Scoping review of marginalised narratives in biodiversity research and management

Katrina Brown, Alba Juarez-Bourke, Rebecca Gray & Hebe Nicholson

March 2023

Executive Summary

a. Aims, Objectives & Approach

The aim of this 'Scoping report on marginalised biodiversity narratives' is to report on a review of opportunities and barriers to greater inclusivity of narratives typically marginalised in biodiversity research and management in Scotland, drawing upon existing academic literature, policy documents and data, and supported by stakeholder interviews.

The specific objectives of the review are:

- to summarise how narratives and marginalisation matter in relation to biodiversity research and management;
- to identify narratives and narrative approaches typically missing or marginalised in biodiversity research and management, as relevant to Scotland;
- to identify implications for our research in which we will develop and evaluate audio-visual and interactive narrative tools and techniques to better enable their productive engagement for transformative change, and, in particular;
- to scope potential opportunities to explore and address marginalisation and biodiversity narratives in the case-study area, the Cairngorms National Park.

This scoping exercise was done through a primarily desk-based qualitative review and analysis of existing material (academic, policy and grey literature) relevant to marginalised narratives and biodiversity research in Scotland. This was supported by stakeholder insights from existing data from previous relevant SRP research and semi-structured interviews conducted with key stakeholders over winter 2022/23.

b. Insights regarding marginalised narratives in biodiversity research and management

Narratives and stories are central in how we understand ourselves and our relations to human and nonhuman others. They play an important role in the framing and practices of all socioecological relations, including biodiversity policy, research and management. A substantial and growing literature asserts that biodiversity enhancement and conservation will be more effective and inclusive if we pay serious and analytical attention to narrative, particularly in identifying and addressing how narrative and story work to marginalise particular people, ecologies and ways of knowing.

When we constitute biodiversity and related ecologies through particular narratives in research and management, key issues are raised regarding what and whom become excluded or marginalised, and how. Addressing marginalisation is seen as a policy goal in itself (notably in IPBES) as well as critical for the lasting effectiveness of conservation actions.

Narratives relating to biodiversity can marginalise along three key, interrelated axes:

1. Marginalisation of **people** and social or cultural groups (e.g. age, gender, ethnicity, sexual orientation, disability)
2. Marginalisation of particular **ecologies**; ecological or biophysical entities, relations and processes (e.g. particular species, species assemblages, habitats, ecotones)
3. Marginalisation of particular **ways of knowing** (e.g. knowing as embodied, sensory and emotional as well as cognitive; knowing as done through languages other than

English-speaking and discursive domains, such as minority languages, visual languages, as well as biosensory, biochemical or other more-than-human 'languages ' or modes of articulation and response).

In short, how we make and foreclose particular narrative space matters in the contested geographies and histories of which ecological entities are given consideration and in what terms, for and by whom, where we find or expect to find and conserve particular ecologies, and how. Paying attention to these ways the making and reworking of narrative space is therefore central to addressing the critical question for this WP of who will influence and benefit from particular ways of constituting biodiversity.

A range of marginalised narratives relevant to biodiversity research and management emerged from our scoping of empirical material. They pertained in particular to:

- **Languages beyond English** (in Scotland relating especially to Gaelic, Scots, and other minority languages);
- **Experiential** domains and knowledges;
- **Dynamic**, **plural**, **uncertain** and **less tangible** ecologies;
- (Particular) **people being *and feeling* centred** in - on the 'inside' of - biodiversity research and management rather than playing a temporary, minor, 'air-brushed' or provisional role;
- Narratives **beyond those centring white, masculine, English-speaking, ableist, heteronormative norms** of conservation, science, and related cultural practices (such as cultures of 'the outdoors');
- **Geographies** of where particular ecologies or people 'belong' or are 'out of place'
- Diverse people having **agency** in shaping goals and management of biodiversity, not just having pre-defined connection or involvement.

c. Implications for our research

There is growing recognition of the transformative potential of conservation through the social sciences, arts and humanities, especially when bringing many forms of ecological expertise, including narrative and story-based approaches. In seeking specifically to identify and help address marginalisation in relation to biodiversity narratives, a number of methodological implications arise. These centre around:

- **Who** we engage in our research practices (human and nonhuman), given the need to consider carefully the power relations and possible reinforcing of marginalising/exclusionary processes in inviting particular participants and not others, and;
- **How**, especially regarding how we enable articulating and responding of participants in particular spaces and times, as assembled with particular technologies, narratives, images (generating research encounters that can enable the marginalised both to 'speak' and be heard).
- The importance of paying attention to the **geographical and spatial** constitution of marginalisation in relation to biodiversity narratives.
- Likewise how different **temporalities** can be mobilised, such as in narratives of past or future inclusion (e.g. how inter-generational dynamics of humans and nonhumans matter for each other)
- Calls for methods that build connections and mutual understanding in biodiversity conservation, rather than just understanding conflicts.

Acknowledgements

This research is funded by the Rural and Environment Science and Analytical Services Division (RESAS) of the Scottish Government, as part of the 2022 - 2027 Strategic Research Programme. This report corresponds to Deliverable 2.1 ‘Scoping report on marginalised biodiversity narratives’, within project D4.1 (People and Nature), Work Package 2 (Enabling inclusivity in biodiversity narratives). We are very grateful for the insights from our research participants and from our project partners.

Contents

Introduction

There is growing evidence that conservation and biodiversity measures succeed best when a plurality of voices and diverse forms of knowledge can be engaged in the co-development of management solutions (Myers 2017; Gavin et al., 2018; Wyborn et al 2020). This work forms part of a broadening call for transformative change towards more just and sustainable ways of living (Turnhout et al 2021), and a debate in which narratives have been identified as central in how we enact, make sense of, and potentially transform our relationship to biodiversity.

Recognition is growing that enhancing biodiversity requires acknowledging and working with narratives and narrative approaches that are often missing or marginalised in biodiversity research and management. To inform effective biodiversity measures in Scotland, as elsewhere, it is crucial to consider the work of narratives in bounding the ecologies considered pertinent and valuable, who should be involved with them, and *how* biodiversity enhancement might proceed.

The research of which this forms a part (RESAS SRP Hutton D4-1 WP2 'Inclusive Biodiversity Narratives') seeks to identify marginalised narratives in relation to biodiversity in Scotland, and develop and evaluate audio-visual and interactive narrative tools and techniques to better enable productive engagement to address marginalisation in biodiversity research and management and in turn facilitate transformative change.

a. Aims & Objectives

The aim of this 'Scoping report on marginalised biodiversity narratives' (D2.1; due March 2023) is to report on a review of opportunities and barriers to greater inclusivity of narratives typically marginalised in biodiversity research and management in Scotland, drawing upon existing academic literature, policy documents and data, and supported by stakeholder interviews.

The specific objectives of the review were:

- to summarise how narratives and marginalisation matter in relation to biodiversity research and management;
- to identify narratives and narrative approaches typically missing or marginalised in biodiversity research and management, as relevant to Scotland [NB fulfils MS2.1, due Jan 2023]
- to identify implications for our WP2 research in which we will develop and evaluate audio-visual and interactive narrative tools and techniques to better enable their productive engagement for transformative change, and, in particular;
- to scope potential opportunities to explore and address marginalisation and biodiversity narratives in the case-study area, the Cairngorms National Park (hereafter CNP). [NB fulfils MS2.1, due Jan 2023]

b. Approach

This scoping exercise was done through a primarily desk-based qualitative review and analysis of existing material (academic, policy and grey literature) relevant to marginalised narratives and biodiversity research in Scotland. This was supported by stakeholder insights

from existing data from previous relevant SRP research and semi-structured interviews conducted with key stakeholders over winter 2022/23.

Desk-based review

We identified and collated the key sources of information (academic, policy and grey literature) relevant to our D4-1-2 WP 'Enabling inclusivity in biodiversity narratives' with a view to identifying a fuller range of biodiversity narratives relevant to Scotland, especially voices and narratives that have so far been neglected or marginalised in relation to biodiversity.

As part of the review of academic literature we scoped the relevant scholarship on both terrestrial and marine biodiversity as well as literature dealing with neglected or marginalised narratives as pertaining to nature-society relations. We also explored how the literature conceptualises key concepts such as biodiversity and narratives; identified understandings and approaches to conducting narrative analysis; and reviewed the different understandings of narratives in relation to biodiversity.

We also reviewed sources of neglected or marginalised narratives that might be indicated by narratives present and absent in biodiversity-relevant policy and grey literature, including documents published by both Scottish and international bodies (e.g. the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)). As part of this review we identified how key concepts such as 'biodiversity', 'narratives', 'inclusion', 'diversity' and 'marginalisation' are framed in policy documents.

Review of existing relevant data

We reviewed the relevant data we had collected in the previous SRP (2016-2022) as part of RD 1.4.2 WP4 (Understories), including in the form of video stories illustrating stakeholders' perspectives and experiences regarding woodlands in the Cairngorms; research notes on the construction and curation of a 'storymap', and workshop discussions with diverse stakeholders exploring their experience in exporting the storymap.

Scoping interviews and meetings with stakeholders

With the aim of identify marginalised biodiversity narratives, especially as relevant to CNP case study, we conducted scoping interviews and meetings with relevant stakeholders.

During winter 2022-23 we conducted 11 scoping interviews with key stakeholders including a range of individuals representing different areas of engagement (and non-engagement) in biodiversity research and management, covering a wide range of roles and sociocultural groups. Interviews were conducted either in person or by video-call, and were audio-recorded and transcribed with the informed consent of the interviewees. We used the following interview guide:

Thinking about biodiversity-related research and management in Scotland, and the way it is framed and executed, in your view and your experience:

1. *What people tend to be marginalised, overlooked, dismissed or excluded?*
2. *Which ecologies tend to be marginalised or overlooked? E.g. species, assemblages, habitats, aspects, bio-physical elements and processes, etc.*
3. *What ways of knowing and understanding biodiversity tend to be marginalised or given less legitimacy? E.g. ways of knowing beyond the mainstream/scientific/ rational knowledge.*

We also conducted 3 meetings with Cairngorms Connect staff, 4 meetings with Cairngorms National Park Authority staff (working either in the Heritage Horizons team or in Nature and Landscape themes), and 2 meetings with relevant natural scientists working at the James Hutton Institute.

c. Key definitions

By marginalised and missing narratives and approaches we mean those ways of expressing, experiencing, knowing, and framing biodiversity and its significance, value and worth that are often outside of biodiversity research and management, and including those associated with urban and disadvantaged communities, minority groups and languages, and ways of knowing beyond dominant forms of scientific knowledge.

As background, we provide here working definitions of key terms, whilst acknowledging that such terms can be contested - including in relation to marginalising processes - and thus must be used reflexively and with openness to alternative framings.

Marginalisation

Marginalisation is explicitly and implicitly a longstanding core concern of social and cultural research across many disciplines. Whilst there are many differences in specific approach, marginalisation can be considered as both process and experience, which is constituted bodily, materially and biophysically as well as culturally and socio-economically, through which particular beings, places and ideas are privileged in relation to others. The influential work of Ferguson et al. (1992), who gave marginalisation explicit consideration in relation to contemporary audiovisual cultures, defines it as "*that complex and disputatious process by means of which certain people and ideas are privileged over others at any given time*" (Ferguson et al, 1992: 7). The concept usually mobilises notions of differentiation such as inside and outside, centre and periphery, inclusion and exclusion, dominant and subjugated, prevailing and obscured, powerful and disempowered. Marginalisations are typically multiplicitous and involve complex processes and relationships, rather than there being any singular or universal centre and periphery, inside and outside: "*When we say marginal, we must always ask, marginal to what? But this question is difficult to answer. The place from which power is exercised is often a hidden place. When we try to pin it down, the centre always seems to be somewhere else. Yet we know that this phantom centre, elusive as it is, exerts a real, undeniable power over the whole social framework of our culture, and over the ways that we think about it. Audre Lorde calls this centre the mythical norm, defined as 'white, thin, male, young, heterosexual, Christian and financially secure.... (This combination) defines the tacit standards from which specific others can then be declared to deviate, and while that myth is perpetuated by those whose interests it serves, it can also be internalised by those who are oppressed by it*" (Ferguson, 1992: 19).

The original Call under which this research was commissioned mobilised notions of marginalisation with respect to outside and inside as it referred to "*narratives usually outside of biodiversity research*" and the need to attend to them.

Biodiversity

Biodiversity can be defined in various and sometimes contested ways (Baldauf & Oliveira Lunardi, 2020). The IPBES defines biodiversity as "*the diversity within species, between species and of ecosystems*" (IPBES, 2019, p. XIV) and, in more detail in the glossary, as: "*The variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part. This includes variation in genetic, phenotypic phylogenetic, and functional attributes, as well as changes in abundance and distribution over time and space within and among species, biological communities and ecosystems.*" (IPBES, 2019, p. 1033).

Other definitions incorporate a human or social dimension. For example the UN's Food and Agriculture Organisation define biodiversity in relation to what it means to farmers: "*The variety and variability of animals, plants and micro-organisms that are used directly or indirectly for food and agriculture, including crops, livestock, forestry and fisheries. It comprises the diversity of genetic resources (varieties, breeds) and species used for food, fodder, fibre, fuel and pharmaceuticals. It also includes the diversity of non-harvested species that support production (soil micro-organisms, predators, pollinators), and those in the wider environment that support agro-ecosystems (agricultural, pastoral, forest and aquatic) as well as the diversity of the agro-ecosystems"* (FAO 1999, as cited in Bardsley *et al.*, 2019, p. 596). Bardsley et al (2019) highlight from this definition the inclusion of social processes as a key element for conservation and agriculture, challenging the way that policy traditionally divides 'natural' and anthropogenic ecosystems (Bardsley *et al.*, 2019).

The Scottish Government's 'Land Reform in a Net Zero Nation' consultation paper defines biodiversity as "*The variety of life on earth, essential for sustaining the ecosystem that provide us with food, fuel, health, wealth, and other vital services*." (Scottish Government, 2022a, p. 36), framing biodiversity in terms of the services it provides to humans.

The Scottish Biodiversity Strategy provide a wider definition: "*Biodiversity is the web of life. It is the variety of all living things and the ecosystems where they live (on land or in water). It comprises the living organisms in a particular space, whether in a window-box, garden, park, meadow, peatland, river, loch, estuary, ocean, beach or mountain top. … Biodiversity refers to the variability among living organisms within terrestrial, marine and aquatic ecosystems and the ecological complexes they are part of. This includes diversity within species, between species and across ecosystems.*" (Scottish Government, 2022c, p. 11). This document also frames biodiversity as providing benefits to people: "*Biodiversity supports food production and security through insect pollination in farming and horticulture and our fishing industry, which depends on resilient and productive seas. It provides the blueprint for many modern medicines and contributes to our wellbeing, providing recreation, relaxation and a sense of place. Healthy biodiversity protects soil from eroding, purifies water and helps prevent and mitigate flooding*." (Scottish Government, 2022c, p. 12). The Strategy also includes in its glossary definitions of biodiversity as understood by the CBD ("*the diversity of life in all its forms—the diversity of species, of genetic variations within one species, and of ecosystems*" (Scottish Government, 2022c, p. 77) and by the IPBES

("*Plants, animals, and micro-organisms in a given area or volume*" (Scottish Government, 2022c, p. 77).

The Nature Conservation (Scotland) Act 2004 also uses the same definition for biodiversity as the UN's CBD: "*biodiversity' has the same meaning as has 'biological diversity' in the United Nations Environmental Programme Convention on Biological Diversity of 5 June 1992 as amended from time to time (or in any United nations Convention replacing that Convention)*" ("Nature Conservation (Scotland) Act (2004)," 2004).

Whilst there are calls to work with a singular concept of biodiversity (e.g. Faith, 2021) there is also a substantial literature highlighting the need to remain attentive to the variety of narrative framings of nature and our relationship with it, particularly relating to marginalisation and its effects, including on the effectiveness of biodiversity management and enhancement. This will be elaborated in Section 3.

Narrative

Since the 'narrative turn' in the 1960s, different humanities and social science disciplines have developed insights into the role of narratives and storytelling in society: "*This literature mobilizes understandings of narrative that span from being a foundational spatial-temporal cognitive structure by which people 'make sense' of, or create order out of experience [11, 14, 18, 19]; to a literary praxis that situates heroes, victims, and villains on a plotline, using particular sensory language and settings [17]."(*Veland et al., 2018, p.41)

Robertson et al (2000) define 'narrative' as "*stories that are bounded by the narrator's particular experiences, observations, and attachment to place. They include anecdotal information, oral environmental history, and local knowledge*" (Robertson et al., 2000, p120, as cited in Bardsley et al., 2019, p. 597). Shelley-Egan and Dratwa (2019) describe narratives as containing multiple storylines, e.g. "*the storylines of the narrative both marginalise – and in direct conflict with – the actual lived realities of the people affected*" (Shelley-Egan & Dratwa, 2019, p. 3).

Vlachos and Gaynor (2021) describe stories as the way through which environmental management practices are produced and made meaningful. "*Narratives remain our chief moral compass in the world. Because we use them to motivate and explain our actions, the stories we tell change the way we act in the world*" (Cronon 1992, as cited in Vlachos & Gaynor, 2021, p. 126).

Hilson (2022) found that in the field of environmental law, the term 'narrative' is often used interchangeably with 'framing' and 'discourse'. In their paper, 'narrative' is defined as follows: "*At a basic level, a narrative can be seen as possessing some of structural features of a story. These might include one or more of: characters; story events, a plot order in which those events unfold; a temporal sequence involving a beginning, middle and an end; a moral of the story; and a narrator (who may be reliable or unreliable)*" (Hilson, 2022, p. 3).

According to Louder and Wyborn (2020): "*Narratives shape human understanding and underscore policy, practice and action; they frame an issue, define which actors are included or excluded, assign culpability and prescribe action. As a heuristic for*

deconstruction, narratives can serve as a critical analytical tool and help unpack why destructive, ineffective or unjust systems persist. However, narratives are also understood as a tool to mobilize and inspire action. On a deeper level, narratives also stabilize ontological categories: they are at once simple storylines and anchors for particular views of how the world works." (Louder & Wyborn, 2020, p. 251). The authors describe what narrative analysis involves: "*Narrative analysis draws attention to how humans act by highlighting emotion, affect and meaning; it complicates notions of humans as rational economic maximizers or as acting based on facts. Careful attention to narrative highlights the essential role of the social sciences, humanities, arts and cognitive science to biodiversity conservation and can serve to connect different ways of knowing*." (Louder & Wyborn, 2020, p. 251).

Wyborn et al. (2021) include the following description of narratives: "*Narratives can be powerful, emotive stories that incentivize collective action (Rose 2018). Narratives are not neutral descriptions of reality; they frame issues, determine which actors are included or excluded, define cause and effect, assign culpability, and prescribe action (Stone 1989). Once entrenched, dominant narratives can be hard to supplant, even in the face of contradictory evidence (Roe & Eeten 2004).*" (Wyborn et al., 2021, p. 1091) .

García-Dory et al. (2021) describe policy narratives as storylines that make use of particular types of knowledge to define problems and solutions about the world.

While many authors use terms like narratives, stories, storylines and discourses interchangeably or not explicitly defined, Vercher et al. (2021) make a distinction between 'narratives' and 'story': "*narratives are socially constructed representations about people and the human world (Floysand and Jakobsen 2007). While the 'story' itself is regarded as primary 'raw' data generated from what people communicate, the narrative behind it is the critical point of analysis (Baú 2016). Thus, narratives are not necessarily an accurate reflection of reality and can differ depending on who tells the story (Medvedev 2017)*." (Vercher et al., 2021, p. 167). They also explain how narrative theory distinguishes the form and content of narratives: "*The form of a narrative refers to the structure and textual qualities, while the content denotes the logical structure of events, actions, characters and other objects in time and space (De Fina and Georgakopoulou 2011).*" (Vercher et al., 2021, p. 170). They describe narratives as having the following role: "*narratives: (1) provide local stakeholders with a mean to create an identity and cohesion; (2) constitute a guide for action and (3) enable reframing of the perceived context and structure according to an alternative vision that suit stakeholders intended purpose (Mohan and Topp 2018; Saltmartshe 2018; Wittmayer et al. 2019). … narratives have heuristic value in that they enable local actors to make sense of a complex reality and help them build capacity for the future (Berkhout et al. 2002; Rhisiart et al. 2015). Their key components that help make sense of this complex reality are: problematisation, solutions and goals, plot and actors*" (Vercher et al., 2021, p. 170).

Stelling et al. (2017) distinguish between narratives and frames: frames are understood as philosophical perspectives. "*Frames are interpretive lenses providing meaning and privileging some ideas over others (Goffman, 1977), and "perceptual lenses, worldviews, or underlying assumptions that guide communal interpretation and definition of particular issues" (Miller, 2000; p. 211).*" (p. 201). Narratives on the other hand are understood as themes of discussion, and as expressing frames. "*Narratives enable humans to construct*

experiences, convey meaning (Atkinson, 2010; Bruner, 1991) and represent reality (Czarniawska, 2004)." (p.2).

The IPBES's global assessment report of biodiversity and ecosystem services (IPBES, 2019) describes narratives as one of the ways in which indigenous and local peoples and communities (ILPC) communicate their understanding of the co-production of nature's contribution to people (NCP): "*ILPCs communicate their understanding of NCP co-production in a variety of ways, including … Narratives"* (IPBES, 2019, p. 328). The document also acknowledges storytelling as a form of knowledge transmission: *"Oral histories, storytelling, songs and poems, objects and artifacts continue to be powerful and as relevant today as forms of knowledge transmission*." (IPBES, 2019, p. 29)

Review of academic literature relating to marginalised narratives in biodiversity research and management

d. How narratives matter in biodiversity research and management

Narrative and story are well established as central to how we make sense of ourselves - especially in relation to human and nonhuman others - and therefore how we move through, know, and shape the world (e.g. Barthes & Duisit, 1975; Clandinin & Caine, 2008; Haraway, 2016). Accordingly, the 'narrative turn' in the social sciences and humanities that has produced rich and sophisticated insights on the social dimensions of narratives and storytelling is now increasingly informing issues of biodiversity, nature, and conservation (Harris, 2022). Increasingly highlighted is the co-agency of narratives in shaping how we connect to, engage with, and materially transform ecologies, including how we study them (Harris, 2022; Takala et al, 2019). Narratives about biodiversity, as illustrated for climate change "constitute reality as we know it by making sense of observations, leading us to new inferences, and providing models for a path forward" (Veland et al., 2018, p.42, citing O'Brien (2016)).

As Veland et al. (2018) highlight, narratives are not only world-describing (e.g. describe a particular environment or issue) but are also world-making in the way they provide the 'reference points' that enable the working and reworking of particular 'stories': "the timelines, characters, and phenomena of these narratives provide the 'reference points' that shape and become reworked by the 'stories' we tell about the world, such as about societal transformation or extreme events. This implies scientists, journalists, and other actors alike perform 'storytelling', using written word, images, and figures. Each narrative constrains and enables what is thinkable and sayable about the past, present, and future" (p.42).

Crucially, this means narratives have implications for the current, historical, and possible future socioecological relations or socionatures that can become valorised or devalorised, thinkable or unthinkable, speakable and unspeakable (Cronon, 1995; Haraway, 2016; Veland et al., 2018). In turn, attention to narrative forces us to acknowledge/confront the 'ontological schisms' (Veland, 2017) that permeate environmental conflicts (cf. Ivaşcu & Biro, 2020), the questions we ask, and our capacities and modes of addressing them: "These deeply material implications of cognitive, world-making narratives confirm that conflicts cannot be reduced to deficient scientific understanding, a lack of dialogue, or disagreement as to means. Rather, they suggest ontological disjunctures or schisms that go 'all the way down'" (Veland et al., 2018, p.42, citing Veland, 2017).

Although much contemporary work on ecological narratives centres on climate issues (e.g. Van Der Leeuw, 2020; García-Dory et al, 2021; Dillon & Craig, 2022), there is a growing body of work that flags the implications for how we conceptualise, research and manage biodiversity specifically (e.g. Ducarme et al., 2020; Baldauf & de Oliveira Lunardi, 2020; Faith, 2021; Pascual et al., 2021; Andres et al., 2022).

Research notes how mainstream narratives and storying of biodiversity have been very particular and, in many ways, narrow, e.g. "the dominant story continues to reproduce nature as an object external to society that is possible to know, monitor and manage from

afar" (Lövbrand et al. 2015, p.216). Narratives are often imbued with the "modern concept of Nature as a pure, singular and stable domain that can be accounted for through systemic observation and scientific explanation" (Lorimer, 2012, as cited in Lövbrand et al. 2015, p.215). Moreover, narratives have not worked sufficiently to halt or address ecological degradation (Pascual et al., 2021). Others too identify the dangers of a singular narrative or a 'narrative monoculture' in relation to biodiversity (Rankin, Hansteen-Izora & Packer, 2007), for example, the particularity of understanding environments and our relationship to them through notions of 'wild', 'wildness' and 'wilderness' (Cronon, 1995).

Burgeoning scholarship explicates how narratives matter in ecological and biodiversity research and management with respect to marginalisation and its processes (e.g. Suchet, 2002). Lövbrand et al. (2015) elaborate how dominant narratives of the Anthropocene have worked to universalise and naturalise particular socioecologies in marginalising ways. Similar critiqued have been given to narratives of cultural ecosystem services (Gould et al., 2020a, 202b). Despite helping to address the binary separations of people and environment by bringing human dimensions into the realms of nature, such narratives have worked to deny space to social and cultural diversity, multiplicity and inequalities of those human dimensions. Such narratives could thus work against inclusion of particular people, ways of knowing, and ways of deciding in relation to ecologies: the "tendency to downplay the social dynamics of environmental change does not only lead to generalized and disembodied accounts of human agency. It also runs the risk of producing a post-political narrative that invites techno-managerial planning and expert administration at the expense of democratic debate and contestation." (Lövbrand et al. 2015, p.217).

Policies are shaped by narratives, and in turn, science plays an important role in shaping narratives by promoting particular knowledge, problematisation of issues and solutions. In turn, narratives are utilised to fulfil political agendas and to shape policies (Wong et al., 2022).

e. How biodiversity narratives work in relation to marginalisation - implications for inclusion and exclusion

The literature highlights how narratives have power and agency in biodiversity and nature-society research and management in many ways, but also how such narratives are never innocent. King (2003) illustrates how stories not chosen by chance but are told by and about the most powerful. Relating this to ecologies, McLauchlan (2019) highlights that "no mode of storying or being in the world is innocent; apparent kindnesses can cause surprising harms" (p.147). For example, a well-intended non-killing practice can be a violence towards alternative practices of ecological care (McLauchlan, 2019, p.147). Narratives and stories are always situated (Haraway, 1991, 2016) in ways that can work to include and exclude, with social and ecological consequences, such as for resilience and adaptation (e.g. Hunter et al., 2021). This is because they shape whose voices are heard, whether and how they are valorised or devalorised, which ecologies are made visible and important, and whose understandings and ways of knowing social-ecological relations are rendered tangible or credible (e.g. García-Dory et al., 2021; Wong et al., 2022).

It has been shown that, historically, narratives of conservation and biodiversity have enabled marginalisation and exclusion, with ecological as well as social implications (Escobar, 1998; Agrawal, 2005; Heatherington, 2012; Weldemichel, 2020); most starkly through enduring narratives associated with 'fortress conservation' and exclusive practices

around Protected Areas (Brockington 2002; West et al. 2006), but also through subtler forms, which some conceive of in terms of 'slow violence' (e.g. Makey et al., 2022).

The exclusionary work of narratives - both discursive and visual (e.g. Cronon, 1995; Ginsburg, 2008 - can be done through various means, such as fixing notions of people/ecologies/ways of knowing in particular ways and or making them more or less visible, centred or legitimate. For example, the process of 'othering' can be seen as an exclusionary discursive tool (Shelley-Egan and Dratwa, 2019; Weldemichel, 2020).

Similarly, biodiversity and related nature conservation narratives, and their configurations of dominance or marginalisation, have been shown to matter in shaping (often in interlinked ways):

- WHO has capacity and credibility in accessing land and water, and influencing and making decisions about it.

There is evidence that narratives about biodiversity are articulated, authorised and mobilised in arenas of power, from which certain social groups (e.g. based on ethnicity, age, gender, sexual orientation, disability) are excluded (e.g. Freeman, 2019; O'Donoghue, 2019). For example, Vlachos and Gaynor (2021) identify the historical and dominant narrative in Western Australia as revolving around 'the conquest of nature and economic wealth', to the marginalisation of indigenous people.

The decisions that are made regarding biodiversity also affect who gets to access, use and manage biodiversity. For instance, biodiversity extinction narratives have been used to legitimise the appropriation of land for conservation purposes to the exclusion of local people (Weldemichel, 2020), and the colonial exploitation of resources (Wong et al., 2022). Narratives

Biodiversity narratives also matter in shaping who is centred and who is marginalised within established land management configurations (e.g. Coutinho-Sledge, 2015). As an example, Dotson and Pereira (2022) show how the field of conservation has evolved in its framing of rural people, from being presented as a 'problem' during much of the 20th century, to being presented as biodiversity 'solutions' throughout the past two decades.

Conversely, narratives around 'wildness' can work to dislocate people from their livelihoods and cultural practices (Dolton-Thornton, 2021; Schulte to Bühne et al., 2022), for example in establishing marine protected areas (Kuuliala, 2017).

Narratives also matter in terms of who is centred and marginalised within established scientific research configurations. For example, the creation of scientific knowledge in the field of conservation has historically been dominated by white, western, male voices, to the exclusion and absence of diverse experience (e.g. Mackenzie, 2021; Simard, 2021). As an example, Pomeroy (2022) argues that sociological research in New Zealand has focussed around farming issues, to the exclusion of marginalised rural groups such as the Maori, which impedes finding solutions to wider rural issues.

It is also important to recognise the unequal burden that different social groups carry as a consequence of biodiversity management decisions. For example, biodiversity loss has the highest impact on the those lowest economic rungs (Roe et al, 2019). Roe et al. (2019) note that gender is a blind spot in biodiversity research, where the impact of biodiversity loss.

- Which ECOLOGIES or ecological entities are rendered visible or tangible culturally and or biophysically.

Narratives relate to particular species and assemblages, such as narratives that shape which species get to live and die, which become valorised and prioritised in particular spaces and times, while others become sidelined (e.g. Ginn et al. 2014; Biermann and Anderson, 2017).

Narratives also render particular habitats as visible, valuable, protectable, or not. There are particular habitats tend to be forgotten or neglected, such as the deep ocean (e.g. Jamieson et al., 2021), soils (Zeiss et al., 2022), temperate rainforests (Petrokas et al., 2022) and montane woodland (Watts et al., 2022; Watts and Jump, 2022).

Visual and discursive narratives constitute where particular species, assemblages or habitats are 'visible' or belong' (or not), where narratives can either allow or obscure particular associations to place, space and landscape (e.g. Russel, 2020; Adams, 2020; Ginn, 2008).

- Which WAYS OF KNOWING can be articulated and rendered legible and credible, and the variety of forms, formalities and valorisation of expertise.

These ways of knowing shape how we know biodiversity, including with respect to research and management, and highlight inescapable situatedness and politics of knowledge. For example:

  - Particular (reductive or distanciating) ways of ordering, categorising and measuring (e.g. Haraway, 1991; Rupprecht et al., 2020; Lorimer, 2008).
  - Devalorising or marginalising particular narratives, for example, dismissing particular narratives as 'cultural' as opposed to the rational truth (McLauchlan, 2019).
  - Indigenous ways of knowing and traditional ecological and local knowledge (e.g. Hill et al., 2020; Congretel and Pinton, 2020; Ivaşcu and Biro, 2020; Molnár and Babai 2021, including in marine environments (e.g. Drew, 2005; Kourantidou et al. 2020; Schott et al. 2020).
  - More-than-human (e.g. Topa and Narvaez, 2022) and nonhuman ways of knowing (e.g Haraway, 2008; Woodward & Lemmer, 2019; Ginn & Connor, 2022). This includes plants and their articulation through symbiotic relations. For example, Gorzelak et al. (2015) found that "underground 'tree talk' is a foundational process in the complex adaptive nature of forest ecosystems" (p. 9).
  - Experiential or emotional knowing (e.g. Puig de la Bellacasa, 2017) and affective ecologies (Singh, 2018).

By illustrating how narratives and stories can work to maintain hierarchies in ways that affect our ability to address biodiversity challenges, we are called to question, "To what extent do dominant narratives and ontologies support the work of ecological care?" (McLauchlan, 2019, 135). It is argued that new and alternative narratives are necessary to chart a new ecological direction that would address the biodiversity crisis, e.g.: "fresh language, and access to one's own most meaningful stories and values that will make the path more clear" (Forbes, 2006: 8).

Scholarship therefore underlines the need to go beyond mainstream narratives, and to identify and attend to issues of **marginalisation** in relation to the work of narrative and story in biodiversity and nature-society research (Harris, 2022). On one hand, it is increasingly recognised that to address the urgency, magnitude and complexity of biodiversity challenges, we cannot ignore the **plurality** and **diversity** of narratives of related

ecologies (Tengö et al., 2021; Sato, et al., 2018; Pascual et al. 2021). We are then called to look beyond dominant narratives if we want to a different socioecological story to unfold: "We must tell these stories because they are growing rarer and more and more essential to us. Without these stories of connection and relationship, there is increasingly one dominant story to hear and one story to tell" (Forbes, 2006: 54). International biodiversity and environmental governance entities increasingly highlight importance of local and indigenous knowledges and the bringing them together with science.

This comes in part from a greater acceptance of the need to work (better) with those on the ground managing land and water (Hausner et al. 2020), including calls to integrate or co-constitute narratives amongst different epistemologies and ontologies. For example, Veland et al. (2018) flag with respect to climate the need to explore "how better communication of science might beneficially be accompanied by efforts to co-construct narratives that engage with the stories that give meaning and security to people." (p.41)

Impetus also stems from a recognition of the alternative ways of knowing practiced by the indigenous people who have enabled greatest de facto ecological protection and sustainable ways of relating to ecological engagement (Garnett et al. 2018), and learning from and with them (Hill et al., 2020; Hosen et al., 2020; Thekaekara et al., 2021; Jolly et al., 2022).

A number of scholars highlight how language and naming with respect to place and ecologies influences how and whether narratives marginalise. For example, Stelling et al. (2017) examine the language used to describe regrowth, as "language plays a fundamental role in creating articulating and reinforcing frames through which people view the world." (p. 203). McFadyen and Sandilands (2021) suggest a link between loss of culture and language, and biological diversity. Damage to culture and language comes first, followed by a disregard and abandonment of local knowledge. This severance leads to a profound human-ecological disconnect, as well as damaging environmental consequences.

Kimmerer (2003, 2013) illustrates how we narrate plants affects how we can know them and act in relation to them: "Names are the way we humans build relationship, not only with each other but with the living world" (p. 208) … "The arrogance of English is that the only way to be animate, to be worthy of respect and moral concern, is to be a human" (p. 57) … "When we tell them that the tree is not a who but an it, we make that maple an object; we put a barrier between us, absolving ourselves of moral responsibility and opening the door to exploitation... If a maple is an it, we can take up the chain saw. If a maple is a her, we think twice" (p. 57) (Kimmerer, 2013). Language and naming thus has implications for how we might be able to follow Kimmerer (2013) in weaving together of three key forms of knowledge: (1) Traditional Ecological Knowledge (TEK); (2) Western science, and; (3) the teachings of plants and other nonhumans.

Further, Hunter et al. (2021) highlight English language as the dominant language in research, at the disadvantage of researchers whose who have a different first language, leading to linguistic injustices and inequity and the marginalisation of non-dominant narratives. It is also important to consider how the dominance of one language can obscure a diversity of perspectives: "Plurality in discourses is difficult to discern because sometimes different voices are forced to use the vocabulary of the dominant discourse" (Thompson and Rayner, 1998, as cited in Adger et al., 2001).

Language is also significant in terms of biodiversity management and policy-making: "problems, like their solutions, are narratively constructed through direct or strategic use

of language, signs, symbols and metaphors. Language is the key driver of change in policies. It can shift power balances and, hence, determines what policies or institutions are supported, established, changed or not changed" (Reinecke and Blum, 2018).

This has relevance for Gaelic language and naming and how biodiversity enhancement and related land management may or may not weave with the restoration and revitalisation of Gaelic culture (Maclean, 2021; MacIsaac & Davidson, 2022; MacPhail, 2002). The decolonisation of conservation is something that has been debated with respect to third world countries for a long time but not (until recently perhaps) in relation to all parts of the world (though see MacPhail, 2002). MacIsaac & Davidson (2022) point out that although there are no officially delineated indigenous people in Scotland, there are elements of recognised traces of indigenous culture and knowledge that have ecological implications; in particular Scotland's two Indigenous languages: Scots and Gaelic.

This raises issues of how we 'speak for others' or 'invite others to speak', especially when engaging with cultural practices in which storying has central and long-established importance of story. Harris (2022) prompts us to learn "from traditions where work on story has been central to deepen and broaden this potential" (Harris, 2022, 854) whilst underlining the need to attend to complexities, assumptions and ethics of representation practices & power dynamics, as well as possibilities for addressing marginalisation (e.g. Nagar, 2013).

In short, the literature highlights myriad ways in which the work of narrative and story is socioecologically consequential; it matters which stories are told, how, when, where, by whom, and for whom.

In Scotland, most work examining marginalisation in relation to biodiversity narratives has concerned cultural and economic forms of marginalisation relating to conservation, rewilding and nature-based tourism, and the historical legacy of alienation from occupation of, and control over, land, especially in relation to the Highland clearances (Rohde, 2004; Dalby and Mackenzie, 1997; Dolton-Thornton, 2021; McFadyen & Sandilands, 2021).

Such marginalisation is often linked to narratives of particular areas of land or water in Scotland as 'wild', and relatedly as 'untouched', pristine, unpeopled, or even 'uncivilised' (Kuuliala, 2017; McCombes, 2018). Here narratives can work to valorise particular species or assemblages of species – including in ways thought vital to their preservation (Jones et al., 2020) - whilst devalorising humans with a stake or place in such ecological assemblages. This desire for wildness and wildlife is noted as having its roots in the Romantic period of the 18th century (Byg et al 2017). Having a particular desire to experience wildness, and the resources to fulfil it, has an established association with elite socioeconomic groups in conservation debate (Kuuliala, 2017). Such narratives can be mobilised in relation to a sense of threat and disempowerment.

Narratives can work to either render people and livelihoods invisible, or can create a sense that any form of tourism or other development or livelihood opportunity can take precedence over established cultural practices and meanings relating people to land and water (Jones, 2009). Narratives can therefore pit ecological health and livelihoods against each other.

Narratives can also pit conservation against the presence of people in areas identified as important for biodiversity. Dolton-Thornton (2021) discuss how efforts to re-wild

depopulated areas has the effect of disempowering local populations by erasing culture and heritage of place.

Yet narrative space can likewise be created for local communities asserting their desire for environmental quality. For example, Dalby and Mackenzie (1997) describe how past narratives of marginalisation can re-emerge as new threats emerge. They give an example of how historical narratives of clearances in relation to deer and sheep were reworked in relation to proposed developments, including the threat of development presented to nature-based conservation.

Bone (2018) discusses how the rewilding movement that aims to reintroduce 'missing species' such as Bears, Lynx or Wolves is a response to a romanticised perception that urban populations have of the Scottish Highlands, and ignores the concerns of local residents. Similarly, Bavin and MacPherson (2022) acknowledge that minority voices can be marginalised and excluded by rewilding efforts that seek to reintroduce the Lynx. Gandy and Watts (2021) highlight that while the reintroduction of Beavers is seen as presenting benefits in terms of human wellbeing and connection to nature, farmers and timber producers are unlikely to benefit.

Jones and Dennings (2018) discuss how island life in Scotland has been historically viewed in a romanticised way, while the local identity is being degraded: "the rich diversities of alternative cultures (languages, local customs, forms of local production and consumption) are being degraded and extinguished by industrialised globalised capitalism" (p. 4).

Byg et al. (2017) indicate in relation to peatland conservation that solutions for biodiversity enhancement must be reached that both consider all the underlying factors of particular cultural perceptions, and that benefit all stakeholders.

Macpherson (2014) argue that a new environmental narrative is developing amongst community landowners in Scotland, characterised by the development of pluralistic approaches to environmental challenges, where landowners take control of their collective narrative.

f. Transformative potential: Identifying and addressing marginalisation regarding biodiversity narratives

Scholarship has also highlighted how narratives hold transformational potential; how narratives can positively as well as negatively affect (response)abilities to create liveable ecologies (Ruwhiu et al., 2021). For example, Hilson (2021) suggests that narratives can make environmental law more effective by bringing in passion and emotion, while also giving voice to those marginalised, including of those human, non-human and nature itself. Barlagne et al. (2021, p. 5) describe co-constructed narratives as important for community cohesion, as comprising the concepts of marginalisation and the natural environment, and as fostering "the creation of better social relationships while enabling collaboration and participation. As such they are a powerful means of encouraging collective action." (Barlagne et al., 2021, p. 5).

Yet it is noted that the "transformative potential of story represent elements that are relatively less well explored, opening opportunities for enriched engagement" (Harris, 2022, p.836). Indeed, many scholars argue there is a need to go further in identifying and addressing issues of marginalisation in relation to biodiversity or socioecological narratives,

suggesting that the transformational potential of such narratives will only be unlocked if we attend more closely to the power relations that enable or disenable narratives to centre or de-centre particular voices, ecologies or ways of knowing (Shackeroff & Campbell, 2007; Latulippe & Klenk, 2020; Moola & Roth, 2018; Sidorova, 2020). It is however debated what this means for western biodiversity research and management (Nadasdy, 1999, 2005; Johnson et al. 2016; Howitt & Suchet-Pearson, 2006; Gillette & Singleton, 2022).

Bodies of scholarship from new materialism (e.g. Haraway, 2008, 2016), to indigenous and decolonial studies (e.g. Kimmerer, 2013), emphasise the need to take seriously the reasons that issues of social diversity and inclusion have been late to mainstream ecological/conservation/biodiversity debate - the colonial relations and narratives woven through the history and geographies of conservation and biodiversity research - before they can be adequately addressed (see also: Todd, 2016; Lopez-Maldonado, 2022).

This literature has been influential in opening up the question of who the 'we' is in the narratives that configure particular socioecologies (Goeminne, 2011; Alaimo, 2016), including who the 'we' is that seeks or might benefit from enhanced biodiversity (Alaimo, 2019). Moreover, this scholarship elaborates ways in which scientific narratives addressing 'an undifferentiated global "we"' (Goeminne, 2011, 20-21) without sufficient recourse to other forms of meaning and authority actually make enhanced ecological outcomes less likely. For example, Goeminne (2011) explains how transformation to more liveable ecologies is made more improbable in practice by marginalising and downplaying social differentiation and associated practices of deliberation and choice. With reference to the narrative framing of sustainability, she argues that:

"*Such an expert-focused technological determinism, embedded in a discourse of ecological modernisation, now acts to marginalise the issues of human choice involved in putting sustainability into effect and to downplay deliberation over the socio-cultural practices, behaviours, and structures such choice involves. As a result of this techno-scientific focus, the need for accordant social change is removed from view, which makes sustainability all the less likely to occur in practice. This is convincingly illustrated by the current impasse on climate change that has been created and maintained by making political action subordinate to a scientific framing of what is in essence a societal problem. The narrow scientific focus on global climate change addresses itself to an undifferentiated global [p.20-21] "we" and relies exclusively on the authority of science to create a sense of urgency for structural change (Demeritt 2001, p. 329). In the absence of some other basis of appeal, "we" are likely to act as uninvolved spectators rather than participants in the shaping of our future, making responsible, sustainable change all the more improbable to occur*"
(Goeminne, 2011: 20-21)

Regarding biodiversity specifically, Alaimo (2019) questions who the 'we' is who would express "the desire for a multitude of species to continue to exist through and beyond the era of the Sixth Great Extinction … and whether that ['we' as a] category of enunciation presumes colonising, extractive, and falsely universalising positions" (p.398). Alaimo (2016) discusses how dominant ecological narratives discipline and cleanse particular ways of knowing and engaging with ecologies, including but not only scientific ways of knowing. In her conclusion she explains how narrative works to generate and sustain palatability in networks of power, but at a cost to inclusiveness and engagement. She asks whether it is "possible to disconnect epistemologies, politics, and practices of global environmentalisms

from colonial histories, epistemologies of scientific distance, and a disembodied Man?" (Alaimo, 2019, 398).

Molnár & Babai (2021) summarise a decolonising approach to research as "an ethically, ontologically, and politically redesigned, reworked theoretical and methodological approach congruent with Indigenous and other traditional epistemologies in ways of producing knowledge; guided by the values and research agenda of Indigenous peoples and other traditional communities, it treats local and scientific knowledge and perspectives as equally valid and relevant. The main goal of decolonizing research methods is to rebalance the relations between researchers and the studied community and ultimately to foster locally relevant research led by TEK holders" (p.680)

A number of scholars highlight how, in order to co-create new narratives to reimagine more liveable socioecologies, western ecological knowledges might usefully be brought into a more generative relationship with indigenous ways of knowing that emphasise multispecies interconnectedness, reciprocity, respect and care (Haraway, 2016; Kimmerer, 2003, 2013; Ojeda et al., 2022).

There are a number of ways in which working with narrative and story can be transformative, and potentially enable transformations in biodiversity research and management. As Mazzocchi (2020) states, "The present-day environmental crisis urges us, in fact, to critically revise the overall scheme in which our societies are rooted, and in particular the very foundation of Western culture, since it plays a predominant role in planning the future. In order to gain insights on the matter, first, the article investigates the knowledge of indigenous people. It especially scrutinizes the principles, like reciprocity and caretaking, which oversee indigenous relationship with nature. These principles are driven by a sense of intimacy and interconnectedness and draw attention to the importance of giving back to nature. For this reason, they challenge the Western idea of sustainability, whose focus is still centered on maintaining the possibility of exploitation, and which is embedded in a sense of detachment from nature" (Mazzocchi, 2020, 77).

Cajete (2020) challenges all concerned to "take Indigenous science seriously as an ancient body of applied knowledge for sustaining communities and ensuring survival over time and through generations." (p. 1), while also considering "how to use Indigenous science, community building, and education as a tool and a body of knowledge which may be integrated with appropriate forms of Western science in new and creative ways that serve to sustain and ensure survival rather than perpetuate unexamined Western business paradigms of community development" (p.1). Likewise Wheeler et al. (2020) identified the opportunities and challenges for autonomous Indigenous-led research as well as coproducing knowledge with scientists, highlighting that there were still many misconceptions typically surrounding engagement of indigenous knowledge (IK) in scientific research which were limiting its effectiveness in developing more collaborative biodiversity management, such as those misconceptions "associated with the ideas that IK is limited in spatial, temporal or conceptual scope, or needs verifying by western science to be useful", including that "the scope [of IK] is limited to traditional activities of Indigenous peoples and perhaps less relevant to the current context of rapid social-ecological change" (p.552).

Alaimo (2016; 2019) explores the possibility of insights from material feminist posthumanism, queer and indigenous studies, suggesting "more intimate modes of ecological knowing and being that are implicated rather than transcendent, tangible rather

than immaterial, and scale shifting rather than distancing" (Alaimo, 2019, p.398). She introduces the concept of trans-corporeality (Alaimo, 2008) and argues that by enacting a transcorporeal subjectivity we make space to become involved in generating transformative socioecologies: "rather than approaching from an externalized perspective, we think, feel, and act as the very stuff of the world" Alaimo (2016, Abstract). The idea is that foregrounding "a sense of precarious, corporeal openness to the material world" (Alaimo, 2009, p.23) allows a deeper recognition of more-than-human interconnectedness and co-vulnerability, in part by recognising the differences that shape our narratives of the lifeforms that are valorised and how we seek to nurture, support and protect them.

Likewise, in urging us to 'stay with the trouble' of marginalising socioecological configurations, Haraway (2016) foregrounds the symbioses (though not necessarily mutual benefits) of more-than-human relations, and demonstrates how a more engaged, attentive multispecies 'living-with' these symbiotic configuring and reconfiguring - e.g. "Living with and dying with each other potently" (p. 2) - is what can generate response-ability in dealing with our material-cultural differentiations. Haraway (2016) centres stories and 'storying otherwise' as key ways of staying with such trouble, emphasising that "it matters what stories we tell to tell other stories with … It matters what stories make worlds, what worlds make stories" (p.12). To elaborate, Haraway (2008, 2016) emphasises narrative and storying as a principal mode of response to our current ecological crises, and centres both telling and hearing stories as a crucial way to render each other response-able as we 'stay with the trouble' of unknotting and reknotting more-than-human relations borne of inescapable histories and geographies of exclusion and marginalisation. She foregrounds how storying and restoring can change and disrupt as well as consolidate particular meanings and sense-making. Haraway (2016) draws our attention to how we are differently moved and equipped to respond to challenges when we hear a new story or way of expressing particular junctures or experiences, notably including nonhuman or more-than-human modes of articulation. Such work asserts a profound agency in hearing and witnessing new narratives, which King (2003) poses as almost a challenge to how we will respond to our current predicament (in our case socioecological) configurations: "don't say in the years to come that you would have lived your life differently if only you had heard this story. You've heard it now" (p.29).

Accordingly there are growing calls for closer engagement with story and narrative methods for understanding and addressing marginalisation in biodiversity and enabling transformation in wider socioecological relations (e.g. Harris, 2022). However, there are also indications of the need to consider carefully the methodological and ethical implications; heeding King (2003) to "be careful with the stories you tell … [and] … to watch out for the stories that you are told. For once a story is told, it cannot be called back" (p.10).

The literature indicates a number of ways in which working with narrative and story can be transformative, and potentially enable transformations in biodiversity research and management (see Table 1).

Table 1: How narratives work to enable transformations in biodiversity research and management.

WHAT NARRATIVES AND STORIES CAN DO	
Help make sense of ourselves in relation to human and nonhuman others	Individually
	Collectively
	Linking between individual and collective entities and scales
	More-than-human
Help share learning	Stories can pass on learning to next generations
	Stories can pass on learning to other people and places
Foster relationships	Generate feelings and senses of community
	Build new and/or collaborative relationships (and associated relations of trust, reciprocity, etc)
	Generate shared meanings or goals
	Building bridges / Allow border crossings between different sociocultural collectives/framings
	Enable inclusive relationships involving marginalised groups
Work with and through emotions and bodily experiences (Story can be transformative in terms of working with affective socioecological relations)	Convey and evoke emotion, including to identify significance or spur action
	Help sharing of experiences often "too charged and difficult to discuss" (including in a more-than-truth or beyond truth way, i.e. revealing 'the truth' is not the crux move)
	Teach us about emotions and how we might deal with or process them
	Understand and address wellbeing issues
	Enable empathy and perspective taking
	Enable emotional openings to new ways of thinking or doing (Can invite re-living/re-telling/recasting/restorying)
Stories have generative & transformative potential	Help imagine alternative futures or ways of doing things differently
	Help create fresh consciousness to enable problem solving
	Generate (senses and relations of) empowerment
	De-centre knowledge hierarchies
	Enable adaptation and resilience / Dealing with uncertainty (& associated fear, discomfort, etc)

	Aid (re)formulation of law and policy
	Help constructive confronting of difference and discomfort
	Building bridges/new relationships
	(Re)affirm memories of connection

a. Summary of key points

In summary, a substantial and growing literature asserts that biodiversity enhancement and conservation will be more **effective** and **inclusive** if we pay serious and analytical attention to narrative, particularly in identifying and addressing how narrative and story work to marginalise particular people, ecologies and ways of knowing.

Better recognising how narrative and story have the power to include and exclude, centre and marginalise, as well as render present or absent, we can consider more carefully how we might better unlock the transformative potential of narrative (and its many forms of agency) in biodiversity research and management. Not least we would understand better how to render each other more response-able (after Haraway, 2008) in ways that hold possibilities for enhancing biodiversity and co-creating inclusive and liveable ecologies.

The next step for us is therefore to consider the methodological and ethical implications in terms of how we invite various narrative and storying practices and agencies into each stage of our research, from refining and addressing particular research questions and parameters, to designing and negotiating particular fieldwork encounters, tools and techniques.

Stakeholder scoping of marginalised biodiversity narratives

g. Insights from Understories

Here we outline the insights gathered as part of project RD 1.4.2 WP4, in the previous SRP (2016-2022). Firstly, we summarise the forms and processes of marginalisation relating to biodiversity research and management highlighted in the data of the Understories project. Secondly, we reflect retrospectively on how our approach in Understories may have helped identify and address marginalisation on one hand, and may have reinforced marginalisation on the other. Lastly, we outline some key implications our reflection on Understories has for the methodological development of such future projects, such as 'Inclusive Biodiversity Narratives' in RESAS D4-2.

Please note that the Understories digital storymapping research did not set out to identify or address marginalisation per se, but rather to seek a range of perspectives. Herein lies a key distinction between Understories and the audio-visual platform and process we will build as part of the current project. However, the material collected and curated (and not) in Understories and the process of doing so provides a number of insights on the people, ecologies and ways of knowing that are made visible or valorised, and not.

Note also that this research did not have the opportunity to engage fully with the material collected due to covid-19 and related multi-scalar institutional responses. This provides both an opportunity and ethical obligation regarding our approach in the current project D4-2.

Participants in the video creation and workshops identified the following people, ways of knowing, and ecologies that they and/or others feel are marginalised in prevailing biodiversity research and management.

Marginalisation of particular people and experiences:

Processes and forms of participation in the study suggest that the power to speak and make decisions about woodland expansion in the CNP tend to centre those in already privileged social groups. This requires further exploration in future research.

Our recruitment experience (detail of which will be expanded below) of seeking and securing workshop participants, and participants and perspectives represented in the videos and storymap, suggest that those prevailing in speaking, gatekeeping and making decisions about woodland expansion in the CNP tend to centre (especially institutionally and narratively) on those who are white, able-bodied, middle aged, socio-economically advantaged, heterosexual and male. The narratives and experiences of those with a wider range of ages, abilities, gender and ethnic identities, socioeconomic backgrounds, and complex intersections of them, were found to be absent or relatively de-centred, and harder to engage in such socioecological research without appropriate, careful and resourced ways of doing so.

Therefore, our research suggests that those not white, able-bodied, middle aged, socio-economically advantaged, heterosexual and male face extra challenges in both conducting and participating in research relating to biodiversity.

Our project illustrated how women working in research relevant to biodiversity can be disadvantaged in consequential ways as both participants (there were difficulties recruiting non-male researchers and land managers in particular), and as researchers (the PI experienced constraints typical of women researchers working part-time and navigating care of small children, especially in the context of various covid-19 management measures (see Myers et al., 2020).

Stories of experiencing or witnessing marginalisation in biodiversity-related research on the basis of gender, socio-economic status, property ownership, education, and language, were shared by participants and possible recruits, but predominantly not in the official spaces and times of data collection.

Some participants noted that young people and ethnic minorities were the social groups most obviously not involved in ecological research and management in CNP/Scotland.

Marginalisation of particular ways of knowing

Understories highlighted examples of marginalisation of particular ways of knowing - and indeed not knowing - ecologies, and in particular past/present/future woodland ecologies, including:

Marginalisation of and within minority languages:

- Non-English language ways of relating to ecologies (notably Gaelic, but also Scots and the many other languages spoken by the people of Scotland, and even within the CNP)
- Woodland ecologies as marginalised even within a minority language's repertoire of knowing and connecting with ecologies.

Marginalisation of non-expert or non-scientific ways of knowing:

- Ways of knowing past, present or future woodland ecologies were differently valorised, differently visible (and otherwise tangible), and could be enacted/experienced in ways that were at times internally as well as externally conflicted.
- Research elements, outputs and processes that align most with dominant ways of knowing (e.g. cartesian maps, quantitative and spatial representativeness of participants, the 'truth' of their stories) were still most valorised by powerful actors (whether potential participants or within academia and policy), underscoring the additional transaction costs and affective ecologies of working generatively with more experimental, open-ended, transdisciplinary approaches.
- Particular uncertainty and unease existed around the ways in which scientific and technical ways of knowing would and could meet with other (especially experiential and 'creative') ways of knowing. More experimental and participatory elements and avenues that could have been fruitfully explored were not due to discomforts (of researchers and participants) around the purpose, ethics, and practicalities of such work, particualrly regarding the production and timing of coherent and easily recognised/valorised deliverables.
- Tensions around questing for a singular truth and how and with whom the validity

of different truths would be arbitrated. Note contrast with literature cited elsewhere in the report that asserts a well-established advantage of using story-based approaches is de-centring the need to arbitrate a single truth (e.g (McLauchlan, 2019).

- Artistic and/or recreational ways of knowing the past, present or future woodland ecologies of the CNP were largely absent or considered separately from the articulation of scientific and managerial ways of knowing. For example, participants indicated a need to downplay or keep separate their scientific or economic or technical ways of knowing ecologies from other ways of knowing they had capacities and interests in (including those valorising non-market or non-timber dimensions and benefits of woodland ecologies).
- Affective ways of knowing: research staff had experiences of feeling exposed and occasionally a sense of shame at not possessing ecological knowledge of the type and detail as some of the participants (e.g. not knowing all the species, especially less common species, emerging in creating and working with the videos). On one hand, this underlined the sense that sociocultural expertise was overlooked whilst ecological expertise (or its lack) were highlighted. On the other hand, this flagged issues of affective ecologies and how they intersect with the creation of safe spaces to articulate and respond to different forms and levels of expertise.

Marginalisation of particular ecologies

Examples of marginalisation of particular past/present/future ecologies highlighted in Understories included the marginalisation of particular **species**, including:

- refugee species
- absent or near-absent species or hybrid or sub-species
- divisive or controversial species (especially large predators that require reintroduction)
- less charismatic or visible species (e.g. soil biota, fungi, microbes)

Some participants flagged a range of narratives marginalised in relation to refugee species, which are defined as species or assemblages that are treated by scientists and/or management as belonging to a particular area or habitat or assemblage when they actually evolved to thrive in more optimal ecologies (e.g. Kerley et al., 2012). The implication articulated is that their survival in a place cannot therefore be taken as evidence that that is their preferred or optimal habitat, spatial location and/or extent. Participants mentioned numerous species (including plants, mammals, birds) in the Cairngorms that have become associated with particular habitats or altitudes or species assemblages in prevailing narratives, often in ways that present additional challenges to addressing biodiversity crises.

Some species were flagged as are not typically addressed in official narratives of Scottish Biodiversity. For example, a number of participants mentioned the marginalisation of a species of birch *Betula nana* (Dwarf Birch). They conveyed that it is both now rare in Scotland but also difficult to see because of its short height, often exacerbated by being grazed to the ground. The Botanical Society of Great Britain and Ireland state in their

Species Account: "*Betula nana* is a monecious, wind-pollinated deciduous shrub with prostrate, hairy twigs and small orbicular leaves with regular toothing. In Britain its stronghold lies in the Highlands of central and north-west Scotland, with outlier populations in the southern Uplands and English border counties of Northumberland, Cumbria and County Durham. It is absent from Wales and Ireland. *B. nana* is typically found in peats on sloping and saturated ground above 300 m AOD in vegetation equivalent to NVC M19 Calluna vulgaris-Eriophorum vaginatum blanket mire. The species is categorized as of Least Concern in Great Britain but has been assessed as Critically Endangered in England" (Botanical Society of Britain & Ireland, n.d.). Similar points were made about a sub-species of birch known as *B. pubescens ssp. tortuosa*, which is a hybridisation of *Betula nana* and *Betula pubescens*.

Participants mentioned that species or assemblages that are difficult or costly to monitor or research can be marginalised, especially if related to processes happening at micro and macro scales, and/or if involving dynamics that are typically tightly controlled in biodiversity management. Examples given related to management to meet criteria of site condition monitoring in protected areas or management of particular predators rather than wider assemblages of predators, wild and domestic and understanding complex predator-prey dynamics.

Particular habitats and ecotones were identified as marginalised in mainstream biodiversity research and management. Upland woodland and especially montane woodland and scrub was given as illustrative example by a number of participants. Narratives relating to its marginalisation raised issues of:

- A focus on carbon sequestration as a particularly valorised ecosystem service meant that smaller, sparser assemblages of tree species and their wider value, including biodiversity value, were overlooked.
- Long-established cultural absence or marginalisation of upland woodland in Scotland, and nascent revalorisation, in contrast to other European countries.
- Devalorisation of deer and revalorisation of conservation and commercial forestry.
- Material or biophysical absences or marginalisation of particular ecologies (e.g. montane woodland ecotone) or lack of tangible presence (montane trees that are very hard to see when small or eaten to the ground).
- Lack of seed sources of appropriate tree species and sub-species and geographically adapted ecological communities
- Absence or marginalisation of scientific knowledge and research resource as it relates to woodland ecologies in Scotland (e.g. regarding the pace of change of effective deer management practices; regarding complex contingencies of woodland regeneration in relation to seed sources, symbiotic relations, other biophysical and cultural factors).
- Resistance to the dynamic propensities of birch ecologies, especially given a mismatch with spatially defined protected areas. It was noted that even within particular estates particular ecologies have to be kept to particular spaces.

It was also noted that transitional zones (e.g. ecotones) can be marginalised because ecologies are not always easily or permanently categorised as one habitat or another.

Reflections on how our approach intersected with processes of marginalisation

Our approach helped to identify and address marginalisation in a number of ways including:

- Participants were given broad scope to define the themes and modes of storying recorded in the videos within the overall theme of woodland in CNP.
- Efforts were made to follow up threads of the stories participants shared through other places, beings and stories with which they were woven. These included people, ecologies and ways of knowing that are typically marginalised (e.g. following up: seed collection parts of afforestation assemblages of practices and imaginaries; Gaelic language as a way of knowing ecologies; experiences of dispossession whether historically or contemporary such as from corporate greening).
- Experiments took place in how to incorporate nonhuman agency and ways of articulating ('nonhuman storying') in video story form; particularly involving the trees themselves. This helped to identify ecologies and ways of knowing and managing them that are relatively marginalised, notably dynamic and symbiotic dimensions of woodland ecologies, especially in upland and montane ecotones.
- The researchers took part in video storying themselves so they could experience first hand the process; including its considerations, material and sociocultural constraints, benefits and vulnerabilities. Such immersion and reflection is the basis for a more careful and empathetic approach.
- Efforts were made to flag aspects we were marginalising as we became aware of them, acknowledging more needed to be done in future to address them adequately (e.g. the centrality of people, species, histories and geographies 'off-map' in relation to the CNP area, as well as those present in the CNP area but not gaining presence on the story map). They were interjections of making visible in general sense rather than being given a chance for fuller expression of situated meanings and materialities in the research.
- We aimed to engage and experiment with experiential ways of knowing through more embodied ways of filming or mapping, such as mobile ethnography, screendance, and other experimental forms (although did not have the opportunity to develop these as much as we could have). We followed up stories in which marginalisation had been flagged but were not always able to do this in a way that gave those most marginalised a direct voice or agency.
- We sought to engage the technology in inclusive ways, such as using closed captions.
- We offered participants options that allowed for different levels of skill and interest in recording audio and video
- To some degree wider values of trees, and tree and scrub ecologies had a chance to be highlighted, especially beyond mainstream cultural and economic values (e.g. looking beyond valorised timber, carbon and even hydrological values, looking beyond 'granny pines' to other less obvious or tangible symbols of 'lost' forest or

biodiversity.

- We learned that the emotional labour and associated resources were crucial to consider when creating 'contact zones' between different stories and narratives.
- Some 'meetings' of, and issues emerging in relation to, different narratives had feelings and elements of risk and discomfort associated with them. The generative potentials of these were flagged but in general not facilitated further. We did not have the capacity at that time to develop materials and practices to enable generative contact zones in which both (relatively) marginalised and (relatively) privileged individuals or collectives could safely express themselves, could spark or experience discomfort, and be 'held' or supported 'care-fully' in any opening up and vulnerability.
- We noticed how ecologies in other places and countries could be used as a device to prime the visual, discursive and experiential narratives and imaginaries of how biodiversity in Scotland, or particular areas such as upland Scotland, could look in the future.

Our approach may also have reinforced prevailing relations of marginalisation in a number of ways, including:

- Lack of diverse social groups represented in the story map, largely reflecting the main gatekeepers of narratives about woodland expansion in CNP/Scotland: relatively few participants found beyond white, middle-aged, middle class males. The majority of perspectives represented in our story map therefore came from already privileged voices (white, middle class males) and typically privileged ways of knowing (managerial, scientific, English, technical, cartesian, rational and disembodied).
- A more balanced representation in Understories was hampered by a more inclusive approach not being planned into the project resourcing, or covid-related project adaptations.
- The women working in woodland expansion are more difficult to include in such research; a more balanced gender representation in Understories was hampered by those engaged or working in woodland or its potential expansion not identifying as male being were more typically involved in freelance, part-time or voluntary capacities, which meant they were less able to take part and the ethics of making demands on their time more difficult to navigate. Furthermore, we found some more likely to call into question the notion that they had something authoritative or worthwhile to say, whilst others had to be mindful of their future employment and contractual prospects of sharing their full knowledge and experience.
- Framing the curation of stories in ways led by the 'griddable ecologies' (Myers, 2017) and ways of seeing and knowing central to cartesian mapping, with all the associated issues of distanciating, decontextualising, reducing, disembodying, erasing (people, practices, places, narratives), overwriting, alienating, dispossessing, separating dualisms such as mind-body and nature-culture.
- Efforts to allow nonhuman agency and articulations to be storied did not account as well for those not as easily obvious or accessible to video recording assemblages: below-ground, microscopic or macroscopic ecological entities and processes;

historical dimensions; geographies of woodland expansion that are 'off-map' from the CNP area.

- Lacking capacity to engage practically and ethically with the many established and merging artistic ways of storying woodland and its afforestation in CNP (professionally and otherwise), for example, in dance, film, music, written word, spoken word, and many forms of visual art. Reasons included the original allocation of researcher resource (and covid adaptations) but mainly because there are difficulties asking artists, especially those working freelance, to contribute significant time and perhaps intellectual property to the property without adequate support.

We recognised that future research needs to amplify the experience of diverse scientists and researchers working in biodiversity (Bailey et al., 2020), as well as those of myriad diverse 'stakeholders'; others with a stake in enhancing biodiversity whose narratives and ways of knowing have typically been marginalised.

We noted too that some people working in ecological research may not be able to afford the time or the uncertainty/open-endedness/risk of participating in transdisciplinary research and/or management - especially if working freelance or on short-term or casual contracts (see also Satterthwaite et al., 2022).

h. Insights from stakeholder scoping interviews

Stakeholders conveyed how marginalisation in biodiversity research and management is not only manifest as being excluded from the centre or mainstream, but also in the additional economic and emotional costs experienced by some who are included (i.e. access, work or otherwise operate) in mainstream spaces. Marginalised narratives were those making visible material and experiential aspects of marginalisation, and how they interlink.

Marginalisation was articulated in the form of absences and exclusions (e.g. particular people, ecologies or ways of knowing), but also in the form of their devalorisation, which can be harder to detect, and creates additional costs even when participation or involvement does occur. Costs highlighted included: extra skills or languages to learn, extra emotional labour of handling the (sometimes unintentional) microaggressions stemming from difference from white, masculine, ableist, heteronormative norms of belonging and narrative frameworks. In biodiversity research and management, exclusion and marginalisation occurs not only as an *absence* or *dearth* of inclusion, but also as the *additional actual and perceived costs and risks* - experiential, educational, social, economic - of being or becoming included.

Stakeholders convey significant challenges in expressing marginalised narratives beyond prevailing white, masculine, English-speaking, ableist, heteronormative norms, including due to their own or witnessed experiences in relation to biodiversity research and management in Scotland.

Understanding and addressing marginalisation in relation to biodiversity narratives may involve effort and discomfort for those who are currently privileged as well as those disadvantaged, but holds significant potential for developing new and more sustainable ways of knowing and engaging with ecologies.

Stakeholders highlighted insights and experiences that conveyed how narratives were marginalised in biodiversity research and management in relation to:

- Age (especially youth)
- Ethnicity, race, and the centring of whiteness
- Disability (regarding both physical and mental impairment)
- Gender and sexual orientation (especially deviation from prevailing norms of masculinity and heteronormativity)
- Class and socioeconomic circumstances (especially how they related to income, employment, education and housing)

There can be additional marginalisation within marginalised dimensions of biodiversity research and management (e.g. gender within class exclusions) (e.g. sociocultural marginalisations within ecological marginalisations).

Some stakeholders highlighted difficulties of having agency in biodiversity research and management, especially through their own ways of knowing and expressing. The knowledge and understanding of some involved in land management or research are not visible or valorised because their first language expressions do not map easily on to prevailing ecological or policy framings.

Other marginalised narratives emerging were:

- Narratives of the value and influence of *experiential knowledge* and ways of knowing, including embodied, mobile, sensory and emotional dimensions of experience and how they can combine to provide insights into the particularities of place, process, people and other species that flag opportunities and constraints for biodiversity enhancement.
- Narratives of the *experiences* of marginalisation particular people had on both the inside and outside of mainstream biodiversity research and management.
- Narratives in which excluded groups had more than just involvement in, or access to, biodiversity research and management. That is, narratives in which typically excluded voices had *agency and influence in strategic and managerial decisions* in how biodiversity is known and enhanced (i.e. pertaining to the degree and form of agency given to those marginalised even when included).
- Narratives of uncertainty, lacking or ceding control, reciprocity, symbiosis, empowerment, care, fairness, justice, governance and ownership of assets shaping biodiversity enhancement goals and practices.
- Narratives in which addressing social challenge was seen as part of - not separate from or a nuisance to - addressing ecological challenge.

Further detailed points emerging

Narratives of socioeconomic marginalisation

The interviews highlighted emerging narratives sidelining or reducing **socioeconomic** marginalisation in biodiversity research and management. Socioeconomic or class-related marginalisations were flagged by a number of participants as important, yet were the *least articulated* or addressed dimensions of marginalisation. Several stakeholders independently indicated socioeconomic and class-related marginalisation as the least visible and acknowledged in prevailing biodiversity narratives.

Emerging narratives of **socioeconomic** marginalisation in biodiversity research and management included:

- Socioeconomic dimensions were sometimes reduced to issues of housing - especially in known biodiversity hotspots - or access to nature connection in disadvantaged areas.
- The socioeconomic barriers to working (or even volunteering) in biodiversity research and management (many of which were identified as particularly acute in conservation hotspots such as the CNP). These related to the following, often interrelated, aspects:
- Skills, confidence, networks, awareness relating to biodiversity work opportunities.
- Additional economic costs and risks (especially in relation to education, housing, the need to afford volunteer experiences and/or precarious or low-paid positions).
- Additional emotional labour of becoming and being included in work opportunities, experiences, and training.
- Lack of authoritative language or dialect (see section on language).
- Narratives of knowing and managing biodiversity in less commercial or commodifiable ways are sidelined.
- Narratives of a more inclusive ownership of land and assets are often sidelined.
- Barriers to residing in or near biodiversity hotspots or where regular opportunities for biodiversity connection and engagement activities take place, e.g. in urban areas.
- Further marginalisation can happen within marginalised dimensions of biodiversity research and management. Examples included gender as further marginalising within class exclusions, and sociocultural ways of knowing being marginalised further in relation to marginalised ecologies.

Narratives of marginalisation of other social groups

Key narratives included:

- Complex and 'under the radar' experiences of women included and excluded from particular spaces, roles, and statuses in biodiversity research and management (whether professionally or as volunteer, for example, in monitoring); including costs and risks to physical and psychological safety of biodiversity-related practices, or those building capacity (skills, confidence, experience) to enable access to them.
- Women as having as much expertise, authority, and field-hardiness in biodiversity research and management as men.
- Those taking seriously the **intergenerational** practices and relationships needed for biodiversity enhancement and management
- Those giving young people **agency** to decide the goals and practices of biodiversity enhancement and management, as well as to take part in (usually narrowly delineated) forms of involvement
- **Experiences** of young people feeling like they are **not** fully included or given agency

in biodiversity research and management.

- Local residents to the CNP being sidelined in favour of visitors.

Marginalised narratives relating to the minority languages of Scotland

Marginalisation of narratives relating to biodiversity research and management occurs in Scotland (and our CNP case study area) in relation to language, including Gaelic, Scots and other minority languages.

Some participants highlighted the language barriers to having agency in contributing to or influencing biodiversity research and management:

- Lack of common first language or dialect.
- The knowledge or ways of knowing of some involved in land management or research are not visible or valorised because their first language expressions do not map easily on to prevailing ecological or policy framings.
- Assumptions of lack of authoritative knowledge due to status (e.g. tenant) and language (e.g. Doric, a form of Scots).
- Fear of speaking up in forums dominated by mainstream norms of belonging.
- Minority languages being centred in decontextualised or appropriative ways (e.g. a risk was highlighted that languages such as Gaelic can be promoted as an economic or ecological asset without necessarily addressing the sociocultural value, meanings or relationships in which it is embedded)

Marginalisations related to minority languages can intersect with other established dimensions of marginalisation in a variety of ways. For example, even increasingly centred expressions of belonging such as 'Dùthchas' have historically excluded women or required significant additional demonstrations of worth.

Marginalised narratives pertaining to the body, senses, emotions and other dimensions of experience

Narratives expressed about, and through, the body and embodied experience and knowledge were also identified by some as marginalised in various realms of knowing and managing biodiversity. How it feels - in multiple sensory and emotional registers - to experience, move with, and know ecologies, and to express that knowing tends to be narrated in particular and non-centring ways. For example, experiential knowledge can become visible in narratives as 'anecdotal evidence', 'place-based' knowledge, 'connection to nature' or as a cultural product, but tend not to be ascribed the same agency and status as the experiential knowledge codified in various biodiversity field skills. See also literature flagging the downplaying of embodied and emotional ways of knowing as part of biodiversity research (e.g. Lorimer, 2008; Maderson, 2023)

Such expressions are often ephemeral and do not always leave traces, at least not in ways codified or otherwise deemed acceptable and authoritative in mainstream biodiversity research and management. Accordingly, the expertise and craft of those experienced in such embodied and affective ways of knowing is not always felt to be recognised in

mainstream biodiversity narratives. Yet participants flagged other sectors and activities creating narrative space that centred experiential knowledge relevant to biodiversity (from everyday land management practices, through field visits, to the arts). They highlighted the potential for further learning from those practices and sectors if engaged more meaningfully.

Other key points raised related to **sensory hierarchies** and **affective economies** (and **affective ecologies**) of biodiversity research and management include:

- Narratives of letting the marginalised 'speak' are much more prevalent than of allowing them to listened to and be **heard.**
- Narratives of how ecologies should **look** in the future are much more prevalent and valorised than how future ecologies should **feel.**
- Particular forms of **visual** expression prevail in mainstream biodiversity research and management (e.g. maps and images in which people - or even other key species or assemblages - are not present, or only present as tightly choreographed moments and places of 'engagement').
- There are many visual - and particularly non-visual - narratives that are not enabled or centred (e.g. less spectacular or recognisable as 'data' or evidence). Those relating to various senses of touch are highlighted as the least centred, or convey narrowly defined ways (e.g. centred narratives of how we should get 'in touch' with nature).
- Marginalised narratives expressed how prevailing narratives often erased or sidelined the **emotional** experience, labour and risks of inclusion, as well as exclusion.
- Emerging narratives conveyed how particular affective economies and ecologies of biodiversity research and management were consequential in bounding acceptable people and practices; especially complex relations of fear and passion in those included and excluded, such as when particular fears become centred in biodiversity narratives over others.
- Narratives often marginalised are those telling stories of the social, emotional and physical 'distance' that has to be travelled by those on the periphery to centred spaces of biodiversity research and management; how it can be prohibitive, how it can be overcome, and the costs and burden of overcoming it.
- Also less prevalent are narratives of the centre taking on the burden and discomfort of coming to, and being in, marginalised spaces of biodiversity research and management.
- Narratives of how mental health - and efforts to maintain or restore it - shape biodiversity research and management (as opposed to prevailing narratives of connection to biodiversity and nature as a separate and perhaps leisure-based activity).
- Narratives of how eco-anxiety can shape biodiversity research and management, and who is included and how.
- Artistic expression as a way to understand biodiversity and human connection to biodiversity.

Marginalised narratives of ecologies and how we know biodiversity

Points made about marginalised narratives in biodiversity research and management included:

- Those relating to particular methodologies or techniques, particularly those regarding more complex relational entities or phenomena (e.g. narratives around genetic techniques can sideline or 'forget' other techniques or understandings).
- Those relating to **nuances** and **contingencies** in symbiotic relations (e.g. between fungi and plant species) - which were identified as marginalised within specialist scientific and land management as well as more broadly in policy and public spheres.
- Narratives in which the **dynamism** and **uncertainties** of nonhuman agency in biodiversity management is accepted.
- Place-specific ecological knowledge.
- Narratives of ecologies that are now largely absent, less visible, more difficult to measure yet still holding potential for biodiversity enhancement.
- Issues of accessibility of knowledge (e.g. National Biodiversity Network data).
- Narratives of particular species, assemblages and habitats belonging to sites beyond those to which they are currently confined (i.e. the nature and degree of spatial marginalisation of ecologies). Some debate does explore issues of what constitutes a current versus possible ecological niche. How particular narratives inform this debate is interesting and worth further exploration. Work in social science already explores sociocultural framings of what 'belongs' where (e.g. when is a particular species or assemblage of species 'out of place') (e.g. Lindström et al., 2016).
- Narratives of processes and species not seen as useful to humans.
- Narratives of humans as part of nature and as being part of the ecosystem.
- Narratives of the value of biodiversity in urbanised areas.
- Traditional uses of biodiversity, e.g. medicinal uses or food, or as inspiration for cultural expression, e.g. through song, stories and poetry.
- Climate mitigation objectives having negative impacts on biodiversity.

Many above the above speak to a marginalisation of narratives conveying the complex and contingent **geographies** shaping biodiversity research and management.

Marginalised narratives of who has agency in biodiversity research and management

Narratives of biodiversity enhancement being inextricably linked to a greater involvement and empowerment of people were thought to often be sidelined.

Marginalised groups - such as young people, ethnic minorities, or wellbeing support groups - are increasingly being involved in initiatives aiming for biodiversity enhancement but tend to have little or no agency over the nature of that involvement or in strategic or management decisions.

Some reported a growing feeling of unease and at time disillusionment that social groups are being involved in biodiversity initiatives to tick boxes and for PR aims but without commitment to including them in decisions and actions of strategic and everyday biodiversity management.

Some highlighted difficulties of having agency in biodiversity research and management, especially through their own ways of knowing and expressing (see section on 'language').

Key points regarding marginalised narratives:

- It was suggested that ecological challenges and social challenges were not separable and could only be tackled together if they were to be effective and lasting.
- There was discomfort with the notion that the main people-related task of those working in biodiversity was to win them over to a predefined vision of the biodiversity enhancement required and how to reach it.
- They identified and questioned the sense of immunity sometimes conveyed by those studying or managing biodiversity to consideration of issues of inclusion or marginalisation in biodiversity research and management on the grounds of the separateness or primacy of ecological imperatives.
- They expressed unease with the sense of urgency of ecological crises being used to imply there was no time to focus on people and the complications they bring.
- They conveyed close links between ecological restoration and the restoration of people's relationships with land (including meaningful involvement, purpose and agency in the goals and means of biodiversity management).
- They open up the possibility of a greater diversity of people doing, influencing and setting the parameters for biodiversity management, rather than only having the option to join in with existing biodiversity enhancement activities, framed and run by others.
- They iterate the role the governance and ownership of land and assets can play in biodiversity research and management.

i. Empirical themes emerging

A range of marginalised narratives relevant to biodiversity research and management emerged from our scoping of empirical material. They pertained in particular to:

- **languages beyond English** (in Scotland relating especially to Gaelic, Scots, and other minority languages);
- **experiential** domains and knowledges;
- **dynamic**, **plural**, **uncertain** and **less tangible** ecologies;
- (particular) **people being *and feeling* centred** in - on the 'inside' of - biodiversity research and management rather than playing a temporary, minor, 'air-brushed' or provisional role;
- narratives **beyond those centring white, masculine, English-speaking, ableist, heteronormative norms** of conservation, science, and related cultural practices (such as cultures of 'the outdoors');

- **geographies** of where particular ecologies or people ‘belong’ or are ‘out of place’
- diverse people having **agency** in shaping goals and management of biodiversity, not just having pre-defined connection or involvement

Review of relevant policy narratives

j. Biodiversity policies

The IPBES's global assessment report of biodiversity and ecosystem services (IPBES, 2019) cites among its key messages the synergies between nature and the SDGs related to gender equality and reducing inequalities (key message C2 "*Important positive synergies between nature and the Goals related to education, gender equality, reducing inequalities and promoting peace and justice (Sustainable Development Goals 4, 5, 10 and 16) were found".* (IPBES, 2019, p. XIX)). Key message D3 says that one of the leverage points to achieving transformations towards sustainability is targeting inequalities, and justice and inclusion in conservation: "*Transformations towards sustainability are more likely when efforts are directed at the following key leverage points, where efforts yield exceptionally large effects …: … (4) inequalities; (5) justice and inclusion in conservation;…"*. (IPBES, 2019, p. XXI). The document also recognises the role of indigenous local knowledge, practices and innovations (ILK) in the management and conservation of biodiversity: "*Today, indigenous and local knowledge (ILK) is increasingly seen as relevant for sustainable resource use, not only for IPLCs* [Indigenous Peoples and Local Communities] *but also more broadly. This reflects a shift from centralized, technically oriented solutions, which have not substantially improved the livelihood prospects for many small farmers (even if helping others).*" (IPBES, 2019, p. 78). "*ILK is acknowledged as an indirect root driver for transformation: Appreciation of indigenous and local knowledge (ILK) for managing nature is rising yet, at the same time, these local knowledge systems continue to be degraded (*well established*). Indigenous and local knowledge (ILK) generated within IPLCs increasingly is seen as relevant for sustainable production. It offers broadly applicable alternatives to centralized and technically oriented solutions, which often have not substantially improved prospects for smaller producers"* (IPBES, 2019, p. 55).

The Scottish Biodiversity Strategy to 2045 'Tackling the Nature Emergency in Scotland' states that Scotland's Biodiversity Delivery Framework has a "*participatory and inclusive 'whole-of-society' approach that engages: a wide range of delivery partners including local authorities and non-governmental organisations (NGOs); local communities; business, especially land and water-based businesses: and the scientific and research community. They will be inclusive, engaging and empower [sic] stakeholders and communities through local and regional institutions*" (Scottish Government, 2022c, p. 49). It places responsibility on 'everyone' for addressing damage to biodiversity: "*The Scottish Biodiversity Strategy is for everyone – large corporate players, small businesses, land managers, non-government organisations and Scotland's communities and citizens whose decisions in everyday lives as producers and consumers have an impact on biodiversity. Only by coming together to deliver transformational change in the way we use and manage our resources can we avoid irreversible damage to biodiversity*." (Scottish Government, 2022c, p. 13). This document also incorporates as a priority strengthening the role of National Parks for a Just Transition, defined as "*Introducing changes in the economy to deliver environmental benefits in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities and leaving no one behind. This involves maximising the social and economic opportunities of climate action, while minimising and carefully managing any challenges – including through effective social dialogue among all groups impacted, and respect for fundamental labour principles and rights*" (Scottish Government, 2022c, p. 82).

The Biodiversity Strategy reflects a change in the narrative around the role of agriculture in the biodiversity crisis; while changes in agricultural practices throughout the 20th century are cited as causing a decline biodiversity, agriculture is now discusses as part of solution. For example, the vision for 2045 includes "*Management of deer ranges, grouse moors and upland agriculture … contributing to the regeneration of biodiversity in upland areas*." (Scottish Government, 2022c, p. 33).

It is also worth noting that the Biodiversity Strategy refers to biodiversity and climate change as 'twin crises'. Scotland is discussed as becoming 'nature positive' by 2030, framing biodiversity as quantifiable, echoing the concept of 'carbon neutral'.

The Strategy includes a commitment to expand protected areas to at least 30% of land surface by 2030 (Scottish Government, 2022c, p. 41), and NatureScot has been commissioned to develop a National Framework and Implementation Plan for the delivery of this objective, known as 30x30, in Scotland. NatureScot is taking a co-design approach to develop the framework (NatureScot, 2020b). However, it is unclear which stakeholders are involved in these discussions. Landowners and land managers are framed as important in monitoring the delivery of the objective, but as lacking knowledge and expertise (NatureScot, 2020a).

The original biodiversity strategy ('Scotland's Biodiversity – It's in your hands'), published in 2004 (Scottish Government, 2004) appears to give a bigger emphasis on inclusion, both to enhance biodiversity, and the benefits it provides. The vision of the strategy for 2030 is "*Everyone is involved; everyone benefits*." (Scottish Government, 2004, p. 11). One of its objectives was *"To increase awareness, understanding and enjoyment of biodiversity, and engage many more people in conservation and enhancement*" (Scottish Government, 2004, p. 35). Its preface says: "[this strategy] *addresses issues relevant to farmers and land managers, fishermen and fish farmers, transport companies and utility providers, and businesses – both large and small. Indeed, this strategy makes it clear that everyone in Scotland has a role to play in the future of biodiversity conservation and enhancement*" (Scottish Government, 2004, p. 8). Under Section 3 (Issues and opportunities), it says: "*Engaging more people in biodiversity conservation represents both an end in itself and a means to an end. It will enrich our lives and those of future generations. Everyone should benefit."* (Scottish Government, 2004, p. 26).

The document '2020 Challenge for Scotland's Biodiversity', published in 2013 (Scottish Government, 2013), supplements the 2004 document, and together constitute the Scottish Biodiversity Strategy (NatureScot, 2020c). One of its aims is to "*connect people with the natural world, for their health and wellbeing and to involve them more in decisions about their environment*." (Scottish Government, 2013, p. 6). The document highlights as part of its approach, to "*Involve people in decision-making, especially those who benefit from ecosystem services and those who manage them. This means valuing people's knowledge, helping people to participate, and giving people greater ownership and responsibility*." (Scottish Government, 2013, p. 13). It also acknowledges disadvantaged sectors of society and the need to include them ("*While participation is increasing across Scotland, it is lowest amongst the most disadvantaged in society. More effort is needed to ensure everyone can enjoy the outdoors, whatever their background, health or age*." (Scottish Government, 2013, p. 38)). This document includes a list of the CBD's Aichi targets, including Target 18 ("*By 2020, the traditional knowledge, innovations and practices of*

indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels." (Scottish Government, 2013, p. 82)).

SEPA's position statement on biodiversity (Scottish Environment Protection Agency, 2015) makes no reference to social inclusion, justice or equality.

k. Protected Areas policies

The Cairngorms National Park Forestry Strategy 2018 highlights the importance of the Park's forests for biodiversity, particularly in relation to other of the park's habitats: "*The Cairngorms forests are disproportionately significant for rare flora and fauna. There are 223 species known to be 'highly significant' in the National Park, ie between 75 –100% of their UK population is within the National Park. Of these, 100 are dependent on woodland whilst, by comparison, wetland hosts 12, grassland eight and moorland only one*." (Cairngorms National Park Authority, 2018, p. 10). It frames forest connectivity as significant in improving biodiversity and in making the area more resilient. This is particularly the case for the Capercaillie, which is mentioned throughout the strategy. The document discusses the need to encourage landowners to create woodland and to take up the Scottish forestry grant scheme on target areas: *"existing forests and woodlands; preferred areas; potential areas (with known sensitivities); potential montane woodlands*" (Cairngorms National Park Authority, 2018, p. 42). Similarly to other policies, this raises the questions of who is seen as responsible for improving biodiversity. The importance of timber production is discussed throughout the strategy as an important industry for this area. Felling and forestry management is also discussed as bringing significant biodiversity and recreational benefits. The document includes a 100-year vision in which forests are 'fully recovered' and where the central montane core of the Park is "*fringed by many forests reaching the natural tree line*" (Cairngorms National Park Authority, 2018, p. 15). The document highlights a sense of 'wildness' that should be enhanced by minimal intervention (p. 27).

While the Cairngorms Nature Action Plan 2019-2014 stresses the need to prioritise certain conservation 'flagship' species, it also acknowledges the importance of lesser-known species: "*the bulk of the nationally important species are made up of plants, fungi, lichens, bryophytes and insects' that are likely not to be as well-known*" (Cairngorms National Park Authority, 2019, p. 25). Land managers are portrayed in the role of 'hero' in this policy in the enhancement of biodiversity: *"Managing for biodiversity and the sustainable use of the area's natural resource is part of many land managers' everyday business"* (Cairngorms National Park Authority, 2019, p. 18).

Most of the reviewed strategies and plans of the CNP make brief mentions of social inclusion: The Cairngorms National Park Forest Strategy 2018 mentions making woodlands more accessible for all sectors of society (Cairngorms National Park Authority, 2018, p. 38). The Cairngorms Nature Action Plan 2019-2024 states that its aim is to be inclusive ("*As a partnership the aim is to be inclusive, to consult and seek agreement, to use evidence and to tackle difficult issues by building rust and relationships through discussion and collaboration and ultimately making a difference on the ground*") (Cairngorms National Park Authority, 2019, p. 4). The Cairngorms Local Development Plan 2021 (Cairngorms

National Park Authority, 2021) includes plans for a new settlement at An Camas Mòr, described as demographically inclusive: "*the people living in An Camas Mòr will form a community of their own which is inclusive and vibrant with a demographically balanced population*." (Cairngorms National Park Authority, 2021, p. 102).

The Cairngorms Nature Action Plan 2019-2014 accentuates the role of partnerships and cooperation in managing the Park, and has as one of its aims the involvement of people: "*We need to make the connection between people's everyday lives and the nature and wildlife they value, or even depend on. And we need to make this information accessible and engaging, delivered in the most credible and persuasive manner possible*" (Cairngorms National Park Authority, 2019, p. 33). The focus on making the information accessible and engaging is one step further than in some of the other policy documents reviewed such as the Cairngorms National Park Forest Strategy 2018, which highlight the need for a more informed general public but not how that will happen. This document emphasises the sense of wildness in the Park and its importance in helping people feel connected to nature (Cairngorms National Park Authority, 2019).

The Cairngorms National Park Partnership Plan 2022-27 (Cairngorms National Park Authority, 2022) has a stronger emphasis on equality and inclusion; objective B10 (A park for all) states: "*Anyone, no matter who they are, where they come from, what their beliefs or their needs are, should be able to visit and enjoy the Cairngorms National Park. We recognise that a continued focus on equalities is imperative, particularly at the current time, following a global pandemic and in the midst of a cost-of-living crisis that has exacerbated inequalities in our society. We have also recognised in the last few years the need to engage more proactively with external equalities experts. To this end we reconstituted our Equalities Advisory Panel in 2020, bringing together experts from across the public, private and third sector to provide evidence-based feedback, guidance and advice, grounded wherever possible in lived experience. Residents of the National Park should have opportunities to benefit from living in a spectacular natural environment with a strong sense of community. There is also a need to provide targeted support across the National Park to ensure that programmes and projects contribute to reducing inequalities for residents and visitors alike. Finally, we also* ***need to ensure that a wider range of people are involved*** *in, benefit from and support activities that protect and enhance nature and tackle climate change in the National Park. Tackling the climate emergency and nature crisis can only be done by taking people with us: local communities, workers in the rural economy, visitors,* ***under-represented groups*** *and so on. … There will be better opportunities for everyone to enjoy the National Park and* ***the visitor profile will be more diverse, especially with regards to people who are disabled, from lower socio-economic backgrounds, LGBTQ+ and from minority and ethnic groups***." (Cairngorms National Park Authority, 2022, p. 73). The Pan's Policy B5 is: "Support **under-represented groups** to visit, work and live int eh National Park and ensure a Park for All" (Cairngorms National Park Authority, 2022, p. 78).

In 2020 the CNP established an **Equality Advisory Panel**, which includes people "*with expertise in education, community representation, disability advocacy, mental health, poverty and socio-economic disadvantage, health and social care, gender, LGBTQ+ advocacy and working with ethnic minority communities*." (Cairngorms National Park Authority, 2022, p. 112).

I. Other related policy

Forestry policies

Scotland's Forestry Strategy 2019-2029 (Scottish Government, 2019a) includes a narrative of change in Scotland's forestry that runs through the strategy. It outlines how Scotland's forests drastically depleted with growing population until it was recognised as an issue in 1918. Since then there has been reforestation and afforestation in Scotland increased from 5% in 1918 to 18.5% in 2018 (Scottish Government, 2019a, p. 15). There is also a recognition that historically much of this reforestation occurred in monoculture plantations, which is now acknowledged as not being good for the environment. In the last thirty years there has been a focus on sustainable forestry management, with the motto of 'the right tree in the right place'. The document uses a definition of sustainable forestry from 1993 to guide its approach: '*The stewardship and use of forest lands that maintains biodiversity, productivity, regeneration capacity, vitality and potential to fulfil now and in the future relevant ecological, economic and social functions at local, national and global levels and that does not cause damage to other ecosystems*' (Scottish Government, 2019a, p. 6). This approach is framed as contributing to biodiversity: "*Forests and woodlands support a diverse range of species and are rich in biodiversity; to date, researchers at Stirling University have recorded over 1000 species associated with Scottish forests. These include 172 protected species, comprising some of Scotland's most charismatic and recognisable species, including the pine marten, twinflower, crested tit, Scottish Crossbill, black grouse, capercaillie, as well as an estimated 75% of the UK's red squirrel population*" (Scottish Government, 2019a, p. 11). While forestry can be seen as a 'hero' in this narrative, the 'villains' can be identified as globalisation and its association to increasing pests, diseases and invasive species.

Similarly to other national policy documents, the Forestry Strategy discusses biodiversity as an issue that the whole population of Scotland needs to be involved with, and that there is a lack of knowledge about the value of sustainable forestry. However, there is unclear how this can be remedied and whose responsibility it is to address it. The document mentions social inclusion and equality. However, these are mentioned in terms of the urban context: "*Urban forestry (Box 4) represents an opportunity to benefit a significant proportion of the Scottish population, providing accessible spaces for active travel, exercise and other forms of recreation, promoting physical and mental health and well-being, improving social inclusion and helping to reduce health inequalities*." (Scottish Government, 2019a, p. 27). The document also mentions inclusive economic grown and inclusive economy, but it is unclear what is meant by inclusivity.

The previous Forestry Strategy, published in 2006 (Scottish Executive, 2006) has as one of its principles "*Social inclusion – through helping to provide opportunities for all, and helping to build stronger communities*" (Scottish Executive, 2006, p. 8). A narrative here seems to be that 'forestry supports social inclusion': "*Support for Scottish forestry will also help to combat social exclusion by promoting opportunities for people to benefit from woodlands and woodland management, helping to tackle the barriers to inclusion, helping children and young people get the best possible start in life, and helping to strengthen communities and regenerate deprived areas*." (Scottish Executive, 2006, p. 14). Another principle of the document is social justice: "*People should not be disadvantaged by who they are or where they live ('social justice').*" (Scottish Executive, 2006, p. 71). The stronger emphasis of social

inclusion and equality in this document compared to the current strategy seems to echo the stronger emphasis of these concepts in the 2004 Biodiversity Strategy compared to the upcoming new Biodiversity Strategy.

The Forestry Commission's document 'The Scottish Government's Rationale for Woodland Expansion' (Forestry Commission, 2009) mentions the benefits that woodlands provide for society, but does not mention equality or social inclusion.

Land use policies

Scotland's Third Land Use Strategy (2021-2026) (Scottish Government, 2021) acknowledges land as delivering nature and biodiversity, and it also mentions equality as one of the results of good land management and use. The Strategy mentions social justice and building a fairer society as one of the strategy's principles. It also mentions inclusivity: "[the strategy] *seeks to make land use more understandable and accessible to everyone, in support of a shift in the way we think about land, towards more inclusive conversations around how we use land and who should be involved in those decisions*." (Scottish Government, 2021, p. 8). The document introduces the RLUPs (Regional Land Use Partnerships), including the Cairngorms National Park RLUP.

The previous Land Use Strategy (2016-2021) (The Scottish Government, 2016) does not mention equality or justice. It includes 'Community inclusion in land use decision making' as one of the indicators for monitoring the Strategy (The Scottish Government, 2016, p. 39).

Other relevant policies

The Environment Strategy for Scotland (Scottish Government, 2020a) includes as an outcome a "*healthy environment that supports a fairer, healthier, more inclusive society*." Under this outcome the Strategy provides an example of how this is being done: "*improving air quality and access to greenspace will create significant health benefits and help tackle inequalities"* (Scottish Government, 2020a, p. 18). Similarly to Scotland's Forestry Strategy 2019-2029, the contribution of nature to equality focusses on urban settings.

Scotland's draft fourth national planning framework (Scottish Government, 2019b) includes several policies and outcomes, including protecting biodiversity, and improving equality and eliminating discrimination.

The consultation paper for the 'Land Reform in a Net Zero Nation' frames biodiversity as a crisis to be tackled, in which land has an important role to play: "we must take every opportunity to bring about a just transition to net zero, and tackle the biodiversity crisis. Land has a fundamental role to play in how we respond to the climate crisis and biodiversity crisis." (Scottish Government, 2022a, p. 4). The document also refers to avoiding trade-offs between increasing biodiversity and people's rights: "Actions taken in pursuit of tackling climate change and increasing biodiversity must not have the effect of displacing people from the land." (Scottish Government, 2022a, p. 4). The consultation paper includes as one of the core aims of the land reform policy 'to increase diversity of landownership' (Scottish Government, 2022a, p. i). It includes as one of its questions for

consultation: “Should Management Plans include information on … plans for development/activities that will contribute to local and inclusive economic development or community wealth building” (Scottish Government, 2022a, p. 16). It also refers to historical inequalities (“as we continue in Scotland’s land reform journey, addressing historical inequalities, we must also be alive to new and emerging challenges with an eye to the future.” (Scottish Government, 2022a, p. ii).

Conclusions and methodological implications

New, inclusive and co-generated narratives and stories are increasingly flagged in academic, policy and public domains as crucial to effective and ethical biodiversity research and management. The marginalisation of narratives is understood as process as well as outcome.

In biodiversity research and management, as more broadly, marginalised narratives cannot be understood in isolation from the wider dimensions of marginalisation within which narrative expression is constituted, reconstituted, or inhibited.

Marginalisation in biodiversity has roots in established exclusionary narratives and practices associated with cultural practices of conservation and 'the outdoors'. Specifically, prevailing narrative frameworks in biodiversity research and management are constituted in relation to the legacy of white, masculine, English-speaking, ableist, heteronormative norms of belonging of conservation, science, and related cultural practices. Identifying and addressing aspects of marginalisation in biodiversity research and management requires acknowledging and working with this legacy of exclusionary norms and narrative framings.

The scoping review suggests that marginalised narratives and stories in biodiversity research and management relate closely to the materialities and imaginaries framing how particular identities and languages have agency in defining the goals and practices of biodiversity enhancement.

In biodiversity research and management, exclusion occurs not only as an absence or dearth of inclusion, but also as the additional actual and perceived costs and risks - experiential, educational, social, economic - of being or becoming included.

Understanding and addressing marginalisation in relation to biodiversity narratives may involve effort and discomfort for those who are currently centred as well as those marginalised, but holds significant potential for developing new and more sustainable ways of knowing and engaging with ecologies.

Marginalised narratives identified and questioned the sense of immunity sometimes conveyed by those studying or managing biodiversity to the consideration of social, economic or cultural inclusion. These narratives were typically alongside narratives questioning the separateness or primacy of ecological imperatives in relation to other societal or land management imperatives.

Forms and processes of marginalisation are often co-constituted or interwoven in (sometimes subtle or taken-for-granted) ways consequential for inclusion.

We have identified three (interrelated) key dimensions of marginalisation important to biodiversity research and management, and note associated key findings emerging:

1. Marginalisation of people, social groups and cultural identities - including in relation to: age, gender, ethnicity, socioeconomic circumstances, sexual orientation, disability, and their intersectionality.

Stakeholders highlighted the least visible and acknowledged narratives in relation to biodiversity research and management as:

- marginalisations related to *socioeconomic* circumstances or class (and how they relate to skills, education, experience, confidence, and housing)

- the *experience* as well as the fact of exclusion
- the experience as well as the fact of *inclusion*
- marginalised people having *agency* in - not just access to or involvement in - biodiversity research and management

2. Marginalisation of ways of knowing - including particular registers, languages, concepts, grammars, narrative forms, and interlinked practices and skills e.g.: *experiential* knowledge; *minority languages* (Scots, Gaelic and many others); *sensory*, *emotional, and bodily* as well as linguistic registers; *nonhuman* as well as human forms of articulation; understandings of *complexity, open-endedness,* and geographical and temporal *contingency*; *ephemeral* or process-related narrative forms.

3. Marginalisation of ecologies - including particular species, habitats, bio-physical processes, and how visible, tangible and understandable they are, such as in relation to: spatial marginalisation and inaccessibility; culturally devalorised ecological entities (e.g. lost habitats, hidden species assemblages, less 'beautiful' landscapes, or ecosystem services valued less than others, such as in relation to carbon or timber markets); complex, dynamic and uncertain processes affecting sustainability and adaptation, and their geographies; nuanced dimensions of symbiotic relations (e.g. between fungi and tree species).

In short, a range of marginalised narratives relevant to biodiversity research and management emerged from our review. They express dimensions of who and what is currently excluded or sidelined, as well as valuable clues as to how such marginalisation might be addressed. These will be explored further in Year 2 of this project and beyond.

In particular, appropriate methodological and ethical approaches to further exploring and centring marginalised biodiversity narratives must take care and heed the risks and vulnerabilities emerging as important in creating, reinforcing and addressing marginalisation.

Emerging as important is the need to consider how influential narratives and stories in biodiversity research and management are shaped by:

- Who gets to work in biodiversity (and who does not), especially in conservation hotspots like the CNP;
- Who gets to participate in voluntary biodiversity activities (e.g. local groups, citizen science projects, etc), and who does not;
- Who gets to contribute to, and influence, biodiversity research and management projects, and who does not;
- The actual and perceived costs and risks (economic, social, cultural) of contributing, participating and working in biodiversity research and management.

Since key forms and processes of marginalisation are often interrelated, sometimes in hidden or taken-for-granted ways, an important function of a platform would be to **enable connections between narratives** (and related forms and processes of marginalisation) to be made, made visible, and explored i.e. create and invite particular **contact zones** in which narratives can be articulated, represented and responded to.

Methodological implications for our research include:

- **Who** we engage in our research practices (human and nonhuman), given the need to consider carefully the power relations and possible reinforcing of marginalising/exclusionary processes in inviting particular participants and not others, and;
- **How** we engage people in our research, especially regarding how we enable articulating and responding of participants in particular spaces and times, as assembled with particular technologies, narratives, images (generating research encounters that can enable the marginalised both to 'speak' and be heard).
- The importance of paying attention to the **geographical and spatial** constitution of marginalisation in relation to biodiversity narratives.
- Likewise how different **temporalities** can be mobilised, such as in narratives of past or future inclusion (e.g. how inter-generational dynamics of humans and nonhumans matter for each other)
- Calls for methods that build connections and mutual understanding in biodiversity conservation, rather than just understanding conflicts.

References

Adams, W. M. (2020). Geographies of conservation III: Nature's spaces. Progress in Human Geography, 44(4), 789–801. https://doi.org/10.1177/0309132519837779

Adger, W. N., Benjaminsen, T. A., Brown, K., & Svarstad, H. (2001). Advancing a political ecology of global environmental discourses. *Development and change*, 32(4), 681-715.

Agrawal, A. (2005). Environmentality: Community, intimate government, and the making of environmental subjects in Kumaon, India. Current anthropology, 46(2), 161-190.

Alaimo, S. (2016) Exposed: Environmental Politics and Pleasures in Posthuman Times, University of Minnesota Press, Minneapolis.

Alaimo, S. (2019). Wanting all the species to be: Extinction, environmental visions, and intimate aesthetics. Australian Feminist Studies, 34(102), 398-412.

Alaimo, Stacy. 2008. Trans-Corporeal Feminisms and the Ethical Space of Nature. In Material Feminisms. Edited by Stacy Alaimo and Susan Hekman. Bloomington: Indiana University Press, pp. 237–64.

Alaimo, Stacy. 2009. Insurgent Vulnerability and the Carbon Footprint of Gender. Women, Gender, and Research (Kinder, Kon, og Forskning, Denmark) 3: 22–35.

Andres, S. E., Standish, R. J., Lieurance, P. E., Mills, C. H., Harper, R. J., Butler, D. W., ... & Gallagher, R. V. (2022). Defining biodiverse reforestation: Why it matters for climate change mitigation and biodiversity. Plants, People, Planet.

Baldauf, C., de Oliveira Lunardi, V. (2020). Multiple Perspectives on Biodiversity Conservation: From Concept to Heated Debate. In: Baldauf, C. (eds) Participatory Biodiversity Conservation. Springer, Cham. https://doi.org/10.1007/978-3-030-41686-7_2

Bailey, K., Morales, N. & Newberry, M. Inclusive conservation requires amplifying experiences of diverse scientists. Nat Ecol Evol 4, 1294–1295 (2020). https://doi.org/10.1038/s41559-020-01313-y

Bardsley, D. K., Palazzo, E., & Stringer, R. (2019). What should we conserve? Farmer narratives on biodiversity values in the McLaren Vale, South Australia. Land Use Policy, 83, 594-605. https://doi.org/10.1016/j.landusepol.2019.02.036

Barlagne, C., Melnykovych, M., Miller, D., Hewitt, R. J., Secco, L., Pisani, E., & Nijnik, M. (2021). What are the impacts of social innovation? A synthetic review and case study of community forestry in the Scottish Highlands. Sustainability, 13(8), 4359. https://doi.org/10.3390/su13084359

Barthes, R., & Duisit, L. (1975). An Introduction to the Structural Analysis of Narrative. New Literary History, 6(2), 237–272. https://doi.org/10.2307/468419

Bavin, D., & MacPherson, J. (2022). The Lynx to Scotland Project: assessing the social feasibility of potential Eurasian lynx reintroduction to Scotland.

Bone, J. (2018). Rediscovering the 'Noble Savage': The Rewilding Movement and the Re-Enchantment of the Scottish Highlands. Scottish Affairs, 27(4), 465-485.

Botanical Society of Britain & Ireland. (n.d.) *Betula nana L*. https://bsbi.org/wp-content/uploads/dlm_uploads/Betula_nana_species_account.pdf. Accessed: 17 February 2023.

Biermann, C., & Anderson, R. M. (2017). Conservation, biopolitics, and the governance of life and death. *Geography Compass*, 11(10), e12329.

Brockington, D. (2002). Fortress conservation: the preservation of the Mkomazi Game Reserve, Tanzania. Indiana University Press.

Byg, A., Martin-Ortega, J., Glenk, K., Novo-Nunez, P. (2017). Conservation in the face of ambivalent public perceptions, The case of peatlands as 'the good, the bad and the ugly', Biological Conservation, 206, 181-189. http://dx.doi.org/10.1016/j.biocon.2016.12.022

Cairngorms National Park Authority. (2018). Cairngorms National Park Forest Strategy 2018 Retrieved from https://cairngorms.co.uk/working-together/publications/publication/464/

Cairngorms National Park Authority. (2019). Cairngorms Nature Action Plan 2019-2024 Retrieved from https://cairngorms.co.uk/working-together/publications/publication/466/

Cairngorms National Park Authority. (2021). Cairngorms National Park Local Development Plan 2021 Retrieved from https://cairngorms.co.uk/wp-content/uploads/2021/03/CNPA-LDP-2021_100dpi.pdf

Cairngorms National Park Authority. (2022). Cairngorms National Park partnership plan 2022-27 Retrieved from https://cairngorms.co.uk/wp-content/uploads/2022/08/CNPPP_V12_Low_Res_Web.pdf

Cajete G.A. (2020) Indigenous science, climate change, and indigenous community building: A framework of foundational perspectives for indigenous community resilience and revitalization. *Sustainability* 12(22): 9569, https://doi.org/10.3390/su12229569

Clandinin, D., & Caine, V. (2008). Narrative Inquiry. In Lisa M. Given (Ed.), The Sage Encyclopedia of Qualitative Research Methods. (pp. 542-545). Thousand Oaks, CA: SAGE Publications, Inc. doi: http://dx.doi.org/10.4135/9781412963909.n275

Congretel, M., & Pinton, F. (2020). Local knowledge, know-how and knowledge mobilized in a globalized world: A new approach of indigenous local ecological knowledge. People and Nature, 2, 527–543. https://doi.org/10.1002/pan3.10142

Coutinho-Sledge, P. (2015). Feminized forestry: The promises and pitfalls of change in a masculine organization. Gender, Work & Organization, 22(4), 375-389.

Cronon, W. (1995). The trouble with wilderness; Or, getting back to the wrong nature. In Uncommon ground: Rethinking the human place in nature, edited by W. Cronon, 69–90. New York, NY: W. W. Norton & Co.

Dalby, S., & Mackenzie, F. (1997). Reconceptualising local community: environment, identity and threat. Area, 29(2), 99-108. https://doi.org/10.1111/j.1475-4762.1997.tb00012.x

Dillon, S., & Craig, C. (2022). Storylistening: How narrative evidence can improve public reasoning about climate change. WIREs Climate Change, e812. https://doi.org/10.1002/wcc.812

Dolton-Thornton, N. (2021). Rewilding and repeopling in Scotland: Large-scale land managers' perspectives and practices. Journal of Rural Studies, 86, 36-45. https://doi.org/10.1016/j.jrurstud.2021.05.010

Dotson, T., & Pereira, H. M. (2022). From antagonistic conservation to biodiversity democracy in rewilding. One Earth, 5(5), 466-469. https://doi.org/10.1016/j.oneear.2022.04.014

Drew J.A. (2005) Use of traditional ecological knowledge in marine conservation. *Conservation Biology* 19(4): 1286–1293.

Ducarme, F., Flipo, F., & Couvet, D. (2020). How the diversity of human concepts of nature affects conservation of biodiversity. Conservation Biology, 35, 1019 - 1028.

Faith, D. P. (2021). A Singular Concept of Biodiversity Remains the Best Way to Address the Plural Values of Nature in Conservation Planning. Conservation, 1(4), 342-349.

Ferguson, R., Gever, M., Minh-Ha, T. T., & West, C. (Eds.). (1992). Out there: Marginalization and contemporary culture. MIT Press.

Forbes P (2006) What is a whole community? A letter to those who care for and restore the land. Available at: https://peterforbes.org/writing/what-whole-community [accessed 11 Nov 2022]

Forestry Commission. (2009). The Scottish Government's rationale for woodland expansion Retrieved from https://forestry.gov.scot/images/corporate/pdf/ForestExpansion.pdf

Freeman, B. (2019) Promoting global health and well-being of Indigenous youth through the connection of land and culture-based activism, Global Health Promotion 26(3_suppl):17-25, DOI: 10.1177/1757975919831253

Gandy, S., & Watts, R. (2021). Potential psychological benefits of nature enrichment through the reintroduction of the Eurasian beaver (Castor fiber) to Britain: A narrative literature review. European Journal of Ecopsychology, 7, 41-74.

García-Dory, F., Houzer, E., & Scoones, I. (2021). Livestock and climate justice: Challenging mainstream policy narratives. 10.19088/1968-2021.128

Garnett, S. T., Burgess, N. D., Fa, J. E., Fernández-Llamazares, Á., Molnár, Z., Robinson, C. J., ... & Leiper, I. (2018). A spatial overview of the global importance of Indigenous lands for conservation. Nature Sustainability, 1(7), 369-374.

Gavin, M. C., McCarter, J., Berkes, F., Mead, A. T. P., Sterling, E. J., Tang, R., & Turner, N. J. (2018). Effective biodiversity conservation requires dynamic, pluralistic, partnership-based approaches. Sustainability, 10(6), 1846.

Gillette, M.B., Singleton, B.E. Inevitable epistemological conflict: Reflections on a disagreement over the relationship between science and indigenous and local knowledge. Ambio 51, 1904–1905 (2022). https://doi.org/10.1007/s13280-022-01739-7

Ginsburg, F. (2008). Rethinking the digital age. In The media and social theory (pp. 141-158). Routledge.

Ginn, F. (2008). Extension, subversion, containment: eco-nationalism and (post) colonial nature in Aotearoa New Zealand. Transactions of the Institute of British Geographers, 33(3), 335-353.

Ginn, F., & Connor, K. (2022). Vegetal HydroPoetics: an arts-based practice for plant studies. Cultural Geographies, 0(0). https://doi.org/10.1177/14744740221135013

Ginn, F., Beisel, U., & Barua, M. (2014). Flourishing with awkward creatures: Togetherness, vulnerability, killing. Environmental Humanities, 4(1), 113-123.

Goeminne, G. (2011). Once upon a time I was a nuclear physicist. What the politics of sustainability can learn from the nuclear laboratory. Perspectives on Science, 19(1), 1-31.

Gorzelak, M. A., Asay, A. K., Pickles, B. J., & Simard, S. W. (2015). Inter-plant communication through mycorrhizal networks mediates complex adaptive behaviour in plant communities. AoB plants, 7.

Gould, R.K., Adams, A.B., & Vivanco, L.A. (2020a). Looking into the dragons of cultural ecosystem services. Ecosystems and People, 16, 257 - 272.

Gould, R. K., Bremer, L. L., Pascua, P. A., & Meza-Prado, K. (2020b). Frontiers in cultural ecosystem services: toward greater equity and justice in ecosystem services research and practice. BioScience, 70(12), 1093-1107, https://doi.org/10.1093/biosci/biaa112

Haraway, D. (1991) Simians, Cyborgs and Women. New York: Routledge.

Haraway, D. (2008) When Species Meet, University of Minnesota Press, Minneapolis and London.

Haraway, D.J. (2016) Staying with the Trouble. Making Kin in the Chthulucene. Durham, NC: Duke University Press.

Harris, L. M. (2022). Towards enriched narrative political ecologies. Environment and Planning E: Nature and space, 5(2), 835-860. DOI: 10.1177/25148486211010677

Hausner VH, Engen S, Brattland C, et al. (2020) Sámi knowledge and ecosystem-based adaptation strategies for managing pastures under threat from multiple land uses. *Journal of Applied Ecology* 57(9): 1656–1665.

Heatherington, T. (2012) Remodeling the Fortress of Conservation? Living Landscapes and the New Technologies of Environmental Governance, Anthropological Forum, 22:2, 165-185, DOI: 10.1080/00664677.2012.694172

Hill R., Adem Alangui W.V., et al. (2020) Working with indigenous, local and scientific knowledge in assessments of nature and nature's linkages with people. *Current Opinion in Environmental Sustainability* 43: 8–20. https://doi.org/10.1016/j.cosust.2019.12.006

Hilson, C. (2022). The role of narrative in environmental law: the nature of tales and tales of nature. Journal of Environmental Law, 34(1), 1-24. https://doi.org/10.1093/jel/eqab043

Hosen N, Nakamura H, Hamzah A (2020) Adaptation to climate change: Does traditional ecological knowledge hold the key? *Sustainability* 12(2): 676.

Howitt, R., & Suchet-Pearson, S. (2006). Rethinking the building blocks: Ontological pluralism and the idea of 'management'. *Geografiska Annaler: Series B, Human Geography*, 88(3), 323– 335.

Hunter, N., North, M., & Slotow, R. (2021). The marginalisation of voice in the fight against climate change: The case of Lusophone Africa. Environmental Science & Policy, 120, 213-221. https://doi.org/10.1016/j.envsci.2021.03.012

IPBES (2019): Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. 1148 pages. https://doi.org/10.5281/zenodo.3831673 [accessed 13.11.22]

IPBES (2019): Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S. Díaz, J. Settele, E. S. Brondízio, H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razzaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.). IPBES secretariat, Bonn, Germany. 56 pages. https://doi.org/10.5281/zenodo.3553579 [accessed 13.11.22]

Ivaşcu CM, Biro A (2020) Coexistence through the ages: The role of native livestock guardian dogs and traditional ecological knowledge as key resources in conflict mitigation between pastoralists and large carnivores in the Romanian Carpathians. *Journal of Ethnobiology* 40(4): 465–482.

Jamieson, A. J., Singleman, G., Linley, T. D., & Casey, S. (2021). Fear and loathing of the deep ocean: why don't people care about the deep sea?. *ICES Journal of Marine Science,* 78(3), 797-809

Johnson JT, Howitt R, Cajete G, et al. (2016) Weaving indigenous and sustainability sciences to diversify our methods. *Sustainability Science* 11(1): 1–11.

Jolly, H., Satterfield, T., Kandlikar, M., & Tr, S. (2022). Indigenous insights on human-wildlife coexistence in southern India. Conservation biology : the journal of the Society for Conservation Biology, e13981.

Jones, P. J. (2009). Equity, justice and power issues raised by no-take marine protected area proposals. Marine Policy, 33(5), 759-765. https://doi.org/10.1016/j.marpol.2009.02.009

Jones, O., & Denning, L. (2018). Views over the Sound: imagining (Northern) isles as grounds for alternative narratives of becoming non-modern. In Visual Culture in the Northern British Archipelago (pp. 169-188). Routledge.

Jones, O., Rigby, K., & Williams, L. (2020). Everyday Ecocide, Toxic Dwelling, and the Inability to Mourn: A Response to Geographies of Extinction. Environmental Humanities, 12(1), 388-405. https://doi.org/10.1215/22011919-8142418

Kerley, G.I.H., Kowalczyk, R. and Cromsigt, J.P.G.M. (2012), Conservation implications of the refugee species concept and the European bison: king of the forest or refugee in a marginal habitat?. Ecography, 35: 519-529. https://doi.org/10.1111/j.1600-0587.2011.07146.x

Kimmerer, R. W. (2003). Gathering Moss: A Natural and Cultural History of Mosses. Penguin

Kimmerer, R. W. (2013). Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants. Minneapolis: Milkweed. [mine Penguin version?]

King, T. (2003). The truth about stories: A native narrative. House of Anansi.

Kourantidou M, Hoover C, Bailey M (2020) Conceptualizing indicators as boundary objects in integrating inuit knowledge and western science for marine resource management. *Arctic Science* 6(3): 279–306.

Kuuliala, V, A. (2017). Wild at Sea: The wilderness concept in Scottish and EU environmental and marine conservation, and its interpretations by stakeholders. University of Kent (United Kingdom).

Latulippe, N & Klenk, N (2020) Making room and moving over: knowledge co-production, Indigenous knowledge sovereignty and the politics of global environmental change decision-making, Current Opinion in Environmental Sustainability, Volume 42, Pages 7-14, https://doi.org/10.1016/j.cosust.2019.10.010.

Lidström, L., West, S., Katzschner, T., Pérez-Ramos, M. I., Twidle, H. (2016). Invasive Narratives and the Inverse of Slow Violence: Alien Species in Science and Society. *Environmental Humanities*; 7 (1): 1–40. doi: https://doi.org/10.1215/22011919-3616317

Lopez-Maldonado, Y. 2022. Practice what you preach: Ensuring scientific spheres integrate Indigenous Peoples' and Local Communities' rights and agency too. Ambio 51: 811–812. https://doi.org/10.1007/s13280-021-01663-2

Lorimer, J. (2008). Counting corncrakes: The affective science of the UK corncrake census. Social studies of science, 38(3), 377-405.

Lorimer, J. (2017). Parasites, ghosts and mutualists: a relational geography of microbes for global health. Transactions of the Institute of British Geographers, 42(4), 544-558.

Lorimer, J. (2020). The probiotic planet: using life to manage life (Vol. 59). U of Minnesota Press.

Lorimer, J., & Davies, G. (2010). When species meet. Environment and Planning D: Society and Space, 28(1), 32-33.

Louder, E., & Wyborn, C. (2020). Biodiversity narratives: Stories of the evolving conservation landscape. Environmental Conservation, 47(4), 251-259. 10.1017/S0376892920000387

Lövbrand, E., Beck, S., Chilvers, J., Forsyth, T., Hedrén, J., Hulme, M., ... & Vasileiadou, E. (2015). Who speaks for the future of Earth? How critical social science can extend the conversation on the Anthropocene. Global Environmental Change, 32, 211-218. https://doi.org/10.1016/j.gloenvcha.2015.03.012

Mackenzie, A. (2021). Experience Distributed in the Biodiversity Science-Base. *Science & Technology Studies*.

MacIsaac, F. & Davidson, M. (2022) A sense of belonging, Resurgence & Ecologist, Vol.330, 36-37.

Maclean, R. (MacIlleathain, Ruairidh). 2021. Ecosystem Services and Gaelic: a Scoping Exercise. NatureScot Research Report No. 1230.

MacPhail, I. (2002). Land, crofting and the Assynt Crofters Trust: a post-colonial geography? (Doctoral dissertation, University of Wales Lampeter).

Macpherson, D. (2014). The Roots of the People: an Investigation of the Influence of Community Landownership in Scotland on Environmental Narratives. http://hdl.handle.net/1842/10389

Maderson, S. (2023). There's More Than One Way To Know A Bee: Beekeepers' environmental knowledge, and its potential role in governing for sustainability. Geoforum, 139, 103690.

Makey, L., Parsons, M., Fisher, K., Te Huna, A., Henare, M., Miru, V., ... & Miru, M. (2022). (Un) Heard Voices of Ecosystem Degradation: Stories from the Nexus of Settler-Colonialism and Slow Violence?. Sustainability, 14(22), 14672.

Mazzocchi, F. (2020). A deeper meaning of sustainability: Insights from indigenous knowledge. The Anthropocene Review, 7(1), 77–93. https://doi.org/10.1177/2053019619898888

McFadyen, M., & Sandilands, R. (2021). On 'Cultural Darning and Mending': Creative responses to ceist an fhearainn/the land question in the Gàidhealtachd. *Scottish Affairs*, 30(2), 157-177.

McLauchlan, L. (2019). A multispecies collective planting trees: Tending to life and making meaning outside of the conservation heroic. *Cultural Studies Review*, 25(1), 135-153, http://dx.doi.org/10.5130/csr.v24i1.6415

Molnár Z, Babai D (2021) Inviting ecologists to delve deeper into traditional ecological knowledge. *Trends in Ecology & Evolution* 36(8): 679–690. https://doi.org/10.1016/j.tree.2021.04.006

Moola, F., & Roth, R. (2018). Moving beyond colonial conservation models: Indigenous protected and conserved areas offer hope for biodiversity and advancing reconciliation in the Canadian boreal forest. *Environmental Values*, 27, 200– 201.

Myers, N. (2017). Ungrid-able ecologies: decolonizing the ecological sensorium in a 10,000 year-old natural cultural happening. Catalyst: Feminism, Theory, Technoscience, 3(2), 1-24. https://dx.doi.org/10.28968/cftt.v3i2.28848

Nadasdy P (1999) The politics of TEK: Power and the "Integration" of knowledge. *Arctic Anthropology* 36(1/2): 1–18.

Nadasdy P (2005) The anti-politics of TEK: The institutionalization of co-management discourse and practice. *Anthropologica* 47(2): 215–232.

Nadasdy P (2011) "We don't harvest animals; we kill them" agricultural metaphors and the politics of wildlife management in the Yukon. In: Goldman MJ, Nadasdy P, Turner MD (eds) Knowing Nature: Conversations at the Intersection of Political Ecology and Science Studies. Chicago, Illinois: University of Chicago Press, pp.135–151.

Nagar, R. (2013). Storytelling and co-authorship in feminist alliance work: reflections from a journey. Gender, Place & Culture, 20(1), 1-18.

Nature Conservation (Scotland) Act (2004), asp 6. Retrieved from https://www.legislation.gov.uk/asp/2004/6/contents Access date: 8 November 2022

NatureScot. (2020a). 30x30 themed workshops. https://www.nature.scot/doc/30x30-themed-workshops

NatureScot. (2020b). 30 by 30 and Nature Networks. Retrieved from https://www.nature.scot/professional-advice/protected-areas-and-species/30-30-and-nature-networks.

NatureScot. (2020c). Scotland's Biodiversity Strategy Consultation. Retrieved from https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy-and-cop15/scotlands-biodiversity-strategy-2022-2045#:~:text=Scotland%27s%20Biodiversity%20Strategy%20Consultation,and%20reverse%20it%20by%202045.

O'Donoghue, R., Sandoval-Rivera, J. C. A., & Payyappallimana, U. (2019). Landscape, memory and learning to change in changing worlds: Contemplating intergenerational learning and traditional knowledge practices within social-ecological landscapes of change. *Southern African Journal of Environmental Education*, *35*.

O'Brien KL: Climate change and social transformations: is it time for a quantum leap? Wiley Interdisc Rev Clim Change 2016, 7:618-626

Ojeda, J., Anne K Salomon, James K Rowe, Natalie C Ban, Reciprocal Contributions between People and Nature: A Conceptual Intervention, BioScience, Volume 72, Issue 10, October 2022, Pages 952–962, https://doi.org/10.1093/biosci/biac053

Pascual, U., Adams, W.M., Díaz, S. et al. (2021) Biodiversity and the challenge of pluralism. Nat Sustain 4, 567–572 (2021). https://doi.org/10.1038/s41893-021-00694-7

Petrokas, R., Ibanga, D. A., & Manton, M. (2022). Deep Ecology, Biodiversity and Assisted Natural Regeneration of European Hemiboreal Forests. Diversity, 14(10), 892.

Pomeroy, A. (2022). Reframing the rural experience in Aotearoa New Zealand: Incorporating the voices of the marginalised. Journal of Sociology, 58(2), 236-252.

Puig de la Bellacasa, M. (2017). Matters of care: Speculative ethics in more than human worlds, U of Minnesota Press.

Rankin, P., Hansteen-Izora, R., & Packer, L. (2007). Living Cultural Storybases: Selfempowering narratives for minority cultures. *Aen journal*, *2*(1).

Reinecke, S., & Blum, M. (2018). Discourses across scales on forest landscape restoration. Sustainability, 10(3), 613. https://doi.org/10.3390/su10030613

Rohde, R. (2004). Ideology, bureaucracy and aesthetics: landscape change and land reform in Northwest Scotland. Environmental Values, 13(2), 199-221. https://doi.org/10.3197/0963271041159840

Roe, D., Seddon, N., & Elliott, J. (2019). Biodiversity loss is a development issue. *International Institute for Environment and Development. Available at: https://pubs. iied. org/pdfs/17636IIED. pdf (accessed 12 February 2021)*.

Rupprecht, C.D., Vervoort, J., Berthelsen, C., Mangnus, A.C., Osborne, N., Thompson, K., Urushima, A.Y., Kóvskaya, M., Spiegelberg, M., Cristiano, S., Springett, J., Marschuetz,

B., Flies, E.J., McGreevy, S.R., Droz, L., Breed, M.F., Gan, J., Shinkai, R., & Kawai, A. (2020). Multispecies sustainability. Global Sustainability, 3.

Russell, J. (2020). Telling better stories: Toward critical, place-based, and multispecies narrative pedagogies in hunting and fishing cultures. The Journal of Environmental Education, 51(3), 232-245.

Ruwhiu, D., Arahanga-Doyle, H., Donaldson-Gush, R., Bragg, C., & Kapa, J. (2021). Enhancing the sustainability science agenda through Indigenous methodology. Sustainability Science, 17, 403 - 414.

Sato, A. Y., Price, M. R., & Vaughan, M. B. (2018). Kāhuli: uncovering indigenous ecological knowledge to conserve endangered Hawaiian land snails. Society & Natural Resources, 31(3), 320-334.

Satterthwaite EV, Komyakova V, Erazo NG, Gammage L, Juma GA, Kelly R, et al. (2022) Five actionable pillars to engage the next generation of leaders in the co-design of transformative ocean solutions. PLoS Biol 20(10): e3001832. https://doi.org/10.1371/journal.pbio.3001832

Schott S, Qitsualik J, Van Coeverden de, Groot P, et al. (2020) Operationalizing knowledge coevolution: Towards a sustainable fishery for Nunavummiut. *Arctic Science* 6(3): 208–228.

Schulte to Bühne, H., Pettorelli, N. & Hoffmann, M. The policy consequences of defining rewilding. Ambio 51, 93–102 (2022). https://doi.org/10.1007/s13280-021-01560-8

Scottish Environment Protection Agency. (2015). SEPA position statement on biodiversity Retrieved from https://www.sepa.org.uk/media/142680/sepa_position_statement_on_biodiversity_2015.pdf

Scottish Executive. (2006). The Scottish Forestry Strategy Retrieved from http://extwprlegs1.fao.org/docs/pdf/gbr148198.pdf

Scottish Government. (2004). Scotland's Biodiversity. It's in your hands. Retrieved from https://www.gov.scot/publications/scotlands-biodiversity---its-in-your-hands/

Scottish Government. (2013). 2020 Challenge for Scotland's Biodiversity Retrieved from https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2013/06/2020-challenge-scotlands-biodiversity-strategy-conservation-enhancement-biodiversity-scotland/documents/00425276-pdf/00425276-pdf/govscot%3Adocument/00425276.pdf?forceDownload=true

Scottish Government (2019) Scotland 2045: Our Fourth National Planning Framework - Draft. ISBN: 978-1-80201-244-6.

Scottish Government. (2019a). Scotland's Forestry Strategy 2019-2029. Retrieved from https://www.gov.scot/publications/scotlands-forestry-strategy-20192029/documents/

Scottish Government. (2019b). Scotland 2045. Our fourth national planning framework. Draft Retrieved from https://www.gov.scot/binaries/content/documents/govscot/publications/consultation-paper/2021/11/scotland-2045-fourth-national-planning-framework-draft/documents/scotland-2045-fourth-national-planning-framework/scotland-2045-

fourth-national-planning-framework/govscot%3Adocument/scotland-2045-fourth-national-planning-framework.pdf

Scottish Government. (2020a). The environment strategy for Scotland: vision and outcomes Retrieved from https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2020/02/environment-strategy-scotland-vision-outcomes/documents/environment-strategy-scotland-vision-outcomes/environment-strategy-scotland-vision-outcomes/govscot%3Adocument/environment-strategy-scotland-vision-outcomes.pdf

Scottish Government (2021) Scotland's Third Land Use Strategy 2021-2026: Getting the best from our land. ISBN: 978-1-80004-857-7. Retrieved from https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2021/03/scotlands-third-land-use-strategy-2021-2026-getting-best-land/documents/scotlands-third-land-use-strategy-2021-2026-getting-best-land/scotlands-third-land-use-strategy-2021-2026-getting-best-land/govscot%3Adocument/scotlands-third-land-use-strategy-2021-2026-getting-best-land.pdf

Scottish Government. (2022a). Land Reform in a Net Zero Nation. Consultation paper. Retrieved from https://www.gov.scot/binaries/content/documents/govscot/publications/consultation-paper/2022/07/land-reform-net-zero-nation-consultation-paper/documents/land-reform-net-zero-nation-consultation-paper/land-reform-net-zero-nation-consultation-paper/govscot%3Adocument/land-reform-net-zero-nation-consultation-paper.pdf

Scottish Government. (2022b). Scotland's Biodiversity Strategy. A consultation. Retrieved from https://www.gov.scot/publications/scotlands-biodiversity-strategy-consultation/documents/

Scottish Government. (2022c). Scottish biodiversity Strategy to 2045. Tackling the Nature Emergency in Scotland. Retrieved from scottish-biodiversity-strategy-2045-tackling-nature-emergency-scotland.pdf (www.gov.scot).

Shackeroff JM, Campbell LM (2007) Traditional ecological knowledge in conservation research: Problems and prospects for their constructive engagement. *Conservation and Society* 5(3): 343–360.

Shelley-Egan, C., & Dratwa, J. (2019). Marginalisation, ebola and health for all: From outbreak to lessons learned. International Journal of Environmental Research and Public Health, 16(17), 3023. https://doi.org/10.3390/ijerph16173023

Sidorova, E. (2020). The incorporation of Traditional Ecological Knowledge in the Arctic Council: Lip service? *Polar Record* 56(e28): 1–12. doi:10.1017/S0032247420000273

Simard, S. (2021). Finding the Mother Tree: Uncovering the Wisdom and Intelligence of the Forest. United Kingdom: Penguin Books Limited.

Singh, N. M. (2018). Introduction: Affective ecologies and conservation. Conservation and Society, 16(1), 1-7.

Stelling, F., Allan, C., & Thwaites, R. (2017). Nature strikes back or nature heals? Can perceptions of regrowth in a post-agricultural landscape in South-eastern Australia be used in management interventions for biodiversity outcomes? Landscape and Urban

Planning, 158, 202-210. Retrieved from https://www.sciencedirect.com/science/article/pii/S0169204616301682

Suchet S (2002) 'Totally Wild'? Colonising discourses, indigenous knowledges and managing wildlife, Australian Geographer, 33:2, 141-157, DOI: 10.1080/00049180220150972

Takala, T., Hujala, T., Tanskanen, M., & Tikkanen, J. (2019). Competing discourses of the forest shape forest owners' ideas about nature and biodiversity conservation. Biodiversity and Conservation, 28(13), 3445-3464. Retrieved from https://link.springer.com/article/10.1007/s10531-019-01831-7

Tengö, M., Austin, B.J., Danielsen, F., & Fernández-Llamazares, Á. (2021). Creating Synergies between Citizen Science and Indigenous and Local Knowledge. Bioscience, 71, 503 - 518.

The Scottish Government. (2016). Getting the best from our land. A land use strategy for Scotland 2016-2021. Retrieved from https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2016/03/getting-best-land-land-use-strategy-scotland-2016-2021/documents/00497086-pdf/00497086-pdf/govscot%3Adocument/00497086.pdf

Thekaekara, T., Bhagwat, S.A., & Thornton, T.F. (2021). Coexistence and Culture: Understanding Human Diversity and Tolerance in Human-Elephant Interactions. Frontiers in Conservation Science.

Todd, Z. (2016) An Indigenous Feminist's Take On The Ontological Turn: 'Ontology' Is Just Another Word For Colonialism, Journal of Historical Sociology 29(1):4-22, DOI: 10.1111/johs.12124

Topa, W., & Narvaez, D. (2022). Restoring the kinship worldview: Indigenous voices introduce 28 precepts for rebalancing life on planet earth. North Atlantic Books.

Turnhout E, et al. (2021) Enabling transformative economic change in the post-2020 biodiversity agenda. Conserv. Lett. e12805. https://doi.org/10.1111/conl.12805

Van Der Leeuw, S. (2020). The role of narratives in human-environmental relations: an essay on elaborating win-win solutions to climate change and sustainability. Climatic Change, 160(4), 509-519.

Veland, S. (2017). Transcending ontological schisms in relationships with earth, water, air, and ice. Weather, climate, and society, 9(3), 607-619.

Veland, S., Scoville-Simonds, M., Gram-Hanssen, I., Schorre, A. K., El Khoury, A., Nordbø, M. J., Lynch, AH, Hochachka, G. & Bjørkan, M. (2018). Narrative matters for sustainability: the transformative role of storytelling in realizing 1.5 C futures. Current Opinion in Environmental Sustainability, 31, 41-47.

Vercher, N., Barlagne, C., Hewitt, R., Nijnik, M., & Esparcia, J. (2021). Whose Narrative is it Anyway? Narratives of Social Innovation in Rural Areas–A Comparative Analysis of Community-Led Initiatives in Scotland and Spain. Sociologia Ruralis, 61(1), 163-189. Retrieved from https://onlinelibrary.wiley.com/doi/abs/10.1111/soru.12321

Vlachos, A., & Gaynor, A. (2021). The oldest new woodland on earth: Recognising, mapping, naming and narrating the Great Western Woodlands. International review of environmental history, 7(2), 125-144. Retrieved from https://search.informit.org/doi/abs/10.3316/informit.190628261378962

Wang, Z., Zeng, J., Meng, W., Lohman, D. J., & Pierce, N. E. (2021). Out of sight, out of mind: public and research interest in insects is negatively correlated with their conservation status. Insect Conservation and Diversity, 14(5), 700-708.

Watts, S. H., Mardon, D. K., Mercer, C., Watson, D., Cole, H., Shaw, R. F., & Jump, A. S. (2022). Riding the elevator to extinction: Disjunct arctic-alpine plants of open habitats decline as their more competitive neighbours expand. Biological Conservation, 272, 109620. https://doi.org/10.1016/j.biocon.2022.109620

Watts, S. H., & Jump, A. S. (2022). The benefits of mountain woodland restoration. Restoration Ecology, e13701. / Watts, S.H. and Jump, A.S. (2022), The benefits of mountain woodland restoration. Restor Ecol, 30: e13701. https://doi.org/10.1111/rec.13701

Weldemichel, T. G. (2020). Othering pastoralists, state violence, and the remaking of boundaries in Tanzania's militarised wildlife conservation sector. Antipode, 52(5), 1496-1518. Retrieved from https://onlinelibrary.wiley.com/doi/full/10.1111/anti.12638

West, P., J. Igoe and D. Brockington. 2006. Parks and peoples: The social impact of protected areas. Annual Review of Anthropology 35: 251–77.

Wheeler HC, Danielsen F, Fidel M, et al. (2020) The need for transformative changes in the use of indigenous knowledge along with science for environmental decision-making in the Arctic. *People and Nature* 2(3): 544–556.

Wong, G. Y., Holm, M., Pietarinen, N., Ville, A., & Brockhaus, M. (2022). The making of resource frontier spaces in the Congo Basin and Southeast Asia: A critical analysis of narratives, actors and drivers in the scientific literature. World Development Perspectives, 27, 100451. Retrieved from https://www.sciencedirect.com/science/article/pii/S2452292922000595

Woodward, W., & Lemmer, E. (2019). Introduction: Critical Plant Studies. Journal of Literary Studies, 35(4), 23-27.

Wyborn, C. et al. (2020). An agenda for research and action towards diverse and just futures for life on Earth. Conserv. Biol. https://doi.org/10.1111/cobi.13671

Wyborn, C., Montana, J., Kalas, N., Clement, S., Davila, F., Knowles, N., . . . Christel, L. (2021). An agenda for research and action toward diverse and just futures for life on Earth. Conservation Biology, 35(4), 1086-1097. doi.org/10.1111/cobi.13671

Zeiss, R., Eisenhauer, N., Orgiazzi, A., Rillig, M., Buscot, F., Jones, A., ... & Guerra, C. A. (2022). Challenges of and opportunities for protecting European soil biodiversity. *Conservation Biology*, *36*(5), e13930.