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# Chapter 9

## Exploring the effects of post-medieval crofting on the modern hillside ecosystem: vegetation history as cultural legacy

*Louise Smith, Jeff Oliver, Gill Plunkett, Kate Britton,  
and J. Edward Schofield*

### **Introduction**

Scottish uplands have been the focus of human activity for over 10,000 years (Guttmann *et al.* 2006; Wickham-Jones *et al.* 2020). While upland ecologies have been shaped by humans over much of this history, agricultural improvement in the late 18th and 19th centuries at the hands of crofter colonists – both legal tenants and opportunistic squatters – brought profound and previously unseen changes to the landscape. The colonists altered uplands in a variety of ways. The abiotic physical properties of soils, such as the texture, structure, and depth were permanently changed, as were biotic factors such as the seedbank, the amount and types of seed available, and the range of plant life growing on these sites. Today, many of these former smallholdings are abandoned and either lie fallow or have been turned over to forestry. With no one to maintain them, they are subject to secondary vegetation succession, the process by which new plants start to encroach onto sites, and eventually replace existing plant communities. Generally, ruderal herbaceous species appear first followed by shrubs and trees (Egler 1954; Flinn and Vellend 2005). Over time, this facilitates the replacement of earlier vegetation communities by new ones (Egler 1954). The speed and composition of emigrating species is dependent upon a variety of factors. This includes time since abandonment, the physical state of the site, climate, soil, and the presence of initial plant species (Myster 1993).

In this chapter we investigate the impact that crofter colonists had on the environment of Scotland's uplands and how the legacies of their actions continue to inform the ecological make-up of these places today. Two sites in Aberdeenshire that have lain fallow for more than 80 years form the focus for this pilot study: Boghead of Tullos, a croft located within the Bennachie Colony – a former squatter settlement – located on the flanks of the hill of Bennachie, and Baudyground Croft,

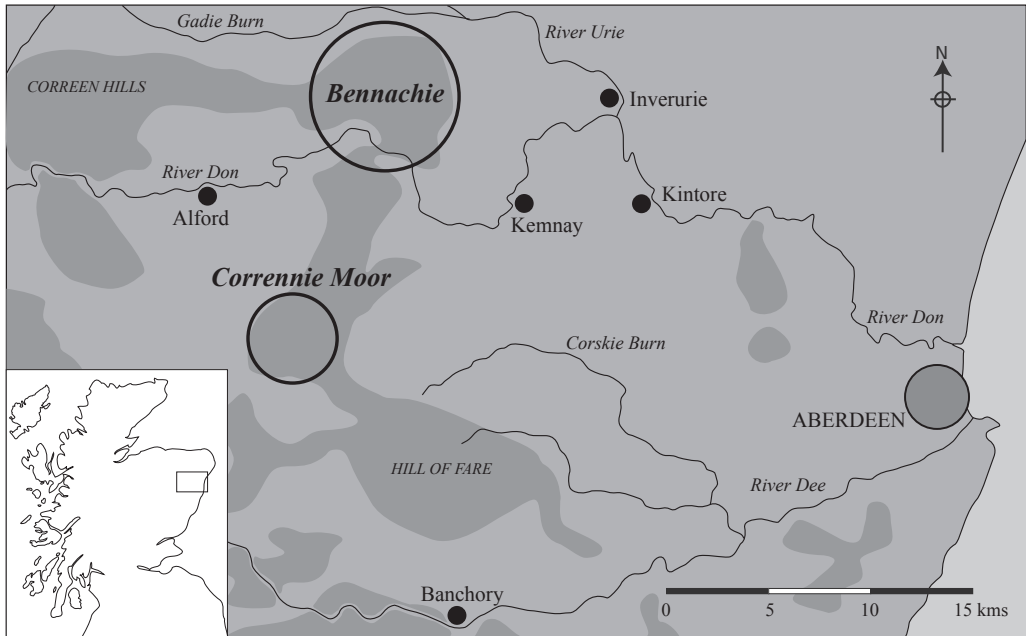


Figure 9.1. Map of northern Britain, with a closer look at Aberdeenshire showing the two study sites: Bennachie and Corrennie Moor.

located within an area of crofter colonisation on the slopes of Corrennie Moor (Figure 9.1). Both sites saw moorland and rough grazing transformed into small agricultural holdings beginning in the mid-19th century. To understand how these settlers modified these environments, our methodology draws on the use of historical details, including historical maps and plans, and standing archaeology, alongside the use of vegetation surveys. While the project is ongoing, in this chapter we present some preliminary qualitative observations on vegetation patterning based on our initial data, demonstrating that crofter colonisation resulted in lasting changes to the diversity of plant species found on the hillsides as well as the wider ecological context.

## Background

The agricultural improvements of the late 18th and 19th centuries not only changed how agriculture was practiced, but it had major social effects as well. Prior to the improvements, multi-tenancy farms focused on subsistence agriculture were the norm. However, with the shift to 'improved' farming methods, agriculture was increasingly focused on capitalist production. Open fields worked in common were replaced by unitary farms orientated towards growing for the market. Many tenant farmers were displaced as larger capitalist farms swallowed up land, while high rents limited those who could afford to participate in the new status quo. Some migrated into growing

towns and cities, but others chose to settle upland 'wastes' of moor, bog, and rough grazing (Kay 1962). The settlers can be separated into two types. Crofter colonists were attracted by token rents and the opportunity to develop a smallholding on marginal areas within landed estates. In contrast, squatters encroached areas beyond the direct influence of lairds, usually areas of commonry, which were by custom open to local tenants and their dependants for accessing resources like turf, peat, and stone, and grazing for stock. Despite differences in their legal status, both of these groups (crofters and squatters) fundamentally transformed uplands on a scale previously unseen (Oliver and O'Driscoll 2024). While the smallholders struggled to implement some of the larger scale improvements of wealthy tenant farms, they nevertheless enclosed and drained land, introduced cultivars, crop rotations and new fertiliser regimes to hillsides that had never before seen a plough or a hoe.

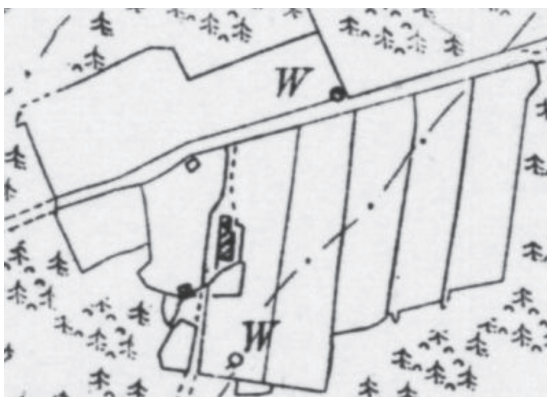
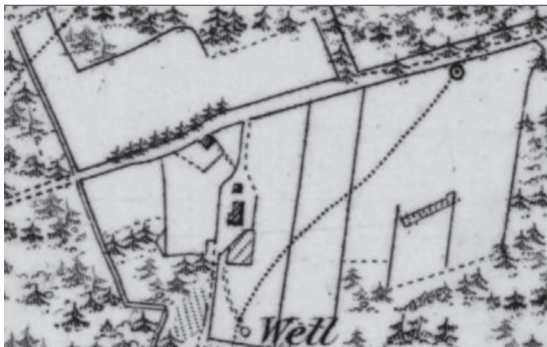
Over years and decades, settlers transformed upland ecosystems, often at altitudes of between 200 and 400 m, into small, and often piecemeal, parcels of agricultural land. Small granite cottages and outbuildings were often built, and small fields and kitchen gardens enclosed. Settlers were particularly industrious during the early and mid-19th century. However, by the later 19th and early 20th century, many of these places experienced eventual decline and abandonment. The reasons for this are complicated: sometimes it was a result of agricultural viability on land that was simply too marginal. In these cases, uplands were turned over to forestry plantations or have been left to be recolonised by nature. In other cases, smallholders could be victims of the value of land risen through their own efforts of improvement. No sooner had they made substantial investments than lairds would move to reorganise their holdings through 'engrossment' (Kay 1962; Carter 1992). This entailed the amalgamation of crofts to make larger capitalist hill farms that could be leased at market rates. Some of these holdings survive today as hill farms focused on the pasturing of sheep and cattle.

### **Locations and approaches**

Identifying former crofting sites on the ground today can prove challenging and requires mixed methods. While some estate sponsored crofting colonies are known from the literature, others can only be recognised using historical maps and plans. Crofting colonies are often identifiable through their field shapes on Ordnance Survey maps, usually small rectangular enclosures of between two and four acres and are often part of a wider scheme of settlement. Squatter encroachment on the other hand is identifiable through their even-smaller and more irregular field shapes and can be found on surveyed schemes and plans designed to divide areas of commonry among surrounding estates (Oliver and O'Driscoll 2024). Many commonries in north-east Scotland were divided in the late 18th and early 19th centuries (being among the last major privatisations of common land in Scotland). Once candidates for potential sites have been located, field visits can help to assess the contemporary condition of these sites. Many have been subsequently planted over with forestry, others have been recolonised

by successional vegetation and lay hidden under dense grasses and shrubland. Aerial photographs and satellite images, together with field visits can help to establish their contemporary condition. Two case studies have been selected for this study: Boghead of Tullos, a croft of 6.2 acres located between 180 and 220 m above mean sea level (amsl) on the hill of Bennachie, and Baudyground croft, 2.5 acres, situated at an altitude of 380–420 m amsl on the slopes of Corrennie Moor.

Until 1859, the hill of Bennachie, sometimes known as ‘Free Bennachie’ or the ‘King’s Forest of Bennachie’, was a large commonty whose natural resources were considered a privilege for tenants and their dependants from surrounding estates (McConnachie 1890). Taking advantage of the legal ambiguity of the commonty, in the 1830s, an informal settlement of squatters was established on the lower flanks of the hill (Oliver *et al.* 2016). By 1851, at least 56 people were recorded as residing in the colony (Fagen 2011). 1859 was a watershed year because the commonty was legally divided by surrounding estates, making squatters into lease-paying tenants. Harsh winters and steep rents spelled decline. By 1881 there was a single remaining croft, Boghead of Tullos, and by the beginning of the 20th century a single crofter. George Esson continued to rent land in the former colony until his death in the 1930s (Bodgan *et al.* 1999). While the land has remained in private hands,



Figures 9.2–9.4. OS maps of Boghead of Tullos at Bennachie in Aberdeenshire, Scotland, for the years 1865–6 (9.2), 1899–1901 (9.3), and 1920 (9.4). The maps show enclosed fields representing the improved area of the croft as well as the cottage, well and a potential kitchen garden. A roofed and later unroofed outbuilding is also shown (Scale: 6 inches to one mile. Source: National Map Library Scotland, CC by National Library Scotland).

there are no records or other indications in the landscape to suggest that the land has been used for agriculture since this time.

Historical records provide additional details concerning the Boghead of Tullos croft. Figures 9.2 to 9.4 show the historical development of the area using Ordnance Survey (OS) maps. These maps reveal that the majority of the site was already well developed by the 1860s and that, by this point, a plantation had already been established surrounding the croft. Between the 1860s and 1920, only minor changes in the use of an outbuilding and the field layout are visible.

Site visits reveal that many of the features seen on the maps are still apparent in the landscape today. Archaeological features include the ruins of the cottage and the kitchen garden, along with surprisingly intact enclosure walls that separate the croft into multiple smaller fields. The croft is surrounded by forestry on three sides, with semi-natural woodland bounding it on the north-west. Today the site is open to wildlife, so grazing by deer is likely. New plant species may have invaded the site when the surrounding forestry was still young. However, as the trees are now tall and mature, presenting a significant barrier, this is less likely today. Old photographs can also be used to help further establish aspects of continuity and change. Figures 9.5



Figures 9.5 and 9.6. Two photographs of the cottage on Boghead, Bennachie, Aberdeenshire; one taken during the 1930s (Figure 9.5) (Bailies of Bennachie) and the other in 2023 (Figure 9.6) (Louise Smith).

and 9.6 show two images of Boghead of Tullos taken almost 100 years apart. One can see some of the trees planted back then have survived until today.

Less information is available about Baudyground. While there are no written records about this settlement, historical map evidence suggests it was established when the commonty of Corrennie was thrown open to settlement by crofter colonists, sometime after 1834. The site is located at an altitude of around 400 m and is therefore at the very edge of viability for agriculture if one considers frost-free days, and this may explain why it was abandoned at some point in the early 20th century. To the east of Baudyground lies a mature plantation. To the south, modern hill farms have swallowed up the remnants of what was once a larger crofting colony. Mostly hobbyists, sheep farmers continue to use the land for grazing today. Archaeological features include the ruins of at least one cottage along with a number of possible outbuildings, the walls of the former kitchen garden and a possible mill; the precise purpose of the latter is currently unknown. Some of the former enclosure walls are still visible, except on the croft's northern edge where the land runs steeply up to the edge of moorland.

The vegetation landscapes at Boghead and Baudyground appear to be in the early stages of plant succession. Both sites are primarily covered by grasses with a sparse cover of low shrubs and trees. Early stages of succession are typically marked by high levels of biodiversity and usually only last a decade (Myster 1993). However, since they have been abandoned for at least 80 years, the two locations appear to be experiencing a relatively slow rate of plant succession. This discrepancy makes them ideal candidates to investigate how the former settlers shaped the environment and the vegetation legacy this has produced.

Our study uses plant surveys to provide data about the current vegetation characteristics at each site (Harmer *et al.* 2001). These surveys provide different kinds of data. First, the general vegetation on the sites was assessed using quadrats. At least 30 squares, each measuring four square metres per site were placed according to a randomised grid. All vegetation species were identified within each square according to percentage. Additionally, species of interest – those with known culinary, cultural or medicinal relevance – were mapped to examine their relationship to recognisable archaeological features, such as enclosure walls, cottages and kitchen gardens. These species, in a number of cases, are likely to have been introduced by the crofters themselves and recording their presence can be helpful in better understanding whether artificial or natural introduction of these and other species at the sites are more likely.

Each croft was also paired with a control site. These locations have provided us with details about what plants are prevalent in areas without significant histories of settler interference. At Boghead (Plate 9.1) the comparison site is located less than 500 m from the croft and is primarily covered by heather and birch trees (Plate 9.2). Although OS maps suggest the control site has not been used for any recent agriculture or forestry, we cannot discount the possibility it was historically grazed by stock prior



to the division of the commonity. At Baudyground (Plate 9.3) the comparison site is directly adjacent and supports a heathland ecology apart from a natural drainage line which is covered in grasses and herbs (Plate 9.4). Like the other comparison site, this has not been used for any recent agriculture or forestry. As with Bennachie, Corrennie Moor has, however, been a site of historical grazing.

## Preliminary observations

### *Boghead*

At Boghead, the vegetation survey revealed that the croft (Plate 9.1) is primarily covered by wild grasses. The enclosed fields are surrounded by active forestry and (semi-) natural woodland. None of the 19th-century cultivars that crofters are known to have husbanded, such as oats, barley, rye, and clover grass (Carter 1979, 22) were visible on the hillside and seem to have been displaced by wild grass species. One grass species identified, cock's-foot (*Dactylis glomerata*), was widely used for producing hay and featured within pastures.

Herbs also make up a large portion of the plant species identified during the survey. Four recorded herbs – foxglove (*Digitalis purpurea*), yarrow (*Achillea millefolium*), angelica (*Angelica sylvestris*), and common self-heal (*Prunella vulgaris*) – have uses that are either medicinal, culinary, or ornamental (Van den Eynden 2022). However, the vegetation survey showed no specific spatial patterns with regards to their location, making it difficult to say if they were planted purposefully or spread naturally onto the site. Foxglove, for instance, has both ornamental and medicinal uses (Brickell 2008; Goldthorp 2009) though how they were used locally in the north-east of Scotland historically is poorly documented. The species also occurs naturally and could have spread onto the site during or after abandonment. A third possibility is that the presence of foxglove is the product of both natural and cultural processes.

Larger plant species, shrubs and trees, can be categorised as introduced or naturally occurring taxa with more confidence. Two species of shrub at Boghead exhibit interesting patterns: gorse (*Ulex europaeus*) and raspberry (*Rubus idaeus*). Gorse grows primarily on or close to standing archaeological features such as enclosure and house walls, specifically where the ground has been disturbed (Jones 2021). Historically, this plant was used for hedging and for marking boundaries as well as for a variety of cultural, culinary, and medicinal uses. It was also used as fuel and to create dyes, and when bruised it provided winter fodder for livestock (Rotherham 2007). The latter is well attested at a range of lowland farms across the north-east (Brook 2024). In the uplands gorse was an important tool for controlling boundaries (Winchester 2000). Unfortunately, we do not currently have any clear idea whether such practices were in use within the Bennachie Colony. The vegetation survey has shown that gorse is growing disproportionately around edges of dry-stone walls, making ingress in some places towards the inside of fields. While its abundance along field boundaries could suggest an anthropogenic origin, it is more likely to be a legacy of the settler presence

than the result of their deliberate planting. In other cases, gorse's presence is likely a result of it taking advantage of well-drained and disturbed ground associated with historic enclosures (Jones 2021).

Raspberry is and was an important food crop, can easily be grown in the uplands, and has many culinary uses. At Boghead, vegetation survey revealed an interesting distribution for raspberry plants. The majority are located close to the former kitchen garden and house and their frequency decreases with distance. Large parts of the croft do not have any raspberries. The tendency for raspberry to be located adjacent to kailyards and dwelling houses provides reasonably compelling evidence that these are the descendants of those introduced by the colonists. The Bailies of Bennachie, a long-standing community group, with close ties to the hill, have created a model 'kailyard', at Shepherds Lodge – another abandoned croft within the Bennachie Colony – and have included raspberries in their planting roster (as discussed by Chris Foster in this volume).

Of the tree species found on the site, of particular interest are rowan (*Sorbus aucuparia*), cherry (*Prunus avium*), and sweet chestnut (*Castania sativa*). All three species seem to have been introduced by the settlers and some of the trees that were originally planted still exist today. The longer lifespan of trees and the relative size of their trunks means we can estimate age. In Figure 9.2 a line of trees can be seen on the north edge of a trackway bisecting the parcel in the First Edition OS map dated to the 1860s. Field observations reveal a row of old rowan trees in the same location. This provides a compelling argument that they were planted by the residents. While we cannot discount their aesthetic appeal as a motivation for the choice of this tree, rowans also hold cultural significance (Kenicer 2020; Van den Eynden 2022). They were believed to ward off evil and to protect livestock from interference by witches. Their position at the edge of the property may therefore indicate that they were intended to fulfil a similar purpose at Boghead. Additionally, rowan had a culinary use. Their berries can be made into jelly, jam, chutney, and even wine. Future work into the folk history of the region may help us to understand whether such products might have been made on Bennachie.

In Figures 9.5 and 9.6, three trees can be clearly seen to the left of the cottage in both pictures. One picture was taken in the 1930s prior to abandonment. Two of the trees appear to be fully grown and decades old while the third may be younger. The vegetation survey has shown three trees growing in the same area today: two cherry trees and a sweet chestnut. They can also be seen in the photograph from 2024 (Figure 9.6). The old photograph provides evidence for the trees having been planted during the crofting era, possibly for aesthetic or culinary reasons.

At the comparison site adjacent to Boghead, the vegetation survey registered only a small number of additional species such as bilberry (*Vaccinium myrtillus*), cowberry (*Vaccinium vitis-idaea*), wavy hair grass (*Deschampsia flexuosa*), and sphagnum moss (*Sphagnum* sp.). There was very little evidence of overlap between the species found on the croft and those on the comparison site, which was dominated by birch forest

and heath. Most importantly, plants with potential practical or cultural purposes were not found on the comparison site, emphasising that they probably did not originate from there prior to crofting activities.

### **Baudyground**

The vegetation at Baudyground (Plate 9.3) shares many similarities with that described for Boghead and is also mostly covered by various grass species. The cover of grasses appears to be lower than at Boghead and broom and gorse are growing in larger quantities across the site. There are no extant crop plants growing on the site either (Carter 1979, 22). Cock's-foot was found, though it is not clear whether it was introduced by the crofters or if it occurs naturally in the area.

It is difficult to determine if any of the herb species observed at Baudyground were introduced by the crofters. However, one species is found only at Baudyground and not Boghead: the bluebell (*Hyacinthoides non-scripta*), which was located in the former kitchen garden. While bluebells are typically indicator species for ancient woodlands (Glaves *et al.* 2009), their kitchen garden location with its thicker soils provides a more compelling answer: they were probably planted for aesthetic purposes. They were a favourite in parks designed by the Victorians and were popular garden plants during that era (Hamilton *et al.* 2006). The plants that have survived until today are very probably the descendants of bluebells planted in the 19th century. The site also supports foxgloves but, as for Boghead, it is hard to determine if the species was introduced by the crofters or if it occurs naturally at these locations.

Several shrub species were found at Baudyground including bilberry, raspberry, elderberry, gorse, and broom. The distributions of bilberry and raspberry, both known for culinary purposes, are particularly interesting. Raspberries exhibit a similar pattern to their counterparts on Boghead, with the frequency of recorded plants decreasing with distance from the house and kitchen garden. Therefore, they were most likely planted by the crofters in their kitchen garden or around the house. Bilberries, on the other hand, are more frequent at a distance from the house and kitchen garden and are especially prevalent on and adjacent to the nearby moorland. They are most abundant at the comparison site and have probably encroached upon the crofting site from these areas. It is unlikely that the crofters planted these in the kitchen garden as there were likely plenty of bilberries growing nearby (see Foster, this volume).

The gorse and broom (*Cytisus scoparius*) on the site are also distributed slightly differently than at Boghead. While they are still covering the ruins of the house, they are absent from the kitchen garden and occur randomly across the wider site in larger patches. They are not correlated with any of the former enclosure walls as they are at Boghead. Most likely, they have spread onto the site since the abandonment and have no relationship with crofter occupation.

The last shrub species of interest at Baudyground is the elderberry (*Sambucus nigra*). Two individuals were identified during the vegetation survey, with the more mature of them found at the corner of the kitchen garden (Plate 9.5). This position,

directly at the edge of this feature, may indicate that the plant was strategically planted there. The other is roughly 20 m away and appears to be a younger individual, based upon its smaller height and size. It may be a descendant of the older plant. Elderberries are known for culinary, medicinal, and cultural uses. Elderberries were seen as protectors and avengers within local folk tradition (Charlebois *et al.* 2010). Notably, they were thought to offer protection from malicious spirits and witches, as well as from lightning and thunder, which might explain why this taxon was planted at the edge of the kitchen garden. For centuries, the fruits of the plant have also been used as natural remedies against colds, fevers and the flu (Blochwitz 1677). They were, and are, also used to make jellies, jams and cordial, being particularly popular during the Victorian era (Langlands *et al.* 2008). The positioning, in combination with the usefulness of the plant, makes it very likely that it was planted by the settlers and that it has since produced at least one viable offspring.

There is only one tree species of interest on the site: rowan. These can be divided into two categories: mature trees and young saplings. The mature specimens are located at the upper edge of the property in a straight line, strongly indicating that they were planted here (Plate 9.6). They may have served a similar purpose to that postulated at Boghead, *i.e.* as an aesthetic barrier, spiritual protector or culinary resource. Across the north of the site, close to the mature rowan trees, are a large number of rowan tree saplings (Plate 9.7). They decrease in frequency with distance from the adult trees and are most likely their offspring. The comparison site had no unique species and the only species of interest that occurred at the comparison site was bilberry.

### **Conclusions: what plants tell us about the lifeways and legacies of crofting**

The changes that crofters made to the uplands they settled are still very much visible today and have modified localised ecosystems for almost two centuries. In comparison to proximal ‘control’ sites without known crofting activities, the plant communities we have identified at sites settled in the past 200 years have been altered and enriched by species introduced by their human inhabitants. Several of the species identified provide insights into how plants were viewed and perhaps used by the colonists, ranging from practical to spiritual intent. Species identifications inform on culinary choices, animal foddering/provisioning and even building materials – including how they roofed their houses – and what they may have used to treat illnesses. Taxonomic diversity even hints at culturally important superstitions, despite living through a period often associated with ‘enlightenment’ and ‘improvement’ values. Analysis of the plants found at both sites also suggests that, in some senses, the settlers may have chosen what to grow no differently than other members of rural, Victorian society (Langlands *et al.* 2008). The species we have identified, such as raspberries and elderberries, show that their diet did not solely consist of the stereotypical brose (an oat-based porridge) and tubers like turnips and potatoes. It was probably enriched by fresh fruits, when in season, but possibly also by preserves, wines, and cordials (*ibid.*).

A number of steps can be taken to explore this phenomenon further. Firstly, the study area can and should be expanded beyond the small number of hills tackled here into other parts of the north-east, Scotland more widely, southern Britain and beyond. We know, for example, that the poor and landless were making similar kinds of choices in transplanting cultivars to crofting sites in Sweden (Williamsson 2024). Much might be learned about commonalities of small-scale agriculture and how local strategies varied through comparisons across these different regions. Other avenues of research may provide complementary evidence, such as further investigations of the pollen record. Pollen analysis (Moore *et al.* 1991) can be used to reconstruct vegetation histories for sites where suitable deposits (peats, lakes, muds, or acid soils) are available. Analysing pollen samples collected close to archaeological sites can help fill historical gaps in our understanding of vegetation history (see, for example, Jones and Noble, this volume; Shepherd and Ralston, this volume). Such research would help us to understand both the more recent period of abandonment as well as the deeper historical context prior to settler colonisation. The pollen record may help us understand more clearly the similarities and differences between upland squatters and crofters and lowland tenant farmers. Much more can be done to help us determine the range of species selected by crofter colonists and how these continue to shape upland ecologies today. The application of dendrochronological methods, such as the use of an increment bore to date mature living trees, would help to clarify, with greater precision, when they were planted and help in relating them to the chronology of upland settlement. With regards to further exploring the culinary (or other) uses of the different taxa identified, the analysis of plant macrobotanical remains from archaeological contexts at these sites may provide fresh evidence for how different plants were processed and thus utilised (see D'Andrea 2020 and Johnston 2023 for recent summaries of this approach). Evidence of material culture from the excavation of sites would also help determine the ways in which the different plants featured in the everyday lives of settlers. Such an approach might even be paired with the chemical analysis of residues on vessels, which can be used to analyse, amongst other things, the presence of alcohol, resins, and waxes (see overview in Pecci 2018).

From the evidence shared here, it is abundantly clear that there are significant legacy effects on vegetation and the ecological composition of Scotland's uplands as a result of the efforts of squatters and crofters. The built environment they created continues to have an impact on the hillside, even though natural recolonisation processes are clearly playing-out and decreasing the visibility of their efforts. More research is needed to investigate this phenomenon in order to bring emerging patterns into clearer focus. Crofting is an important, but often under-acknowledged, part of the historical ecology of uplands in the north-east. Continuing research into the vegetation legacy of crofting will not only increase our understanding of the lifeways of the poor and landless, but also help to improve our knowledge concerning what the future ecologies of hillsides might look like.

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