UnderStories

Storying woodland use, management and expansion in the Cairngorms National Park

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Summary

There is growing recognition in Scotland that resilient future landscapes will increasingly feature trees but that a nuanced approach is required to get the 'the right tree in the right place'. There is a need to take into account the specific biophysical, economic, and cultural geographies and histories of areas of current or prospective woodland. For stakeholders, what counts as the 'right tree in the right place' is not a straightforward matter and is contested through practices and narratives shaping woodland expansion. Different people have different experiences and expertise that highlight – and deepen understandings of - what needs to be taken into account when seeking to expand woodland in line with local and national targets. The Understories project has built a prototype digital woodland storymap of the Cairngorms National Park, featuring videos that illustrate a wide range of ways of knowing the area, in terms of past, present and potential future woodland. The videos are contributed by stakeholders including scientists, agency and third sector staff, and different users and managers of the land, and include accounts of professional knowledge, and of personal experiences of woodlands in the Cairngorms, and the intersections between both. It has been built to be tested as a deliberative tool for enhancing dialogue and decision-making amongst a wide variety of stakeholders and decision-makers. A series of online workshops was conducted to gain feedback on the prototype storymap, with a view to it being developed and refined further as required for specific project and policy objectives. Due to constructive feedback and stakeholder demand, such development will now happen in the next SRP (2022-2027) as part of JHI-D4-1 'People and Nature'.

In exploring the storymap, participants had opportunities to learn about experiences, methods and knowledge outside of their usual spheres. We found the inclusion of different ways of knowing (e.g. scientific, experiential, emotional) was crucial to the storymap's potential for fostering understanding and empathy between stakeholders, as well as being key for engaging participants and likely wider audiences. The diversity of stories provides the subtleties and contradictions needed to build a nuanced discussion around the issue of 'the right tree in the right place'.

Potential uses of the storymap, as identified by participants, include: using it in consultation and legislative processes; a tool to facilitate deliberation around specific topics; an educational tool, and; as an exemplar for exploring other land use or environmental experiences and narratives, especially with a view to integrating them with biophysical data. We identified further technical and conceptual developments that could maximise the storymap's potential. Future research could consider to what extent and how to incorporate additional accounts, such as those of future stakeholders, and non-human elements. Future versions of the storymap may situate stories in time as well as in space, to reflect the evolving physical, social and political realities of the Cairngorms' treescapes.

Acknowledgements

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Contents

Introduction and research goals

There is growing recognition that Scotland's landscapes will increasingly feature trees, for a range of economic, social and environmental reasons, but that a careful and nuanced approach is needed to get the 'the right tree in the right place'. Much depends on the geography of the growing conditions, culture, economy and history of an area, and on bringing into constructive conversation the diverse ways of knowing past, present and future treescapes. Different people have different experiences and expertise that both highlight and deepen understanding of what needs to be taken into account when seeking to expand woodlands, in line with local and national targets.

There are already digital mapping tools that primarily contain information about soil, climate and biodiversity of woodlands, but miss out important human and social factors. A storymap approach was idetnfiied as a potential way to fill in this gap and provide place-based information on different knowledges, experiences, visions and feelings about woodland, and in a way that can trace and layer past, present and future narratives of land and its use. Such information is vital in creating a dialogue and deeper understandings around contested environmental narratives, including where particular kinds of woodland and the types of management approaches are considered thinkable/appropriate or not, and the reasons for this.

This project has developed, with diverse stakeholders, a prototype digital storymap of the Cairngorms National Park (CNP) area, that can be used and developed both as an archive of spatialised woodland values, and as a decision-making and deliberative tool. The storymap features videos illustrating a wide range of ways of knowing the CNP area in terms of past, present and potential woodland, including different users and managers of the land, residents of different ages, and a range of scientists, public agency and third sector staff. The storymap has been built to be tested and refined as a tool for enhancing dialogue and decision-making amongst a wide variety of stakeholders, specifically in this case regarding actual and prospective woodland, but with relevance for any land use and management challenges in which diverse or contested stakeholder narratives matter. This project aims to enable multiple ways of understanding woodlands to be articulated through the storymap, with a view to co-creating more adaptive and collaborative ways of envisioning and planning for new and upland woodlands.

In this report we explore:
  A. How a storymap might be used to aid conversations around land and woodland in the future;
  B. How this iteration of the storymap could or should be developed further, and particular ways to realise this potential.

Policy background

Expanding the quantity and quality of woodland is recognised to be critical to the achievement of multiple socioeconomic and ecological objectives, from local to global scales (e.g. carbon sequestration, biodiversity enhancement, sustainable livelihoods, businesses and communities, flood management, environmental quality, and recreation, health and wellbeing) (Reid, 2018). However, geography matters fundamentally in how such woodland expansion could and should occur; as emphasised in the imperative to have the 'right tree in the right place' (Scottish Government, 2019). What counts as the 'right tree in the right place' is not a straightforward matter and is contested through practices and narratives shaping woodland expansion.

The Cairngorms National Park is home to some of the most extensive woodland in Scotland and the UK, and some of the most important in terms of rural development and protected areas and species. The CNP recognises the importance of woodlands as part of the area's landscapes, ecology, economy and cultural heritage. This importance is identified in part as due to the predominance of native tree species (Cairngorms National Park Authority, 2018).

Despite the importance of woodlands in the CNP, the area has a relatively small forest cover, of 16.4% (see Figure 1); the CNP is host to other habitat types too, including farmland, moorlands, peatlands and grasslands, which are also recognised as providing a wide range benefits (Cairngorms National Park Authority, 2018).
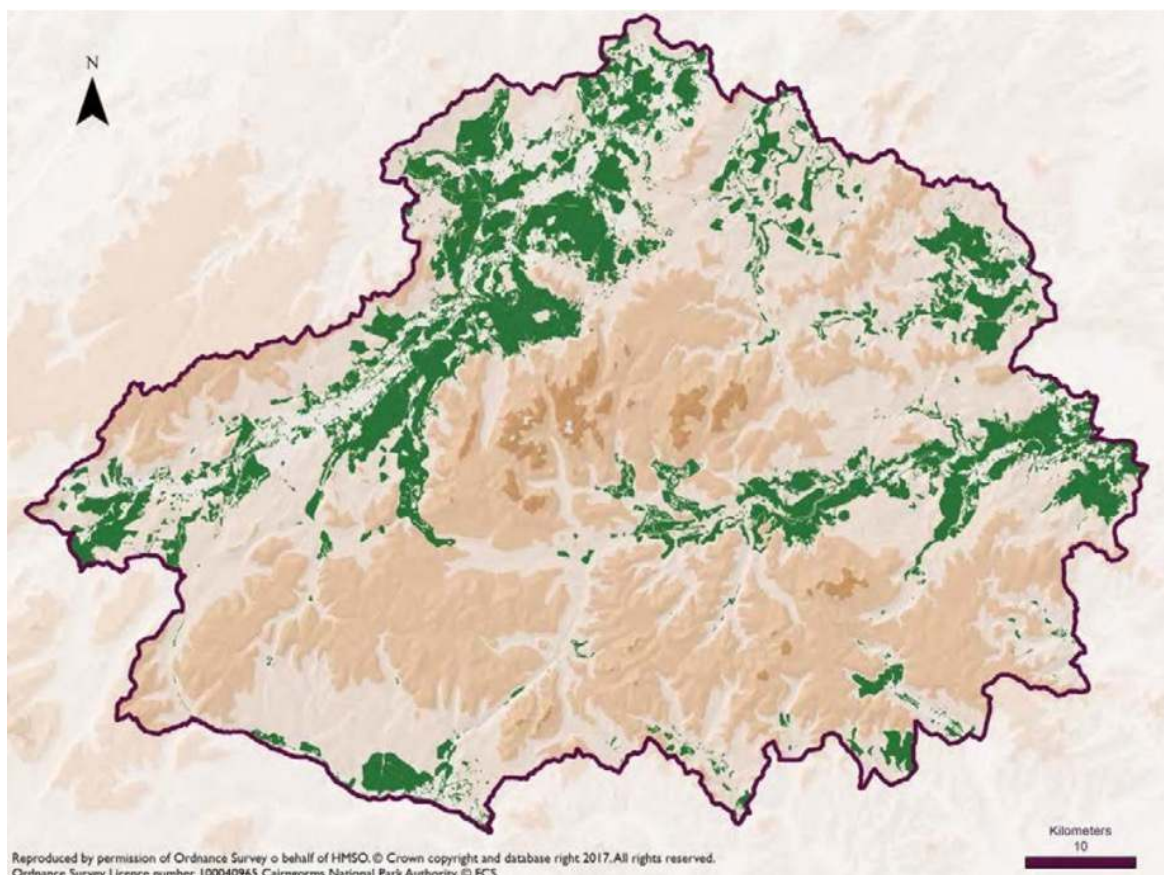
Figure 1. Current forest resource in the Cairngorms National Park (produced using the National Forest Inventory, 2015). (Cairngorms National Park Authority, 2018)

The Park is recognised as having potential to expand woodland further. However, careful planning is required to do this in a way that contributes to multiple benefits, including biodiversity, species restoration, business and community development, landscape, recreation opportunities, soil and water quality, flood management, and carbon sequestration. The CNP's 2018 Forest Strategy identifies a potential scope for woodland expansion in the CNP (see Figure 2) (Cairngorms National Park Authority, 2018).
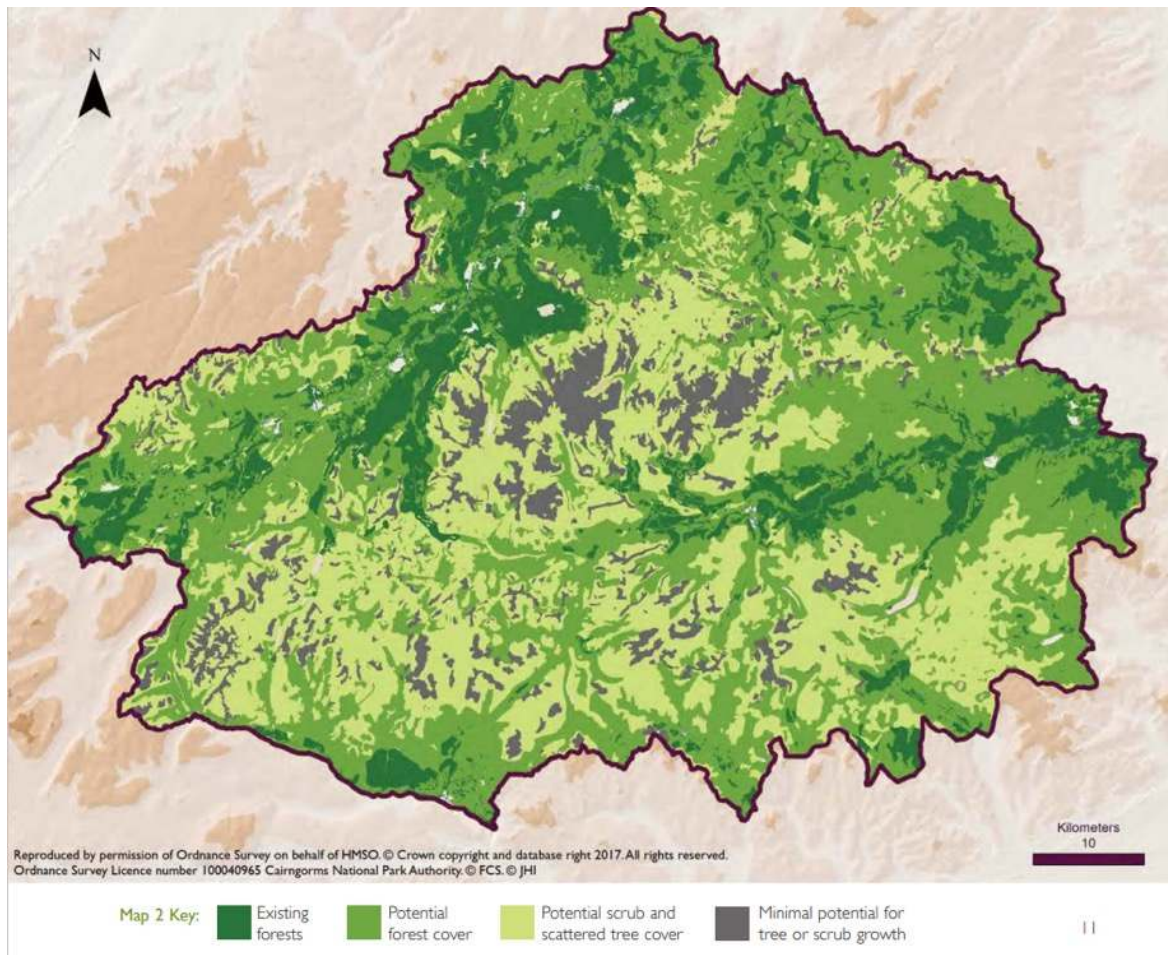
Figure 2. Ecological potential for woodland and scrub in the Cairngorms National Park, as identified in the CNP's Forest Strategy 2018 (produced using the Native Woodland Model, 2004). (Cairngorms National Park Authority, 2018)

Policy narratives framing woodland expansions initiatives - such as 'potential for woodland' (Cairngorms National Park Authority, 2018), 'the right tree in the right place' (Scottish Government, 2019) and 'landscape-scale conservation' (e.g. Cairngorms National Park Authority, 2019)) - all invoke complex assemblages of past, present and future spatial materialities and imaginaries that allow particular species and practices to be connected and belong in particular places and not others.

Conceptual background

Adaptive co-management and stakeholder involvement

Adaptive management approaches deal with the complexity and unpredictability of socio-ecological systems, by adapting to specific situations and change through a learning-by-doing approach. With adaptive *co*-management, the co-management dimension adds to this approach, by bringing together different sectors of government and civil society, providing an extended learning from multiple stakeholders, therefore improving the understanding of the matters at stake (Plummer & Armitage, 2007).

Stakeholder involvement is seen as essential for an effective and just management of social-ecological systems (Biggs *et al.*, 2010); due to the complexity of social-ecological systems, they cannot be understood and managed by a single actor or at a single scale (Carpenter *et al.*, 2009). The inclusion of stakeholders in decision-making has also been described as improving the effectiveness of management (Reed, 2008), and as helping to deal with conflict (Sultana and Abeyasekera (2008) Carmona *et al.* (2013)). Finally, public participation has been described as a democratic right (Reed, 2008).

An effective involvement of stakeholders in the management of woodlands requires stakeholders to better share, understand and empathise with each other's perspectives, knowledges and ways of knowing, amongst different scientific disciplines, practitioners and communities. Understories seeks to address this need through the storymap in three key ways: (a) as a way to engage stakeholders: (b) integrating different types of knowledge; and (c) helping to articulate the issues about which decisions need to be made, and informing discussions of how to address them.

Narratives and storytelling

Stories and narratives are central to how humans make sense of the world, and thus how they shape and reshape that world. A growing body of scholarship underlines not only how our stories and practices of storying are central to how particular ecological configurations are made possible (and not) in particular spaces and times, but also how nonhuman agency plays an active rather than passive role in such storying (Harris, 2018; Haraway, 2016; 2019; Myers, 2017; Abblitt, 2019). For example, Haraway's discussion of multispecies storying (2016)) states that, "it matters what stories we tell to tell other stories with" (p.12), and Myers (2017, pp. 11-12) emphasises the need to expand our methods to fully acknowledge the part that nonhuman agency does in storying ecologies. Whose stories get to play a part, and how, in the ongoing storying of a place emerge as a central consideration. This chimes with evidence suggesting that land management initiatives succeed best when a plurality of voices, narratives and forms of knowledge can be engaged in the co-development of management solutions especially in circumstances of contestation and uncertainty (Wyborn et al., 2021).

Accordingly, how we story and re-story woodland expansion with regard to the Cairngorms National Park (CNP) matters for the particular ecologies brought into being there; where, by whom, and how. It is important to look at how CNP woodland expansion has been storied until now, and work with these stories to see how they weave together and relate to each other, and how they might configure and co-produce particular land use and management futures. Different ways of storying woodland expansion will shape how particular spaces and times of possibility are opened up and which are closed down.

Digital storytelling

Digital Storytelling is increasingly used in social science and the humanities – especially in the health, civic engagement and higher education spheres. It is currently being propounded and explored as a particularly powerful way of organising and curating knowledges so as to facilitate meaning-making processes (such as building common ground or mutual understanding upon which decisions can be made - and sometimes even therapeutic encounters - as well as generating artefacts (e.g. audio accounts or videos) that can influence, motivate and inspire others (Heck & Tsai, 2022). De Leeuw *et al.* (2015) list among the potential uses of Digital Storytelling: engaging the culture and context of communities; exploring common narratives; facilitating discussions around difficult topics in a relatively non-hierarchical and non-threatening way; and behaving as a bridging tool and aid in building relationships.

Our focus is to explore digital storytelling as a basis for practices of discussion, connection, learning, awareness, meaning-making, perhaps empathy and finding some common language – and ultimately decision-making - across stakeholders with conflicting interests and perspectives, within the digital storytelling process. Traditionally digital storytelling has been done within peer groups or groups with strong commonalities rather than bringing them all under one roof. There is a need to explore the potential of digital storytelling for helping to develop a better platform of understanding for adaptive management. Crucially storying is not just about the form and content of resulting product. The very act of constructing a multi-media story product could pay dividends for adaptive (co)management as a tool facilitating numerous active agents all negotiating meanings and practices together (i.e. stakeholders engaging with each other and the decision-making process). The method has many of the benefits of a focus group in deliberating different experiences of a topic but allows a much deeper engagement with various hopes, struggles and realisations, providing a structure and resource for substantive listening and responding. If also available online, dialogue and a stakeholder meeting space can occur beyond the time-limitations of a focus group.

Digital storytelling has traditionally been used to tell individual stories with less emphasis on engaging actively, equally and iteratively with the audiences of the stories. Thus, in this way our digital storytelling exercise has aspects in common with Participatory Video, but has the flexibility of not being tied to the medium of video, and can work effectively to bridge stakeholders who are difficult to bring together in person. A further evolution from traditional digital storytelling is that the exercise is not (solely) producing a multi-media product to speak truth to power but seeks to use the process to get on a level with powerful actors, share stories with them in both directions, and thus develop a better platform of understanding for adaptive management of different perspectives, forms of knowledge and ways of knowing.

Storymapping

Storymapping is relatively novel strand of inquiry and engagement, enrolling elements of both digital storytelling and participatory mapping, to create a spatially explicit way of curating and exploring the stories collected. This also will help incorporate the more-than-human dimension. Spatial dimensions of stories are thought to be enhanced through judicious use of digital media anyway. For example, the Mobile Video Ethnography pioneered by ourselves and others in outdoor recreation and agriculture spheres (e.g. Brown and Spinney (2010); Brown *et al.* (2008))

, has been recognised as evoking and bringing explicitly into analysis elements of location, embodiment, mobilities, and the situatedness of practices in particular environments that can

otherwise be neglected. It has also highlighted how interweaving the recording and reflecting upon moving images can create rich layers of understanding between those. One potential form of engagement could involve a storymap that includes scenarios of woodland expansion with clickable points that link to stories about particular places. These scenarios could thus develop, and iteratively layer in, a biophysical and social dimensions. integrate biophysical results with participants local knowledge. Because Digital Storytelling is place-based, or at least associated with an environment that embodies particular characteristics, it is therefore potentially spatial, allowing it to be linked to the biophysical modelling. This allows exploration – and prospective integration – of knowledge based on people's experience of the environment with biophysical data of the ecosystem and its functions and service.

Method

The project consisted of three stages: the story collection, mapping of these on a storymap, and testing and discussing the storymap with stakeholders.

Story collection

Between January 2018 and December 2021 we identified and contacted stakeholders, inviting them to take part in this research. Stakeholders were identified through stakeholder relations build throughout the project, and on previous projects (see Brown *et al.* 2016b) and Brown *et al.* 2016a). Other stakeholders, such as researchers at the James Hutton Institute, were identified through their work being relevant to woodlands in the Cairngorms. Additional stakeholders were suggested by existing contacts.

An invitation letter and information sheet were emailed to 84 prospective participants, outlining the aims, approach, and what would be expected of participants. Follow-up emails or phone calls were made, where needed, to clarify and expand on this. Participants were asked to record - or offered to collaboratively record with a researcher - a video answering the following questions:

- What does 'the right tree in the right place' meant to you, and why (e.g. under what circumstances)?
    - What factors, processes or other considerations need to be taken into account when making decisions about woodland creation or expansion in the CNP?
    - What experience of the area and/or particular approaches, tools and techniques inform your knowledge?
    - Could you speak to one or more areas of 'potential woodland' demarcated in the latest policy document?

Videos were either filmed by the participants themselves using their own smartphones, or by the researchers. Many participants preferred the researcher to film, in part due to perceived technical capacities, and in part, because they found it easier to story in an interactive exchange with another person. Selfie sticks were provided for those who requested them. Participants were given the option to edit their own videos or submit the rough footage to be edited by the researchers. In the cases where videos were filmed and/or edited by the researchers, a draft was shown to participants for their feedback and approval.

Construction and curation of the storymap

All videos were uploaded to Vimeo. Privacy settings were selected so that only people with the URL link to the videos can view them, and so that they cannot be downloaded or embedded on other websites. Subtitles were added to the videos where the audio was not clear. Videos that were longer than 2 minutes include a shorter 'trailer' at the start of the video, summarizing the topic of the story. The titles of the videos were selected by the researchers to reflect the content of the video. The titles of some videos are descriptive of the main topic, while the titles of other videos were based on memorable wording or phrases used in the video. Different ways of titling were encouraged so it could be explored for its implications in the stakeholder feedback workshops.

We built an interactive map of the video stories, using ESRI ArcGIS as a platform for this (see https://storymaps.arcgis.com/stories/844f1375edf44091add002a6a9988a8f). Red markers were used to geographically locate each video story onto a map of the Cairngorms National Park. Each marker contained the title of the video, its duration, a still image from the video, and a link to the video on Vimeo. The storymap also displays a list of all the videos, highlighting the video titles and durations (see Figure 3). Each video is included under one of three headings: at the top of the list is 'A story from each contributor', which includes one story per contributor (as selected by the researchers), with the aim of providing similar visibility to each contributor. Additional stories by each contributor is included under the header 'More Understories'. The header 'Other stories coming soon' includes stories that have not yet been included in the storymap (either because they have not yet been finalised[1] , or because contributors have not yet consented to them being included). These are indicated on the map with gray markers, instead of red ones. Finally, the stories contributed by the researchers are included under the header 'Understories team stories'. The markers are positioned on the map either at the location where the video was filmed, or at a location referred to in the video, or, when the video does not refer to a specific location, researchers selected a relevant point to position the markers.
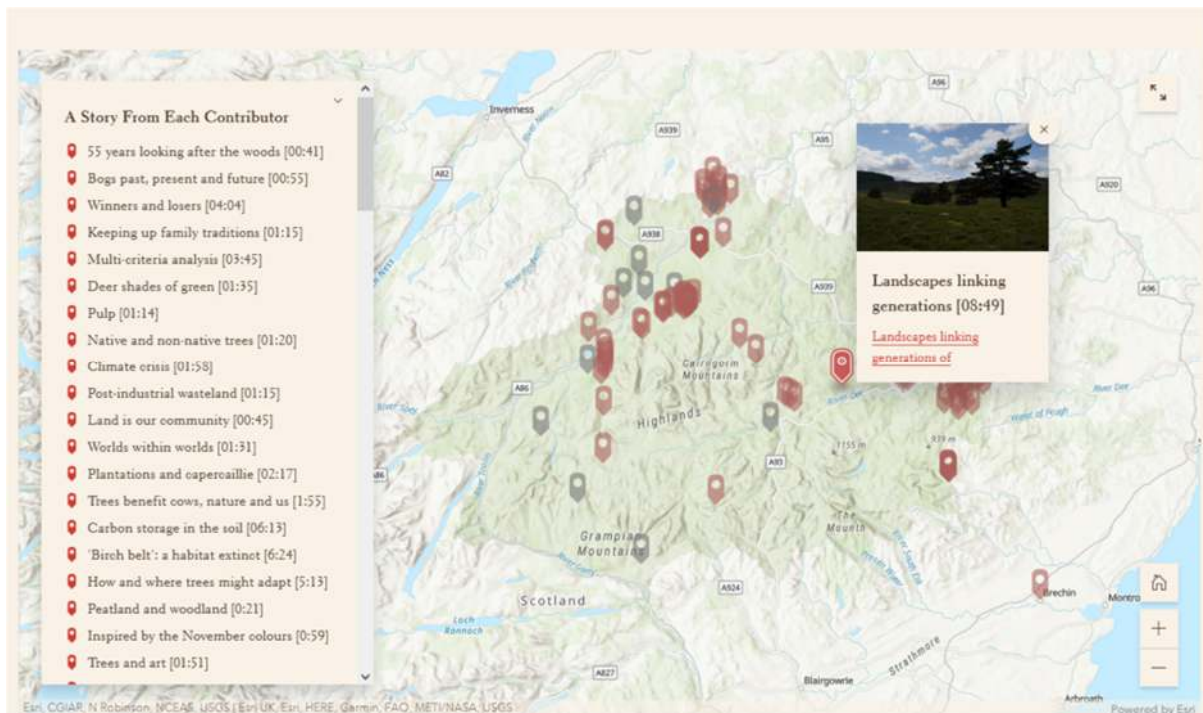
Figure 3 Storymap. Here one of the red markers on the map has been selected, showing the corresponding video's title, its duration, a still image from the video, and a link to the video on Vimeo. Grey markers on the map indicate stories that have not yet been uploaded to the storymap. All the videos titles and their durations are listed on the left.

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[1] Disruption to key staff due to cover/health protection closures of school classes and nurseries meant that some videos could not be edited within the project period. This will be taken up in SRP 2022-2027 JHI-D4-1.

Workshops

Video contributors were invited to take part in a discussion workshop. The aim of this was to discuss how the storymap might be used to aid conversations around land and woodland in the future, and to identify how the storymap could or should be developed further, and particular ways to realise its potential.

Those who accepted the invitation were invited to explore the storymap before taking part in the discussions, with the aim of considering the strengths and weaknesses of the woodland storymap in its current form. To stimulate a reflective exploration of the storymap, participants were asked to think and take note of: what surprised them the most (and why); what moved them the most (and why); and what was most intriguing (and why).

In December 2021 we carried out three one-hour discussion workshops with 13 video contributors. Workshops were held online through Webex. Each workshop had between 3 and 6 participants, and was supported by four researchers: the principal investigator, a workshop facilitator, and two note-takers. Efforts were made for each workshop group to have a diverse composition in terms of the participants' backgrounds. The first workshop included an academic, a habitual walker in the Park, and a woodland advisor for the Park. The second included a park ranger, a member of staff of an environmental NGO, and to academics. Participants in the third workshop were four ecologists, a member of staff of an environmental NGO, and the stalking manager of an Estate in the Park. In the third workshop, for part of the discussion, participants were divided into two breakout groups; the first included two ecologists and the stalking manager; and the second included two ecologists, and the NGO member of staff.

The workshops consisted of a brief introduction and context-setting by the project leader, followed by discussions structured around the following questions:

- Introductions:
    - What surprised you the most (and why)?
    - What moved you the most (and why)?
    - What was most intriguing (and why)?
- How did you explore the map?
    - Were you happy to be exploring serendipitously, or did you find yourself drawn to a particular topic or location?
    - What should we do to ensure the map remains engaging and useful to people (rather than overwhelming or disorientating)?
- What did you learn or appreciate that you didn't know before?
    - Did any of the stories change your perspective in any way?
    - What most challenged your own views?
- What is the potential of the storymap for aiding constructive conversation around the right tree in the right place?
- What should we change or develop further?

Short reports summarising each workshop was sent to participants to give them the opportunity to correct any misunderstandings or to share further reflections. Seven participants confirmed that they were happy with how the discussions were interpreted and summarised, and one of them said

that, on reflection after seeing other people's videos, he would like to contribute an updated 'more polished' version of his video.

Ethics and data management

This work was approved by the James Hutton Institute ethics committee, and the data collected has been processed, stored and managed in compliance with the UK and EU General Data Protection Regulation (GDPR). Separate consent was sought for uploading the video stories to the storymap, and for taking part in the workshop. Those who contributed a video story are not identified by name in this report or on the storymap, but could be identified through the content of the videos on the storymap. To this date the storymap has only been shown to workshop participants. Should the storymap be made available to a wider audience, consent has been secured from most video contributors for this. The workshop participants are identified in this report, but the views represented here are not linked to any particular individual.

Results

Story collection

44 people contributed one or several video stories (Tables 1 and 2). Video contributors included members of staff of public agencies (e.g. CNPA, Scottish Forestry, Forestry and Land Scotland, BBC), NGOs (Cairngorms Capercaillie Project, Woodland Trust, Scotland the Big Picture), academics from research institutions (James Hutton Institute, Norwegian Institute for Nature Research, University of Aberdeen), land managers (foresters, land-owners, rangers, conservation manager, a farmer, a stalker), members of the community (artists, habitual walkers in the Park, local residents). The researchers in this project also contributed our own stories, for the purposes of providing exemplars, positionality, and to develop a greater understanding of the experience of making a video for this storymap.

Table 1. List of stories included in the storymap, the stakeholder type that each contributor belongs to, and duration of each story.

Stakeholder type	Contributor	Story title	Story duration
Public Agency	1	What I thought was wild	04:27
		Connectivity provides resilience	06:55
		Scotland's celebrated landscapes	06:55
		How trees march up a hill	05:34
		Placenames give clues	03:43
		Understanding natural treeline	07:06
NGO	2	Plantations and capercaillie	02:17
		Expanding capercaillie's habitat	05:30
		Capercaillie and the treeline	02:19
		Bog, woodland and capercaillie	01:41
		Capercaillie and deer fences	01:34
	3	Worlds within worlds	01:31
		Around the corner	02:09
		Getting to know trees	01:23
		Sense of wonder	01:58
		Sharing perspectives	01:33
	4	The tree custodian	00:23
		Hand-built dams	01:03
		Post-industrial wasteland	01:15
		Without fencing	00:51
	5	Spreading genetic tree material	09:40
		Seed source for broadleaves	08:02
		How and where trees might adapt	05:13

Recreation	6	Climate crisis	01:58
Community members	7	Origins of rewilding	01:27
		Pulp	01:14
	8	For pure enjoyment	00:40
		Land is our community	00:45
		Osmotic learning	00:50
		That's not a fir tree!	00:33
		The warm wood	01:02
	9	Granny pine	00:58
		Plantations and natural woodlands	00:40
		Inspired by the November colours	00:59
		Enjoying diversity in the woods	01:17
		They all have their place	00:42
	10	The lime tree is a different tree	00:37
		Trees and art	01:51
Land Manager	11	Anagach Woods	01:28
		Beech trees	00:59
		Bogs in the past, present and future	00:55
		Frail little pine seed	00:43
		Wood ants	00:37
	12	Personal experiences, landscapes	10:27
	13	Trees benefit cows, nature and us	01:55
	14	Bend not break with management	08:01
		Woodland with or without fencing	00:51
	15	Deer shades of green	01:35
		Common ground	00:40
		Conflict in the rural sector	00:40
		Evolution not revolution	00:45
		Megaphone diplomacy	01:12
		The whole story	02:20
	16	A diverse landscape for ecosystem services	05:35
		Giving the woodland a hand	06:47
		Native and non-native trees	01:20
		The privilege of living with trees	01:27
	17	Community-owned woods	00:48
		Regeneration	01:41
		Home of the Scots pine	00:24
		Where the heather came in the pines followed	01:13
		55 years of looking after the woods	00:41
Community/Academic	18	Placelessness in green marketing	08:24
		Reimagining land	12:04

		Knowledge a greening economy	04:07
Academic	19	Peatlands and woodlands	00:21
	20	The impact of trees on vegetation	03:48
		Carbon storage in the soil	06:13
		Tree planting is not a panacea	00:38
	21	Keeping up family traditions	01:15
	22	The 'birch belt': A habitat extinct	06:24
		The Northern Corries in 2050?	00:10
	23	Winners and losers	04:04
	24	Multi-criteria analysis	03:45
Academic (Understories researcher)	25	Care for T-rex	01:21
		Extinction	00:54
		Oak tree and the rock	00:33
		People in offices	01:21
		The dark of the woods	00:51
	26	Landscapes linking generations of trees & people	08:49
	27	Higgledy-piggledy	03:50
	28	Climbing trees	04:03
	29	Personal memories	03:04

Table 2. List of stories not yet included in the storymap, and the stakeholder type that each contributor belongs to.

Stakeholder type	Contributor	Story title
Public Agency	30	Changing demands on Cairngorms forests
	31	Forest wildlife dynamics
NGO	32	Changing ourselves in line with how nature changes (or needs to change)
Community members	33	How woodland expansion might shape how we adventure in the hills
	34	Whatever you want it to be
	35	Horse-riding and access
Land manager	36	Rothiemurchus historical changes from the air
Academic	37	Mar Lodge woodland expansion
	38	Knowledge and feelings about trees can be two different things
		Tree genes and responding to climate change
		Not as simple as just planting trees everywhere - identifying woodland potential
		Dealing with uncertainty
		Different knowledges are needed to solve land use problems
		Species and their names are clues to how we have worked with nature in the past
	39	Complex dynamics of forest species
Community	40	Gaelic tree alphabet

Community	41	How mountain bikers see woodland
Community	42	Artist's view of woodland
Community	43	Gaelic ways of seeing nature
Community	44	Woodland expansion's impact on adventure

Stories were recorded principally in the form of a video, at a specific location relevant to the story, or in some cases as still images with a voice-over. One participant submitted a story in the form of PowerPoint slides with a voice-over recording.

The videos collected include accounts of professional knowledge, and of personal experiences of woodlands in the Cairngorms, and the intersections between both. They include accounts that refer to locations in the Cairngorm National Park, and accounts that apply to broader geographic scales, ranging from the wider Park area, to a global scale. The topics of the videos include: the role of trees and soil for capturing carbon, personal memories of specific woodland areas, trees as inspiration for art, the history of woodlands, personal preferences for different types of trees and landscapes, links to language and culture, the impacts and trade-offs of woodland expansion on different wildlife and vegetation species, woodland management techniques, perceptions of woodland and landscapes across generations, and the natural tree line in the Cairngorms. The duration of each video varies between 21 seconds and 12 minutes.

Figure 4. Still images from two of the videos contributed.

Exploring the storymap

Participants' approaches to exploring the storymap varied between those who were drawn to what they are familiar with – familiar topics, people, or geographical location, and those who selected stories that they thought would show them something new. There were also differences between those who were intrigued by the videos whose titles did not reveal the topic of a video, and those who would have preferred knowing the topic and the author of a video, to make an informed choice as to what videos to watch. There were some participants who explored the map in ways that combine these approaches. For example, one participant described how they initially looked at stories in the geographical area where they live, as well as stories they are particularly interested in, such as those about the capercaillie, and other stories whose title sounded interesting, such as 'Pulp' and 'Higgledy-piggledy'. Another participant said they were drawn both to topics they have a

particular interest in, as well as to stories that seemed different to their own experience, judging by the title. A different participant said that they did not find the titles helpful for selecting what videos to watch, as they did not reveal the individuals' expertise or background. They suggested that having more information on this would be helpful in order to select a range of different perspectives. In contrast, one participant said that, to them, the most intriguing titles were those that did not reveal what the story would be about, e.g. 'Pulp', as opposed to 'Carbon storage in the soil'. Having obscure video titles was suggested as an advantage, as by not revealing their subject matter or perspective, they may draw viewers in who might have otherwise not selected certain stories, therefore providing a wider perspective. However, it was also pointed out that it could lead to some people disengaging from the storymap.

One participant said that they were drawn to the stories they thought they would have most in common with, or would agree with. There was a suggestion to categorise the stories into types, such as by geographical area, or theme, or by using keywords, in order to help select stories to watch. This was suggested as particularly useful as further stories are added to the map. However, the absence of a way to make such tags or categories on the ESRI Storymaps platform in some ways made it more likely that people view perspectives different to their own. Another suggestion was for location-specific stories could be differentiated from non-location-specific ones by using differently coloured pins on the map.

Both the pins on the map and the list of titles were considered useful in selecting stories, with each participant either preferring one approach over the other, or using a combination of both. For example, one participant initially looked at places they recognised on the map. They then scrolled down the list of titles, selecting the stories that caught their eye. Another participant initially selected stories at random, and then focussed on familiar locations on the map. It was suggested that geography might be more relevant to people who live within the Park. Participants who used the list of titles to select stories generally began from the top of the list, meaning that stories at the top of the list will be viewed more often. The order in which stories appear on the list could be randomised, to prevent giving more visibility to some stories over others.

There was a general consensus that having stories with different types of content – 'emotional' and 'technical' – was the key to the storymap being interesting. The title of the stories does not reveal whether a video contains emotional or technical aspects, the combination of which was described as making the experience of exploring the map more interesting. Stories with an emotional dimension were described as being more engaging. In fact, one of the participants thought that videos that contained an emotional aspect had an advantage in conveying their perspective over those that did not.

Some participants said that if they had had more time they would have watched more or all of the stories, and one participant said that they would re-watch some of the longer videos, to fully understand or retain the content. The variation in video durations was described as being enjoyable and useful, in that it allowed participants to engage with the storymap for different lengths of time.

The geographical distribution of stories on the map was thought striking, and was seen as reflective of where people live within the Park, its accessibility, and the way that people interact with the landscape. It was noted that there were areas on the map without associated stories, such as upper Strathdon and Glenlivet, and that this could be a sensitive issue for those who perceive some areas

as being neglected by the Park Authority.

The fast pace of discussions around woodlands means that it might be difficult to keep the tool useful over time. There would therefore be value in the storymap reflecting these changes over time.

Learning about others' perspectives

Through interacting with the storymap and watching the video stories, participants were able to learn about perspectives and ideas they were not familiar with. One participant said that they learnt new perspectives from the stories that included a personal dimension, rather than from the purely scientific stories, which they are already familiar with. Another participant said they enjoyed hearing about different perspectives, and gave the example of a story where trees are planted to use as forage for cattle, which is a use they had not hear of before. One participant said that some of the stories made them think about some topics more deeply. They mentioned as an example a video that made them reflect on the type and location of trees to be planted, and who lives in these locations. Participants who are originally from a foreign country found it interesting to compare stories of the Cairngorms to the perspectives they have of woodlands in their home countries. Another participant said that they learnt about woodland management techniques. One participant learnt about the history of woodlands (e.g. the story 'By the time Scotland's mountain landscape became widely celebrated the trees had gone'). Other participants said they did not learn anything new, either because they mostly watched videos on issues they are already familiar with, or because they were already familiar with the different perspectives presented.

Although there was a general agreement that participants enjoyed the diversity of stories on the map, both in content and in style, and provided examples of where they learnt something new, participants did not think they had changed their views as a result of interacting with the storymap. One participant explained that some of the stories are akin to their values while others they disagree with, but neither of these have changed their perspective. Nevertheless, some indicated that they understood better *why* other people held particular views, even if they disagreed with them.

It was suggested that, because of the storymap format, where viewers select what stories to watch, it may reinforce what viewers already know or believe, missing out on many perspectives. In contrast, a more highly curated approach, in the form of longer feature films on particular topics, could show viewers various sides of a story. Stories could also be structured in a way that guides the viewer through a narrative journey through various locations in the Cairngorms, e.g. along the Spey or the Dee. Another idea was to include an introductory longer video showcasing a selection of stories, as well as conclusions from the project.

Participants expressed that some of the stories in the map contained 'factual inaccuracies', such as how long a tree takes to grow, what the landscape looked like in the past, and the role that trees can play in mitigating climate change. Those who raised this as an issue thought that inaccuracies should be corrected, albeit while maintaining the emotional authenticity of the stories.

Potential of the storymap

Participants offered ideas as to potential uses and applications of the storymap in the future. It was suggested as a method to help understand people's view in consultation processes, as a way of

obtaining feedback on projects such as net-zero or peatland restoration projects, or as a way to record stakeholder views or facilitate stakeholder interactions in a specific location such as a river catchment. It was also suggested as particularly useful tool to capture local history, e.g. through people's memories of a place. It was also suggested as an educational tool for use in schools and community groups.

The storymap was noted to hold particular promise as a way to hear the voices of those who are more seldom heard, such as children, young people and proxies for future generations. Allowing people to engage with the map in person, for example through a touch-table, to allow access to people who are unable to interact with the storymap online. The storymap could also include stories about non-human beings, by including elements of nature, such as animals, trees or landscapes, as individuals in their own right. It was thought to be interesting to include stories without words, e.g. a forestry operation in action, or tracking a plant's growth, or a season throughout its development. The question was raised of how the storymap could be used as part of a legislative process, for instance, in granting legal rights to non-human elements of the landscape such as animals or a river.

The storymap could be used as a tool to help change narratives for the future, by facilitating a debate, where the conversation should go beyond discussion 'the right tree in the right place', to include issues of injustice, inequality, and land-ownership. Including the stories of stakeholders living outside of the park area was proposed, given that stakeholders can influence or be influenced by the park beyond its boundaries.

There were opposing views on whether the storymap should be used so support a political agenda, such as promoting woodland expansion. Those who thought it could be used in this way, thought that it should be representative of the whole population, and stories should be collected systematically and avoiding bias.

Participants provided feedback on some of the technical and practical aspects of the storymap: it would be a good idea to clearly indicate that it is possible to zoom into the map in order to make it easier to select stories that are spatially clustered together in a geographical area. Another suggestion was to allow the possibility for stakeholders to view and respond to the storymap, by adding their own stories or comments. Finally, having the videos directly embedded into the map would be preferred to the current system where users must open an external link. These would all be possible with a bespoke platform or one of the fast-developing other digital story platforms.

Discussion and conclusions

The storymap is shown to have significant potential both: (a) as cultural and research resource as ongoing archive of interweaving and rich land, environment and place-based narratives, and; (b) as decision-making and deliberative tool to facilitate a dialogue between different perspectives, that can promote understanding and empathy, by bringing different ways of knowing into conversation with each other. Other research highlights the need to facilitate the right conditions to foster understanding of others' perspectives and experiences (Cundilll *et al.*, 2015, p. 191). The discussion workshops showed that in exploring the storymap, participants had opportunities to learn about experiences, methods and knowledge outside of their usual spheres. The inclusion of different ways of knowing (e.g. scientific, experiential, emotional), is crucial to the storymap's potential for fostering understanding and empathy between stakeholders, as well as it being key for engaging participants. Participants were particularly moved by and interested in stories that had a personal or emotional dimension to them. The diversity of stories provides the subtleties and contradictions needed to build a nuanced discussion around the issue of 'the right tree in the right place'.

Further attention is required to understand how to maximise the storymap's potential. A key capability of the storymap is inviting encounters with different people, places and experiences, yet different participants were differently open to such encounter and/or differently open to encounters with difference being serendipitous or exploratory versus self-directed and controlled. Allowing participants to interact with the storymap, and giving them the freedom to create their own storyline by deciding which stories to view, and in which order, gives them the possibility to engage with stories that they are more drawn to, as well as the chance to watch stories they 'happened upon' but would not have specifically have chosen themselves. Participants described both as being engaging and interesting approaches. It may also have the benefit of granting participants the agency to learn and build empathy at a pace that they are willing and able to do so. However, it could be seen as a drawback that participants can, if they wish, only view (or continue viewing) stories they are already familiar with, or that align with their own perspective.

An alternative approach would be for the researchers to curate the stories into a film or montage illustrating or flagging different points of view and stakeholder types. This more highly curated approach removes some agency from the participants, but would ensure everyone would hear perspectives or experiences different to their own, potentially providing more opportunities for building understanding and empathy between stakeholders. Further research would provide more insights as to the benefits and weaknesses of each of these approaches.

One of the strengths of the storymap is its ability to locate stories geographically, adding context and meaning to stakeholders' experiences and values. The storymap holds the potential of facilitating conversations around specific themes or geographic locations. Future versions of the storymap may situate stories in time as well as in space, to reflect the evolving physical, social and political realities of the Cairngorms' treescapes. It may be important to enhance the iterative and interactive dimensions of the storymap, by allowing contributors to update their views and knowledge over time, or respond to stories on the map with story responses or questions. This could add further value to the storymap, by helping to advance constructive conversations. However, facilitating and curating such a space would require considerable effort and resources.

The main limitation for stakeholders exploring the storymap was their time available to do so. Some participants focussed their time on the stories whose topics they are familiar with or whose perspective they thought would align with their own. Had all stories been shorter, they may have had time to view additional stories, with a wider range perspectives. The length of the stories therefore might have constrained the storymap's power to facilitate empathy-building and understanding between stakeholders.

How stories are presented and signposted on the storymap is fundamental for it to be both engaging to the users, and effective in its goals. It is therefore important to give further consideration to what extent stories should be 'tagged' or otherwise categorised on the map (e.g. by topic, type of stakeholder, or geographical specificity), and how this should be done (e.g. using keywords or colour coding). It is also important for the storymap to be easy to use; improving some of the technical aspects of the map would make it more inclusive of a wider diversity of users. Categorisation can allow more tailoring of individual explorations of the storymap, and allow more tailoring of story curation and the meeting spaces and times through which stories are encountered. ESRI ArcGIS may not be the most appropriate platform for the purposes of the storymap; a technically improved version of the map on a more suitable platform could improve users' experience, enhancing the storymap's effectiveness.

Having stakeholders who have different types of expertise in the same discussion group sessions could mean that some participants feel uncomfortable sharing their views, if they feel they are not 'experts', or if specific topics are perceived as sensitive to some of the participants. Although the goal of having people with different perspectives seeks to facilitate the sharing of views and break down barriers or 'silos', having separate discussions with different stakeholder types could enable a more open discussion.

In this research we collected stories from a variety of stakeholder types (i.e. NGO, land manager, public agency, community member, recreation, academic), with the aim of including a diverse range of perspectives, and in this report we identify our workshop participants under these descriptors. However, it is important to note that many people belong to more than one category. For example, land managers, academics and agency and NGO staff are likely to also be members of the community who habitually enjoy walking in the Park. The stories that are considered to be of a scientific or technical nature are also informed by personal and normative values, blurring the boundaries between the objective and subjective. It was argued during the workshops that the content of some of the stories is factually inaccurate. However, the aim of the storymap is not to present objective facts; it goes beyond this, to present the realities of different people from their own knowledge systems, with the aim of enabling understanding and empathy between stakeholders, and to aid constructive conversations. Future research could explore how different ways of knowing could be more explicitly and deeply explored.

Future research could consider to what extent and how to incorporate additional accounts, such as people who visit or live in the park area but are 'harder to reach', stakeholders beyond the park area, who neither live in the park area or visit it, but who may have an impact on the area, or an interest in it. Additional accounts could also include future bearers of benefits and costs of how woodlands are managed in the area. It is also worth further reflecting on what constitutes the full the physical geographies of the Cairngorms National Park, whether these should be incorporated into the storymap, and if so, how this could be done. For instance, physical events elsewhere in the

world that could affect the Cairngorms treescape, such as forest fires elsewhere that affect global timber supply. Future research might also incorporate accounts of nonhuman agency, such as accounts of natural elements (e.g. trees, animals, habitats, or landscapes). There are examples of non-human elements being recognised as legal persons with rights (e.g. Argyrou and Hummels (2019), and other research has highlighted the need to acknowledge the role that non-humans play in storying ecologies, and to expand the range of methods to do this (Myers, 2017, pp. 11-12). However, the agency – both the role and influence – of the non-human tends to not be well accounted for in participatory or discursive processes of engagement. How to represent these aspects through film requires further reflection; for example, some biophysical processes (e.g. relating to subsoil biota) may need to be interpreted through specialist knowledge, and the spatial and time scales of some processes may need the use of specific or experimental filming devices.

Future research

The storymap is a live document, where story collection is ongoing. In the next RESAS SRP 2022-2027, we plan to build on this work, by exploring biodiversity narratives in the Cairngorms National Park. Through this work we plan to investigate how different methods of inviting and curating audio-visual narrative data make a difference to inclusive engagement, listening and learning (e.g. techniques for unifying and finding connections between narratives versus techniques maximising polyvocality). This will allow us to identify the main opportunities and challenges preventing generative exchange between different ways of knowing, and to identify opportunities for overcoming these challenges through a digital platform. In this work we plan to identify and engage with additional narratives, such as those of minority groups, experiential and more-than-human knowledges, youth and future generations.

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