restoration work taking place.	Spiders (*Araneae*) and beetles (*Coleoptera*) were collected from eight sample locations representing key habitat types present within the estate using a variety of sampling methods. Sample locations were: Runtaleave, Cormuir flush, Cormuir riverside, Driesh summit, Corrie of Lick, Cairn Dye, Cairn Inks, Dry Banks. Methods included: 'active searches' in vegetation by hand, 'Bugvac' was used to vacuum sample invertebrates from ground level, 'pitfall traps' transects consisting of five individual pitfall traps spaced 5m apart at each sample location, 'sweep net transects' - transects were walked while sweeping through dense vegetation with a robust net.	A total of 246 species were recorded including one Near-Threatened species, two Nationally Rare species, 12 Nationally Scarce species, one Scottish Biodiversity List species, four species on the spider Amber list, 13 very local species, and 71 local species. Most species (144) were associated with open habitats, while 45 species were wetland-associated, and 28 species were tree-associated. The highest number of species with conservation statuses were recorded at Driesh summit, reflecting the highly specialist niches present in this montane plateau habitat. Analysis of species associations identified a relatively small number of plant associated species (46) from all sample locations. This is likely to reflect overall low plant diversity and poor habitat structure at the sample locations at the time of the survey.	Some of the notable species identified are reliant on specific habitat conditions that risk being lost without targeted management to maintain them. Therefore, future management should aim to maintain as wide a range of habitat types as possible, including some good examples of current open habitat types to allow existing invertebrate communities to persist. Multiple notable species are likely to benefit from drain blocking, rewetting and restoration of wetland habitats, including in peatland areas. The presence of many other invertebrate species within the target taxa, including most spiders, are closely related to habitat structure and the microhabitats that result from different forms of vegetation growth. A reduction in herbivore impacts and the planting of trees and shrubs is expected to result in an increase in overall invertebrate species diversity. The land management plan will • Maintain good examples of existing open habitat types • Monitor the impacts of land use change, including recreation, particularly in restricted

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				habitat types such as mountain plateaus. • Avoid use of herbicides to treat weeds or invasive non-native plants.
Aquatic Invertebrates survey	To provide a snapshot of invert communities found to be present within the river at Glen Prosen. This can be used as a baseline against which data collected in future years can be compared, to detect changes which may be the result of habitat restoration activities.	Field surveys done by kick sampling in 5 locations through Spring and Autumn 2024, assessed using the *Community Conservation Index (CCI)* method.	Assessed areas support an assemblage of aquatic macroinvertebrates generally typical of upland acidic habitats. No species of notable conservation interest were recorded. One 500m sampling location was found to be of moderate conservation value using the CCI, though the value recorded was at the low end of the moderate range. The remaining four sampling locations were found to be of low conservation value using the CCI. Of these, the lower altitude sites, at 300m and 400m, were close to the upper limit of the low conservation value range, and approaching the threshold for moderate value. These results are indicative of a species-poor, low biodiversity species assemblage that is typical of a fast-flowing watercourse flowing within a degraded, heavily grazed, and vegetatively species-poor landscape of simple habitat structure.	Use to monitor impact of woodland creation and river habitat restoration and adapt management accordingly.
Fresh Water Pearl Mussel survey	To assess whether the Fresh water pearl mussel (a Special Area of Conservation notified species) is present, and state reasons for its population status in the FLS stretch of Prosen Water, to	A 10-day survey (March 2024) with 3 surveyors - using the recognised NatureScot survey method - a riverbank/ wading walk to identify suitable substrate; then an in-river investigation/ search. If no FWPM found, a search of all appropriate niches in the locality is undertaken using minimal disturbance method. Where FWPM found, a standard transect count is undertaken.	No live or dead FWPM were recorded in any survey reach. Only small areas of suitable substrate were found, usually in association with riverbank tree roots in the lower parts of the stretch. The rest of the stream (as with many upland streams and rivers) had a substrate of loose gravels and boulders which are mobilised during increasingly intensive storm events resulting from climate change impacts.	Recommended practices that would support FWPM further down the catchment and improve the prospect of re-establishing populations in the upper catchment are: (1) peatland restoration to hold more water in catchment and reduce 'spatey-ness'. (2) Cessation of muirburn - resulting in more surface vegetation to hold water back in the catchment for longer (3) ditch blocking for same reason (4) Riparian tree planting to reduce water temperature and stablise

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	inform future river restoration and management.			substrate (5) Instream tree deflectors (6) Host-fish (salmon) conservation measures.
Fish habitats, invertebrates and fish surveys	To provide baseline information on the current state of fish habitat and densities, and to inform future management of the river.	Undertaken in June July 2024, the fish habitat survey covered 9.84 hectares of in-stream habitat along 10.1 km of the mainstem of the Prosen Water that was accessible to migratory fish, and a further 5.5km of tributaries in the Glen.	In-stream habitat for salmonid fish was generally good, with no barriers to fish migration observed. Riparian habitat was of low diversity, with few riparian trees and a lack of vegetative complexity. Salmon fry and parr were found throughout the survey location at low to moderate densities, when compared to other sites in the East region of Scotland. Trout fry and parr were also found throughout the survey area. Invertebrate surveys found mainstem sites were assessed as moderate to good, with minimal signs of sedimentation but low nutrient status limiting primary productivity. Most tributaries were accessible to migratory fish, with juvenile salmon and trout found in most locations, except for a burn blocked by a raised ford. For invertebrates, tributary burns were moderately impacted by silt, with one exception which was assessed as being 'polluted'.	Management recommendations that would improve the river and tributary habitat for salmonid fish include planting or regeneration of riparian trees, removing non-native conifer trees, and easing passage for upstream migration of salmonid fish on two tributary burns. Minimise impacts of commercial forestry in the plantation on the tributary burns.
Water voles	To undertake water vole surveys to inform management planning, including the new woodland creation. (Water vole is a Scottish Biodiversity List species which	A targeted water vole survey was conducted from July to Sept 2024, following best practice guidance (Dean et al., 2016; NatureScot, 2020). Surveyors searched for field signs such as burrows, latrines, runs, footprints, and feeding evidence along suitable wetland habitats, including riparian zones within 2 m of water bodies. Habitat quality was	During the field surveys undertaken in July and August 2024, no conclusive evidence of water vole activity was identified during the survey visits. However, potential feeding signs and runs were recorded. American mink scat and control measures were identified on site, and it is possible that mink could have driven the local water vole population to extinction, if they	No further action required specifically for water vole, although many of the actions being proposed for riparian zone restoration should benefit any water vole present.

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	public bodies must consider).	assessed using criteria like vegetation type, bank suitability, disturbance levels, and connectivity, and rated from High to Negligible—with sub-categories used where necessary. All observations were recorded with detailed field notes, GPS tagging, and supporting photographs to document water vole activity and habitat suitability across the site.	were present. Habitat suitability for water vole was assessed as being Moderate in the centre and south of the site, with Low/Moderate to Low suitability determined for the rest of the site.	
Reptiles	The aim of the surveys was to identify where suitable habitat areas for reptiles are located.	Using professional judgement in conjunction with relevant guidance (Froglife, 2015 and Edgar et al., 2010, Cathrine, 2024), the habitats present on site were classified as High, Moderate, Low, or Negligible in terms of their suitability for reptiles e.g. High would include: Large, connected, low-disturbance areas with varied microhabitats supporting foraging, basking, shelter, and hibernation. Where assessments were deemed to be between classifications, a sub-category was used to provide a closer representation of the habitat suitability.	No statutory sites within 2 km include reptiles as qualifying features. However, Caenlochan SAC lies within the site and offers habitats potentially suitable for reptile foraging, refuge, hibernation, and basking. Reptiles in Scotland—adder, slow-worm, and common lizard—are protected under Schedule 5 of the Wildlife and Countryside Act 1981 and listed on the Scottish Biodiversity List under “avoid negative impacts". A single sighting of common lizard was recorded during the reptile survey, with 22 common lizards and two adders recorded incidentally during other ecological surveys within the site. Most of the site was of at least Moderate suitability for reptiles and included High suitability areas. Overall, the site was described as Moderate in suitability. Low suitability areas were located where habitat was cropped short, included steep rock faces or extensive muirburn. Several rocky crags/outcrops, stone/boulder piles, dry stone walls and rocky grouse butts were present and provided suitable communal hibernation potential.	Action to protect lizard and adder will be taken where possible during implementation of the management plan - specifically protecting the potential communal hibernation locations which have been recorded across the site and will form important features for reptiles to hibernate, bask, and forage.

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SOIL and WET HABITATS				
Soils survey	To identify soil types across the newly acquired site	Standard soils survey including walkover and digging pits and using other environmental and vegetation indicators to build a picture of the soils across the site. Boundaries between soil types were digitally mapped.	The results indicate a mosaic (sometimes intimate associations) of different soil types, including peaty soils, acidic gleys, and occasional calcareous outcrops.	Understanding the soil types and the vegetation they do or could support underpins the plans for habitat restoration and new woodland creation.
Soil biodiversity baseline - eDNA study	Before habitat changes begin, a biodiversity survey using environmental DNA (eDNA) has established a baseline to track future soil biodiversity shifts.	The survey analysed 48 sample plots using three DNA markers (16S, 18S, ITS2) to detect organisms across all seven kingdoms of life, emphasizing fungi due to their critical role in tree survival and regeneration.	Results revealed an immense diversity, with 12,253 taxa identified, dominated by bacteria (40%) and fungi (30%), followed by various nematodes, arthropods, annelids, and unicellular organisms. Soil biodiversity showed strong spatial heterogeneity, with richness influenced by pH, elevation, and soil chemistry rather than specific land-use categories. However, soil community composition differed between forested and open habitats, especially for fungi, which were more prevalent in areas with existing or past tree cover but scarce in planned regeneration sites, potentially delaying woodland recovery.	This survey demonstrates the potential of eDNA analysis in tracking below-ground biodiversity shifts in response to land management changes. The dataset provides opportunities for long-term monitoring, examining ecosystem functions like nutrient cycling and carbon sequestration, and constructing soil food webs. Future research can assess how land use impacts soil communities, aiding sustainable restoration strategies for Glen Prosen's evolving landscape. Ectomycorrhizal fungi, which are essential for tree establishment and survival, were primarily found in areas with existing or previously felled trees, suggesting that past woodland presence influences fungal distribution. These fungi were also detected—though in much lower numbers—in areas that had not supported trees for many years. However, they were largely absent in open habitats where tree planting and natural regeneration are planned, which may need action to encourage colonisation of appropriate fungi.

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Drainage and vegetation - Drone photogrammetry survey	To capture high resolution photographic imagery of the open site to identify man-made drainage and vegetation cover.	Flying a drone over the whole of the open site with average flight height of 120m above ground level, 12m/s flight speed and 70% side overlap. Desktop analysis of imagery to identify and map potential man-made drains.	Survey showed complex mosaic of vegetation cover, comprising grassland, flushes and fens and a variety of heath/moorland within which past muirburn can be seen, giving a patchwork of different stages of heather growth. 58km of potential drains mapped - these are now being ground-truthed by a walkover survey.	The drains map will help to inform where we need to do drain blocking to help restore open habitats and rewet the site. The imagery has potential to help with detailed tree planting plans within habitat mosaics.
Peatland Code Survey	To assess areas of peatland with restoration potential under the *Peatland Carbon Code*.	To survey peat condition in 'potential peatland' areas: Map erosion features: Desk-top mapping of peat hag crests and bare peat, verified during field survey Map fen features: Desk-top then field identification of dominant vegetation, drainage, and non-peatland features Field sampling: 643 sample points at 100m intervals assessed for peatland condition Peat depth sampling: Taken at 50m intervals in shallow peat (<50cm blanket bog, <45cm modified fen) to refine boundaries Blanket bog survey: Record peat condition and depth within 5m of 100m sample points (>50cm depth); take site photo Modified fens survey: Minimum 3 transects with 50m peat depth sampling; record fen vegetation (Field Protocol 2.1) and dominant type (NVC broad community) within 20m radius	Awaiting results.	The peatland survey will help us to identify and prioritise areas for restoration, and it will support and complement the drains survey, to give a fuller picture of areas where drain-blocking needs to be undertaken.

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Ground Water Dependant Terrestrial Ecosystems survey	To identify and assess significance of ground water dependency on habitats across the site	This method follows current best practice per SEPA (2024) and CONFOR (2018) guidance for assessing GWDTE in woodland creation: Potential GWDTE identified via desk survey will be walked and vegetation mapped using 1:25cm aerial imagery. GWDTE are identified and mapped. Where mixed with non-GWDTE, percentage cover estimates are made. Small GWDTE features (e.g. springs) are noted as targets. Homogenous vegetation polygons classified using the National Vegetation Classification—broad for non-GWDTE and sub-community for GWDTE. Botanically rich and restorable GWDTE is highlighted. GWDTE indicators within each polygon include: Spring-related habitats Waterlogged soils on otherwise drained slopes Concave slopes Diffuse groundwater emergence along geological lines Persistent water flow Base-enrichment	Awaiting results.	Survey results identify areas of open habitats with ground water dependency that need to be managed as open, and those which present no constraint to woodland creation.
HABITATS and VEGETATION				
NVC habitats survey	To produce a National Vegetation Classification (NVC) habitats map	Walkover with stops recording vegetation ground, field, upper canopy layers, with target notes, and allocating to an NVC class and	Digital map coloured to show the principal polygon habitat type, with notes detailing other NVC types in the polygon (%). The map highlighted	This survey in combination with soils has underpinned targeting for woodland creation. Finer scale or targeted surveys have/ will be undertaken prior to planting.

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		mapping the boundaries. Most of the site covered, other than the high montane areas.	priority habitat types. Approximate proportion (%) of the site survey area* (3407ha) in each habitat type is as follows: Upland heathland 41.1 Acid grassland 23.7 Blanket bog 15.4 Upland flush, fen & swamp 7.5 Montane heath 7.5 Neutral grassland 3.3 Purple moor-grass & rush pasture 0.5 Broadleaved woodland 0.3 Fen, marsh & swamp 0.2 Native pine woodland 0.2 Upland birchwood 0.1 Wet woodland 0.1 Dwarf shrub heath 0.1 Coniferous woodland 0.0 *Not including bare rock and water	
Montane NVC survey	To conduct targeted National Vegetation Classification (NVC) surveys at Glen Prosen to inform woodland creation plans, particularly the expansion of montane willow scrub	The survey was carried out in August 2024 by a team of ecologists and botanists, mapping high-altitude vegetation communities above 700m, focusing on steep, north-facing slopes. Data were analysed using ArcGIS Pro, and field observations identified habitats suitable for montane willow planting.	Montane willow scrub thrives in base-rich soils, typically in flushes, montane grasslands, and rocky ledges. The survey identified suitable sheltered areas and boulder fields but highlighted the impact of heavy grazing, which restricts its spread. Existing records of various willow species—including downy, dark-leaved, and tea-leaved willow—were noted, with some species limited by substrate richness and grazing pressures.	The survey provides valuable baseline data for woodland expansion but recommends further targeted research before planting trials. Grazing control and site selection will be key to successful montane willow restoration, ensuring resilience in subalpine and alpine zones. Future assessments could refine habitat suitability and enhance restoration strategies.

Survey title	Purpose	Methods (including coverage)	Results summary	Implications for planning and management
NRF Riparian Zone Assessment	Assess planting areas and priority flora within Nature Restoration Fund area (a pre- LMP project)	Specialist vegetation survey to seek out significant plants to ensure tree planting avoids them. Walking E to N, then returning along S bank within NRF fenced area.	Priority rare and uncommon plants marked with GPS to inform tree planting which happens in the winter when the priority plants are dormant and not visible.	The GPS markers will be used to mark areas physically on the ground just before tree planting begins.
Habitat Quality and Herbivore Impact Baseline (pilot survey) Monitoring	1. Develop a baseline survey method which can describe and measure the quality and changes to habitat structure and diversity in Glen Prosen. 2.Assess herbivore impacts across a range of habitats 3. Describe habitat structure, diversity and quality from areas surveyed during the 2024 pilot survey. 4. Assess the future condition of existing habitats under current herbivore impacts	The method draws together two long-established systems for monitoring herbivore impacts in woodland and open habitats within the British uplands. It also assesses plant communities and predicts succession under different levels of herbivore impact. This monitoring covered 49 10m radium plots and is intended as a pilot. A systematic grid of 138 points used in the RSPB bird survey was adopted and 49 points selected to sample a range of vegetation communities. Additionally, several 2x2m quadrats were opportunistically assessed to sample rarely encountered habitats such as flushes.	The method developed is innovative and allows the tracking of habitat succession or maintenance of floristic diversity on valuable open habitats. Once the baseline is completed, it will allow an objective medium to long-term assessment of the impact of FLS management on habitat restoration. Without this full botanical assessment (albeit over a relatively small sample area) it would not be possible to objectively assess the quality of habitat change, merely the general direction of change from one broad habitat type to another.	The method will allow the refinement of two herbivore impact assessments (one for woodland and one for open habitats) and may be the foundation of a new, combined HIA that can be used more simply across a range of habitats. Our understanding of relative palatability of different plant species has been greatly improved by this study and it is likely that we will be able to sample a smaller sub-set of species periodically to track headline herbivore impacts. Observations of different NVC communities and results of herbivory on succession will allow us to target managed grazing to maintain valuable open habitats and to direct deer control where succession to woodland is desirable. Results may also influence where fence lines are established to leave some valuable open habitats out with enclosures.
Tree regeneration survey	To assess current natural tree regeneration (regen) across Glen Prosen and identify opportunities and limitations for future forest establishment and development.	Sampling: 15 distinct areas were surveyed, ranging in size and terrain. Assessment Criteria: Tree density and species composition Modal height of regenerating trees Presence or absence of seed sources Vegetation density Signs of browsing (e.g., by deer) Soil nutrition and historical land use (e.g., burning, grazing)	General Trends: Regen was present in most areas but often sparse, patchy, or limited to edges near mature trees or plantations. Sitka spruce and downy birch were dominant species where regeneration occurred. Tree height mostly low, with few areas showing advanced growth. Constraints Identified:	This survey has informed the Future Regeneration Outlook: Likely slow progression of regeneration, mostly dominated by Sitka Spruce due to proximity to plantation seed sources. Regeneration could be improved through management interventions like fencing, vegetation control, and planting to increase species diversity and speed up forest recovery.

Survey title	Purpose	Methods (including coverage)	Results summary	Implications for planning and management
			Lack of natural seed sources, especially in open hills. Dense heath and grassland vegetation inhibiting seedling establishment. Poor soil nutrition throughout the site. Past burning and current grazing pressure (notably by sheep and deer) suppressing growth. No deer fencing in place to prevent browsing impacts.	And enabled Restoration Recommendations: Identify and protect existing regen hotspots. Consider planting native species in areas with no seed source or severe limitations. Monitor browsing and vegetation cover to guide adaptive management. Assess areas for potential fencing to mitigate deer pressure.
WHOLE LANDSCAPE				
Heritage	Assess and record the site for heritage and archaeological features.	Professional desk-based study and assessment of the site with follow up targeted walk-over survey to ground truth desk top study, measure heritage features on the ground, and look for any new unrecorded features.	Desktop study identified 60 non-designated assets within the boundary of the site, mostly consisting former farmsteads, rig & furrow, sheilings, sheep folds, summit and boundary stones. The study identified target areas covering 37 known sites for walk-over surveys along the Prosen Water and Cramie Burn due to evidence of historic settlement. The walkover survey confirmed the sites expected from the desk study, recorded precise locations, photographed, measured, described and assigned a condition score which ranged from good to very poor.	Results will inform planning and management on the ground around significant heritage features to ensure they are managed in a suitable sustainable way for their protection and compliance with *UKFS Forests and Historic Environment*. Significant features of 'regional' and 'local' importance have been recorded on FLS heritage data GIS layer.
Fixed point photography	To capture visual vegetation, habitat, and landscape change over time through photography	Twenty-one viewpoints were chosen across the site to give spatial coverage and to show key habitat types and viewpoints. Photographs were taken on four bearings (N, S, E and W) at each point.	Photographs from first year are saved on file and the same twenty-one points will be photographed again every 3-5 years.	Over time the fixed-point photography will show changes in the landscape, habitats and vegetation cover on site which will be used as a tool for adaptive management and to engage stakeholders and communities in our work through interpretation and education.