A grounded theory of change for rewilding

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This whole world is wild at heart and weird on top.

—David Lynch (Wild at Heart, 1990)

Abstract

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Various theories and approaches to rewilding have been developed in response to contextual influences and drivers. Widespread recognition of the concept has necessitated attempts to consolidate rewilding theory and practice. However, there remain inconsistencies among conceptualisations of rewilding and tensions exist between clarifying rewilding and reflecting its multivalence and complexity. The research documented in this thesis was designed in this context and aims to deconstruct the concept of rewilding using an adapted constructivist grounded theory approach; to examine the influences on the emergence and evolution of rewilding concepts; to identify sources of conflict and areas of common ground; and to (re)construct the concept of rewilding using a theory of change framework. After an initial empirical chapter describing this evolution of rewilding based on the data, the remaining empirical chapters consider rewilding in relation to change: why change is needed, what change is intended, and how change is implemented. Several emergent theories related to change are proposed: a theory of dewilding and related causes and effects; a theory of rewilding's social-ecological aims; a revised rewilding continuum encompassing ecological and socio-cultural change; rewilding principles to inform application and a list of interventions used in rewilding, suggesting how these can contribute to rewilding aims. Finally, two proposed theories of change for rewilding are proposed, one intended to guide international policy and the other to guide those driving rewilding application to create project specific theories of change. These theories are outlined and implications for rewilding are highlighted.

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Author's declaration page

I declare that this thesis is my own work and has not been submitted by me in substantially the same form for the award of a higher degree elsewhere. Any sections of this thesis which have been published elsewhere are clearly identified.

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Chapter 1: Introduction and literature review

1.1. Introduction

Since the emergence of rewilding concepts, projects and theories have proliferated around the world (Johns, 2019). It has been variously described as a practical, science-based method to restore functioning ecosystems and reduce conservation management at a landscape scale (Soule' and Noss, 1998), and also as a movement for transformational change with the potential to restore human-nature relationships and kerb the effects of the Anthropocene (Carver *et al.*, 2021). Rewilding theories and practices continue to evolve (Pettorelli, Durant and du Toit, 2019b; Martin *et al.*, 2021) and interventions used in rewilding can vary, influenced by the context and preferences of those driving rewilding projects (Holmes *et al.*, 2020; Carver *et al.*, 2021). Due to the diverse approaches to rewilding, the concept has come under criticism for lacking meaning and clarity (Jorgensen, 2015; Hayward *et al.*, 2019). Responses to these criticisms have broadly attempted to find consensus among rewilding concepts, for example focusing on the aim of non-human autonomy (Prior and Ward, 2016), rewilding principles (Carver *et al.*, 2021), or classifying different types of rewilding (Pettorelli *et al.*, 2018). However, there remain inconsistencies among conceptualisations of rewilding, with concerns that a lack of clarity is a barrier to application and can lead to misinterpretation that can dampen the transformative potential of rewilding (Wynne-Jones *et al.*, 2020) and its complex, transdisciplinary[1] nature (Carver *et al.*, 2021). There is, therefore, consensus that critical reflection on rewilding conceptualisations is required to find common ground to support collaboration, cement its reputation, and harness its momentum (Carver *et al.*, 2021) while maintaining its multivalence and adaptability to different contexts (Deary and Warren, 2017; Gammon, 2018).

In 2017 the IUCN Commission for Ecosystem Management commissioned a Rewilding Task Force [now the Rewilding Thematic Group (RTG)] to synthesise and streamline the concept of rewilding. Between 2017 and 2020 the RTG undertook an international consultation of rewilding and restoration experts, collecting data through various means, which culminated

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[1]Transdisciplinary approaches integrate knowledge and methods from multiple disciplines to address complex problems (Mauser *et al.*, 2013).

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in the publication of a rewilding definition and ten guiding principles for rewilding (Carver *et al.*, 2021). The RTG continues to work towards synthesising rewilding and developing rewilding guidelines that are applicable in different contexts.

1.2. Research questions and aims

The research documented in this thesis was designed to inform the work of the RTG. Given the context of expanding interest and interdisciplinary engagement with the rewilding concept, I identified a need to study the concept of rewilding broadly and holistically. The initial research question for this study was therefore intentionally broad: **What is rewilding?** While broad, this question addresses how the concept of rewilding is constructed and acknowledges various elements influencing those constructions, e.g., context, subjectivities, how rewilding is applied or promoted, and its theoretical underpinnings. During the research, it became apparent that the emergent theories aligned with a theory of change (ToC) model and therefore a second question arose around whether a ToC could be constructed for rewilding that could highlight common ground among rewilding concepts while allowing for plurality.

To address these questions, the research aims to:

1. Deconstruct the concept of rewilding using a constructivist grounded theory approach, providing a broad representation of rewilding considering context (why), application (how), and goals/impact (what) based on the elements of a ToC framework (section 2.2.5).
2. Use these findings to identify areas of divergence or pluralism and areas of common ground in different conceptualisations of rewilding.
3. (Re)construct the concept of rewilding using a ToC framework, particularly attentive to the plurality of rewilding theory and practice.

These aims address calls made in the literature—discussed further in the literature review in this chapter—to find consensus among different conceptualisations of rewilding, to address ongoing tensions and promote collaboration and a shared vision. While there is a need to find consensus, it is also highlighted rewilding definitions or frameworks should represent the plurality of rewilding and should be adaptable to different social-ecological conditions.

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The research examines the emergence and evolution of rewilding concepts over time. After an initial empirical chapter describing this evolution based on the data, the remaining empirical chapters consider rewilding in relation to change: why change is needed, what change is intended, and how change is implemented. This broad overview provides a basis to highlight common ground and identify the roots of ongoing debate and conflict among rewilding theorists and practitioners. The thesis concludes with a proposed ToC for rewilding, discussing its potential to reflect plurality and common ground in rewilding and highlighting areas for further research. The remainder of this chapter outlines the structure of the PhD thesis and presents a literature review which provides further context and justification for this study.

1.3. Thesis structure

Chapter 1: Introduction and literature review presents the research questions and aims. A literature review examines the context of this study, initially considering the history and politics of the wider conservation movement, before presenting a history and current trends in rewilding. The concluding section situates this research based on the literature review.

Chapter 2: Methodology and research design describes the philosophical positioning, highlights key concepts that informed the research design, and demonstrates how the research was approached using an adapted constructivist grounded theory approach. This chapter also outlines the steps taken to collect and analyse data.

Chapter 3: The emergence and evolution of rewilding concepts provides a brief history of rewilding based on the data, referencing the literature review. This also serves to contextualise the data and this study.

Chapter 4: "Change why": Dewilding and the Anthropocene examines the drivers of rewilding or a desire to affect change, based on the data. In so doing, it describes causes and effects of "dewilding" and highlights the implications for rewilding.

Chapter 5: "Change what": The social-ecological aims of rewilding examines the aims of rewilding extracted from the data—presented under ecological change, socio-cultural change, and systemic or landscape-level change—proposing an overarching vision that may support a holistic rewilding framework.

Chapter 6: "Change how": Rewilding application presents the interventions used in rewilding practice and highlights some of the principles and values that underpin the practice and governance of rewilding, according to the data. These are considered against the existing guiding principles for rewilding (Carver et al., 2021).

Chapter 7: Grounded theories of change for rewilding will draw on the four preceding chapters to construct a general ToC for rewilding and a ToC framework to inform rewilding application.

Chapter 8: Thesis conclusion will reflect on the research process, evaluating the strength of the substantive theories emerging from the research, and highlight limitations and areas for further research.

1.4. Literature review

1.4.1 Introduction

An initial exploratory literature review to inform this PhD research was undertaken in 2018. The purpose was to gain insight into the existing conceptualisations of rewilding and inform the constructivist grounded theory approach, as suggested by Charmaz (2014). This focused on rewilding aims and underpinning values expressed in academic literature, forming a broad overview which shaped the research design. The results of this initial literature review, together with an analysis of survey data, also informed the work of the RTG and provided a focus for workshop discussions culminating in the guiding principles for rewilding (Carver *et al.*, 2021) and so the results of this initial literature review are summarised in Carver *et al.* (2021).

This initial review demonstrated that conceptualisations of rewilding in the literature are largely based on opinion pieces and commentaries (Pettorelli *et al.*, 2018) and have been influenced by personal, organisational, or disciplinary preferences, for example a bias towards ecological aspects of rewilding given a high level of interest among ecologists (e.g. Noss, 1992; Galetti *et al.*, 2017; Bakker and Svenning, 2018) or a focus on ecosystem services and quantifiable benefits to humans driven by intentions to promote the concept of rewilding to policymakers and stakeholders (e.g. Cerqueira *et al.*, 2015; Pettorelli *et al.*, 2018). This is not surprising given that rewilding has received interest from various

disciplines. The literature review demonstrated that there were no empirical studies of rewilding aims and identified a need to find common ground among varied conceptualisations of rewilding, grounded in data, to inform definitions of or frameworks for rewilding. This led to the adoption of a grounded theory methodology. This literature review also demonstrated that there are common intentions and motivations to rewild, while there is a diversity of approaches to rewilding application emerging in different social-ecological contexts (Carver *et al.*, 2021). This influenced the parent nodes used to sort the data in relation to the concept of change, as outlined in chapter 2, differentiating between drivers (change why), aims (change what), and practice (change how).

More recently, a second literature review was undertaken aiming to gain insight into the evolution of the rewilding concept, considering this in relation to the wider conservation movement. An "overview" of the literature was undertaken, rather than a more systematic approach, following the definition provided by Grant and Booth (2009) who describe an overview as a summary of the literature that attempts to survey the literature and describe its characteristics. In overviews, the systematic search and appraisal of the literature is not essential, the synthesis is usually narrative, and the analysis can be categorised depending on the topic, for example conceptual or thematic analyses (Grant and Booth, 2009).

Based on the literature reviewed I first provide a brief history of the conservation movement (section 1.4.2). This provides a foundation for highlighting key concepts in contemporary conservation (section 1.4.3) and I demonstrate how these have influenced conservation theory and politics through an analysis of the "new conservation debate" and related literature (section 1.4.4). Based on this, I suggest a novel approach to critically reflect on conservation approaches that acknowledges plurality. In section 1.4.5 I outline a brief history of rewilding, drawing from key texts on rewilding history. I then draw on academic literature published since 2019 (since the initial literature review) to consider current trends in rewilding theory (section 1.4.6). To conclude, I contextualise this research in relation to the literature review.

1.4.2 A brief history of the conservation movement

The conservation movement emerged in Europe and North America in the late 19th and early 20th centuries in response to observed ecological degradation caused by rapid

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industrialisation, urbanisation, and overexploitation of natural resources (Larsen and Harrington, 2021). Prior to this, in these areas environmental policy and management focused largely on managing natural resources valued for human consumption, through forestry, agriculture, and hunting (Spieles, 2018). However, extinctions of species and loss of natural areas to development and resource extraction caused some to challenge dominant values and worldviews regarding non-human nature. Two influential movements were the Romantic movement in Europe and the Transcendentalist movement in North America, both emphasising nature's beauty, nostalgia, and the potential for spiritual or emotional experiences in nature, spurring interest in earlier animistic traditions and worldviews (Pepper, 1996; Spieles, 2018). Transcendentalists in particular sought social reform, emphasising a need for self-reliance and de-escalation of modernisation, together with environmental policies to limit overexploitation and preserve natural areas for their aesthetic and spiritual value (Nash, 1973). This led to emphasis on preservation and separation of the wild or nature from the human, based on perceptions that modern society is inherently destructive and tendencies to romanticise the countryside, nature, and the past (Pepper, 1996; Spieles, 2018). These movements are considered to be the roots of dualistic ontologies[2], perpetuating wild–domestic, urban–wilderness, or human–nature distinctions (Nash, 1973; Cronon, 1996; Spieles, 2018). Influential figures in this movement were Henry David Thoreau and John Muir, the latter of whom founded the Sierra Club in 1892, advocating for the preservation of wilderness areas (Muir, 1901; Barrow, 2009; Spieles, 2018). This led to the establishment of the US National Parks system which has had a profound influence on conservation policy worldwide, as this model has been reproduced in many countries (Nash, 1973; Barrow, 2009). While Muir saw a place for people in wilderness areas, noting the potential for harmonious coexistence (Muir, 1901) wilderness was largely translated into traditional preservationist approaches and policies as the removal of people and human influence in "pristine" areas, leading to injustices against extant human populations (Cronon, 1996; Arts, Fischer and Wal, 2012). Critical reflections on the concept of wilderness (Nash, 1973; Cronon, 1996; Callicott, Muir and Snyder, 1998)

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[2] In social anthropology, "ontologies" refer to diverse ways that people understand the nature of reality, existence, and the relationships between different entities (Kohn, 2015). In this thesis, dualistic ontology refers to the position that humans are separate from nature, while holistic ontology refers to the position that humans are part of nature.

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have further highlighted ethical concerns that it promotes human–nature dualism and colonial paradigms, although it remains an influential concept in protected area policy (Locquet and Carver, 2022; IUCN WCPA, no date).

Along with the aesthetic and cultural value of protected areas, Muir was motivated by the intrinsic value of nature, emphasising that wild places should be preserved for their own sake, not just for human enjoyment and utility (Muir, 1901). The concept of intrinsic value was further developed by Aldo Leopold in the mid-20th century, advocating for a "Land Ethic", where humans view themselves as part of a larger ecological community and respect the intrinsic value of all living things (Leopold, 1949). The field of environmental ethics emerged in the 1970s, formally recognising and expanding on this concept (Pepper, 1996; Palmer, McShane and Sandler, 2014). Intrinsic value considers that non-human nature has value beyond its usefulness to humans, whether or not humans perceive and acknowledge this (Washington *et al.*, 2017). Intrinsic value is linked to the concepts of ecocentrism [which has been likened to Leopold's Land Ethic, (Washington *et al.*, 2017; Conradie, 2019)] and biocentrism, which give value to ecological or social-ecological systems (SES) and living entities, respectively (Palmer, McShane and Sandler, 2014). However, there remain uncertainties with this concept and debate over the usefulness of intrinsic value in decision-making or in the existence of intrinsic value at all (Palmer, McShane and Sandler, 2014; Spieles, 2018).

Along with environmental ethics, other fields that fall under the umbrella of environmental humanities have emerged since the mid-20th century that concern themselves with human–nature relations, including environmental history, environmental social sciences, and human geography. Given that human influence on the environment was a major driver of conservation advocacy, many studies have considered the point at which human–nature relations become unsustainable (e.g., Merchant, 1989; Spieles, 2018; Ellis *et al.*, 2021; Larsen and Harrington, 2021). These identify important periods including the Enlightenment of the 17th and 18th century during which scientific rationalism emerged, which underpinned technological advancements, economic growth and capitalism, reductionism, and human–nature disconnection. This philosophy underpinned European colonialism and the industrial revolution, during which time overexploitation of non-human nature becomes typical in economic and political systems and urbanisation and globalisation limit people's awareness

of the causes and effects of ecological degradation. Increasingly, studies highlighted relationships between environmental degradation and social justice and equity concerns (e.g, Carson, 1962; Merchant, 1989). Links are noted between the control or exploitation of natural resources and hierarchical human societies that allow the control of some people by others (Johns, 2019). From these concerns arose the field of environmental justice, concerned with the unequal distribution of environmental impacts, highlighting issues of power, ethics, and social responsibility in environmental decision-making. This led to concepts such as sustainable development (UNDP, no date) or planetary health (Redvers, 2021) that consider humans and non-human nature as mutual beneficiaries of conservation efforts. However, this has caused some tension between those motivated by the intrinsic value of nature and those motivated by human justice and equity concerns (Spieles, 2018).

From the mid-20th century, innovations in technology and information affected both increasing human impact on the environment and growing awareness of this impact, leading to tensions between expanding resource needs of modern society on the one hand and desires to stem biodiversity loss on the other, embodied in conflicting policies of economic deregulation and environmental protection (Larsen and Harrington, 2021). Emerging in the early 21st century the concept of the Anthropocene[3], proposed as a new geological epoch, emphasised increasing human pressure on the earth's biosphere (Crutzen and Stoermer, 2000), leading to emphasis on sustainability[4] and resilience in environmentalism (Riedy, 2020). This further enhanced the role of national and international policy in stemming environmental degradation, with increasing pressure to look beyond preservationist approaches in contemporary conservation (Minteer and Pyne, 2013; Holmes, 2015).

1.4.3 Key concepts influencing contemporary conservation

Given the expanding focus of the conservation movement and engagement across multiple disciplines and geographies, there are now many factors influencing conservation practice, theory, and policy. Although the state of contemporary conservation is complex, some key concepts are identified in the literature, particularly considering areas of conflict and debate. These are described briefly below, highlighting links between anthropocentrism and

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[3] Originally coined by Crutzen and Stoermer (2000), the "Anthropocene" refers to the proposed geological epoch characterized by significant human impact on the Earth's geology and ecosystems.
[4] Sustainability refers to the long-term integrity of SES (Turnbull, Clark and Johnston, 2021).

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environmental pragmatism on the one hand, and ecocentrism and transformation on the other, and an emergent relational paradigm.

Anthropocentrism and environmental pragmatism

Anthropocentrism, valuing humans above all else and viewing other beings as means to human ends (Kopnina *et al.*, 2018), stems from utilitarian views of nature as natural resources for human consumption (Spieles, 2018). It carries a negative connotation in environmental ethics, although environmental pragmatists defend certain forms of anthropocentric ethics, emphasizing practical responses to environmental challenges over theoretical debates (Palmer, McShane and Sandler, 2014).

Environmental pragmatism comprises various views sceptical of identifying a single, most justified theory of environmental ethics. Instead, it prioritizes inclusive, collaborative discourse to address environmental issues effectively (Palmer, McShane and Sandler, 2014). Pragmatists can be seen as anthropocentric because they argue that human interests can be prioritised over ecological goals as they likely coincide with environmental needs, and they tend to promote decision making based on weighing an action's benefits against its impact on human wellbeing (Spieles, 2018). Critics argue that evidence linking improved human wellbeing to conservation goals is inconclusive, and that these priorities reinforce material wealth paradigms and consumer culture that are root causes of environmental degradation (e.g., Crist, 2013; Kopnina *et al.*, 2018).

Ecocentrism and transformation

Although its definition has evolved over time (Pepper, 1996), ecocentrism as it is defined here recognizes humans as part of an interdependent system with nature, emphasizing the intrinsic value of all species and prioritizing the health of the system or "whole" over the interests of individuals or species (Washington *et al.*, 2017; Taylor *et al.*, 2020). The concept is rooted in moral arguments countering dominant, Western capitalist, utilitarian, and scientific paradigms that are seen to underpin anthropocentrism and gained traction alongside the emergence of ecology as a scientific field which demonstrated species interdependence (Pepper, 1996; Washington *et al.*, 2017). However, due to historical connections between intrinsic value and wilderness preservation, the concept has faced

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criticism for perpetuating human-nature dualism and undermining social justice concerns (Cronon, 1996; Pepper, 1996; Minteer and Pyne, 2013).

As it is defined here, ecocentrism is a fundamentally different view to anthropocentrism and environmental pragmatism, as it calls for transformative change. Transformative change is described as a "fundamental, system-wide reorganization across technological, economic, and social factors, including paradigms[5], goals, and values and is promoted as essential to achieving global sustainability" (IPBES, 2019). Therefore, those supporting transformation argue that sustainability cannot be achieved through pragmatism, which seeks to work with extant values and institutions (Riedy, 2020). Literature promoting transformation often focuses on seeking alternative paradigms, proposing alternative ethics for the future (e.g., Leopold, 1949; Merchant, 2017) or examples from the past or present (including indigenous worldviews, e.g., Battiste and Henderson, 2000; Wall Kimmerer, 2013; Berkes, 2017). This is supported by deep institutional reform to counter the dominance of scientific rationalism or colonial values (e.g., Merchant, 1989; Cusicanqui, 2012; Abson *et al.*, 2017; Omarjee, 2019) and a shift towards holistic thinking (e.g., Leopold, 1949; Lovelock, 1975; Merchant, 2017). However, there remains uncertainty about how transformation can be achieved, leaving it open to criticism from environmental pragmatists. This has led to literature focusing on the need to move from intention towards application, for example identifying leverage points[6] for transformation (Meadows, 1999; Abson *et al.*, 2017; Riedy, 2020; Arponen and Salomaa, 2023).

Social-ecological systems and a relational paradigm

Some appeals for transformation emphasise a relational paradigm to counteract dualistic paradigms, placing relation at the centre of concern as opposed to concern being human- or nature-centric (Allison, 2019; Wirzba, 2019). Integrating ecological and social perspectives, a

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[5] Paradigms are defined as commonly agreed upon ways of perceiving the world based on linked assumptions which have been accepted into the mainstream; they shape how we perceive the world, what we believe is possible, and how we understand and address sustainability challenges (Mackinnon and Powell, 2008; Walsh, Böhme, and Wamsler, 2020). Shifting paradigms from which systems arise is said to be the most effective leverage point for creating change (Abson et al., 2017; Walsh, Böhme, and Wamsler, 2020).

[6] Leverage points refer to specific points within complex systems where interventions or changes can result in significant and often nonlinear impacts on the system's behaviour or outcomes, providing strategic areas where focused effort can bring about substantial shifts in system dynamics, structure, or overall functioning. Identifying and understanding leverage points can be crucial for effectively managing and influencing complex systems (Abson *et al.*, 2017).

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relational paradigm highlights interconnectedness, integrating concerns for all species to address sustainability challenges at multiple levels (Walsh, Böhme and Wamsler, 2020; Turnbull, Clark and Johnston, 2021; Arponen and Salomaa, 2023). This overlaps with ecocentrism as it is defined above but allays concern over its links to preservationist approaches to conservation. As such, it is appealing to environmental pragmatists (Kareiva and Marvier, 2012) and value pluralists who believe that there are multiple, conflicting values that are all fundamentally valid (Palmer, McShane and Sandler, 2014). This shift has affected considerations for the diverse ways people frame the more-than-human world in relation to themselves (Chan, Gould and Pascual, 2018; O'Connor and Kenter, 2019) and emphasises the need to transcend personal or disciplinary biases (Abson *et al.*, 2017; O'Connor and Kenter, 2019; Riedy, 2020).

This shift is illustrated by the development of an SES framework (Holling, 2001; Berkes, Colding and Folke, 2002; Liu *et al.*, 2007; Ostrom, 2009). This forms part of a wider body of systems science and systems thinking in many disciplines, characterised by several important shifts of perspective: from the parts to the whole; from distinct disciplines to interdisciplinarity; from objects to relationships; from measuring to mapping; from quantities to qualities; from structures to processes; from objective to epistemic science; and from Cartesian certainty to approximate knowledge (Capra and Luisi, 2014). Rather than studying social and ecological systems separately, the SES framework and related concepts made humans subjects in the co-evolution of SES and framed human-nature relations and landscapes as human/non-human entanglements (Latour, 2015), further prompting discussions of coexistence and rights and responsibilities among more-than-human nature (Pepper, 1996; Mauser *et al.*, 2013; Walsh, Böhme and Wamsler, 2020).

1.4.3 The "new conservation" debate and framings of contemporary conservation

The tensions highlighted above, between anthropocentrism and ecocentrism, and transformation and pragmatism, are epitomised by the "new conservation debate", which played out in the literature in response to calls for a "new conservation science" by Kareiva and Marvier (2012). Influenced by the concept of the Anthropocene and a desire to counter preservationist approaches, they highlight that pristine nature separate from humans is not an appropriate goal for modern conservation (Kareiva and Marvier, 2012), and called to integrate human development, corporate interests, and market-based tools to broaden and

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strengthen support for conservation, aligning with pragmatic narratives (Kareiva and Marvier, 2013; Kueffer and Kaiser-Bunbury, 2014; Marvier, 2014). Critics responded by warning against anthropocentrism and calling for transformation and paradigm shifts in human–nature relationships (Crist, 2013; Noss *et al.*, 2013; Soulé, 2013).

The debate itself has been criticised for being overly simplistic, divisive, and counterproductive (Doak *et al.*, 2014; Holmes, 2015; Sandbrook, 2015; Matulis and Moyer, 2016), with authors portraying opponents' positions as exaggerated caricatures (Holmes, 2015). The debate failed to acknowledge common ground among different approaches and to capture the complexity of ideas and plurality of opinions inherent in conservation theory and practice. This led to the challenging of proposals for conservation to unite behind a single philosophy and calls promoting plurality in contemporary conservation (Holmes, 2015; Sandbrook, 2015; Keulartz, 2016; Sandbrook *et al.*, 2019).

The debate and related literature spurred calls for critical reflection of the narratives or framings[7] influencing environmental research, policy, and management (Abson *et al.*, 2017; O'Connor and Kenter, 2019; Sandbrook *et al.*, 2019; Chignell and Satterfield, 2023), to improve understanding of goals, methods, processes, and design (Abson *et al.*, 2017). Studies have considered the dominant worldviews, narratives, or framings influencing conservation theory, policy, and practice. These tend to highlight conflict between "traditional conservation" (associated with preservationist approaches) and pragmatic approaches that provide benefits to people (Minteer and Pyne, 2013; Mace, 2014). Alternatives to these dominant narratives are also highlighted, e.g., "nature despite people" that focuses on limiting human threats and promoting sustainable resource use, and "people and nature" reflecting shifts towards a relational paradigm (Mace, 2014).

Holmes, Sandbrook and Fisher (2017) undertook a Q study to examine perspectives on new conservation held by attendees at an international conservation biology conference, identifying three distinct positions: 1) in favour of conservation to benefit people but opposed to links with capitalism and corporations; 2) in favour of biocentric approaches but

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[7] Narratives can be understood as one component of a broader problem of framing—the way in which a problem is defined and discussed within an intellectual community (Chignell and Satterfield, 2023). Frames make certain facts and values visible, while others fade from view, and are often so embedded and taken for granted within an institution or community that they are rendered invisible (Halffman, 2019).

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with less emphasis on wilderness protection than prominent opponents of new conservation; and 3) in favour of the published new conservation perspective but with less emphasis on increasing human well-being as a goal of conservation. Sandbrook *et al.* (2019) identify three dimensions influencing conservationists based on a large-scale survey: 1) people-centred conservation, relating to the role of people in conservation as participants and stakeholders; 2) science-led ecocentrism, relating to the role of science in the conservation of species and ecosystems, consistent with fundamental elements of ecocentric thinking; and 3) conservation through capitalism, relating to the role of corporations, economic metaphors, and market based approaches in conservation.

While these framings are not incorrect, it has been highlighted that attempts to define narratives fail to capture complexity, nuances, and pluralism (Mace, 2014; Holmes, 2015; Matulis and Moyer, 2016; Sandbrook *et al.*, 2019). Sandbrook *et al*. (2019) found that there were no distinctive "camps" in conservation and diverse alignments with their identified dimensions. They suggest "agonistic pluralism", echoing Matulis and Moyer (2016)— emphasising acceptance and coexistence of multiple perspectives, beliefs, and values, acknowledging neglected positions and embracing conflict—over "inclusive conservation" or seeking a single definition of conservation goals or approaches. This aligns with a shift towards a more relational paradigm that promotes plurality.

However, the need for critical reflexivity in conservation remains (Archer *et al.*, 2022; Chignell and Satterfield, 2023) and so there is a need to develop a framework that enables this while supporting plurality. I suggest a framework identifying goals, governance approaches, and value framings, allowing one to break down identified approaches or narratives and consider varying influences. Based on a reading of the literature around the "new conservation debate" and conservation narratives and framings highlighted above, I identified ecological goals, human-focused goals, governance approaches, and value orientations. These are shown in figure 1.1 and described below.

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Figure 1.1: Goals, governance approaches, and value framings influencing conservation theory, policy, and practice based on the "new conservation debate'" and dominant narratives extracted from the literature. *Value framings are from the life framework of values (O'Connor and Kenter, 2019).
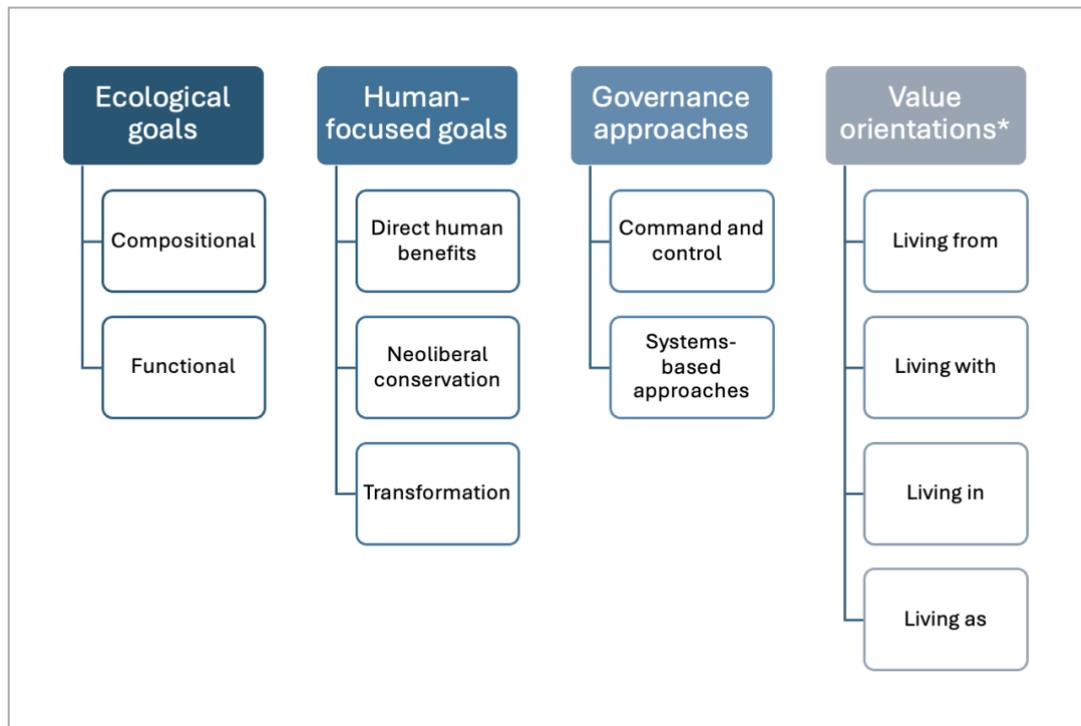
Ecological goals

The ecological goals reflect consensus in the conservation community that maintenance of biodiversity and ecosystem processes should be goals of conservation (Sandbrook *et al.*, 2019), but the two categories represent divergences in compositional or functional approaches to conservation and ecological restoration (Palmer, McShane and Sandler, 2014).

- **Compositional conservation or restoration:** Compositional goals reflect the roots of conservation biology in the preservation of species or habitat types and is therefore strongly associated with "traditional conservation" (Minteer and Pyne, 2013; Sandbrook, 2015; Holmes, Sandbrook and Fisher, 2017). It includes approaches that seek to maintain or restore a desired ecological composition. However, compositional goals are not limited to wilderness or perceptions of "pristine nature" free from humans but can also refer to ecological composition in cultural landscapes (Minteer and Pyne, 2013; Turnbull, Clark and Johnston, 2021; Bachmann-Vargas, Koppen and Lamers, 2024) or novel ecosystems (Kareiva and Marvier, 2012). As

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such, compositional goals can be driven by diverse values, e.g., based on aesthetic values or instrumental values (Pepper, 1996; Büscher and Fletcher, 2019), highlighting the need to separate the value orientation from the goal itself. Compositional goals are criticised as being outdated as they fail to acknowledge change inherent in (social-)ecological systems, and because they are based on human ideals (Minteer and Pyne, 2013; Spieles, 2018). But this approach has significant influence in conservation practice, for example influencing the goals to preserve natural or cultural heritage in protected areas (IUCN WCPA, no date).

- **Functional restoration:** Functional restoration focuses on function as a priority over composition with the goal of ecosystem health and resilience. This is supported by a paradigm shift in ecology from a static to a dynamic view of nature (Keulartz, 2016), underpinned by ecological theories emphasising change inherent in ecosystems, such as Darwin's theory of evolution (Soulé, 1985; Spieles, 2018) and climate change (Ison, 2010). The implications of this shift are that aims related to historical fidelity are increasingly considered impractical (Palmer, McShane and Sandler, 2014). Functional ecological goals affected a shift towards large-scale and long-term thinking, or systems thinking, considering the time and scale requirements of ecological processes. As with compositional goals, functional restoration can also be influenced by instrumental values, for example the provision of ecosystem services (Holmes, 2015). Despite an ongoing paradigm shift, the transition from compositional to functional goals has not been smooth, given that composition affects function, and this has caused debate over the role of historical baselines in ecological restoration (Keulartz, 2016).

Human-focused goals

Human-focused goals are not often explicit in conservation goals, given that the main motivations are often based on ecological goals (Sandbrook *et al.*, 2019). However, increasing recognition of the human dimensions of conservation and considerations for how to manage conflicts between ecological goals and human behaviours, opinions, values, have enhanced human-focused goals in conservation (Baynham-Herd *et al.*, 2018) and these are clearly identifiable in the narratives and framings discussed above.

- **Direct human benefits:** This goal acknowledges that many conservation projects intend to directly benefit human stakeholders or communities—this can be a primary goal or can be used to promote ecological goals. This aligns with sustainable development and nature-based solutions which intend to address societal challenges alongside conservation, although acknowledging their links to neoliberalism (Campagna, Guevara and Le Boeuf, 2017; Waylen *et al.*, 2024). The concept of sustainable development has been developed around the United Nations' Sustainable Development Goals which focus on both human and ecological outcomes. However, the concept is criticised for being anthropocentric and the goals themselves for being conflicting (Campagna, Guevara and Le Boeuf, 2017). It is also strongly associated with the concept of human wellbeing, which is a subjective and contextual concept that has numerous indicators supporting individual or societal wellness (Loveridge *et al.*, 2020; González, Dussaillant and Calvo, 2021). Given the emphasis on subjective notions of wellbeing, this goal promotes a contextual approach mindful of value pluralism, aligning with Sandbrook *et al.*'s (2019) people-centred conservation. They found that people-centred goals were more supported by respondents from Africa, Asia, and South and Central America, countries that have been underrepresented in conservation narratives in the past. They are also mostly considered developing countries that are more biodiverse and therefore perhaps less likely to prioritise ecological goals over human benefits.

- **Neoliberal conservation:** Neoliberal conservation aligns with the "conservation through capitalism" domain identified by (Sandbrook *et al.*, 2019) and somewhat with a pragmatist agenda advocated for by new conservationists (Kareiva and Marvier, 2012; Marvier, 2014). However, while environmental pragmatists in theory take a wider, more adaptable and contextual approach which could be applied to other economic or political systems where they exist (Palmer, McShane and Sandler, 2014), the main focus of neoliberal conservation is on working within dominant socio-economic and -political paradigms to support ecological goals of conservation. Büscher *et al.* (2012) describe neoliberal conservation as an amalgamation of ideology and techniques informed by the premise that natures can only be "saved" through their submission to capital and its subsequent revaluation in capitalist

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terms. It is characterised by approaches based on instrumental values and ecosystem services, such as payments for ecosystem services or emissions-trading schemes (Fougères *et al.*, 2022). Neoliberal conservation is criticised for failing to address economic growth as the primary force driving global environmental crises (Büscher *et al.*, 2012; Noss *et al.*, 2013; Crist *et al.*, 2021), its contributions to inequity among humans (Doak *et al.*, 2014; Holmes and Cavanagh, 2016), and for failing to acknowledge non-market philosophies of many societies (Archer *et al.*, 2022). There are also concerns over misrepresentation or "greenwashing" and hegemony, aligning it with command-and-control management approaches (Büscher *et al.*, 2012). It also aligns with "ecomodernism"—approaches that rely on technology, innovation, and future humans to fix human-caused problems, alluding to supply and demand concepts of neoliberalism (Merchant, 2019). Neoliberal conservation is more about working with extant paradigms than about benefitting people per se (Holmes, Sandbrook and Fisher, 2017), as it has been shown that neoliberal conservation can also perpetuate inequity and injustice, exacerbating pre-existing social, economic and political inequalities (Holmes and Cavanagh, 2016). For this reason, direct human benefit is presented as a separate goal.

- **Transformation:** Transformation reflects calls for paradigm shifts deemed necessary at societal or cultural level to support ecological restoration, coexistence, and ultimately sustainability (Abson *et al.*, 2017; Hammond, 2020; Fougères *et al.*, 2022). Suggested changes include paradigm shifts in human-nature relationships from anthropocentric to ecocentric (Crist, 2013; Noss *et al.*, 2013; Taylor *et al.*, 2020; Vuković, Ančić and Domazet, 2020) and reforming economic structures to allow more equitable distribution of wealth among humans (Noss *et al.*, 2013; Buscher *et al.*, 2017; Crist *et al.*, 2021). The concept is appealing as it calls for action at a scale, scope, and depth that is equal to the biodiversity and climate crises, fulfilling an unmet need for mobilisation (Fougères *et al.*, 2022). Changes are thought to support mutual flourishing of human and non-human as it is recognised that ongoing ecological degradation has negative consequences for humans. However, desired futures may not align with extant values and therefore the potential benefits may not be immediately appreciated or desired by people (Hammond, 2020; Turnbull,

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Clark and Johnston, 2021), although it is acknowledged that transformation should not threaten human wellbeing (Crist et al., 2021; Fougères et al., 2022). Cultural transformation is also linked to personal transformation, extending the transformation inwardly (to "ourselves"—those driving change—and the institutions "we" work within), and is linked to changing governance approaches in conservation (Fougères *et al.*, 2022; Chignell and Satterfield, 2023).

Governance approaches

Governance approaches are not highlighted readily in the dominant narratives of conservation, which tend to focus on the value orientations and goals of conservationists (Mace, 2014). However, they are essential to critiquing conservation and therefore it's important to distinguish these from goals or values. The governance approaches here denote a shift from command-and-control approaches (Holling and Meffe, 1996; Briggs, 2003) to systems thinking and place-based conservation inherent in the relational paradigm (Chignell and Satterfield, 2023). However, the literature also reflects that this shift is difficult to achieve in practice and command-and-control governance approaches remain dominant in applied conservation (Archer *et al.*, 2022; Chignell and Satterfield, 2023; Martin, Fischer and McMorran, 2023). Therefore, it is important to distinguish between governance approaches, considering both the intended and actual approach used.

- **Command and control:** Command and control is a top-down management style where decisions are made by a central authority and is considered a simplistic, reductionist approach to problem solving that is not suitable for addressing complex problems or managing complex systems (Holling and Meffe, 1996; Fernandez and Fernandez, 2008). It aligns with largely top-down, expert-driven decision-making structures (Williams, Stewart and Kruger, 2013), where decision-making is closed and pre-structured, rather than open and reflexive (Hammond, 2020). Command-and-control governance is considered to be hegemonic, but is also perpetuated by hegemonic views of human–nature and human–human power relationships prevalent in Western-centric paradigms and institutions (Archer *et al.*, 2022). As such, it remains influential in environmental management and is considered a major barrier to achieving long-term sustainability (Holling and Meffe, 1996; Briggs, 2003;

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Fougères *et al.*, 2022) as conservation initiatives pay insufficient attention to the relationships between power, wealth, and the control of land and resources. These projects may be concerned with the human dimensions of conservation, but limit considerations to the distribution of costs and benefits and behaviour change, rather than on participation, decision-making procedures, and recognising diverse values, interests, and institutions (Fougères *et al.*, 2022).

- **Systems-based approaches:** In systems-based approaches I have combined systems thinking and place-based conservation, highlighting that context is fundamental to shaping relevant conservation strategies and marking a shift towards more collaborative conservation practices that address social-ecological system dynamics (Williams, Stewart and Kruger, 2013). As such, this aligns with the growing relational paradigm outlined above, seeking to localise and contextualise knowledge, values, and goals (Williams, Stewart and Kruger, 2013) and thereby supporting plurality, emphasising the diverse ways that people derive meaning and identity (Williams, Stewart and Kruger, 2013; Keulartz, 2016; Hammond, 2020; Carmenta *et al.*, 2023). Hence this promotes collaborative, participatory approaches centred on place and change (Merchant, 2019; Chignell and Satterfield, 2023) and continuous reflexivity to avoid assumptions by those driving change (Hammond, 2020; Chignell and Satterfield, 2023). This type of governance can be applied across different scales, with similar approaches sought in landscape-scale conservation, although larger scale introduces challenges for governance (Sayer *et al.*, 2015). Although there is a desire to shift from command-and-control approaches to systems-based approaches, there remain many challenges, especially related to institutional barriers limiting power sharing, genuine collaboration, transparency, monitoring, and recognition of complexity and plurality (Hammond, 2020; Fougères *et al.*, 2022; Martin, Fischer and McMorran, 2023).

Value orientations

The new conservation debate was clearly influenced by different value positions and much of the debate focused on the conflicts between intrinsic and instrumental values. Therefore, it is important to consider these in critical reflections of conservation approaches. For value

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orientations, I suggest using the existing life framework of values (O'Connor and Kenter, 2019) which was developed to address diversity and pluralism. It more comprehensively considers why more-than-human nature matters, integrating the interests of humans and non-humans within a given context, thereby transcending the one-sidedness and anthropocentrism of ecosystem services concept (O'Connor and Kenter, 2019). Recognising that stakeholders typically harbour and express more than one of the four life frames, the framework intends to address stereotyping of stakeholders according to their narrow interests. These life frames influence the goals of conservation, for example affecting the extent to which humans are seen as contributing to the process of conservation or the degree to which human interests are complimented by ecological goals.

- **Living from** points to how we value the world in a provisioning sense but also how it sustains us more broadly. This category spans both the material and non-material contributions that the world makes to humans. These values are predominantly instrumental and relational.

- **Living with** expresses that we share this planet with the more-than-human world. It is expressed through human action to preserve and create space for nature and is therefore linked to conservation as an end-in-itself, rather than as natural resources. It is associated with intrinsic values of non-human nature, relational values insofar as those regulating elements of nature that contribute to our wellbeing are deemed unsubstitutable, and instrumental values in terms of existence values and where regulating contributions are thought of as substitutable.

- **Living in** can be seen to map on to the non-material contributions of the land- and seascapes that help shape (either socially or physically) how cultures, communities, and individuals relate to place, forming and supporting cultural and personal identities. It also maps to material and regulating contributions where they help define the biophysical features contributing to environmental settings. This frame relates particularly to relational values constitutive of well-being, including aesthetic and spiritual dimensions of places, but also includes instrumental values associated with benefits gained from place-based activities that are amenable to substitution and trade-off, such as many forms of recreation and tourism.

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- **Living as** reflects notions and experiences of the more-than-human world, rather than non-human nature. It transcends the ontological or at least semantic dualism values framed as nature's contributions to people, but can be related to practices of care, kinship, and reciprocal relationships between people and the more-than-human. This frame primarily embeds relational and intrinsic values. Relational "living as" values denote that we can value our relations to non-humans and the more-than-human world without this relationship implying that we are separate from them. "Living as" intrinsic values acknowledge that the more-than-human world and the non-humans inhabiting it matter for their own purposes regardless of human affairs, yet we experience or see ourselves as an embedded or inseparable part of this community of life.

1.4.4 A brief history of rewilding

To provide a robust investigation of what rewilding is, the main question underpinning the research presented in this thesis, it is important to understand the drivers and historical context within which rewilding emerged and evolved. By understanding the foundations of the field and the paradigms which have shaped its ethics and values we can better understand how it is different to what has come before. This review of literature related to rewilding history considers the emergence and evolution of rewilding within the context of the history and politics of the wider conservation movement outlined above. The review highlights conflicts and uncertainty inherent in rewilding emerging with shifting paradigms, echoing similar trends within the conservation movement.

The literature reflects continued attempts to provide clarity on rewilding's definition, approaches, aims, or principles and these have grappled with how to combine or reflect the diverse approaches and values that have emerged within rewilding practice and theory (Prior and Ward, 2016; Gammon, 2018; Durant, Pettorelli and du Toit, 2019; Carver *et al.*, 2021). There are attempts in the rewilding literature to identify dominant narratives or framings influencing the rewilding movement. These have tended to focus on different approaches to rewilding based on the main interventions proposed (Jorgensen, 2015; Lorimer *et al.*, 2015), often focusing on geographic divergences between North America and Europe. This literature review identifies and presents the dominant framings of rewilding

based on the literature, separated under three main headings below. Based on the most recent literature, I then consider how the increase in popularity of the concept internationally has affected calls for critical reflexivity, much like those in the wider conservation movement, and supports the development of a framework that reflects rewilding's plurality, which is an aim of this research.

Wildlands Network and 3Cs

In the late 1980s a group of conservationists, ecologists, and activists associated with the organisation the Wildlands Network (WN) began to develop the concept of rewilding in North America. They promoted their ideas through the organisation's magazine, Wild Earth, which published between 1991 and 2004 and in books including *Continental Conservation* (Soule' and Terborgh, 1999a) and *Rewilding North America* (Foreman, 2004). The WN proposal was underpinned by concern for the intrinsic value of nature, and they created a positive vision based on emerging ecological theories considering the needs of other species at landscape scale (Johns, 2019). Many of the key influential figures in the WN were also influential in the conservation movement, particularly aligning with ecocentric and transformation narratives highlighted above (e.g., Michael Soule', Eileen Crist, and Reed Noss). Their shift from conservation to rewilding was driven by ecological theories demonstrating that protected areas and single-species focused conservation was ineffective and mirrored the shift from compositional towards functional ecological goals in conservation (Noss, 1992; Soule and Noss, 1998; Johns, 2019; Carver *et al.*, 2021). Their approach was highly contextual to North America, combining existing protected areas, along with connectivity between those areas, to address the needs of wide-ranging species, particularly carnivores (Noss, 1992; Soule and Noss, 1998). This was dubbed "3Cs" rewilding (cores, corridors, carnivores).

The group was multidisciplinary, including activists, conservation scientists and practitioners, ecologists, and environmental philosophers. This was influential on the development of their conceptualisation of rewilding which combined a respect for wild nature based on intrinsic value and the influence of the deep ecology movement (Johns, 2019; Fisher and Carver, 2022) with citizen engagement and action, including networking and inclusive and collaborative wildlands network design planning (Soule and Terborgh, 1999; Foreman *et al.*, 2000). This contextual, adaptive, participatory aspect came to be as

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important to them as the science behind rewilding (Fisher and Carver, 2022). In this context, their conceptualisation of rewilding evolved over time, as knowledge evolved and the purpose of the WN developed (Fisher and Carver, 2022). An emergent theme in the WN vision is a desire to reach a healthier balance between nature and human society (Fisher and Carver, 2022), reflecting transformative goals outlined above. Concerned with industrial resource extraction as a driver of ecological degradation, the group initially sought ecological restoration goals based on pre-Columbian conditions in North America (Foreman *et al.*, 1992), although this shifted over time based on influences from other rewilding narratives highlighted below.

Given the influence of deep ecology and the wilderness movement, 3Cs rewilding is often equated with wilderness preservation and its relevance to modern conservation is rejected (e.g., Jorgensen, 2015; Pettorelli *et al.*, 2018; Schulte to Bühne, Pettorelli and Hoffmann, 2021). However, these criticisms are often based on limited reviews of peer-reviewed literature, excluding the grey literature that constitutes their main body of work. Fisher and Carver (2022) base their history on Wild Earth and also note a paucity of back-referencing in criticisms of 3Cs rewilding. Given these limitations, these lack critical reflection on the differences between 3Cs rewilding and "traditional conservation," taking into account the group's interdisciplinarity and the plurality and changing perceptions of wild and wilderness among this group. As demonstrated above, this group reflect a transition from command-and-control governance and compositional ecological goals, towards systems-based governance and functional ecological goals. In Wild Earth and elsewhere (e.g., Foreman, 2004), there were expressed desires for people to reconnect and reintegrate with non-human nature and address human–nature dichotomy, reflecting perhaps a transition towards a more relational paradigm and goals of coexistence at landscape scale.

Pleistocene rewilding and taxon replacement

Pleistocene rewilding proposed the introduction of ecological surrogates for extinct Pleistocene species in North America. The initial idea was proposed in articles in Wild Earth (Barlow, 1999; Martin and Burney, 1999) but was brought to the fore in 2005 in an article in Nature, authored by several key individuals associated with the WN, including Michael Soulé and Dave Foreman (Donlan *et al.*, 2005).

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Over time, the interest in Pleistocene rewilding has dissipated, although it's influence on rewilding is apparent. Significantly, the proposal moved the ecological baseline for rewilding to consider Pleistocene extinctions, rather than considering a pre-colonial baseline in North America as initially suggested by the WN. This extended the concern over human influence from the industrialisation of ecological degradation spurred by colonialism, to concerns of overhunting during the Pleistocene era, leading to increased debate over the role of humans in the wild (Jorgensen, 2015).

The concept also opened up the potential for the introduction of ecological surrogates or taxon replacements for extinct species, which have largely been applied in island settings and small private reserves (Jorgensen, 2015; du Toit, 2019). The potential for taxon replacements has prompted questions over indigeneity in the modern context and supports the concept of "novel ecosystems"[8] in conceptualisations of rewilding. These appeal to those aligning with environmental pragmatism, that linking rewilding to historical benchmarks is a mistake (Kareiva and Marvier, 2012; du Toit, 2019). However, the concept of novel ecosystems and the rejection of historical baselines does not have wide support in the literature, echoing similar criticisms of the new conservation proposal that it can perpetuate anthropocentrism and limit functional restoration goals (e.g. Genes *et al.*, 2019).

European rewilding

The concept of rewilding in Europe initially emerged in the UK and the Netherlands during the 1990s and has since become widely supported through the advocacy of large conservation organisations including Rewilding Europe (Locquet and Carver, 2022). Initially, the focus was on an ecological network approach similar to cores and corridors promoted by the WN—arguing for core areas, corridors, restoration areas, and buffer zones to develop connected, ecologically functional landscapes (Lorimer *et al.*, 2015). Differences to the 3Cs approach emerged in Europe driven by distinct geography, politics, and culture, including limited opportunities for "cores" of wilderness areas in highly-managed European landscapes (Bauer, Wallner and Hunziker, 2009; Johns, 2019; Locquet and Carver, 2022) and concerns over potential conflict with wild carnivores and limited dispersal opportunities

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[8] Due to human activities, novel ecosystems differ in species assemblage from those that prevailed historically and cannot be restored to a historical state (Miller and Hobbs, 2019).

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(Locquet and Carver, 2022). In a European context there is limited support for nature–culture divides that are perceived to be supported by 3Cs rewilding. Landscapes instead are considered to be blurred dynamic interactive and mutualistic systems of coexistence, supported by environmental policy (Linnell *et al.*, 2015).

Land abandonment, driven by agricultural intensification and urban migration, is thought to have influenced rewilding in Europe, providing opportunities for the creation of core areas through "passive rewilding" (Navarro and Pereira, 2012; Carver, 2019) and influenced rewilding baselines in Europe to the pre-Neolithic, returning land to a state prior to the clearance associated with intensive agriculture (Jorgensen, 2015). However, while rural land abandonment was regarded as an opportunity among many rewilding proponents, it was also perceived as a threat, with concerns that it would perpetuate negative impacts on rural culture—i.e., the loss of traditions and cultural and natural heritage valued by rural people (Cerqueira *et al.*, 2015; Carver, 2019; Delibes-Mateos *et al.*, 2019) and much rewilding literature from Europe is characterised by considerations for how to balance ecological goals and rural values (e.g., Pereira and Navarro, 2015).

An influential ecological theory in Europe was Frans Vera's wood pasture theory, positing that the natural vegetation of lowland Europe was not closed forest but instead a shifting mosaic landscape including patches of woodland and pasture affected by the presence of wild grazers (Vera, 2000). Oostvardersplassen (OVP), a nature reserve on a reclaimed polder in the Netherlands, became a test site for proving Vera's hypothesis, with the intention to create the pre-conditions (i.e., species assemblages and herbivore densities) to maintain wood pasture within the fenced reserve. This included the introduction of Heck cattle and konik ponies as ecological surrogates for extinct aurochs and tarpan, respectively. The wood pasture theory appealed to environmental pragmatists—those seeking to work with extant rural policies and values—as it aligned wild landscapes with valued qualities of agricultural landscapes (Lorimer *et al.*, 2015; Jepson, Schepers and Helmer, 2018). It also informed functional ecological goals supported by naturalistic grazing—re-establishing a guild of wild or de-domesticated large herbivores to restore or create complex and species-rich ecosystems (Lorimer *et al.*, 2015; Jepson, Schepers and Helmer, 2018), and this became commonplace in rewilding application in Europe, supported by the success of Rewilding Europe's European Wildlife Bank which manages the breeding and transfer of herbivores

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including bison, water buffalo, and Tauros between projects (Jepson, Schepers and Helmer, 2018). Rewilding Europe has instigated policy reform that has established "kept wild" animals that reflect some legal characteristics of domestic animals (Jepson, Schepers and Helmer, 2018), thereby reducing legal implications associated with moving or reintroducing wild animals (Eagle *et al.*, 2022). Links between rewilding and rural culture in Europe has seen increasing alignment between rewilding and agriculture, leading to the concept of agricultural rewilding where wood pasture is maintained by domestic or semi-domestic grazers (Vogt, 2021), supported by the popularity of projects such as Knepp Wildland, a cattle farm transitioning to a rewilding business (Tree, 2019).

The concept of wilderness is also influential in Europe and is supported in proposed rewilding frameworks coming out of Europe (Carver, 2014; Torres *et al.*, 2018; Perino *et al.*, 2019) and organisations such as the Wild Europe initiative (Locquet and Carver, 2022). This has caused conflict among rewilding proponents in Europe (Jorgensen, 2015), echoing tensions between environmental pragmatism or neoliberal conservation and transformation. Some advocate for aligning rewilding with policy or seeking opportunities to enhance ecosystem services or economic development, e.g., through ecotourism (Cerqueira *et al.*, 2015; Jobse *et al.*, 2015; Jepson, Schepers and Helmer, 2018; Pettorelli *et al.*, 2018), while advocates for wilderness or transformation criticise these approaches for being anthropocentric, highlighting the potential for "greenwashing" (Leadbeater, Kopnina and Cryer, 2022; Locquet and Carver, 2022) or for compromising on the transformative potential of rewilding (Genes *et al.*, 2019; Holmes *et al.*, 2020). More transformational goals and links with 3Cs rewilding tend to stem from a group engaging with the rewilding concept in the 90s in the UK, who also coined themselves the Wildlands Network and showed affinity to 3Cs rewilding. This group disbanded but is associated with existing projects and organisations in the UK including Trees for Life and Rewilding Britain, and over time UK rewilding has reflected the plurality of rewilding in Europe. However, this history of rewilding in the UK is not reflected in rewilding histories in academic literature as much of their writing was in ECOS which is not included in all academic literature databases.

Common among rewilding approaches in Europe are functional ecological goals, however given that policy in Europe tends to align with compositional conservation there are concerns that these goals are limited by extant conservation paradigms, policies, and goals

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(Sandom and Wynne-Jones, 2019). Locquet and Carver (2022) describe rewilding in Europe as a "3-legged stool"—considering cores and corridors but de-emphasising the needs of wide-ranging species (i.e., carnivores, echoing the 3Cs approach), with the need to continually "prop up" rewilding with human intervention.

Globalisation and plurality of rewilding

In the context of increased international awareness of biodiversity loss and sustainability challenges, engagement with rewilding has expanded to most continents, supported by increased coverage in public media tapping into growing public interest (Jorgensen, 2015; Johns, 2019; Sandom and Wynne-Jones, 2019). This trend also influenced the appeal of rewilding among policy makers and environmental organisations, especially in Europe (Pettorelli *et al.*, 2018). This has made it even more challenging to define rewilding or a consistent approach, limiting the relevance of theories previously suggested in the literature. For example, Galetti, Root-Bernstein, and Svenning (2017) note that the focus on wilderness in North America and alignment with neoliberal conservation goals promoted by some in Europe, can conflict with the colonial legacy and indigenous values and land use practices in South America. This has led to considerations for how rewilding is interpreted in different social-ecological contexts, e.g., Australasia (Sweeney *et al.*, 2019; Bartel *et al.*, 2020; Irwin, 2021) or South America (Galetti, Root-Bernstein and Svenning, 2017; Root-Bernstein, Galetti and Ladle, 2017).

As such, rewilding application has become highly contextual and diverse, echoing the plurality of the wider conservation movement. Many see this as a threat, e.g., Jorgensen (2015) refers to rewilding as a plastic term—so malleable and inconsistent that it lacks meaning. Responding to these criticisms, many have sought to find common ground among interpretations of rewilding. These can often focus on the meaning of "wild", highlighting the goal of non-human autonomy and functional ecological goals (Prior and Ward, 2016; Torres *et al.*, 2018; Genes *et al.*, 2019) while others highlight the subjectivity and changing meaning of the term, especially in relation to the role of humans (Pettorelli, Durant and du Toit, 2019; Utley, 2021). This has driven emphasis on the notion of coexistence—reflecting shared landscapes and human–nature entanglements (Durant, Pettorelli and du Toit, 2019; Lambert and Berger, 2022). However, these goals reflect indeterminacy and uncertainty, thereby conflicting with governance or monitoring approaches based on fixed goals, ideas of

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success, and desires to limit risk and uncertainty (Lorimer *et al.*, 2015; Root-Bernstein, 2022). Calls have been made for research to develop a more holistic framework, capturing diverse goals, guiding principles, available management options, and key assumptions underpinning rewilding theory and practice (Pettorelli, Durant and du Toit, 2019; Massenberg, Schiller and Schröter-Schlaack, 2023) and this is a key aim of this research.

While Jorgensen's (2015) view of a plastic term was negative, I propose that their observations were more about the plurality of rewilding, echoing a shift towards a relational paradigm in contemporary conservation. In this context, a more nuanced critical reflexivity is required (Chignell and Satterfield, 2023) so that rewilding does not become over-simplified, and definitions and principles capture its multivalence rather than being prescriptive of its methods and underlying values (Gammon, 2017, 2018). A relational paradigm aligns with potential (noted by Jorgensen) that rewilding is about creating future visions and could cross discursive boundaries from the scientific to the political (transformative and multidisciplinary). It aligns with calls that rewilding should be contextual and use participatory, collaborative methods considering the needs of more-than-human nature (Drenthen, 2022; Kopnina, Leadbeater and Heister, 2022). As such, rewilding could itself provide an interesting case study of this shift towards a relational paradigm. While this is not a main aim of this research, this will be considered in this thesis where appropriate.

1.4.5 Current trends in rewilding theory

Given calls to develop a holistic framework for rewilding, which are supported by this research and its aims, it is important to assess how rewilding is considered currently. This section is therefore based on academic literature that has been published since the initial literature review and concentrates on identifying current trends in rewilding theory. A lack of clarity over the concept of rewilding remains a barrier to rewilding application (Cózar-Escalante, 2019; Dandy and Wynne-Jones, 2019; Jones and Comfort, 2020). While progress is being made towards consensus, as is demonstrated by the guiding principles for rewilding developed by the RTG (Carver *et al.*, 2021), there remain several existing or emerging debates or perceived paradoxes, as are highlighted below. The concept is being engaged with across different disciplines, which has driven further engagement with the human dimensions of rewilding and considerations for how the term is understood in different cultural, geographic, or disciplinary contexts (e.g., Holmes *et al.*, 2020; Irwin, 2021; Thomas,

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2022). These studies have been helpful in identifying areas of consensus and areas that require further investigation but there remains uncertainty over the human-centred goals, given differing approaches that promote transformation, neoliberal conservation, or direct human benefits (considered in section 1.4.2).

The review identified some potential causes of continued debate or conflict in conceptualisations of rewilding. Firstly, conceptualisations of rewilding can be influenced by personal preference or disciplinary biases. These can be prejudiced by "strategic disconnections" (Scholfield, 2013) as is demonstrated in a study of rewilding in Europe by Holmes *et al.* (2020), where personal conflicts based on personalities, politics, or ethical principles can fuel conflict among rewilding projects, organisations, or individuals. This can be a barrier to cross-collaboration and consensus, affecting the flow of ideas and resources. This is reflected in the literature by the debate over the relevance of ecological baselines in rewilding (e.g., Genes *et al.*, 2019; Klop-Toker *et al.*, 2020; Schulte to Bühne, Pettorelli and Hoffmann, 2021). Conceptual "stretching" is also highlighted in the empirical studies within the literature reviewed, demonstrating that the concept is altered to align with values, perceptions, or priorities of those promoting rewilding, to appeal to stakeholders, or align with existing policy (Deary and Warren, 2019; Holmes *et al.*, 2020; Wynne-Jones *et al.*, 2020; Martin *et al.*, 2021; Thomas, 2022a). For example, in an empirical study of two rewilding projects in England, Thomas (2022a) demonstrates that rewilding is being "domesticated", with its more radical potential being moderated for the English context. While this stretching is not always considered a problem, as there is a clear need for rewilding to be adaptable to different contexts (Carver *et al.*, 2021), the issue is that rewilding is continually judged by how it is practiced in the present and what is possible within the current paradigm and culture, limiting the resulting definitions and conceptualisations. Theories therefore may not be widely applicable in the field or align with diverse rewilding goals. For example, to interrogate notions of control and autonomy within rewilding, Dempsey (2021) studied rewilding at Knepp Wildland to measure existing levels of human control over natural processes. They conclude that rewilding does not necessarily represent reduced human control of nature, due to the existence of control at Knepp. While the interrogation of notions of control is warranted and welcome, current levels of control in one project are not a fair representation of rewilding aspirations, limiting the validity of the conclusion

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drawn. This further demonstrates a need to expand conceptualisations of rewilding, to consider its aims and motivations alongside its practice to aid critical reflection and the development of a holistic framework. This may help to specify and address perceived conflicts between aims, current practices, and underpinning ethics (Genes *et al.*, 2019; Holmes *et al.*, 2020).

Emerging consensus

Some consensus is reflected in the literature reviewed. This is reflected in the RTG's definition and guiding principles for rewilding which was the outcome of an international consultation of rewilding practitioners, researchers, and theorists (Carver *et al.*, 2021). This work defined rewilding as "the process of rebuilding, following major human disturbance, a natural ecosystem by restoring natural processes and the complete or near complete food web at all trophic levels as a self-sustaining and resilient ecosystem with biota that would have been present had the disturbance not occurred. This will involve a paradigm shift in the relationship between humans and nature." The ten agreed guiding principles are (paraphrased for brevity):

1. Rewilding involves restoring trophic interactions to improve ecological integrity.

2. Rewilding involves landscape-scale planning, acknowledging the need for coexistence among more-than-human nature.

3. Rewilding focuses on the recovery of ecological processes, interactions, and conditions based on reference ecosystems.

4. Rewilding recognizes that ecosystems are dynamic and constantly changing.

5. Rewilding anticipates and mitigates the effects of climate change.

6. Rewilding requires local engagement and support.

7. Rewilding is informed by science, traditional ecological knowledge (TEK), and other local knowledge.

8. Rewilding is adaptive and dependent on monitoring and feedback.

9. Rewilding recognises the intrinsic value of all species and ecosystems, it is primarily ecocentric and not anthropocentric, and involves the removal of human control.

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10. Rewilding requires a paradigm shift in the coexistence of humans and nature with related institutional paradigm shifts. It is transformative and optimistic, delivering the best outcomes for nature and people.

These reflect rewilding intentions of functional ecological goals, coexistence (reflecting shifts towards a relational paradigm), systems-based governance approaches, and transformational human-focused goals.

Given that the RTG work was informed by the literature and an international consultation, the other literature reviewed here reflect consensus emerging in rewilding regarding many of these points. Firstly, that rewilding aspires to enhance ecological processes and related natural dynamism, giving nature greater autonomy (Dandy and Wynne-Jones, 2019; Genes *et al.*, 2019; Perino *et al.*, 2019; Van Meerbeek *et al.*, 2019; Holmes *et al.*, 2020; Wynne-Jones, Clancy, *et al.*, 2020; Massenberg, Schiller and Schröter-Schlaack, 2023). Secondly, the literature reflects multidisciplinary engagement with the concept of rewilding, along with consensus over the need to integrate socio-cultural factors into rewilding research, theories, and application (Cózar-Escalante, 2019; Dandy and Wynne-Jones, 2019; Holmes *et al.*, 2020; Wynne-Jones, Clancy, *et al.*, 2020; Irwin, 2021; Jepson, 2022). There is also some consensus that the process of rewilding will be more effective and sustainable using a systems-based approach to governance (Lorimer *et al.*, 2015; Cózar-Escalante, 2019; Butler *et al.*, 2021; Pettersson and de Carvalho, 2021). Increasing consideration for socio-cultural factors, alongside ecological goals, has driven SES framings of rewilding in the literature (Butler *et al.*, 2021; Drouilly and O'Riain, 2021; Pettersson and de Carvalho, 2021; Massenberg, Schiller and Schröter-Schlaack, 2023) and development of governance frameworks based on adaptive, collaborative approaches (e.g., Butler *et al.*, 2021; Pettersson and de Carvalho, 2021). However, it is highlighted that this is difficult to realise in practice and a propensity for command-and-control governance is noted (Lorimer *et al.*, 2015; Drouilly and O'Riain, 2021; Martin, Fischer and McMorran, 2023; Weber Hertel and Luther, 2023).

Key conflicts and uncertainties

Three key, related uncertainties that are evident in the literature are discussed below. The literature also reflects continued and interdisciplinary engagement with the remaining uncertainties inherent in rewilding. This is driven by a more holistic systems framing of

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rewilding, reflecting a shift towards a relational paradigm, highlighting complex social-ecological interactions in systems (Butler *et al.*, 2021; Jones and Jones, 2023) and wider engagement with the concept across different geographies and disciplines (e.g., Johns, 2019; Rawles, 2022). This trend has highlighted the multivalence of the concept and the need for it to remain adaptable to diverse contexts (Carver *et al.*, 2021).

Perceived conflict between dualistic or holistic perceptions of culture and nature
One key focus of discussion is around the role of people and culture in relation to wildness or non-human autonomy (Desilvey and Bartolini, 2018; Gammon, 2019; Holmes *et al.*, 2020), reflecting differences in value orientations highlighted in section 1.4.3. The RTG principles reflect consensus over the need for a paradigm shift in human–nature relationships (Carver *et al.*, 2021), however, the literature highlights inconsistencies in perceptions of rewilding related to different value orientations, reflecting various degrees of how nature and culture is perceived, from separate to integrated.

This demonstrates the importance of addressing this perceived conflict in rewilding frameworks as these value orientations can influence rewilding aims, practices, and decision-making. Most notably, they can influence whether rewilding aims for "pristine" wilderness free of human influence; aims to integrate nature and culture in shared landscapes; or the extent to which rewilding aims to promote human flourishing and wellbeing (Deary and Warren, 2019; Holmes *et al.*, 2020; Wynne-Jones, Clancy, *et al.*, 2020). These are perceived as conflicting aims and underpins tensions between those aligning with pragmatism (e.g., Jepson, Schepers and Helmer, 2018; Ward, 2019; Schulte to Bühne, Pettorelli and Hoffmann, 2021) or those aligning with transformation (e.g., Genes *et al.*, 2019; Kopnina, Leadbeater and Heister, 2022). Dualistic notions of wilderness have been influential in rewilding frameworks. For example, Torres *et al.* (2018) and Perino et al. (2019) propose frameworks which focus on the rewilding aims of ecological integrity, placing this aim on one end of a gradient and measuring progress towards this based on the withdrawal of human inputs and outputs. This notion is similar to Carver's (2014) wilderness continuum, which suggests that rewilding lies along a continuum of decreasing anthropogenic influence and increasing ecological integrity, from urban to wilderness. These conflict with the potential for human participation in rewilding and the potential for rewilding to occur in urban areas. In a study in Scotland, Deary and Warren (2019) find that

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those who promote the intrinsic value of other-than-human nature tend to align with concepts of wilderness and land sparing, but these may reflect a "living with" value orientation rather than a desire to perpetuate human–nature dualism, and so more critical reflection on goals alongside value orientations is needed. Case studies considering rewilding from different disciplines or in relation to different cultures demonstrate that holistic ontologies can affect perceptions of more-than-human nature as entangled communities (Desilvey and Bartolini, 2018; Deary and Warren, 2019; Gammon, 2019; Baker and Winkler, 2020; Irwin, 2021; Thomas, 2022b), expanding concern to human and other-than-human wellbeing, equity, agency, and responsibility (Gammon, 2019; Wynne-Jones, Clancy, *et al.*, 2020; Kopnina, Leadbeater and Heister, 2022).

It is also interesting to view these discussions in relation to rewilding principles of diversity and inclusion. In current practice, value pluralism and diverse ontologies work to influence rewilding aims, theories, and interventions (Deary and Warren, 2019; Holmes *et al.*, 2020; Wynne-Jones *et al.*, 2020) and it has been suggested that an adaptable approach that accommodates value pluralism can ultimately contribute to landscape heterogeneity as different socio-cultural contexts and priorities will be reflected in different approaches to rewilding (Cózar-Escalante, 2019; Deary and Warren, 2019; Sweeney *et al.*, 2019). However, the literature reflects that there is a need for further consideration of ethical concerns related to these ontologies and there is evidently a need for ongoing social science and environmental ethics engagement, ideally drawing on long-term, multicultural case studies.

Perceived paradox between rewilding interventions and non-human autonomy
Related to the perceived conflict between ontological positions, is an apparent paradox between rewilding interventions and the aim of non-human autonomy, stemming from questions over the degree of human influence deemed compatible with rewilding or the wild (Cózar-Escalante, 2019; Dandy and Wynne-Jones, 2019; Deary and Warren, 2019; Sweeney *et al.*, 2019; Holmes *et al.*, 2020; Wynne-Jones, Clancy, *et al.*, 2020; Thomas, 2022b). This paradox is highlighted as a barrier to rewilding application as rewilding continues to be perceived as the total withdrawal of human influence (Wynne-Jones *et al.*, 2020), echoing concerns with dualistic ontologies. When viewed from a more holistic ontology, rewilding does not necessarily mean the total withdrawal of human influence in

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large areas (Van Meerbeek *et al.*, 2019; Wynne-Jones *et al.*, 2020), rather it enhances the agency of non-human actors as co-creators of cultural landscapes (Gammon, 2019).

While there is general acceptance in the literature that rewilding can't involve total removal of humans or human influence and that there is a need for pragmatism and coexistence (Carver *et al.*, 2021), there remains uncertainty over how rewilding practice relates to notions of non-human autonomy. For example, Van Meerbeek *et al.* (2019) explain that the literature fails to integrate the merits and pitfalls of the ontological positions outlined in the above section and therefore there is currently no guidance for if, when, and how to intervene. They establish a framework suggesting that rewilding works along a gradient from human management to ecosystem self-management. De Cózar-Escalante (2019) similarly suggests that intervention is used initially so that later it becomes unnecessary, although there will always be some level of human control. In a study of the role of semi-wild horses in a Rewilding Europe project in the Greater Côa Valley, DeSilvey and Bartolini (2019) also suggest that there are degrees of non-human autonomy. They define rewilding as the management of tensions that play out through time, understanding animal autonomy as a variable, uneven, and situated process.

This uncertainty has prompted case studies framed around concepts of control (Dempsey, 2021), non-human autonomy (Desilvey and Bartolini, 2018), and biopolitics, which is concerned with the exercise of power over and regulation of living things (Thomas, 2022b). De Cózar-Escalante (2019) suggests that environmental pragmatism may provide a framing to allow for collaboration between humans and natural processes, giving agency to both human and non-human actors in rewilding application, therefore alleviating the perceived paradox between intervention and non-human autonomy. Similar notions are reflected in conceptualisations of collaborative rewilding or place making (Desilvey and Bartolini, 2018; Gammon, 2019; Marland, 2021; Jepson, 2022). Links are drawn between rewilding and compassionate conservation (Baker and Winkler, 2020), ecological solidarity (Moyano-Fernández, 2022), ecoegalitarianism, and the Māori concept of whakapapa (Irwin, 2021), which all promote holistic ontologies and the agency and intrinsic value of other-than-human species. Moyano-Fernández (2022) describes ecological solidarity as balancing tensions "between doing and leaving be, between the freedom of wildlife and caring for it." In a study of rewilding practice and policy in Britain, Wynne-Jones *et al.* (2020) demonstrate

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that rewilding projects are moving away from binaries that influence a more "hands off" approach, offering a more relational approach to enhancing human-nature connectivity and livelihood opportunities. Dempsey (2021) identifies different dimensions of control, namely "stabilisation control" (preventing an ecosystem transitioning into a different form); "location control" (keeping nature within physical or perceived boundaries, with links to notions of land sparing or non-native species); "prediction control" (limiting based on expectations); and "output control" (affecting desired outputs). These metrics can be helpful in further interrogating the notions of human control and non-human autonomy within the concept of rewilding, and in identifying what types or levels of control are considered acceptable or desired. However, there remains a need to better integrate these perspectives into rewilding aims and definitions of "non-human autonomy," clarify how rewilding interventions correspond with notions of other-than-human agency and justice, and develop a more holistic rewilding framework that reflects this potential.

Perceived paradox between pragmatism and transformation
The literature highlights a perceived paradox between how rewilding is practiced or understood within current paradigms and its aims to create paradigm shifts, leading to conflicts and concerns that the transformative potential of rewilding is being compromised (Holmes *et al.*, 2020; Carver *et al.*, 2021; Martin *et al.*, 2021). For example, Wynne-Jones *et al.* (2020) note that metrics used to measure or plan rewilding are still denominated by humans for humans, which is a barrier to integrating notions of intrinsic value and ecocentrism. Another example is demonstrated by Martin, Fischer, and McMorran (2023) who show that, despite aspirations and commitments for rewilding to be inclusive, genuine collaboration is limited by entrenched views of power, ownership, and tendencies to prioritise one's own interests.

These echo much of the conflict in the "new conservation debate," i.e., commodification of natural resources (Irwin, 2021), anthropocentrism (Wynne-Jones *et al.*, 2020), and continued compartmentalisation of human and other-than human areas or interests (Cózar-Escalante, 2019); scientific rationalism and intolerance for risk and uncertainty, driving command-and-control governance approaches to maintain control over rewilding application (Wynne-Jones, Strouts, *et al.*, 2020; Dempsey, 2021; Irwin, 2021; Martin, Fischer and McMorran, 2023). Desired qualities that are promoted in response to these barriers

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include more holistic or ecocentric ontologies that expand notions of wellbeing and interests to more-than-human nature (Cózar-Escalante, 2019; Wynne-Jones, Clancy, *et al.*, 2020; Irwin, 2021; Martin, Fischer and McMorran, 2023); improved adaptiveness and tolerance for uncertainty and dynamism inherent in wilder systems (Cózar-Escalante, 2019; Holmes *et al.*, 2020); and genuine collaboration, trust, and empowerment among stakeholders (Pettersson and de Carvalho, 2021; Martin, Fischer and McMorran, 2023).

While the above shows that concerns of compromise are legitimate, the literature demonstrates that there is potential for rewilding to be both pragmatic and visionary, aligning with a shift towards agonistic pluralism in wider conservation. For example, Pettersson and de Carvalho (2021), in their study of rewilding at Iberá National Park, note a need to continually balance pragmatic legitimacy (meeting the direct needs or interests of stakeholders) and output legitimacy (delivering milestones and communicating success related to the rewilding vision). Holmes *et al.* (2020) discuss the possibility for rewilding projects to adapt to socio-cultural contexts, with the potential to balance pragmatism with transformative goals over time, however they highlight that this requires further investigation.

1.5. Conclusion

In this chapter, I introduce the aims of this research and the thesis structure. Then, based on a literature review, I provide condensed histories of the conservation movement and rewilding, along with current trends in these fields. In section 1.4.3, I define some key concepts influencing contemporary conservation, particularly tensions between pragmatism and anthropocentrism on the one hand and transformation and ecocentrism on the other, along with a shift towards a relational paradigm and the development of an SES framework that encourages transdisciplinarity, pluralism, and systems-based approaches. This has implications for how conservation is planned and monitored, reflecting the openness, uncertainty, and plurality of SES and the need for place-based or systems-based approaches to governance. These concepts are discussed in relation to the "new conservation debate" and dominant framings of conservation highlighted in the literature. To support calls for improved critical reflexivity in conservation theory (e.g., Archer *et al.*, 2022; Chignell and Satterfield, 2023), I propose a novel framework that considers separately conservation's

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ecological and human-focused goals, governance approaches, and value orientations. The use of this framework could help to demonstrate the value pluralism inherent in contemporary conservation.

A condensed history of rewilding considers three theoretical framings of rewilding emerging from the literature, focusing on differences between 3Cs rewilding, Pleistocene rewilding, and European rewilding. This history demonstrates that the concepts identified in section 1.4.3 are echoed in the rewilding literature and underpin tensions between different approaches to rewilding. However, I identify common ground in the literature that an emphasis on divergences among theoretical approaches could miss. Namely, that rewilding represents a shift from compositional to functional ecological restoration goals and from command-and-control governance towards systems-based governance. However, these intentions are restrained in rewilding application due to extant paradigms in conservation. Given the diverse social-ecological contexts in which rewilding is being applied, and diverse priorities or values of those driving rewilding, there are variable levels of success or engagement with these goals and governance approaches, and this underpins the diversity of approaches to rewilding application. Based on the human-focused goals and value orientations highlighted in wider conservation (section 1.4.3), divergences in rewilding seem to echo divergences and tensions in conservation between pragmatism and transformation, and holistic or dualistic perceptions of nature and culture. These underpin several existing uncertainties reflected in recent rewilding literature, namely: 1) a perceived conflict between dualistic and holistic perceptions of culture and nature; 2) a perceived paradox between rewilding interventions and non-human autonomy; 3) a perceived paradox between pragmatism and transformation. Echoing the shift towards a relational paradigm in wider conservation, there are calls to improve critical reflexivity of rewilding approaches and to establish a more holistic framework that supports value pluralism, and this is a key aim of this research—to deconstruct the concept of rewilding and to (re)construct a framework that considers the influences and drivers (chapters 3 and 4), aims (chapter 5), and application (chapter 6) of rewilding in turn.

1.6 Chapter highlights

- Concepts influencing contemporary conservation are identified from a condensed history of the conservation movement, highlighting conflicts between anthropocentrism and pragmatism on the one hand and ecocentrism and transformation on the other, along with a shift towards a more relational paradigm that supports value pluralism.

- A brief history of rewilding demonstrates that these concepts are echoed in the rewilding movement, and it is highlighted that three perceived conflicts or paradoxes exist in recent rewilding literature: 1) a perceived conflict between dualistic and holistic perceptions of culture and nature; 2) a perceived paradox between rewilding interventions and non-human autonomy; 3) a perceived paradox between pragmatism and transformation. The shift towards a more relational paradigm in rewilding is demonstrated by calls for a more holistic framework that can support critical reflexivity while allowing for value pluralism and rewilding's multivalence.

- Some commonalities among rewilding's theoretical approaches are also highlighted, namely a transition from compositional to functional ecological goals and from command-and-control governance to systems-based governance. However, these intentions are restrained in rewilding application due to extant paradigms in conservation. Given the diverse social-ecological contexts in which rewilding is being applied, and diverse priorities or values of those driving rewilding projects, there are variable levels of success or engagement with these goals and governance approaches.

- Responding to studies of dominant framings in contemporary conservation and calls to improve critical reflexivity and support value pluralism, I propose a novel approach to consider separately the goals, governance approaches, and value orientations influencing contemporary conservation. This supports the research aims to deconstruct the concept of rewilding, focusing on rewilding aims, influences and drivers, and application.

Chapter 2: Methodology and research design

2.1. Introduction

To address the research questions and aims, an adapted constructivist grounded theory (CGT) methodology was used. Section 2.2, on philosophical and conceptual underpinnings, shows how my epistemological and ontological stance fits the CGT approach and highlights how other concepts influenced the research design. This chapter then presents a brief history of CGT and a justification for adopting this approach. Finally, this chapter sets out the practical steps taken to collect and analyse data to address the research questions and aims. Box 2.1 outlines my PhD journey, highlighting various setbacks which had significant influence on the research design.

2.2. Philosophical and conceptual underpinnings

2.2.1. Relativist ontology

To address the research question "what is rewilding?" I acknowledge the subjective and context-specific nature of the knowledge and experiences expressed in the data, reflecting a relativist ontological positioning. Relativism rejects the notion of absolute truth and views reality as conditional, local, personal, and able to take on different forms depending on the perspective of each individual person (Lincoln, Lynham, and Guba, 2018). I have taken a relativist ontological position in this research to emphasise how different contexts and influences have shaped conceptualisations of rewilding. Although the rewilding framework presented in chapter 7 seeks to unify the rewilding concept, it does not seek to present an ultimate truth but acknowledges that there are multiple realities that exist and therefore is adaptable to different contexts.

2.2.2. Constructivist epistemology

A constructivist epistemological position acknowledges that reality is multiple, processual, and constructed, aligning with a CGT methodology (Charmaz, 2014). This applies to participants and authors of the data as well as to myself as the researcher. Constructivist research "starts with the experience and asks how members construct it" (Charmaz, 2014, p. 342). This aligns with the research question, "what is rewilding?", acknowledging that the

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data reflect participants' and authors' constructions of the concept of rewilding. It also aligns with the second research question which considers a rewilding ToC, as the proposed framework is presented as a contextual and limited construction of the concept of rewilding that may continue to evolve, rather than a total, fixed representation.

2.2.3. Adaptability and agile project management

Adaptability was key to my experience as a researcher and emerged from the data as a key principle of rewilding. Due to changes and uncertainty throughout the research (as demonstrated in box 2.1), an iterative project design became a necessity. While CGT is iterative in nature, the research design was also aligned with an agile project management approach in its focus on developing a framework in an iterative way. This is an approach I was familiar with as I previously worked as a digital project manager and could sensibly assess and apply the relevance of this approach in undertaking my research.

Agile project management is a project management style that first arose in software development but has since been adapted for other contexts (Fernandez and Fernandez, 2008). Essentially, the objective is to develop a product (in this case a rewilding framework) in an iterative way; creating a beta product in the first iteration, then continually improving that product in subsequent iterations based on feedback, reflection, and changing contexts (Beck *et al.*, 2001; Fernandez and Fernandez, 2008). Intrinsic to the approach is the need to remain adaptable and flexible in the face of uncertainty, transforming traditional, hierarchical governance systems, and command-and-control approaches. It also emphasises cooperation and interdisciplinarity (Fernandez and Fernandez, 2008). Due to parallels with the rewilding principles of adaptability, complex systems thinking, and uncertainty (as outlined in chapter 6) and due to the necessity for adaptability within my research design, it felt appropriate to align the research design with this adaptive, iterative strategy.

2.2.4. Social-ecological systems

Given the paradigm shift in the conservation movement and rewilding towards a relational paradigm (as outlined in the literature review), acknowledging complex human–nature interactions as fundamental to understanding and implementing change, the theories emerging from this research are constructed around the SES concept. The SES framework was originally developed to aid research on the commons (Ostrom, 2009), but its usefulness

towards understanding complex interactions between social and ecological components of systems means it is increasingly used as a tool to diagnose issues affecting the sustainability of SES and to aid planning, decision-making, and monitoring for change (Ostrom, 2009; Partelow, 2018; Fougères *et al*., 2022; Deutsch *et al.*, 2023). The use of the SES concept has also allowed me to identify links between the social and ecological themes found in the data and to present the findings using a comprehensible framing to inform SES, rewilding, and transformative change research and application.

2.2.5. Theory of change

ToC is an outcomes-based framework which was initially developed to aid agencies concerned with creating long-term social change, encouraging them to create a vision for the future which can be used to plan interventions and demonstrate causal links and sequences of events needed to lead to that desired outcome. Essentially it "provides a roadmap to get from here to there" (Centre for Theory of Change, no date), mapping the steps that must be taken between the present context and the desired future (Biggs *et al.*, 2017; Centre for Theory of Change, no date). The use of ToCs has increased and the framework is used across different sectors and disciplines, and it is recommended for use in conservation and environmental decision making and conflict management (Allen, Cruz and Warburton, 2017; Baynham-Herd *et al.*, 2018). The models or instructions for creating ToCs vary, but the main components are similar (figure 2.1).

After considering a ToC framework, it seemed appropriate to use as a basis, together with SES, to present the research findings. As can be demonstrated from figure 2.1, the thematic nodes used in this research to inform the ToC (change why, change what, change how) fit with the main components of a ToC. It has also been suggested that a route to finding common ground among rewilding approaches is to focus on shared goals and a future vision (Pettorelli, Durant and du Toit, 2019b; Carver *et al.*, 2021; Hawkins *et al.*, 2022), echoing a shift towards a more relational paradigm in the conservation movement. As is explored in chapter 5, these goals can provide a vision on which to focus the development of a rewilding ToC. The nature of the themes emerging from the data and the emphasis on theory creation in a CGT approach further justify the adoption of a ToC framework to represent the grounded theories emerging from this research (chapter 7).

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Figure 2.1: Suggested components of a ToC (adapted from Biggs *et al.*, 2017; Ghate, 2018; Reinholz and Andrews, 2020).

Context (why); identifying, describing, and relating parts of a system		Application/pathways (how)		Impact (what)	
Root causes The factors that lead to or cause the need or problem.	**Need** Specific needs, problems or issues to address.	**Resources/ inputs** The resources required to influence change.	**Interventions /outputs** What is done or provided to address the need and lead to change.	**Outcomes** Associated with interventions; preconditions/ qualities contributing to vision; can serve as measurable indicators.	**Vision** Intended long-term changes; what is ultimately to be achieved.

2.3. Background to CGT

Grounded theory is a form of exploratory research (Glaser and Strauss, 1967; Stebbins, 2001). Exploratory research is guided by the precept that, to understand any phenomenon well, it is necessary to start by looking at it in broad, nonspecialized terms and to search for understanding wherever it may be found. In practice, therefore, grounded theory allows for flexible approaches to data collection and analysis, with the researcher exploring data for patterns, ideas, or hypotheses, rather than collecting data to test or confirm hypotheses (Stebbins, 2001; Creswell, 2007; Charmaz, 2014). In this way it is an inductive/abductive[9] approach. The outcome of exploratory research, and grounded theory as a methodology, is to produce inductively derived generalizations about the topic under study, and to weave these generalizations into a grounded theory that goes some way to explaining the phenomenon as experienced by people operating within (Stebbins, 2001; Creswell, 2007; Charmaz, 2014).

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[9] Induction is a process of reasoning that establishes a relationship between observations and theory, moving from particular instances to conclusions about general principles. Abduction similarly makes logical inferences about the world, however the outcomes are plausible explanations based on limited knowledge or observations (Given, 2008).

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Glaser and Strauss (1965, 1967) initially developed a grounded theory methodology to address biases in social science, including biases towards positivistic, deductive approaches due to a perceived lack of rigour with qualitative methods. Their aim was to systematize qualitative inquiry and to promote the potential for qualitative research to address complex human problems and contribute to theory creation (Glaser and Strauss, 1967; Charmaz, 2014; Clarke, 2019). Since the publication of Glaser and Strauss (1967) there have been several developments which have spurred divergences from the original (later referred to as Glaserian) grounded theory approach. The two most notable variations are Straussian grounded theory which was developed by Strauss and Corbin (1990) and provided a more abductive, systematic approach rooted in Strauss' pragmatist foundations, and CGT which was developed by Charmaz (2014). One of the main distinctions between Glaserian grounded theory and CGT relates to the perspective of the researcher, with the former supporting the objectivity associated with a post-positivist paradigm and the latter rejecting assumptions of neutrality and impartiality, implicating the researcher within the meaning making process (Charmaz, 2014).

Common ground among grounded theory methods is that they are inductive/abductive, comparative, emergent, and open-ended approaches, while the notable differences relate to foundational assumptions that shape studies (Clarke, 2019). CGT differs from previous variants in that it encourages flexibility, resisting the mechanical application associated with previous methods, and seeks to answer numerous criticisms raised about the epistemology of the original method, shifting the epistemological foundations of the method to a relativist, interpretivist position that addresses how embodied individuals and groups respond to problems in their material worlds (Charmaz, 2014; Clarke, 2019). Charmaz (2014, p. 13) notes that she "chose the term 'constructivist' to acknowledge subjectivity and the researcher's involvement in the construction and interpretation of data."

There are a number of characteristics of CGT highlighted in the literature, however there is some debate over which of these are essential and definitive. The following list is based on several sources (Charmaz, 2014; Bryant and Charmaz, 2019; Clarke, 2019; Babchuk and Boswell, 2023): simultaneous and iterative data collection and analysis; a focus on actions and processes in the data; memoing; constant comparison; drawing on the data to inform conceptual categories; developing inductive abstract analytic categories or nodes through

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systematic data analysis; theoretical sampling; attending to the context within which data is produced; attending to the subjectivities of the researcher through reflexivity; critical engagement with earlier theories and literature to identify un- or underexamined topics; open-mindedness, even where there is prior knowledge of the subject; and open coding techniques that are not mechanical or ritualistic. Figure 2.2 [from Charmaz (2014, p. 18)] provides a visual representation of the stages of CGT. To what extent grounded theorists follow the actions or principles outlined above and in figure 2.2 can depend on the type of study and the problems arising throughout the research process (Charmaz, 2014). Therefore, applied CGT research is not as linear as figure 2.2 suggests.

Figure 2.2.: A visual representation of a grounded theory (from Charmaz, 2014).
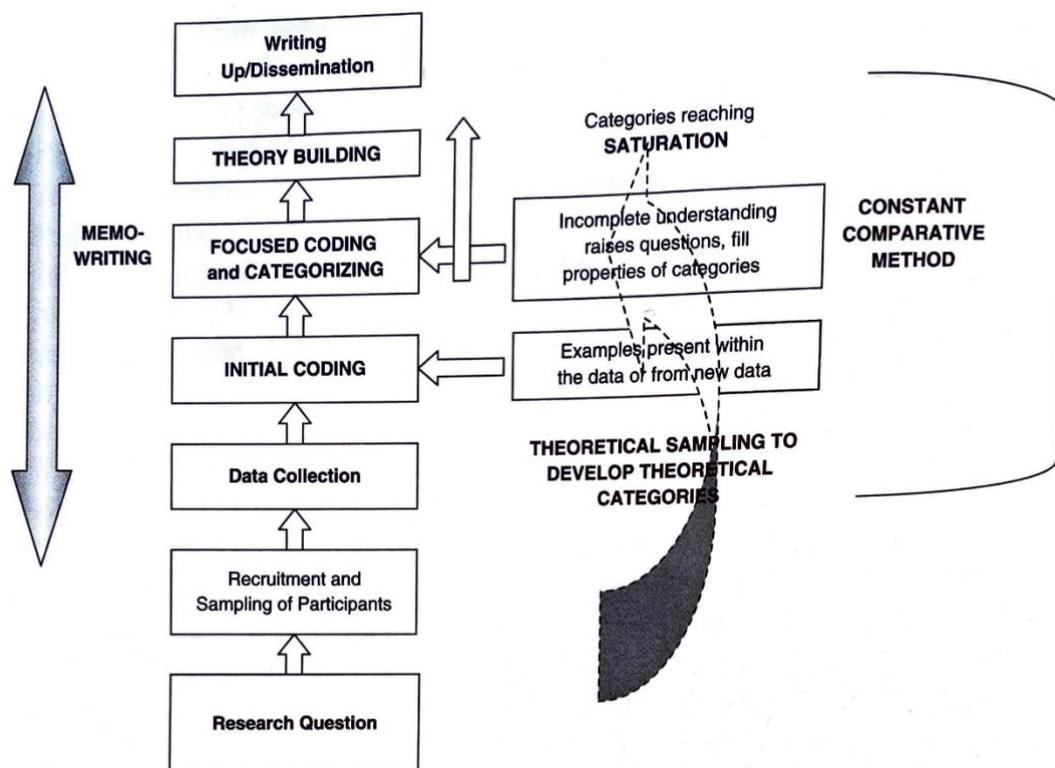
2.4. Adapting a grounded theory approach

For this study, I chose to adopt and adapt a CGT approach. This section describes my reasons for doing so, and the characteristics that define my approach as CGT. When this research methodology was adopted, I had already completed a literature review and some data collection and analysis [the rewilding pioneer survey (RPS), see section 2.5]. This work

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was initially done to inform the RTG's work but was integrated into this PhD research due to setbacks which meant I had to adapt the research design (box 2.1). After considering different research methods, it became apparent that adapting a CGT approach was most appropriate. Figure 2.3 shows the steps that were followed and can be compared with Charmaz's grounded theory diagram displayed in figure 2.2.

Figure 2.3. A diagram demonstrating the CGT approach and research design of this study.

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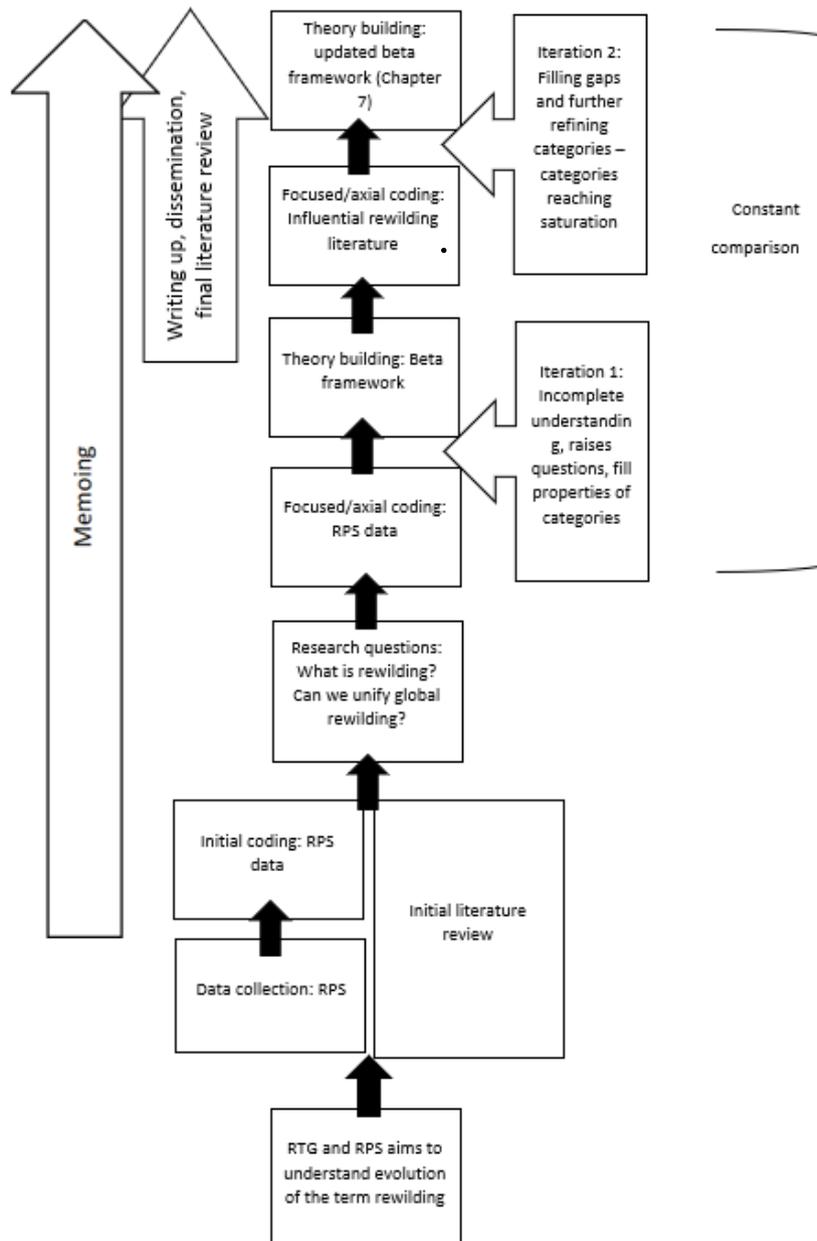
According to Thornberg and Dunne (2019), there are at least three reasons a grounded theory method is necessary:

1. The literature does not provide enough theories to cover all aspects or areas of the social life.

2. Due to their lack of grounding in the data, extant theories seldom fit or work, nor are they relevant or sufficiently understandable to use in research which aspires to be sensitive to the empirical field and its participants.

3. Our reality is dynamic, continually shaped by diverse, subjective lived experiences and innovations—as demonstrated via their quote from Blumer (1969: 23): "the history of empirical science shows that the reality of the empirical world appears in the 'here and now' and is continuously recast with the achievement of new discoveries. The danger of the belief that the reality of the empirical world exists in a perpetually fixed form comes in the natural disposition to take existing knowledge of that reality as constituting the perpetual fixed form."

As demonstrated by the literature review in chapter 1, all three of these reasons are true for the subject of rewilding. Firstly, rewilding literature is biased towards ecological aspects of rewilding, leaving gaps addressing social aspects and the culture of practice. Secondly, most theories, frameworks, and definitions of rewilding are not based on empirical evidence or data but on opinions or policies that have been established by organisations to suit their own requirements and contexts. Thirdly, rewilding continues to be conceptualised by its application in the present, limiting the adaptability and wider applicability of a general rewilding concept, and conflicts arise as varied conceptualisations of rewilding are emerging and evolving.

Figure 2.3 also demonstrates how an agile project management approach was adopted as part of the CGT approach. During iteration one, concepts were identified, and a beta framework developed based only on the RPS data. During iteration two, this framework was tested against a second data set and emerging theories were further developed and refined.

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I had some concerns when adopting a CGT approach that are worth noting here as these help to justify its use in this study. Firstly, my data collection and analysis did not occur simultaneously. However, the main objective for this is to encourage constant comparison and address emerging categories in successive data collection. Constant comparison aims to iteratively develop codes, categories, and themes throughout data analysis (Charmaz, 2014). The richness of the data supported this throughout coding phases. Secondly, some grounded theorists advocate for avoiding any literature review until theory construction phase. However, a preliminary literature review is encouraged in CGT (Thornberg and Dunne, 2019). Finally, I was concerned about the use of secondary data within CGT. This was partly due to observed biases that exist in environmental research against the use of secondary data. This caused some delays as I considered various other sources of data. Further consideration of CGT demonstrated that secondary data can be useful to inform theoretical sampling, a feature of CGT that encourages the sourcing of rich data to explain the social phenomenon (Charmaz, 2014). This insight allowed me to trust and follow my instincts and curiosity to analyse the secondary data highlighted by participants in the RPS survey. Based on my philosophical positioning, my use of coding and memoing, the richness of my data and my intention to approach the topic of rewilding broadly and with an open mind—to deconstruct and ultimately reconstruct a theory of rewilding based on the exploration of data, I felt that this was a valid CGT approach. This is also demonstrated in the concluding chapter of this thesis where Charmaz's (2014) criteria for assessing emergent theories (originality, credibility, resonance, and usefulness) are used to assess the research presented in this thesis. The practicalities of my approach are outlined in the remaining sections in this chapter.

2.5. Data collection

Two sets of data were collected and analysed; a set of primary data that was collected via a rewilding pioneer survey (RPS) and a set of secondary data, the influential rewilding texts (IRT), which are texts cited by participants of the RPS as being influential to their understanding of rewilding. The data sources are further explored in chapter 3 which provides context and informs a study of the emergence and evolution of rewilding concepts.

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2.5.1. Rewilding pioneer survey

The first set of data used was collected through a survey of rewilding pioneers. This survey was initially developed to inform the work of the RTG as we worked towards guiding principles for rewilding, and the outcomes related to this strand of work are presented in Carver *et al.* (2021). The aim of this survey was to establish a better understanding of the trajectory of the term "rewilding" and the history of the field, as well as the current definitions of the term as understood by experts and practitioners, and their views of the future of the field. It was also seen as an opportunity for rewilding pioneers, many of whom are approaching old age, to tell their story and thus contribute to the oral history of the rewilding movement.

Development of the web-based questionnaire

Questions for the survey were devised in early 2018 in collaboration with some RTG members and supervisors at the time; Mark Fisher, Stephen Carver, Ian Convery, Alison Parfitt, and Darrell Smith. An online, written survey was chosen over other data collection techniques as the intention was to reach a large number of international participants, allowing efficient use of researcher time and allowing participants to reflect on their responses in their own time, given that questions were mostly open ended.

The first page of the survey contained introductory information about the survey as well as consent. This was followed by three pages entitled "Rewilding 'then,'" "Rewilding 'now'" and "Rewilding in practice" containing 19 largely open-ended questions. This was followed by the final page containing six questions related to demographic information and contact details. The participant information page and questions can be seen in Appendix 1.

SurveyMonkey was used to host the survey; an online survey was chosen over other mediums due to the geographical spread and the large number of participants we intended to approach. The survey was piloted with staff and research students at the University of Cumbria (UoC). Feedback on the structure and usability of the survey from this pilot led to improvements.

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Identifying and approaching participants

Given the emphasis of GT on theory emerging from the data, and the aims of the study to deconstruct the rewilding concept, the focus was on finding participants who were influential on the rewilding concept primarily, rather than broader concepts in conservation. These "pioneers" were initially identified from authors of rewilding texts, but other influential figures were identified through a snowball method. This widened the participants to figures (as well as projects or texts) that did not necessarily identify with rewilding but were nevertheless influential. This allowed me to see connections with or influences from other fields, including ecological restoration, conservation, and environmental humanities, while maintaining a focus on the topic of study. Although these influences are recognised and considered as part of the data analysis, I do not use them to define rewilding aims or its application. Specifically, participants were identified using the following methods:

- Authors – journals: A Web of Knowledge search using the keyword "rewilding" was undertaken and a list of authors who had published three or more papers on this list was extracted. At the time of undertaking this survey, the results included papers indexed prior to June 2018.

- Authors – books: A search was done on Amazon (June 2018) using the search term "rewilding" and the names of authors of books on rewilding were extracted.

- Authors – Wild Earth: Wild Earth was the magazine of the Wildlands Project, a pioneer rewilding organisation, and is not indexed in Web of Knowledge. An RTG member (Mark Fisher) who had access to the back catalogue of Wild Earth, extracted the names of authors of "rewilding" articles from the magazine via a manual search.

- RTG member recommendations: Members of the RTG suggested those who they considered to be rewilding "pioneers." Along with early pioneers, largely from Europe and North America, emphasis was placed on obtaining perspectives from other geographical areas.

- Snowball method: Respondents suggested who should be contacted via question 8 of the survey, i.e., "In your opinion, who are the rewilding pioneers we should be contacting?"

- Expressions of interest: The RTG was advertised via the IUCN website and social media. This resulted in several practitioners and academics contacting RTG members with a desire to contribute. These individuals were contacted to complete the survey.

In total, there were 156 names on the invitee list. Given that the rewilding concept was initiated in the USA and western Europe, and the focus of the survey was on pioneers influencing its evolution, the majority of these invitees were from these areas. While every effort was made to find up-to-date email addresses to contact all identified pioneers, there were inevitably a few individuals who I was unable to contact. The final number of invitees was therefore 135. Invitees were sent an email with a link to the survey, and where appropriate a number of follow-up reminders. Participants were contacted between May and July 2018 and the survey was closed in August 2018 with 60 responses.

Ethical approval

Ethical approval was granted by the UoC research ethics panel prior to participants being recruited. The consent form stated that respondents would not remain anonymous in research outputs and that they may be directly quoted. Despite this, I have only used participants' names in this thesis where it is significant to the context of the data cited.

2.5.2. Secondary data: influential rewilding texts

The second source of data was texts that were cited by RPS respondents as being influential to their understanding of rewilding. While we did not ask directly for texts that were influential, respondents cited texts in answer to several questions and many responses encouraged further exploration of these texts as they were significant influences on RPS participants. Some examples of responses citing IRT are provided in table 2.1. Based on the reflections on these texts in the RPS, it was concluded that the IRT could provide rich data to further develop and refine the categories and theories emerging from the RPS data and could fill gaps where some identified pioneers had not responded to the RPS, as they were authors of texts cited. I also felt that the data from these texts would be more considered and richer than those that could be extracted from primary data collected through methods such as interviews or focus groups. All texts cited in the RPS were included to promote looking beyond the "usual suspects," acknowledging that "grey literature" has been very

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influential in the development of rewilding concepts and the academic literature often fails to consider these influences, as highlighted in the literature review.

It is also worth noting that some of these texts are not specifically about rewilding and a number were written prior to the term rewilding being developed. However, they have relevance as being influential on the rewilding concept, as demonstrated in table 2.1 and in chapter 3 which demonstrates their influence on conceptualisations of rewilding. The IRT includes 10 peer reviewed academic journal articles, 10 non-peer reviewed articles (including book chapter, magazine articles and policy briefs), 6 popular non-fiction books, and 4 edited books, with publication dates spanning from 1862 to 2019. Table 2.2 lists the IRT with their publication information. The list broken down further into chapters is provided in Appendix 2.

Table 2.1. Examples of RPS participants citing influential texts, noting the relevant questions.

Question		Example of a response citing an influential text
2	When, where and how did you first hear about rewilding?	I can't recall exactly when I first heard the term, however, George Monbiot's book, 'Feral', (in 2013) was when I first took notice of the word - and the ability for the word to improve engagement with the community.
		About 2000; we had commissioned a project called New Wildwoods the year before which was independently going down this line; Vera's book hit the headlines and suddenly the word became part of discussions.
3	At that time, what did you understand rewilding to mean?	Just reread [Soulé and Noss 1998], to see what I probably understood at the time. The key definition there is: "the restoration and protection of big wilderness and wide-ranging, large animals -- particularly carnivores." Soon thereafter, I imagine that I became aware that the primary new action for implementing "rewilding" was the advocacy of "corridors" to link new or established wildlands reserves in order to ensure that large carnivores (especially wandering males) could safely move from one reserve to another.
6	What in your opinion were the circumstances or drivers that gave rise to the rewilding concept?	As indicated, the dramatic reforestation of the Northeast has been a major influence on this thought. Bill McKibben's article "An Explosion of Green" addresses this connection.
		W.D. Newmark's early work (1987,1995) on extinction risks in National Parks.
8	In your opinion, who are the rewilding pioneers we should be contacting?	A new book that offers a distinctive and valuable angle on the topic is Robin Wall Kimmerer's Braiding Sweetgrass. Kimmerer combines her professional experience as a forest ecologist with her Native American heritage to look at wildness in qualitative terms. Check back on Thoreau's Walking, too, where he identifies wildness as a quality of awareness as opposed to a matter of acreage and remoteness. Rewilding is a reversion to Thoreau and Kimmerer from the more quantitative criteria of Muir's wilderness.
		Robin Wall Kimmerer--her book Braiding Sweetgrass has become influential in this field.

		Rewilding has gone through several phases of conceptual development and the latest is captured by the upcoming book edited by Pettorelli, Durant, & du Toit.
		George Monbiot and some of the people discussed in his book (apols can't remember their names!).
9	Thinking about now – what do you understand rewilding to mean?	A new and complimentary approach to conservation guided by principles (see Jepson & Schepers 2016), characterised by pioneer 'post normal' projects and a world view associated with pragmatic realism and interacting with advances in interdisciplinary conservation science.
		See Gammon 2018, "The Many Meanings of Rewilding" in the journal Environmental values. The one sentence summary of that article is that rewilding means a lot of different things and we should be sensitive to those differences.
10	Do you have a preferred definition of rewilding, e.g. one from academic or practitioner literature?	[Thoreau's] Walking's passage of wildness comes as close to such a definition as any other I know.
		Pettorelli et al. 2018. But this is quite an academic definition - I also like the concept of non human autonomy as outlined in Prior and Ward 2016 in their response to Jorgenson.
		Ecological restoration to promote self-regulating biodiverse ecosystems. A key subset of this is trophic rewilding: species introductions to restore top-down trophic interactions and associated trophic cascades to promote self-regulating biodiverse ecosystems (Svenning et al. 2016 PNAS). This was developed based on extensive discussions between a broad set of people with expertise on rewilding and related fields.
11	Do you think rewilding has lived up to your expectations (as listed in question 6)?	I did not have expectations. We worked hard to create a 'wave' of new consciousness - articles, books, seminars, and conferences - but yes: many areas under some kind of 'rewilding' process - see the book 'Rewilding' which Peter Taylor edited (2011).
12	Who would you consider to be the influential people/organisations involved in rewilding now?	Authors from Donlan et al. 2006.
		See the upcoming book "Rewilding" edited by Pettorelli, Durant & du Toit for the BES/CUP series Ecological Reviews. All the key players are contributors to that volume.

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Table 2.2. The list of IRT analysed in the second iteration. The full list, including chapters within books, is included in Appendix 2. NA = Not applicable.

Year of publication	Authors/editors	Title	Type	Source
1862	Thoreau, Henry David	Walking	Magazine article	The Atlantic
1949	Leopold, Aldo	The Land Ethic	Book chapter	A Sand County Almanac
1982	Janzen, D.H. and Martin, P.S.	Neotropical Anachronisms: The Fruits the Gomphotheres Ate	Journal article	Science
1987	Newmark, W.D.	A Land-bridge Island Perspective on Mammalian Extinctions in Western North-American Parks	Journal article	Nature
1990	Snyder, Gary	Practice of the Wild	Book (monograph)	NA
1992	Foreman, Dave	Around the campfire	Magazine article	Wild Earth
1992	Foreman, Dave *et al.*	The Wildlands Project Mission Statement	Magazine article	Wild Earth
1992	Noss, Reed	The Wildlands Project: Land Conservation Strategy	Magazine article	Wild Earth
1995	Newmark, W.D.	Extinction of Mammal Populations in Western North American National Parks	Journal article	Conservation Biology
1995	McKibben, Bill	An explosion of green	Magazine article	The Atlantic
1998	Soule', M. and Noss, R.	Rewilding and Biodiversity: Complementary Goals for Conservation	Magazine article	Wild Earth
1999	Barlow, C.	Rewilding for Evolution	Magazine article	Wild Earth
1999	Martin, P. and Burney, D.	Bring back the elephants!	Magazine article	Wild Earth
1999	Soule', M. and Terborgh, J. (eds)	Continental Conservation: Scientific Foundations of Regional Reserve Networks	Book (edited)	NA

2000	Barlow, Connie	The Ghosts of Evolution: Nonsensical Fruit, Missing Partners, and Other Ecological Anachronisms	Book (monograph)	NA
2000	Vera, Frans	Grazing Ecology and Forest History	Book (monograph)	NA
2004	Foreman, Dave	Rewilding North America	Book (monograph)	NA
2005	Donlan, J. *et al*.	Re-wilding North America	Journal article	Nature
2011	Taylor, Peter (ed.)	Rewilding: ECOS writing on wildland and conservation values	Book (edited)	Chapters originally published in ECOS
2013	Monbiot, George	Feral	Book (monograph)	NA
2013	Wall Kimmerer, Robin	Braiding Sweetgrass	Book (monograph)	NA
2015	Pereira, H.M. and Navarro, L.M. (eds)	Rewilding European Landscapes	Book (edited)	NA
2016	Prior, J. and Ward, K.	Rethinking rewilding: A response to Jorgensen	Journal article	Geoforum
2016	Svenning, J.C. *et al*.	Science for a wilder Anthropocene: Synthesis and future directions for trophic rewilding research	Journal article	PNAS
2016	Jepson, P. and Schepers, F.	Making space for rewilding: Creating an enabling policy environment	Policy brief	Rewilding Europe
2018	Jepson, P., Schepers, F., and Helmer, W.	Governing with nature: a European perspective on putting rewilding principles into practice	Journal article	Philosophical Transactions of the Royal Society B
2018	Gammon, Andrea	The Many Meanings of Rewilding: An Introduction and the Case for a Broad Conceptualisation	Journal article	Environmental Values

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2018	Pettorelli, N. *et al.*	Making rewilding fit for policy	Journal article	Journal of Applied Ecology
2018	Bakker, E. and Svenning, J.C.	Trophic rewilding: impact on ecosystems under global change	Journal article	Philosophical Transactions of the Royal Society B
2019	Pettorelli, N., Durant, S., and du Toit, J. (eds)	Rewilding	Book (edited)	NA

2.6. Coding

Initial coding was done on the RPS data in Word in 2018. At this stage the intention was for this work to inform the work of the RTG. The process fitted with the description of initial coding in Charmaz (2014). This entailed remaining open minded and exploring the ideas and concepts emerging from the RPS data; using line-by-line coding; comparing emergent themes with existing knowledge gained through the literature review; and memoing (section 2.7).

Line-by-line coding is a technique used commonly in qualitative data analysis and in initial stages of CGT as it helps to notice nuances and encourages deep exploration at the early stage of data analysis. While Charmaz (2014) recommends using gerunds to focus on action, I was not aware of this at this stage so did not use gerunds. In this case I took each line of the survey data responses and coded them. Table 2.3 shows examples of line-by-line coding from the RPS data.

Throughout the process, constant comparison between codes and data enabled distinctions and refinement of codes. Focusing on the concept of "change" provided a pragmatic framework to categorize initial codes under initially four parent nodes, to organise the emerging themes; change what (aims of rewilding); change why (context); change how (rewilding interventions and principles of practice); barriers to change. These made immediate sense and provided a frame for later analysis and theory development. The themes listed under these parent nodes after initial coding can be found in Appendix 3.

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Table 2.3. Examples of line-by-line coding in the initial coding phase.

Survey response	Codes
It came from the connection of island theory and trophic cascades, at the scientific level. At the activist level, it's an opportunity to advance bolder initiatives and increase the area devoted to conservation	Emerging ecological theories Influenced by science Influenced by activism Bold, optimistic Increased scale
I still understand rewilding to focus on the restoration of ecological processes (e.g. trophic interactions, disturbances) rather than specific species and/or habitats. Clearly, the (progressive) reduction of human activities to manage the rewilded land is essential. I also now understand that there is no single approach to rewilding and that the degree of intervention needed to put a system on a rewilding path can vary greatly (from passive recolonisation of abandoned areas to the reintroduction of ecological replacements).	Ecological restoration - process Change to practice – holism Progressive/continuum Reducing human activities Context-specific interventions, adaptable Goal-orientated Passive rewilding/land abandonment Reintroduction; taxon replacement

Focused coding was done using Nvivo software. Focused coding of the RPS data was undertaken over 2020 and 2021, followed by focused coding of the IRT data over 2021 and 2022. Focused coding involves attending to how your initial codes account for your data and allows you to synthesize, analyse, and conceptualise larger segments of data (Charmaz, 2014). Focused coding is not as detailed as line-by-line coding, instead it focuses on new ideas to explore and contradictions to resolve (Jackson and Bazeley, 2019). Throughout focused coding, and in line with qualitative data analysis methods (Jackson and Bazeley, 2019), breaks from coding allowed me to periodically check the relevance of nodes and compare codes. In this way codes became further refined and defined, with sub-nodes appearing and some categories shifting to other parent nodes. For example, perceived barriers to change were integrated into rewilding aims and drivers, leaving three main parent nodes related to "change how", "change what", and "change why." The full codebook, showing the final parent and sub-nodes that formed the basis of the theories presented in this thesis, is included in Appendix 4.

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2.7. Memoing

I used memoing throughout all stages to capture reflections, moods, emerging theory, connections between nodes, and obstacles. As advised by Charmaz (2014), memos were spontaneous, raw, and unedited writing to allow creative freedom while analysing the data. Memoing frequently helped me to stay connected to the data, to sustain active involvement with the data analysis, to overcome obstacles, to note emerging connections and theories, and to maintain momentum. Memos were done in NVivo using the notes tool and also against nodes using the "Node properties" function (these notes are included in the final codebook in Appendix 4), while more personal, reflective memos were written in Microsoft Word. Some relevant memos are included throughout the thesis in boxes as "reflexive notes".

2.8. Conclusion

The methodology outlined in this chapter reflects an adapted CGT approach. This entire process, especially within the context of adapting to changing circumstances as outlined in box 2.1, ultimately allowed me to develop methodological sensitivity[10] towards the subject area by:

- Continually reflecting on the significance of the research, background context, and findings through my literature reviews, data analysis, and growing practical experience.
- Carefully and continuously considering the intent and direction of the research questions and aim of the study.
- Memoing to record the above and consider my own position and changing conditions.
- Learning about different types of research that would allow me to become more instinctive and confident about the methods and methodology most suitable to changing situations and research aims and incorporate learning from previous stages in the research, as well as in my career experience, where necessary.

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[10] Methodological sensitivity is defined by Bryant (2017, 36) as *"the skill or aptitude required by researchers in selecting, combining, and employing methods, techniques and tools in actual research situations."*

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2.9. Chapter highlights

This chapter provides an overview of the methodology and methods used in this study:

- The philosophical and theoretical aspects that align with a CGT approach are presented to situate ontological and epistemic underpinnings, while other influential concepts are also introduced, demonstrating how agile project management influenced the CGT approach and how SES and ToC frameworks were combined to frame the research results.
- A CGT approach is introduced, followed by an explanation of why and how a CGT approach was adapted to inform the research plan. This is informed by an outline of my PhD journey (box 2.1).

Box 2.1. Reflecting on my PhD journey and its impact on research design

Over the course of my PhD, I have had to adapt to emerging situations and setbacks outside of my control. The process of having to adapt has at times driven me to feel anxious and disheartened as I was not achieving pre-determined goals, which included wanting to complete in three years! Writing this section has helped me to reflect on just how much I have achieved and overcome in the last six years. My PhD journey also became integral to my development as a researcher, and I was able to draw links between my experiences and some of the themes emerging from my research data, including notions of uncertainty, tolerance for unpredictability, and adaptability. Many of these links are highlighted in boxes of reflexive notes throughout the thesis, much like this one.

The different shapes below have different focuses: Boxes = PhD-related plans or progress; arrows = other work contributing to my career and experience; circles = setbacks that affected my research plans.

Lynx project (2016-2017)

Data collection using a Q method approach as part of the community consultation regarding lynx reintroduction in Kielder, UK. Later published in Hawkins *et al.* (2021).

2017: I officially started my PhD in April 2017 with the intention to explore the social aspects of carnivore reintroductions, using the lynx project as a case study.

Setbacks from the lynx project

In mid-2017 we were forced to end all activities related to the project due to conflicts of interest with the project's governing organisation. Towards the end of 2017, and in discussion with my supervisors, the decision was made to change the focus of my PhD completely

IUCN CEM Rewilding Thematic Group (RTG): 2017-present

The RTG was founded in September 2017. In 2018 I personally undertook a literature review and lead on the RPS survey, both of which informed the RTG work towards guiding principles (Carver et al., 2021).

2018: I rewrote my PhD proposal with the aim to develop methods to assess social-ecological conditions to inform and monitor rewilding interventions. I planned to use a case study approach. Although I felt that the work for the RTG (the literature review and RPS) would inform my PhD research, I did not intend for this to become a major part of my thesis. Based on my experiences with the lynx project, I felt that collecting data using mixed methods in case study areas was more appropriate for the research aim.

Case studies were arranged at iSimangaliso Wetland Park in South Africa where they were developing a rewilding plan; and I had been granted a Newton Fund Scholarship to spend a semester at Tsinghua University in Beijing where RTG contacts would help me to arrange a case study in China.

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Box 2.1. continued.

Lifescape Project (2018-present)

One positive outcome from the lynx project was that we had an incredible, passionate interdisciplinary team covering various aspects of rewilding, including legal, governance, social and ecological aspects. The team went on to found the Lifescape Project, and I remain on the board of trustees, advising on several projects. This has helped in providing perspective about the realities of rewilding application and ground-truthing the theories emerging from this research.

Personal setbacks

While my research and career were progressing relatively well, I was experiencing a chaotic period in my personal life. In spring of 2018 my partner and I separated and put our house on the market. I moved out of my house and put my possessions into storage in November 2018, and I was due to fly to South Africa for several months to see family and undertake my first case study at iSimangaliso. That same day, I attended an appointment at the Lancaster Breast Unit and was diagnosed with breast cancer. I intercalated for 12 months from November 2018 to complete and recover from treatment.

2019: I re-started my PhD at the end of 2019, sticking to the second proposal and plans to collect data in case studies. I rearranged plans and intended to visit China in the spring.

COVID

China went into lockdown in January 2020, and I cancelled my trip to China. I instead flew to South Africa to see my family and ended up being locked down there for several months. Despite the difficulties of lockdown, I was very fortunate to be there as they live on an estuary in a very biodiverse area of the Eastern Cape. I was able to give myself time to rest and properly recover after my cancer treatment. I returned to the UK in the summer of 2020. The experiences of COVID in different countries also encouraged me to reflect on how responses to the pandemic were shaped by context, resources, and culture.

Routledge Rewilding Handbook (2019-2022)

In 2019 the RTG were approached by Routledge to write a proposal for a handbook on rewilding. This ended up being a 3-year project, bringing together an incredible, varied collection of contributors. Although this was a challenging project, this allowed me to grow in experience and I have made many valued contacts along the way. The book was published in 2022 (Hawkins *et al.*, 2022).

2020: COVID created ongoing uncertainty. I hoped to stick to my case study plans but became increasingly aware that this would be impossible. To move forward, I had to adapt my research plans, aims and questions, but also had to ensure that any plans were adaptable to the changing situation.

Reflecting on the findings from my literature review which demonstrated the complexity of the rewilding concept and a need to find common ground in rewilding practice, I chose to go back to the RPS data and approach it with broader goals. The research design that emerged is detailed in this chapter. Reflecting on this process, it has adopted many of the values of rewilding identified in the research, especially adaptiveness and iterative progress, so the research design and emerging theories co-evolved. Being forced to adapt and be more pragmatic also meant that I could prioritise responding to some of the remaining uncertainties in rewilding through my research, rather than prioritising my own interests for travel and adventure. I think as a result this research is a more significant and useful contribution to the rewilding community and work towards rewilding guidelines.

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Chapter 3: The emergence and evolution of rewilding concepts

3.1. Introduction

Supplementary to the history of rewilding outlined in the literature review (chapter 1), this chapter considers this history in relation to insights from the data, contextualising the emergence of different rewilding concepts, and examining some of their influences. As such it also serves to place data sources into context and provides a broad view of the emergence and evolution of different rewilding approaches or conceptualisations, before the remaining empirical chapters focus more specifically on the drivers, aims, and application.

3.2. Examining the data sources

3.2.1. RPS participants

Given that the RPS was aimed at rewilding pioneers, the majority of respondents were from the US and western Europe (figure 3.1), reflecting the historic roots of rewilding in these areas. Participants included academics, authors, and practitioners from various disciplines, many associated with widely regarded rewilding organisations or publications.

Figure 3.1: Respondents by country of residence (as provided in answer to question 24 of the RPS, Appendix 1; n=59; where more than one country was listed all are counted).
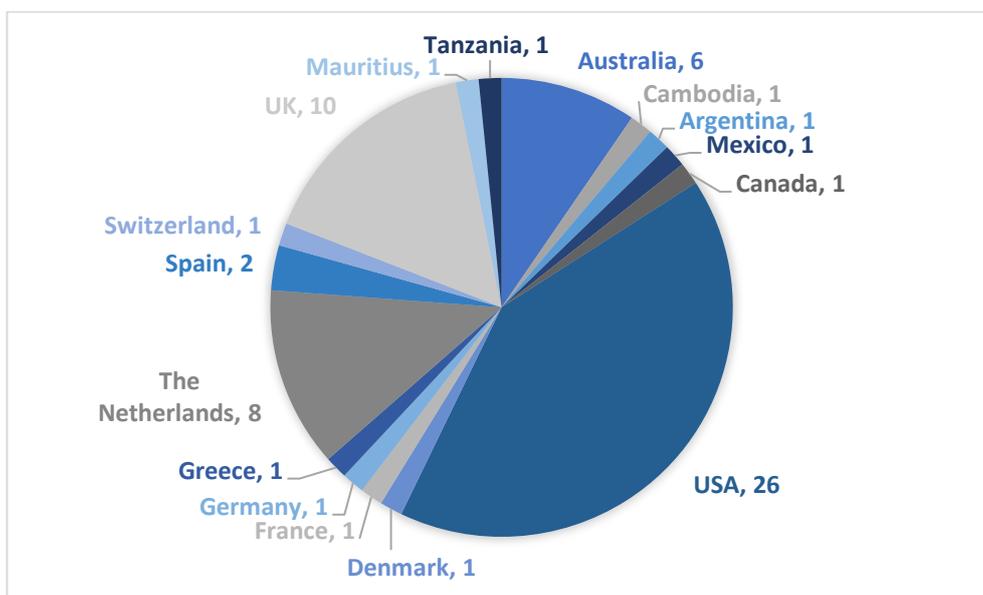
The full list of participants and their affiliations is provided in Appendix 5 to demonstrate the range of disciplines, expertise, and experiences of the participant group. As mentioned in section 2.5.4, the participant information sheet stated that participants would not remain anonymous in research outputs. However, participants are only named against direct quotes in this thesis where the information would provide context.

3.2.2. Exploratory network analysis

The RPS asked participants to describe when and how they first heard about rewilding (Appendix 1, question 2) and the influential figures or organisations at the time (Appendix 1, question 3). This data formed the basis of a basic exploratory network analysis in Pajek, a software product to enable analysis and visualisation of networks (Batagelj and Mrvar, 2004), following the methods for creating a network analysis and visual methods of analysis outlined in De Nooy, Mrvar, and Batagelj (2018). Namely, a table of data was created which assigned participants as B vertices and their cited influencers were assigned as A vertices. Influencers included texts, individuals, projects, organisations, and concepts/movements (e.g., deep ecology, trophic cascades). Directional lines were used to show the direction of influence from A vertices to B vertices. Where two participants cited each other as influential, these were combined to display bi-directional lines. The original network analysis diagram is shown in Appendix 6.

The fisheye tool was used to explore the network in Pajek and visually identify clusters. A simplified version of the network analysis was created from this visual exploration, combined with knowledge gained from the RPS qualitative data (figure 3.2). The IRT data sources were added to this diagram. Here, authorship of the IRT, information from the RPS data, and data from the text itself was used to assign the IRT to groups and the direction of influence. For example, texts published in Wild Earth, the magazine of the Wildlands Network, were included as part of the Wildlands Network node on the network diagram. As another example, although George Monbiot was not an RPS participant, several participants cited the text as being influential to them and *Feral*, contains references to individuals, rewilding projects, and organisations associated with the emergent groups. This data was used to assign arrows demonstrating the direction of influence. Some IRT data sources are not included in this diagram as they are not strongly associated in the data with the emergent groups identified in the network analysis (namely Sandom *et al.*, 2013; Pereira and

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Navarro, 2015b; Prior and Ward, 2016; Gammon, 2018; Pettorelli *et al.*, 2018; Pettorelli, Durant, and du Toit, 2019a). These texts are instead associated with calls for critical reflection and a move towards more holistic frameworks, as discussed in the literature review and later in this chapter.

Figure 3.2: Network diagram highlighting some of the main influences on emerging rewilding groups or concepts, as highlighted in the RPS data. IRT that were influential to these groups are included. (f. = founded; c. = circa).
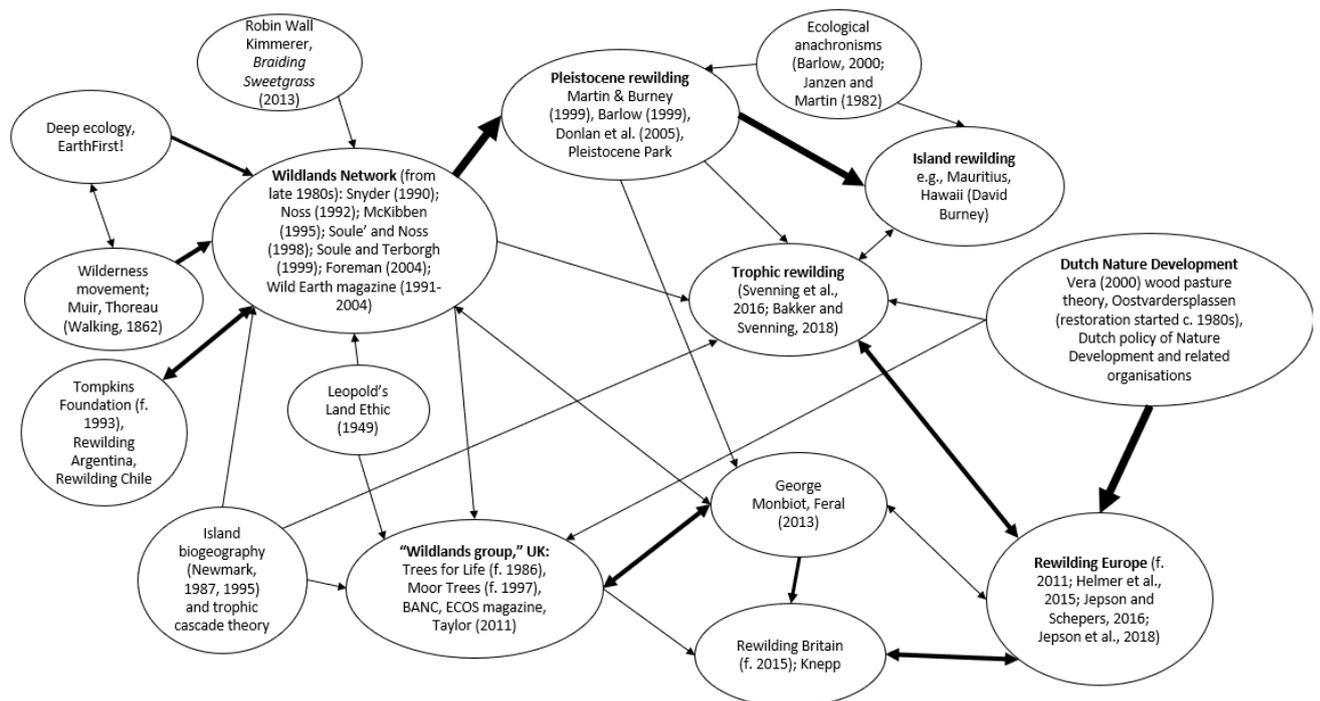
The network analysis revealed three distinct groups emerging in the 80s and 90s which went on to become influential rewilding groups; namely the WN in the US, a group in the Netherlands who originally worked under the concept of Nature Development and later went on to found Rewilding Europe, and a "wildland group" in the United Kingdom (UK). Figure 3.2 highlights some of the influences on those groups, as were expressed in the RPS data. Figure 3.2 also shows the later emergence of other rewilding concepts or groups that emerged from these earlier foundational groups. The emergence of these groups and concepts are considered in this chapter in relation to the RPS and IRT data, with reference to the literature review in chapter 1. The network analysis and further analysis of the data below allows a more thorough critical analysis of these groups or concepts than is offered by the academic literature, given that these draw from personal accounts and grey literature.

Some differences are highlighted between common perceptions of these rewilding approaches (outlined in the literature review) and those offered here, along with commonalities and divergences among different approaches. These are discussed in the context of a shift towards a relational paradigm, as highlighted in the literature review.

3.3. The Wildlands Network and 3Cs rewilding

The RPS data reflect the emergence of the WN during the 80s and 90s in the US, as described in the literature review, and most of the RPS participants from North America were involved in the development of the concept from this time. A key driver described by these participants was perceived inadequacies with the culture and practice of nature conservation. These were largely driven by emerging ecological theories that demonstrated the need for more holistic and large-scale approaches. Two theories were particularly influential; the trophic cascade theory (Paine, 1980) which identified wide ecological consequences of extirpations of apex predators, and the theory of island biogeography (Macarthur and Wilson, 1967) which was applied to identify extinction risks related to the isolation of national parks from one another, in increasingly ecologically degraded landscapes (Newmark, 1982, 1995). These theories formed the basis of two pillars of the 3Cs approach, "carnivores" and "connectivity," respectively. This is also reflected in the emphasis on the scientific basis for rewilding in the data.

The influence of the wilderness concept is also clear from the data, although there are divergences among North American participants over the role of wilderness in rewilding. Two participants reflect that wilderness preservation is an aim of rewilding, and mention interventions including removal of roads and signs of human development. However, while other participants highlight the influence of the wilderness movement, they instead reflect aims to accommodate ecological function at scale, especially focusing on the needs of wide-ranging species as "umbrella" species. Here, the existing network of protected areas in the US are seen as a tool to achieving rewilding goals of functional restoration, rather than serving to perpetuate preservationist conservation goals. This is reflected in a key IRT text from Dave Foreman (2004, p. 164) who, referring to the founding of the WN, states:

> "We chose the word wildlands instead of wilderness to show our commitment to a landscape network instead of just to isolated protected areas. Wildlands include

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designated wilderness areas, other protected core areas, and wildlife movement linkages. The goal for these areas is to protect and restore wild-of-the-land (i.e., self-regulating ecosystems) and the wildeor (i.e., self-willed beasts)."

In terms of human-focused goals, some participants mention the potential for direct benefits to human health and wellbeing, although it is not clear in the data that these are priorities of rewilding. These relate to concerns with how current socio-political or -economic systems negatively influence human wellbeing, and so the emphasis is largely on social transformation. This is further supported by answers to questions relating to barriers to rewilding which include human–nature disconnection, anthropocentrism, capitalism, and dominant (populist) politics driving control over natural processes, overdevelopment, and overconsumption. For example, ecologist George Wuerthner states,

"There are economic barriers as some people seek to exploit natural landscapes and wildlife for profit. And there are the emotional barriers. Many people are insecure and don't like the idea of Nature out of human control—which is just a facade anyway—nevertheless there is a perception we can control the Earth and that control is desirable."

Ecocentrism and desires for paradigm shifts are supported by engagement across disciplines and with indigenous worldviews, and many influential texts and figures are highlighted by participants, including Leslie Marmon Silko, Leopold's *Land Ethic* (Leopold, 1949), Gary Snyder's *Practice of the Wild*, and Robin Wall Kimmerer's *Braiding Sweetgrass* (Wall Kimmerer, 2013). The WN itself is an interdisciplinary group that includes conservationists, activists, philanthropists, environmental philosophers, environmental historians, and ecologists. Participants associated with rewilding in the US and the people they cite as influential reflect this multidisciplinarity.

RPS data from the US also reflect that the intrinsic value of non-human nature is a strong motivator, and this is highlighted, together with related concepts of deep ecology and ecocentrism, by many participants. The data reflect links to the value orientation of "living with" nature, as described in the literature review (section 1.4.3) although there is also some engagement with a shift towards more relational thinking and "living as" or "living in" value orientations that align with engagement with different worldviews and contextual influences

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on human values. This demonstrates that intrinsic value as a motivator doesn't necessarily lead to dualistic approaches based on wilderness preservation, which is a common criticism of 3Cs rewilding (e.g., Jepson, Schepers and Helmer, 2018). Responses from North America don't engage with neoliberal approaches, i.e. reflecting less affinity to a "living from" value orientation. In fact, a desire to "avoid mechanistic metaphors and utilitarian terms that devalue other life-forms" is echoed by many participants.

The subjectivity and changing definitions of the wild and wilderness is evident in the data, as reflected in the literature related to 3Cs rewilding. RPS participant John Elder, a professor of environmental humanities, for example reflects on this:

> "Wilderness and wildness are both strongly associated with the American Transcendentalist movement, and culturally inflected by that literature's Anglo-Saxon and Puritan heritage. Wilderness, in particular, is a term objectionable to every Native American writer I've read on the subject… Rewilding is culturally more flexible, suggesting that wilderness and culture are not antithetical but rather part of a continuum. The advantage of a vocabulary including variants of wildness is in acknowledging ecological realities such as the need for wildlife corridors in maintaining genetically robust populations. Arriving at a less culturally, linguistically, and gender-tilted lexicon will be an ongoing project."

This is echoed by several comments promoting flexibility in the use of the term rewilding to address different perspectives or contexts, for example seeking an adaptable definition or using a different word that might better serve the goals of functional restoration and accommodating natural processes.

This move towards pluralism and adaptability to different contexts is reflected in engagement with more systems-based approaches to governance by the WN, as is highlighted in the literature review and in the research data. Several participants note that rewilding should not be forced on people or used to forcibly remove people. In the RPS, Michael Soulé comments that rewilding application will depend "on the context, culturally, economically, educationally, and geographically." The IRT data reflects that the WN developed their ideas around an existing national parks network that was highly valued culturally and politically in the US (Foreman, 2004) and are committed to engaging with

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socio-cultural factors influencing the potential for rewilding, especially considering the need for coexistence, large scale thinking, and associated socio-cultural challenges. Activist and practitioner Kristin DeBoer in the RPS notes the need for adaptability across landscapes,

> "The conservation community needs to cast a wider tent in the broader community so that all shades of green are accepted, and so that more people can feel that they are part of a solution… These are the other shades of green which must exist on the landscape to make more space for the deep forest green of forever wild landscapes. Rewilding is our greatest hope for the landscape, but we can measure progress along the way, by counting the acres of forest that are still functioning forests, the urban areas that are greening from within through pocket parks, woodlands, and farms that are protected so that we can eat more locally. We need all these shades of green from forest green to asparagus green."

In their texts, the WN consider practical approaches (e.g. Groom *et al.*, 1999; Foreman, 2004), including incentives, habitat restoration, grazing reform, networking, and knowledge sharing. This demonstrates that, despite concerns over perpetuating command-and-control, preservationist approaches to conservation, the WN concept of rewilding aligns somewhat with environmental pragmatism. However, there is a clear aversion to aligning with extant economic systems (as with neoliberal conservation). This analysis of the data also shows that criticisms equating 3Cs rewilding with preservationist approaches are inadequate as they don't account for changing perspectives, plurality, or how rewilding is applied in these areas.

3.4. Ecological anachronisms, Pleistocene rewilding, and island rewilding

It comes across clearly in the RPS data that the theory of ecological anachronisms was strongly influential on the concept of Pleistocene rewilding and related practices, such as island rewilding and ecological surrogates, although this influence does not come across strongly in the academic literature and it is worth noting here. The theory of ecological anachronisms was developed by Paul Martin and Dan Janzen (Janzen and Martin, 1982) and is discussed in detail by Connie Barlow (2000) in *Ghosts of Evolution*. The theory identifies redundancies of evolutionary traits in extant species that co-evolved with extinct (especially Pleistocene) species and highlights the interdependence between species and the potential

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long-term impacts of Pleistocene-era extinctions. In their study, Janzen and Martin (1982) theorise that the introduction of horses and cattle to Central America partly restored seed dispersal processes lost with the extinction of Pleistocene-era large herbivores. This discovery was influential as it highlighted the potential that ecological surrogates could be used in rewilding, whereby existing wild or domestic species could fill the ecological role of extinct species (Barlow, 2000). Interestingly, this aligns with Vera's (2000) wood pasture theory, demonstrating links between Pleistocene rewilding and European rewilding. This influence is reflected in the network analysis in figure 3.2, via the emergence of trophic rewilding as a rewilding approach, which focuses on the (re)introduction of species to achieve functional ecological goals of rewilding (Bakker and Svenning, 2018; Svenning, Munk and Schweiger, 2019). As reflected in the literature review, Pleistocene rewilding has also been influential on islands. RPS participants who work in island rewilding note functional goals and the use of ecological surrogates to support functional restoration.

What is not perhaps reflected in the academic literature related to Pleistocene rewilding is that, given its sensationalism, many RPS participants from outside the US cite this as the first time they heard of rewilding and the concept was said to be influential for many European RPS participants. According to the RPS data, a deep-time baseline was considered inherent to rewilding when the term started to gain popularity outside of the US. While this changed over time according to these participants, they consider the continued association with Pleistocene rewilding to be a barrier to rewilding. This may be the reason that baselines have been so contentious, as reflected in debates in the literature. Interestingly, while many US participants were co-authors on Donlan *et al.* (2005), none of the US RPS participants mention Pleistocene rewilding other than three key figures in its development, demonstrating that support for the concept is limited in North America.

3.5. Emergence of rewilding in Europe

Many RPS participants from Europe heard of the term rewilding during the late 90s and early 2000s mostly in relation to influential publications [Soule and Noss (1998) and Donlan *et al.*, (2005), respectively]. Others became aware of the term later, in relation to the publication of *Feral* (Monbiot, 2013). However, many participants note that they were working on similar concepts before this time and later adopted the term rewilding. As identified from the

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network analysis (figure 3.2), two groups who later became influential to the rewilding concept began to emerge in western Europe in the 80s and 90s, one in the UK and one in the Netherlands. Both groups, like the WN, were driven by observed ecological degradation as well as perceived inadequacies in the culture and practice of conservation. In the western European context, though, the main concern with extant conservation policy and practice was the dependence on intensive management to maintain pre-determined conditions using methods associated with agriculture, such as cutting, burning, and conservation grazing. This is demonstrated in the RPS and in influential texts associated with these groups (Vera, 2000; Taylor, 2011d). In response, both sought a "radical reconceptualization of what it means to protect and respect nature" (RPS data), noting a paradigm shift from compositional towards functional ecological goals. Conceptualisations of rewilding among European RPS participants reflect goals of non-human autonomy, to accommodate natural processes, and reduce human control in European landscapes, which reflect the goals of the WN.

However, the UK and Netherlands approaches to rewilding were initially quite different, namely due to the influence of Vera's wood pasture theory in the Netherlands and goals for reforestation in the UK, influenced by organisations such as Trees for Life. This has led to what is now considered an ideological rift in Europe between those supporting pragmatism, naturalistic grazing, and associated projects and organisations like Rewilding Europe and OVP, and those advocating for reforestation and showing affinity to the 3Cs approach to rewilding, transformation, and considering the needs of wide-ranging carnivores. Participants view these as different "versions" of rewilding. This ideological rift is prevalent across the data, for example in these two RPS participants' responses to a question regarding influential rewilding organisations:

> "Certainly not Rewilding Europe, who do not recognize the earliest science-based foundations of rewilding, claim it as their own and promote a model of one-sided reintroduction of semi-wild ungulates together with a business model for eco-tourism. Around this they create an air of rewilding the whole of Europe with a clever and well-funded PR machine; but rewilding on-the ground is limited to moving Heck cattle, konik horses, and some European bison around." (RPS participant, the Netherlands).

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"I see more innovative approaches coming from European initiatives, particularly Rewilding Europe. Here people are seen as part of, and not separate to ecosystems, and I think these approaches hold more promise in being able to build rewilding into a more inclusive conservation movement that can address Nature Deficit Disorder." (RPS participant, UK).

The two main points of tension relate to interventions and ethical concerns. Debate highlights contradictions between interventions promoting reforestation or limiting succession, especially through naturalistic grazing which is equated with conservation grazing or agriculture. This links to ethical divergences, where critics of naturalistic grazing see it as perpetuating anthropocentrism and human control over natural processes whereas critics of 3Cs rewilding note its links to wilderness and human–nature dualism. Control and cultural biases against risk and unpredictability are particularly a concern highlighted in the IRT text *Rewilding* (e.g., Taylor, 2003; Fisher, 2004; Russell, 2005; Cairns, 2006; Goulding, 2008). For example, Frith and Massini (2007) write,

> "Is there no room for nature to be unleashed from our utilitarian straitjacket… is it a fear of the uncontrollable, or ignorance of the art of the possible, that prevents urban planners, and perhaps conservationists, taking a leap of faith?"

Reflexive note 3.1.

It is interesting to note parallels being drawn in the data between Rewilding Europe and agriculture. In South Africa there are many similarities between livestock agriculture and "wildlife". Species are bred and traded, enclosed behind fences, and stocking densities are determined by humans. While the main purpose is not food, "wildlife" is valued for hunting or tourism, and trade is a key source of income for reserves (see the Kirkwood Wildsfees, a massive annual wildlife auction). There are certainly variations among reserves on a continuum between economic incentives and ecological integrity. SAN Parks tend to promote ecological integrity, although trade is a major source of income for them. One small game reserve I visited kept their lions in small enclosures and fed them cattle carcasses, to save their valuable herbivores from predation. One ranger I spoke to considered wild leopard on the reserve as vermin. Knepp has also started to run "safaris." So where do we draw the distinction between farming and "safari-style" conservation, between wild and domestic?

The use of domestic grazers is seen by some in this group to conflict with a desire to allow nature freedom (Fisher, 2004), given that grazing pressure and intensive agriculture are considered key causes of ecological degradation in the UK (Taylor, 2004; Fisher, 2006; Monbiot, 2013). Opponents of naturalistic grazing and agricultural rewilding express concern that these methods compromise the ecological and cultural transformative potential of the

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rewilding concept. However, human control is also mentioned as a concern by those advocating for pragmatic approaches and so this may reflect differing perceptions of human control or non-human autonomy related to different value orientations.

Despite these tensions, the RPS reflect that commonalities among European advocates of rewilding include functional ecological goals, a desire to accommodate natural processes and to achieve coexistence at landscape scale, and intentions for systems-based approaches to governance. Similar to the findings from the US, European participants support the notion that rewilding can provide mutual flourishing of humans and non-humans in landscapes. Rebecca Wrigley of Rewilding Britain states:

> "Rewilding encourages a balance between people and the rest of nature where each can thrive. It provides opportunities for communities to diversify and create nature-based economies; for living systems to provide the ecological functions on which we all depend; and for people to re-connect with wild nature."

However, there are divergences in human-focused goals, echoing conflicts between neoliberal conservation and transformation highlighted in the literature review. Commonalities in human-focused goals reflect a desire for human–nature reconnection or re-integrating nature into culture. This is supported by highlighting interdependence with nature in different ways, whether relational, economic, or instrumental, suggesting there may be alternative routes to reconnecting people with nature to allow for value pluralism. Ultimately, rewilding in Europe reflects value pluralism, and diverse value orientations. While participants from the US reflected "living with" and a transition towards "living as" and "living in", European participants show differences in affinity with "living with", "living from," and "living in", the latter reflecting the influence of cultural landscapes and place-making in Europe.

3.6 Globalisation and plurality of rewilding

While most of the RPS participants were from North America and western Europe, others reflect the concept's spread to other areas, especially Australia and South America. These participants cite diverse influences and affinities, including 3Cs rewilding, Pleistocene rewilding, and trophic rewilding. Common among these participants are functional ecological goals and a diversity of approaches to suit contexts, including species

reintroductions, urban rewilding, protected area management, and invasive species management. Some participants from outside North America and western Europe reflect anti-capitalist or anti-wilderness views, or both, and these participants are particularly aware of different cultural interpretations of the term wild or wilderness and therefore the need to be adaptable to different contexts.

There is awareness in the RPS data that as the term has grown in popularity around the world, it has also increased in notoriety. It is felt that uncertainty over the meaning of rewilding continues to cause conflict as the concept is sensationalised by the media, used for greenwashing, or aligned with personal or organisational agendas that do not necessarily reflect the true intentions of rewilding theories. Participants note a need to "build bridges" and create a common vision for rewilding, especially mindful of cultural differences and subjectivities. This view is supported by calls for place-based or contextual approaches to rewilding, addressing extant social or ecological conditions. In fact, many participants note that there needs to be more of a focus on rewilding case studies in considering its definition and potential, and express frustration with ongoing theoretical debates. RPS data reflect that rewilding projects are "getting on with it" despite ongoing theoretical conflict, with application responding to context and emerging barriers and opportunities. Hence, practice is being shaped more acutely by the context and project-level priorities than policy or theory which remains unclear. However, this raises concern that projects perpetuate extant conservation paradigms, including command-and-control governance and exclusivity based on preservation or ecotourism models.

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Reflexive note 3.2.

Working on rewilding in practice at Birchfield (a rewilding project in Scotland I am involved with as part of the Lifescape Project) has opened my eyes to the disconnect between practice and theory. In practice, barriers are felt more acutely and significantly shape practice. Planted saplings have been damaged by over browsing and some saplings will need to be removed where we have found peat bog. Restoration is now focused on how to prevent deer browsing (seeking alternatives to culling as the landowners are vegan) and we are testing Treeco spray and salt licks. We have also taken opportunities for funding from AECOM who are developing a Natural Capital accounting approach to monitoring (White et al., 2022) alongside other biodiversity monitoring. This has had marked influence on our monitoring approach, given that it has given us access to technology such as eDNA sampling, which would not have otherwise been possible without major funding. Although there is the intention to apply the IUCN guiding principles and definition, in reality we respond more readily to opportunities and barriers in real time, and rewilding is a very slow process with barriers often taking time and effort to overcome.

3.7. Conclusion

This chapter provides a brief history of rewilding based on an exploratory network analysis and the data. This serves as supplementary to the history provided in chapter 1, based on the literature. From this we can see that rewilding began to emerge in the US and Europe at similar times in response to dewilding (discussed in chapter 4), but with different emphases and interventions used based on contextual influences. This chapter demonstrates that social-ecological contexts have strongly influenced the various understandings of rewilding and are important in identifying the roots of conflict and debate.

Importantly, this chapter highlights that, despite perceived ideological rifts, there are a number of commonalities among the dominant rewilding approaches identified in the literature review. These include functional ecological goals; desires to accommodate natural processes in landscapes and promote coexistence; multidisciplinarity; and a preference for systems-based governance approaches. Perceptions that 3Cs rewilding promotes wilderness preservation are not supported by the findings here and demonstrate that rewilding in North America has changed over time and reflects plurality and a shift towards a relational paradigm. These findings could help to alleviate the perceived rift and promote collaboration going forward. However, the findings do highlight divergences, these seem to be largely based on differences in value orientations and in human-focused goals, reflecting conflicts between neoliberal conservation and transformation highlighted in the literature review.

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Also noted are differences in perceptions of human control and non-human autonomy, driven by perceptions that interventions to limit or promote succession are contradictory. It is also highlighted that theoretical intentions for functional restoration and systems-based governance are not always consistent with rewilding application and concern that extant conservation paradigms are being perpetuated, which is a barrier to achieving transformation or shifts towards a more relational paradigm. This seems to be driven by differing priorities and reflecting tensions between pragmatism and transformation.

This history demonstrates that conflict remains a barrier to creativity and collaboration, reflecting concerns raised by Holmes *et al.* (2020) that personal conflicts based on personalities, politics, or ethical principles remain barriers to cross-collaboration and consensus in rewilding, negatively effecting the flow of ideas and resources. In this context, it remains difficult to identify routes to developing a rewilding concept that focuses on common ground while allowing for plurality. More critical reflection is required and this is addressed in the remaining empirical chapters which highlight areas of common ground and divergences under three themes—drivers of rewilding, aims of rewilding, and rewilding application.

3.8. Chapter highlights

This chapter provides a brief history of emergent and influential rewilding groups and trends based on an exploratory network analysis and qualitative analysis of the data. Key findings note that:

- Despite concerns over perpetuating command-and-control, preservationist approaches to conservation, this study shows that 3Cs rewilding aligns somewhat with environmental pragmatism and that criticisms of 3Cs rewilding fail to account for changing perspectives, plurality, and rewilding application in North America.

- The above misperception of 3Cs rewilding partly influences an ongoing ideological rift in rewilding, reflecting tensions in contemporary conservation between environmental pragmatism or neoliberal conservation and transformation. However, there is frustration with ongoing theoretical debates and an expressed need to develop a more holistic framework allowing for plurality in rewilding and focusing on

application. This may help to provide a shared vision for rewilding and promote collaboration.

- Some commonalities identified may support the development of a holistic framework. These include functional ecological goals; desires to accommodate natural processes in landscapes; promoting coexistence and mutual flourishing of humans and non-human nature; multidisciplinary; and a preference for systems-based governance approaches.

- Differences seem to be largely driven by different value orientations and divergences in human-focused goals (echoing conflicts between neoliberal conservation and transformation). Different interventions are also used to address different social-ecological conditions, and this means there is no consistent rewilding approach and so theories of approaches based on primary interventions, as highlighted in the literature review, are likely inappropriate for guiding rewilding application.

# Chapter 4: "Change why": Dewilding and the Anthropocene

4.1. Introduction

This chapter focuses on data coded under the parent node "change why," focusing on the drivers behind the desire to change or rewild. While chapter 3 examines contextual influences on the emergence of rewilding, this chapter focuses on the theme of dewilding and the Anthropocene, which is a common driver across the data and encompasses data related to growing awareness of the extinction crisis, climate change, the increasing impact of human activities on the environment, and considerations for causes and effects. Within the RPS and IRT data (e.g., Monbiot, 2013), and in the wider literature (e.g., Fisher, 2018; Sands, 2022), "dewilding" is sometimes used as a collective term to describe escalating ecological degradation and its causes and effects, compelling a response to rewild. However, the term dewilding is not defined or clarified and therefore this chapter offers a theory of dewilding and examines the implications for rewilding. Based on intra-acting causes and effects identified in the data coded to "change why" (figure 4.1), dewilding is here presented as a vicious cycle,[11] i.e., a negative self-reinforcing loop spurred by intra-acting detrimental events or conditions (Turnbull, Clark and Johnston, 2021). The cumulative impacts of dewilding at large scales have contributed to the conditions of the Anthropocene, as reflected in the data. Observing these influences at local, national, or international scales support motivations to rewild in response, i.e., to affect a virtuous cycle. The findings demonstrate the complexities and interrelatedness between ecological health and socio-cultural factors such as values and wellbeing, and how a better understanding of these connections is fundamental to achieving sustainability (as is highlighted elsewhere, e.g. Abson *et al.*, 2017; Chan, Gould and Pascual, 2018; Richardson *et al.*, 2022; Beery *et al.*, 2023).

More generally, this chapter also demonstrates the integration of wider socio-cultural challenges of the Anthropocene into the rewilding concept, aligning with a move towards

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[11] In SES science, the concepts of vicious and virtuous cycles are used to explain how systems can amplify either detrimental or beneficial effects over time. A vicious cycle refers to a negative self-reinforcing loop spurred by intra-acting detrimental events or conditions, while a virtuous cycle refers to a positive self-reinforcing loop spurred by intra-acting beneficial events or conditions (Jones, Jiggins and Pimbert, 2011; Turnbull, Clark and Johnston, 2021).

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transformation or integrating social, economic, and ecological factors in international ambitions for biodiversity conservation and sustainability (Reyers and Selig, 2020; Friedman *et al.*, 2022), which is reflected in a move towards systems thinking and a relational paradigm (as highlighted in the literature review, chapter 1) and rewilding aims that address systemic, ecological, and socio-cultural change (as highlighted in chapters 3 and 5).

Figure 4.1: The causes and effects of a dewilding vicious cycle as highlighted in the data as creating the conditions from which the Anthropocene emerged.
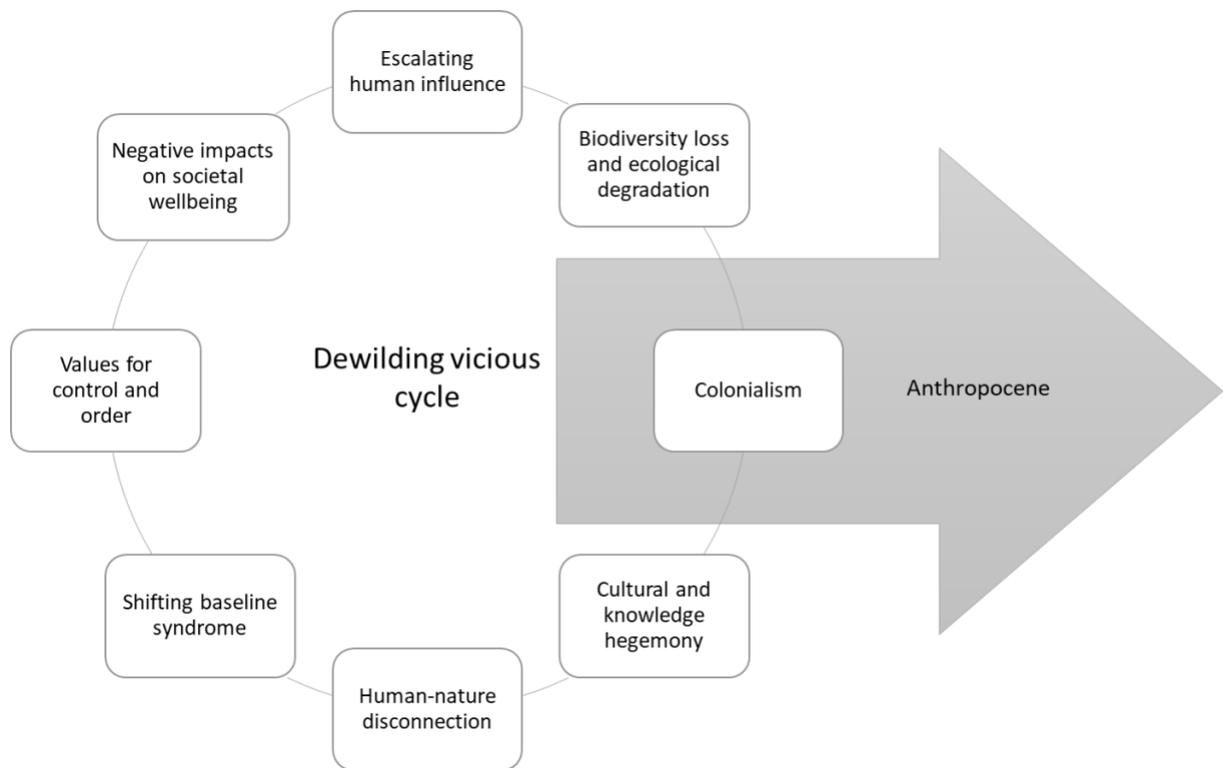
4.2. Escalating human influence

Echoing definitions of the Anthropocene (Crutzen and Stoermer, 2000), fundamental across the data is escalating human pressure on the biosphere, leading to landscapes or systems which are no longer "wild" or socially, economically, or environmentally sustainable (RPS and IRT data, e.g., Simberloff *et al.*, 1999; Warrington, Soans and Cooper, 2009; Clayton, 2019; Johns, 2019). Worth noting is the sense of urgency and escalation of the threat expressed in the data related to this theme, for example:

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> "The fact we are on a path of self-destruct and self-neglect that has got so serious, the people who actually think things through know life as we know it is on a knife edge. And to be fair cannot and will not continue as is for much longer." – RPS participant, UK.

This observed escalation was a key driver of many of the criticisms of traditional conservation highlighted in the previous chapter. As a result, rewilding is framed as a more innovative, bold, and offensive approach to counteract the effects of the Anthropocene (e.g., Foreman, 2004; Monbiot, 2013).

In terms of land use, agriculture and forestry are discussed as key threats, particularly in the last 200 years as methods have intensified through mechanization, the use of chemicals, genetic modification, and agricultural subsidies (Snyder, 1990 ch. 1; Foreman, 2004 ch. 1; Benayas and Bullock, 2015; Boitani and Linnell, 2015; Carver, 2019). Practices that are noted as particularly unsustainable include over grazing and increasing selectivity towards high-yielding crops or livestock species, driving a tendency towards monoculture (Snyder, 1990, ch. 4; Simberloff *et al.*, 1999; Vera, 2000, ch. 7; Monbiot, 2013; Wall Kimmerer, 2013). This is contextualised as part of a dewilding process by George Monbiot (2013, p. 174):

> "The drive towards monoculture causes a dewilding, of both places and people. It strips the Earth of the diversity of life and natural structure to which human beings are drawn. It creates a dull world, a flat world, a world lacking in colour and variety, which enhances ecological boredom, narrows the scope of our lives, limits the range of our engagement with nature, pushes us towards a monoculture of the spirit."

With the focus on productivity and market demands, wilder areas have become isolated to more unproductive land and human land use is perceived to be controlling of ecological processes to limit risk and unpredictability (Leopold, 1949; Snyder, 1990; Simberloff *et al.*, 1999), fuelling distinctions between domestic and wild and human-wildlife conflict (McKibben, 1995; Dobson *et al.*, 1999; Vera, 2000; Foreman, 2004; Comins, 2006; Monbiot, 2013; Boitani and Linnell, 2015; Jepson, Schepers and Helmer, 2018). Here, "monoculture" or landscape qualities associated with intensive agriculture and domestication, commercialisation, or control of nature are considered the antithesis of wild, which influence the aims to rewild, with wild considered as enhanced autonomy of ecological

processes and non-human species in these landscapes (as further discussed as aims in chapter 5).

There is discussion over the point at which human influence becomes unsustainable, which has significance for rewilding baselines and reference ecosystems. Examples of perceived negative influence go as far back as the Pleistocene with the overkill hypothesis—the extinction of large mammals in the Pleistocene era due to overexploitation by humans as they moved into new territories (Foreman, 2004; Donlan *et al.*, 2005; du Toit, 2019). An example of this is given by George Monbiot (2013, p. 7),

> "The study of past ecosystems shows us that whenever people broke into new lands, however rudimentary their technology and small their numbers, they soon destroyed much of the wildlife – especially the larger animals – that lived there. There was no state of grace, no golden age in which people lived in harmony with nature."

This is linked to the emergence of Pleistocene rewilding and pre-human baselines, as highlighted in chapter 3 and the literature review. Others demonstrate marked acceleration in the past 200 years influenced by factors such as industrialisation. Pereira and Navarro (2015a) write,

> "Changes to our planet's ecosystems by Humans go back tens of thousands of years, but what happened in the last couple hundred years has no precedent in the history of our species. We took habitat change, overexploitation, biotic homogenization, and pollution to a new level. We even started to change the Earth's climate, a feat perhaps never achieved by any other single species. Today, with a human population of already over 7 billion, about 40% of the world's forests and other natural ice-free habitats have been converted to cropland and pasture, we have appropriated 15% of global terrestrial net primary production, and species extinction rates are 100 times greater than the average extinction rate for the Cenozoic fossil record."

Echoing calls for cultural transformation in the wider conservation movement, seeking alternatives to dominant or anthropocentric paradigms (as discussed in the literature review), the data include examples demonstrating the potential for sustainable coexistence and the interrelatedness of human activities, such as agriculture or fire, with other species. For example, Wall Kimmerer (2013, p. 124) reflects on the coevolution of humans and crops:

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"The exchange between plants and people has shaped the evolutionary history of both. Farms, orchards, and vineyards are stocked with species we have domesticated. Our appetite for their fruits leads us to till, prune, irrigate, fertilize, and weed on their behalf. Perhaps they have domesticated us. Wild plants have changed to stand in well-behaved rows and wild humans have changed to settle alongside the fields and care for the plants—a kind of mutual taming. We are linked in a co-evolutionary circle."

Given these divergences in perceptions of humans, the data reflect conflict and uncertainty regarding the role of humans in nature, reflecting the different value orientations highlighted in section 1.4.3. This is true even in individuals, for example, although Monbiot's above could be considered misanthropic, elsewhere he considers examples of coexistence and hope that human-nature relationships can be interdependent and sustainable. Given these inconsistencies, while it is agreed that rewilding requires some form of withdrawal of human influence in the landscape, there is debate and uncertainty over the extent and practicalities of that withdrawal, echoing conflict between pragmatism and transformation and differences in value orientations (as is also reflected in chapter 3 and in the literature reviewed, e.g. Holmes *et al.*, 2020; Wynne-Jones *et al.*, 2020). As demonstrated in chapter 3, the common goal of landscape-scale coexistence may help to alleviate perceived conflicts as none of the approaches of rewilding discussed promote total withdrawal of human influence at scale. Coexistence is discussed further as an aim of rewilding in chapter 5. Research may look to identify leverage points to mitigate the acceleration and increased unsustainability of human influence (Meadows, 1999; Larsen and Harrington, 2021) or consider practical approaches to improve coexistence, such as the use of cores, buffer zones, and corridors suggested by the Wildlands Network (Soule' and Terborgh, 1999a) or the three-compartment approach to land use suggested by Aglionby and Field (2022). These approaches aim to alleviate perceived conflicts between human land use and rewilding by suggesting a continuum of land uses with varying degrees of human influence.

4.3. Biodiversity loss and ecological degradation

Extensive ecological consequences of increasing human influence are highlighted throughout the data. These include climate change, loss of habitat, and biodiversity loss

leading to reduced functionality throughout ecosystems (from soil health to apex predators), affecting resilience and sustainability from local to global scales. These spurred many of the ecological theories highlighted as influencing rewilding theory in the previous chapter, including the theory of island biogeography, the trophic cascade theory, the wood pasture theory, and ecological anachronisms.

Species extinctions have accelerated to such an extent that many note a sixth mass extinction or unprecedented loss (e.g., Snyder, 1990; Noss, 1992; Terborgh and Soule', 1999; Foreman, 2004; Johns, 2019). Species extinctions and local extirpations are noted as effecting interdependent species, with knock-on ecological and evolutionary impacts (Janzen and Martin, 1982; Noss, 1992; Barlow, 2000; Svenning *et al.*, 2016), thereby contributing to a vicious cycle. Habitat loss and fragmentation are noted as further simplifying and constraining ecological processes and the dynamic quality of nature (Dobson *et al.*, 1999; Soule' and Terborgh, 1999b; Simberloff *et al.*, 1999; Barlow, 2000; Foreman, 2004; May, Hall and Pretty, 2006; Wall Kimmerer, 2013; Boitani and Linnell, 2015; Navarro and Pereira, 2015a), further reflecting perceptions of wild nature as dynamic and unconstrained, for example Soule' and Terborgh (1999b) write,

> "Wild nature is full of movement and interchange, often on a scale of hundreds and thousands of kilometres. It is the dynamic element of nature that the notion of fragmentation fails to capture."

These concerns are reflected in international policy and resolutions relating to conservation and sustainability, including the Convention on Biodiversity's post-2020 global biodiversity framework (CBD, 2021). As a result, ecological restoration is intrinsic to rewilding practice and is reflected in all definitions of rewilding cited in the literature. Related ecological aims of rewilding are discussed in chapter 5.

4.4. Colonialism

There are many examples of colonialism in the IRT data and, echoing work highlighted in the literature review that considers the links between scientific rationalism and colonialism and their impacts on human-nature relations (e.g., Merchant, 1989; Irwin, 2021), colonialism is discussed as a root cause of ecological degradation and is therefore considered here as an intra-acting quality of a dewilding vicious cycle. Here, increased human pressure through

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exploitation or habitat loss and related ecological degradation drives the need to extend control over other areas, often involving conflict and forced removal of existing communities. The data offer examples of colonialism from all over the world and throughout history, including the spread of pastoral cultures across Europe from the Levant and Mesopotamia (Fisher, 2004; Navarro *et al.*, 2015; Brace *et al.*, 2019), Enclosures and Clearances in the UK (Snyder, 1990; Fenton, Fisher, and Taylor, 2004; Monbiot, 2013), the colonisation of North America by Europeans and continued displacement of Native American people (Snyder, 1990; Cairns, 2006; Monbiot, 2013; Wall Kimmerer, 2013); the annexation of royal hunting grounds in Europe (Vera, 2000, ch. 4; Monbiot, 2013); the seizure of common land in China in the 14th century (Snyder, 1990, ch. 2); seizure of "crown lands" in Australia and Canada, the settlement of tribal lands in Assam by European colonists (Snyder, 1990, ch. 6); and the removal of indigenous people to create nature reserves (an evolution of imperial hunting grounds) at Yellowstone National Park in the US and Kruger National Park in South Africa (Ward, 2019). More recent examples from the 1990s include the appropriation of land from the Yanomami in Brazil for mining (Monbiot, 2013), the displacement of people in Wales by the Forestry Commission to create areas for Sitka plantations (Monbiot, 2013), and the privatisation of commonly held Maasai land in Kenya (Monbiot, 2013), with colonialism increasingly driven by corporate or private interests. Monbiot (2013, p. 106) writes of the Kenyan example:

> "I watched the warriors of the community with which I worked perform their people's last ceremonies—last rites—as the commons in which these had been held were privatized and wired up. This process of enclosure and closure shut the people out of their land almost overnight, shattered their communities, dispersed their peculiar culture, and drove the young people, many of whom were now destitute, into the cities, where their contact with the natural world was permanently severed. I watched, in other words, the recapitulation of the story of my own land, and witnessed the bewilderment, dewilderment, and grief it caused".

The examples throughout history highlight the deep and long-term consequences of colonialism on societies and landscapes. Alan Watson Featherstone, a founder of Trees for Life in Scotland (quoted in *Feral,* p. 152) says,

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> "Scotland suffered a huge psychological blow as a result of the loss of the Battle of Culloden. It is still a psychological wound in the nation today. The Clearances happened partly as a consequence. They brought the sheep in and cleared the people off. Scotland became subservient and demoralized. We became a nation of sheep. Like all the indigenous people when they lose their connection to the land, we lost our confidence."

This demonstrates that the effects of colonialism are felt widely, and over the long term, although the impacts are diverse and experienced differently across space and time.

In an issue of Wild Earth in 1992, Dave Foreman presents the objectives of the WN in opposition to the pervasive effects of colonialism on nature, echoing the WN's engagement with socio-cultural transformation, particularly in relation to economic systems based on colonial paradigms:

> "We seek not the broad highway that leads to gold, empire, and death. Columbus and the hard men who followed have already found that yellow brick road. What we seek is a path that leads to beauty, abundance, wholeness, and wildness. We look for the big outside instead of empire, we seek wolf tracks instead of gold, we crave life rather than death."

This section demonstrates that colonialism is seen as a contributing factor to a dewilding vicious cycle, and that rewilding engages somewhat with postcolonial theory and intends to provide some counteractive to the ongoing impacts of colonialism. This is supported by studies in the data considering the histories of empire and how colonialism or imperialism can undermine wildness, e.g., driving human–nature or wild–domestic distinctions or increased control over land or natural resources, with links to hierarchical societal structures (Vera, 2000; Johns, 2019), as also discussed in the literature review in relation to the emergence of environmental justice.

However, there are also concerns that rewilding can perpetuate colonialist paradigms, inequity, and injustice, through for example land appropriation for rewilding or establishing limitations to access or participation (Ward, 2019). These concerns are supported in the data by recent examples of rewilding or conservation projects that echo these tactics, thereby exacerbating tensions that may exist related to land ownership and rights (Monbiot, 2013).

For example, Peter Taylor (2008) expresses concerns that a wolf reintroduction in Scotland driven by a "rich man's whim" is replicating exclusionary tactics associated with imperial hunting grounds or safari-style ecotourism, tapping into existing inequities related to land clearances. These concerns are also reflected in criticisms of 3Cs rewilding as perpetuating wilderness preservation models, but findings in chapter 3 demonstrate that these perceptions do not reflect the plurality of perceptions of those promoting 3Cs rewilding. Colonialism is clearly considered in the data as a root cause of ecological degradation alongside human equity and justice concerns, and this has supported calls for more participatory, systems-based governance approaches in rewilding (as reflected in the previous chapter), and calls to decolonise rewilding (Ward, 2019). However, the data also show that there are clearly divergences in theory and practice, reflected also in the literature review and chapter 3, that are likely perpetuated by extant conservation paradigms that limit systems-based governance approaches (Martin, Fischer and McMorran, 2023). This research therefore echoes Ward's (2019) call to decolonise rewilding, providing further justification for the need for decolonisation. Further research considering the effects of (neo)colonialism on ecological degradation would contribute to establishing the importance of systems-based governance in rewilding, along with improving guidelines for how to approach systems-based governance. This is considered further in chapter 6 relating to rewilding application.

4.5. Cultural and knowledge hegemony

Cultural hegemony is a concept developed by Antonio Gramsci, which refers to the domination of a culturally diverse society by the ruling class, who manipulate the culture of that society, such as their beliefs, values, and perceptions, so that their imposed worldview becomes the accepted cultural norm (Gramsci, 1985). However, over time it has been expanded to consider not just the ruling class but also those privileged by dominant economic or political systems, especially capitalism, considering cultural hegemony in a contemporary context and its influence on human-nature relationships and environmental degradation at societal level (Harvey, 2010; Moore, 2015). The expansion of the concept is reflected in how cultural hegemony is perceived in the IRT data, for example "the way in which ideas and concepts which benefit a dominant class are universalized. They become norms, adopted whole and unexamined, which shape our thinking" (Monbiot, 2013, p. 154).

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Cultural hegemony is considered in the data as a cause and effect of colonialism, normalising the underlying competitive, capitalist values exacerbating human inequity and justice concerns alongside ecological degradation. The current market economy is seen as an extension of the "frontier mentality" (Terborgh and Soule', 1999) and is highlighted as self-perpetuating, with mechanisms in place to devalue local, freely available resources; to decouple consumers from the sources of goods, driving ignorance; and to manipulate supply and demand (e.g., Snyder, 1990; Wall Kimmerer, 2013). Wall Kimmerer (p. 307) writes,

> "We are all complicit. We've allowed the 'market' to define what we value so that the redefined common good seems to depend on profligate lifestyles that enrich the sellers while impoverishing the soul and the earth."

This echoes findings that anthropocentric or utilitarian perceptions of nature can exacerbate human-wildlife conflict and excessive consumption (Richardson *et al.*, 2022) and that perceptions of progress based on profit and competition are extensions of colonial hegemony, with marked effects on many cultures (Battiste and Henderson, 2000). Addressing capitalist hegemony is particularly a priority for those RPS participants supporting human-focused goals of transformation and motivated by the intrinsic value of nature, as they see the commodification of nature as a driver of ongoing ecological degradation. This reflects divergences in how neoliberalism is perceived as supportive of or conflicting with rewilding's ecological goals. This is interesting when considering Ward's (2019) calls for decolonising rewilding as her main concern is the wilderness concept and its

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association with human–nature dualism and injustice, which is associated with those motivated by the intrinsic value of nature. The data show that there are additional concerns that neoliberal approaches that seek to commodify nature, for example through natural capital or ecotourism models, are linked to concerns over capitalist and colonial hegemony. This concern is reflected in the literature reviewed relating to neoliberal conservation (e.g., Büscher *et al.*, 2012; Holmes and Cavanagh, 2016).

Cultural hegemony is discussed as having influenced the institutions and assumptions underpinning nature conservation and related sciences, echoing concerns with the effects of scientific rationalism highlighted in the literature review, including biases towards quantitative, objective science (Soule' and Terborgh, 1999b; Taylor, 2007; Wall Kimmerer, 2013), inadequate approaches to complex systems thinking (Taylor, 2004), a lack of consideration for practical application (Taylor, 2009), and discrimination against other forms of knowledge (Snyder, 1990; Taylor, 2004, 2009; Wall Kimmerer, 2013). This can therefore influence what knowledge or values are deemed valid when developing rewilding theories and approaches. There are calls to counteract knowledge and cultural hegemony in rewilding theory and practice, and this is reflected in engagement with traditional ecological knowledge, diverse ontologies, and environmental ethics to inform re-evaluations of human–nature relationships, as highlighted in previous chapters and recent literature (Irwin, 2021; Fenton and Playdon, 2022; Rawles, 2022; Taylor *et al.*, 2022), and there seems to be some consensus over the need to counteract knowledge hegemony in the RPS data, related to general support for more participatory, systems-based governance approaches. These echo calls for transformation and a shift towards a relational paradigm and systems thinking in the wider conservation movement. This quote from a farmer in Wales demonstrates the link between cultural and knowledge hegemony and the need for systems-based approaches (from Monbiot, 2013, p. 86):

> "I'm not against something new, not by any means, but it should be a progression from what you've got, not wiping the slate clean. With blanket rewilding you lose your unwritten history, your sense of self and your sense of place. It's like book-burning. Books aren't written about people like us. If you eradicate the evidence of our presence on the land, if you undermine the core economies that support the

Welsh-speaking population in the language's heartland, you write us out of the story. We've got nothing else."

As highlighted by this quote, a route to tackling knowledge and cultural hegemony in rewilding will be balancing the need for transformation with extant values and cultural norms through systems-based approaches, suggesting a balance between transformation and pragmatism. Here cultural hegemony at societal scale is addressed by challenging outdated institutions and disciplinary biases, while it is also addressed at a local scale, supporting local knowledge, place making, and cultural diversity linked to bioregionalism and indigeneity (Snyder, 1990; Wall Kimmerer, 2013). This is further discussed in chapter 6 relating to rewilding application, but this section demonstrates that concerns for knowledge and cultural hegemony influence theories on how rewilding should be practiced. Common concern for cultural and knowledge hegemony have driven support for systems-based governance approaches, while there are varying degrees of concern over capitalist hegemony based on divergences over how neoliberalism is perceived as supportive of or conflicting with rewilding's ecological goals. These findings show that decolonisation of rewilding needs to engage with the complexity and contextual root causes and hegemonic effects of colonialism, and this study of qualities of dewilding contributes to this by considering colonialism as one of a number of intra-acting qualities of a vicious cycle. These can be used to assess the governance of rewilding projects to limit ongoing colonial hegemony.

4.6. Human-nature disconnection[12]

The data highlight that many of the processes outlined in this section contribute to human-nature disconnection at societal or individual level, with humans increasingly distanced, estranged, and alienated from nature, physically, culturally, and psychologically (e.g., Thoreau, 1862; Leopold, 1949; Snyder, 1990; Jeeves, 2006; Monbiot, 2013; Wall Kimmerer, 2013; Clayton, 2019; Owens and Wolch, 2019). This process is presented as a vicious cycle, as humans increasingly spend time only among themselves and lose knowledge of and relationships with other species or places, perpetuating fear of the unfamiliar or unknown,

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[12] Beery *et al.* (2023) propose that human-nature disconnection in individuals is the lack of a sense of identity or belonging coupled with one's perception of nature, whereas societal disconnection looks at the collective, institutional, and social forms and drivers of this disconnection.

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as well as ignorance of the extent of ecological degradation. This is demonstrated in the earliest data, with Thoreau in 1862 writing,

> "We are so early weaned from [nature's] breast to society, to that culture which is exclusively an interaction of man on man—a sort of breeding in and in, which produces at most a merely English nobility, a civilization destined to have a speedy limit."

The data considers drivers of human-nature disconnection at a societal and individual level to be linked to ecological degradation and the tendency towards monoculture (as discussed above in section 4.2), driving increasing control over natural processes, urbanisation, and human–nature or domestic–wild distinctions. While there may be divergences among individuals related to their access to rural areas or reliance on natural processes for their livelihoods, there is general concern over societal-level disconnection with wilder systems, given the level of control associated with industrial agriculture, forestry, or fishing, limiting engagement with the risk and unpredictability of functioning ecological systems.

One outcome of this separation is that humans are not perceived as ecological actors, both in terms of their ability to degrade ecosystems or to restore them (Leopold, 1949; Snyder, 1990; Barlow, 2000), and this continues to influence debates over the extent to which humans can coexist and be part of wild landscapes or their role in rewilding. The data also reflects that this separation can cause a romanticised perception of wild places or nature (Ward, 2019), particularly where people experience these places only as temporary visitors, in relatively safe and controlled settings. This trend further perpetuates human-nature dualism and decreases the potential for human-nature coexistence (Vera, 2000; Cairns, 2006; Sandom and Wynne-Jones, 2019), as humans lose knowledge of how to manage unpredictability and associated risks, which include wild animals, natural disasters, and even seasonal changes. As an example, one study by Bauer and von Atzigen (2019) shows that cultural tolerance for wolves is lowest when there has been a period of separation, but that tolerance improves over a period of coexistence. Findings elsewhere show a link between human-nature disconnection and overexploitation and ecological degradation (Richardson *et al.*, 2022; Beery *et al.*, 2023). These studies assert that dualistic ontologies are failing and

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promote paradigm shifts in human-nature relationships, integrating ecocentrism into evaluations of planetary health (Redvers, 2021; Redvers *et al.*, 2022; Richardson *et al.*, 2022). While Beery *et al.* (2023) offer a considerable effort towards improving understanding of the complexities of disconnection among individuals, societies, and institutions, they recommend further studies, with consideration for different cultural or political contexts. This chapter draws parallels with human-nature disconnection and other intra-acting qualities of a vicious cycle of dewilding, and identifies disconnection as a key driver and concern of rewilding. This may help to promote the importance of human-nature connection in rewilding and the integration of concepts of disconnection and connection into future studies.

> **Reflexive note 4.2.**
>
> *Coexistence is not conscious but an unconscious lived reality. Drawing on experiences growing up in South Africa… We grew up with vervet monkeys often coming into the house to steal food from the kitchen. It was a nuisance! But we learnt to listen out for signals – rustling trees and the galloping of monkeys on the roof. We'd rush to close the windows and shout "monkeys!" so that everyone knew to do the same. I learnt that I must never tease monkeys with food and that they responded more to deep voices – so if monkeys ever got too close, I'd bark at them. There are caracal (similar to lynx) living in the middle of Cape Town in the Table Mountain national park. Many people don't even know that they're there. I swam in the sea often, despite the presence of sharks – my partner is horrified at the thought! But we grew up aware of the levels of risk and how to mitigate them. I wouldn't say coexistence is perfect in South Africa in any way, but it is unconscious, it is every day, you just get on with it. If these species didn't exist and were being reintroduced, the lack of knowledge and experience would probably have a significant effect on my perceptions of them.*

4.7. Shifting baseline syndrome

SBS describes a gradual change in the accepted norms for the condition of the natural environment due to a lack of human experience, memory and/or knowledge of its past condition (Soga and Gaston, 2018). This is noted in the IRT and RPS data as having negatively influenced people's perceptions of wildness, ecological traits, natural features, or species. Baseline expectations of natural states vary across different areas, given the variation in speed and nature of ecological degradation coupled with local climate and context. SBS is noted as being especially critical in very nature-depleted areas such as western Europe where agricultural landscapes are highly valued (Leopold, 1949; Vera, 2000; Ashmole and Chalmers, 2004; Fisher, 2004; Taylor, 2011a; Monbiot, 2013; Ceausu *et al.*, 2015). The effects of SBS are noted in the earliest set of secondary data, as Thoreau (1862) notes the changing perceptions of nature in English literature, further shifting expectations of nature:

"[English literature] is an essentially tame and civilized literature, reflecting Greece and Rome. Her wilderness is a green wood, her wild man a Robin Hood. There is plenty of genial love of Nature, but not so much of Nature herself. Her chronicles inform us when her wild animals, but not when the wild man in her, became extinct… Mythology is the crop which the Old World bore before its soil was exhausted, before the fancy and imagination were affected with blight; and which it still bears, wherever its pristine vigour is unabated."

As highlighted in the data, SBS has implications for human-nature disconnection; perceptions of nature as "other" or "untouched" can perpetuate views that there are no beneficial relationships between people and the environment (Wall Kimmerer, 2013, p. 6; Ward, 2019) or views that only humans and their livestock are able to create or maintain desired ecological conditions (Vera, 2000; Fenton, Fisher and Taylor, 2004). Loss of species effects their inclusion in cultural expressions, and they become less familiar and significant to people, further eroding our experience with them and our expectations to see them in our landscapes. Given the issues identified regarding SBS, there are implications for rewilding. It is important to consider in rewilding planning how people's perceptions of nature have been influenced by SBS—this can be valid for those driving rewilding as well as for local stakeholders. Given the cultural implications of SBS, this may suggest that reference ecosystems may also include socio-cultural factors as evidence to inform the integration of nature and culture as part of the rewilding process. This is further explored in relation to the aims and application of rewilding (chapters 5 and 6, respectively).

4.8. Value for control and order

Echoing concern with the hegemony of scientific rationalism and its influence on human-nature relations, as highlighted in the literature review, the data highlights that cultural values for control, regulation, domesticity, tameness, predictability, tidiness, and order have increasingly become the norm in some contexts (e.g., Jeeves, 2006; Monbiot, 2013; Wall Kimmerer, 2013, p. 138; Johns, 2019). The drivers of this trend are reflected across the themes in this section and include cultural hegemony, scientific rationalism, authoritarianism, the intensification of agriculture, and resource extraction and market demands. These trends led to increased necessity or desire to plan or manage landscapes,

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particularly in densely populated or intensively farmed areas (Carver, 2006; Jeeves, 2006). In this context, perceptions of unpredictability, nature, or "the wild", became increasingly negative, extending to natural processes [such as decay, aging, death, and predation (e.g., Snyder, 1990; Cortes-Avizanda *et al.*, 2016)] as well as other species (e.g., Monbiot, 2013; McKibben, 1995; Cairns, 2006). These values imply that biodiversity or landscape heterogeneity increases risk and must be controlled to mitigate risk and unpredictability, and these perceptions are noted as being current barriers to rewilding.

While nature is largely presented as the victim of domestication and control, the process is extended to people through "civilization," demonstrating that cultural diversity can be perceived as dangerous or risky alongside biodiversity or landscape heterogeneity (Snyder, 1990; Johns, 2019). This is particularly discussed in the context of the UK in several chapters in Peter Taylor's book *Rewilding*, and by George Monbiot, where he describes feelings of being overly controlled in the UK context, noting the influence on people's ability to handle risk and uncertainty. This is a key driver of his desire for rewilding. In one example he compares his own life to that of Toronkei, a Maasai worrier (p. 44-46):

> **Reflexive note 4.3.**
>
> *I do empathise with Monbiot's feelings of over-civilisation. The effects are deeper than just having more opportunities for thrill or wildness in the landscape. Living in unpredictability, you develop skills to adapt and become more resilient. I've lived in SA, Egypt and China – things can get pretty chaotic compared to England... But people get on with it and adapt. No electricity, drought, crime... people shrug their shoulders and get on with it. You have no choice. I think adaptability and tolerance for uncertainty is probably a factor of wellbeing. But there's a danger of glorifying "the wild" – this unpredictability is not something you can really experience as a tourist for short term. To develop resilience and tolerance, you need to live it every day. But there's a balance to be achieved between safety and unpredictability – South Africa is probably in need of a little more control, while the UK probably needs a little less! But then are we really more safe in this country or just scared of the wrong things?*

> "I thought of railings and hoardings. I thought of walks in the English countryside, where people start shouting at you as soon as you stray from the footpath. I succumbed, not for the first time in my life, to an attack of the futilities... Why did I not defect to Toronkei's community?... I could not cope with the uncertainty... The Maasai accepted wild fluctuations in their fortunes with equanimity... To know what comes next has been perhaps the dominant aim of materially complex societies. Yet, having achieved it, or almost achieved it, we have been rewarded with a new collection of unmet needs. We have privileged safety over experience; gained much in doing so, and lost much."

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In his history of rewilding, David Johns (2019) notes how efforts to control nature eventually result in the creation of hierarchical human societies, highlighting parallels between control of humans and natural resources, citing Sanday (1982) who traces the subjugation of women to the transition of humans "from a world in which they experience themselves in nature—and without a wild-domestic distinction—to societies built on control." These echo theories from Marx that draw parallels between animal suffering, commodification of nature, and human suffering and suggest that humans divorced from nature have no existence at all (Foster and Clark, 2018). Links are drawn in the data between colonialism and hierarchy, as colonialists systematically targeted and suppressed nature-centric cultures as they were seen as barriers to resource exploitation (Snyder, 1990; Wall Kimmerer, 2013). These examples suggest that the suppression of holistic ontologies has been integral in colonialism and overexploitation, further highlighting the potential for human-nature connection to influence sustainability (Beery *et al.*, 2023). These findings are reflected in wider postcolonial literature (e.g., Merchant, 1985; Battiste and Henderson, 2000; Federici, 2004; Cusicanqui, 2012).

4.9. Negative impacts on human wellbeing

While many of the themes above mention negative impacts to individual or societal wellbeing[13], it is important to highlight separately the wider implications of the dewilding process on society, which are extensively highlighted across the data, spanning many different aspects of wellbeing, including physical and psychological health. Reflecting on this, one RPS participant in the UK notes,

> "All of the WHO statistics about depression/suicide etc [are] all heavily related to our
> lack of connection with ourselves as wild animals and needing our natural
> environment and neighbours intact - but until the connection is made people will not
> be that interested in addressing it either for the sake of humanity or for the sake of
> all the other creatures and landscapes."

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[13] Wellbeing is a complex and subjective concept, but generally refers to a state of being comfortable, happy, and healthy considering numerous indicators that are highly contextual, including physical health, sense of purpose, strong relationships, financial security, equity, etc (Loveridge *et al.*, 2020; González, Dussaillant, and Calvo, 2021). Societal wellbeing concerns subjective perceptions and evaluations of society, rather than evaluations of our own life which are associated with individual wellbeing.

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Many of the implications to wellbeing relate to decreased opportunities to access or experience wilder landscapes, leading to "ecological boredom" (Monbiot, 2013), "extinction of experience" (Russell, 2005; Monbiot, 2013), and nature deficit disorder[14] (Durant, Pettorelli and du Toit, 2019; Maller, Mumaw and Cooke, 2019)—these terms all refer to ecological degradation or biodiversity loss having the potential to negatively impact psychological wellbeing, creativity, problem solving skills, opportunities to experience joy and wonder, and cultural aspects of wellbeing including identity and sense of place. The impact of nature deficit disorder on children are especially highlighted. Pearce (2005), speaking within the context of the UK notes,

> "Like most of my peers I grew up substantially outdoors, literate in weather and seasons, confident, responsible, resourceful, independent, persistent, and blessed with great stamina. Today, young people are widely pilloried for lacking these qualities, but is it any wonder given how little freedom and experience they get and how much they are required to remain indoors?"

The potential for a pervasive consumerist and egocentric culture to affect our wellbeing and breed discontent is also highlighted by many IRT authors and RPS participants. Wall Kimmerer (2013, p. 306) describes a mythic creature, the "Windigo," as "a human whose selfishness has overpowered their self-control to the point that satisfaction is no longer possible." This echoes findings from Richardson *et al.* (2022), that the promotion of consumer or technological routes to satisfaction come at the expense of the potential for other forms of satisfaction, for example those stemming from a close relationship with nature. Also noted is a sense of loss, despair, or anxiety caused by observing or experiencing ecological degradation or dewilding. Wall Kimmerer highlights that a further product of this grief may be psychological detachment, suppressing our natural response to catastrophe and further "breeding despair when it should be inspiring action" (p. 327).

Concerns with colonialism and hierarchy mentioned above suggest that the negative effects of dewilding on wellbeing are felt unequally across a population—with those benefitting tending to hold the power to perpetuate the status quo. The perceived negative effects on

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[14]Nature deficit disorder is a term coined by (Louv, 2005), referring to the idea that modern society, characterized by increased screen time, urbanization, and a decrease in direct exposure to nature, has led to a range of behavioural and health issues in individuals, particularly children.

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wellbeing have driven many to promote the potential for rewilding to positively influence wellbeing, echoing the human-focused goals of wider conservation as discussed in the literature review. However, there are divergences in the data related to the different focal points of human-focused goals (outlined in section 1.4.3), of neoliberal conservation, direct human benefits, or transformation. This section demonstrates that the impacts of dewilding or ecological degradation on individual and societal wellbeing are very broad and wider engagement with the concept of wellbeing in rewilding is therefore prudent. Some headway has been made in the most recent data from this data set (e.g., Maller, Mumaw, and Cooke, 2019) along with more recent literature (VanVolkenburg *et al.*, 2022), although these call for further studies and engagement with broad definitions of wellbeing in rewilding theory and practice.

4.10. Discussion and conclusion

By outlining the concerns driving advocates of rewilding and posing them as intra-acting qualities of a vicious cycle of dewilding, rewilding can be considered a virtuous cycle to counteract this trend. This chapter demonstrates the inherent transdisciplinarity of rewilding and its intentions to create paradigm shifts, especially responding to shifts towards a relational paradigm and calls to counteract colonial hegemony through decolonisation. This reflects recent opinion that rewilding should integrate socio-cultural change, responding to a perceived bias towards ecological restoration in the rewilding literature (e.g., Carver *et al.*, 2021; Rawles, 2022; Maffey and Arts, 2022; Taylor *et al.*, 2022). Based on the findings presented here, this cultural change may look to counteract the intra-acting causes and effects of dewilding. From these findings, we can see that rewilding seeks to restore degraded ecosystems, withdraw human influence to some extent across landscapes in order to accommodate non-human autonomy, promote human-nature connection and coexistence, mitigate SBS, mitigate the causes and effects of colonialism including overexploitation and values for control over nature and other people, and take a holistic approach to wellbeing. This supports findings highlighted in the previous chapter that rewilding intends to promote mutual flourishing of humans and non-human nature, however the findings also suggest that there remain concerns over command-and-control approaches to governance which would limit the potential for rewilding to promote human wellbeing. There remain several uncertainties and complexities in trying to integrate these

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objectives into rewilding theory and practice. This chapter suggests areas that require further research to support the development of a holistic framework for rewilding and the following chapter considers the implications for rewilding aims more explicitly.

One of the key points emerging from this study of dewilding is the need to genuinely engage with decolonisation and multiculturalism or plurality within rewilding theory and practice. This process will need to avoid overly simplistic assumptions or generalisations that can perpetuate conflict and divergent views. This problem is highlighted in the previous chapters and elsewhere, for example noting that studies of traditional knowledge and scientific knowledge or of holistic or dualistic ontologies can tend to be reductionist, oversimplifying and exaggerating differences or perceived paradoxes (Battiste and Henderson, 2000; Berkes, 2017). There is evidence of this occurring in the data and wider literature, for example driving conflict in the "new conservation debate" (section 1.4.3) and misconceptions of 3Cs rewilding limiting the

> **Reflexive note 4.4.**
>
> *How do we celebrate or experience cultures without changing or romanticising them? We are obviously influenced by our own subjectivities but what about when people change how they express their own culture to meet perceived expectations – like in tacky African-themed restaurants in Cape Town. Who controls cultural expression? Cultural expressions can be shaped to make them more accessible, palatable, or marketable to others. There are surely pros and cons to this.*

potential for collaboration (chapter 3). Rewilding theory therefore needs to be mindful of these complexities and of the many ethical pitfalls associated with perpetuating cultural and knowledge hegemony, including those associated with neocolonialism and neoliberalism in conservation, such as land grabs, cultural appropriation, and the commodification of nature (Battiste and Henderson, 2000; Holmes and Cavanagh, 2016; Holmes, Sandbrook and Fisher, 2017). One of the difficulties is that, while there is a clear desire to be inclusive and accepting of diverse worldviews, rewilding also seeks to change views, mitigating SBS and human-nature disconnection in areas where these are prevalent. This reflects tensions between pragmatism and transformation further discussed elsewhere in this thesis. While there is a clear desire to be more inclusive, for rewilding to be a widely applicable concept it will need to genuinely engage with decolonisation and multiculturalism, avoiding simplistic generalisations and idealisations that can decontextualise and depoliticize divergent concepts, further entrenching cultural and knowledge hegemony (Cusicanqui, 2012; Berkes, 2017; Schmitt *et al.*, 2021). This would also improve understanding of how to effectively shift paradigms while working with extant plural values and value orientations. This chapter

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further highlights the potential for systems-based approaches to governance to support this and wider shifts towards relational paradigms and transformation.

By presenting what are considered to be common causes and effects of dewilding in the data, this study contributes to ongoing work to identify potential leverage points for rewilding or sustainability more widely, providing a broad-strokes baseline from which to improve understanding of the dewilding process. This chapter draws on data mainly from North America and western Europe, and therefore it would be prudent to investigate the causes and effects of dewilding in different social-ecological contexts. Future research could identify factors influencing the rate, causes, and effects of dewilding and this could improve the efficacy of systems-based governance approaches and guide international policy on how to mitigate vicious cycles in SES. The elements of dewilding are presented here in the context of rewilding, but it is important to note that there are many parallels to broader studies in environmental humanities and sustainability. Many of the drivers of rewilding, in particular those issues related to the Anthropocene, have influenced people from across different disciplines and interests, and this has led to cross-pollination and growing awareness and a proliferation of organisations, theories, activists, policies, and commitments dedicated to improving the potential for global sustainability, as reflected in chapter 1. Where rewilding sits in relation to other theories, practices, or policies, is not within the scope of this PhD research, although links drawn clearly in the data are included. This warrants further investigation, as identifying commonalities and distinctions among these different fields would promote joined up working and may help to identify more effective routes to achieving sustainability at different scales.

4.11. Chapter highlights

This chapter considers data coded to the parent node "change why" and as such considers motivations to create change or rewild.

A substantive theory emerging from this chapter proposes these motivations as intra-acting qualities of a vicious cycle of dewilding, which is a concept used in rewilding literature but that is not well conceptualised. Intra-acting qualities of a dewilding vicious cycle are identified as: escalating human influence; biodiversity loss and ecological degradation; colonialism; cultural and knowledge hegemony; human-nature disconnection; SBS; values

for control and order; negative impacts on human wellbeing. This provides a broad-stroke baseline study of dewilding to support further research into dewilding and vicious cycles in related fields. There is general consensus over these qualities, while there is some divergence over the extent of human withdrawal in rewilding in response to accelerating human impact reflecting different value orientations, differing responses to negative impacts on human wellbeing reflecting differences in human-focused goals, and differing prioritisation of addressing capitalist hegemony, reflecting conflicts between neoliberal conservation and transformation.

The implications of this theory for rewilding are considered:

- As a response to dewilding, rewilding is a virtuous cycle. This provides further justification for SES framings of rewilding considering systemic, ecological, and socio-cultural change, and support findings in chapter 3 that rewilding is multidisciplinary and characterises a shift towards a relational paradigm.
- Given the impact of accelerating human influence on biodiversity and ecological function, there is agreement that rewilding requires some level of withdrawal of human influence in degraded landscapes, although there remain uncertainties over the extent and practicalities of that withdrawal related to different value orientations. It is suggested that the concept of landscape-scale coexistence may help to alleviate tensions (explored further in chapter 5).
- The data show that rewilding engages somewhat with postcolonial theory and intends to provide some counteractive to the perceived ongoing impacts of colonialism and cultural hegemony. Responding to calls for decolonisation of rewilding by Ward (2019), I note additional concerns in the data for capitalist hegemony, supporting calls for cultural transformation. This highlights the need to engage with the complexity and contextual causes and effects of colonialism in rewilding theory and practice. This theory of dewilding identifies colonialism as one intra-acting quality of a dewilding vicious cycle and by identifying these intra-acting qualities the theory presented here can support decolonisation, providing potential qualities to assess whether rewilding application is perpetuating or counteracting colonial hegemony.

Several areas for further research are suggested:

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- Case studies in different contexts are required to enhance understanding of the factors identified above. These could improve guidance on how and when to withdraw human influence, identify leverage points to mitigate associated risks, and enhance multicultural engagement with the qualities identified.

- Genuine engagement with decolonisation and multiculturalism would improve understanding of how to effectively shift paradigms and work with plural values and ontologies.

- Identifying commonalities and divergences related to the proposed qualities of a vicious cycle among different fields and policies would promote joined up working and may help to identify more effective routes to achieving sustainability at different scales.

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# Chapter 5: "Change what": The social-ecological aims of rewilding

5.1. Introduction

This chapter focuses on RPS and IRT data coded to the parent node "change what," and as such considers the aims of rewilding. This provides an empirical study of the aims of rewilding [after Hawkins (2022) which was based only on the RPS data], which has been identified as a priority for rewilding research in the literature (Pettorelli, Durant and du Toit, 2019b). Rewilding aims emerging from the data relate to change in three different categories—change to landscapes or social-ecological systems (SES), ecological change, and socio-cultural change. The aims are presented along with SES, ecological, and socio-cultural qualities that the data suggest may contribute to achieving rewilding aims (Figure 5.1.). An updated continuum for rewilding, integrating the key aims and addressing concerns with a paradox between non-human autonomy and active rewilding, is proposed in the concluding section.

When seen together, the aims presented here demonstrate the potential highlighted in the previous chapters for rewilding to promote paradigm shifts and transformative change. The aims and qualities identified in this chapter establish a potential vision for rewilding, providing common ground for a holistic rewilding framework and metrics, offering a focus for rewilding practice, and highlighting areas requiring further research. This is further considered in the concluding chapter which proposes a ToC for rewilding.

It is worth noting that the data also reveal intentions to change the practice or culture of conservation science, restoration, and rewilding, as is also highlighted as a driver of rewilding in chapter 3. While this could have been presented as a fourth category in this chapter, it seemed more appropriate to link it to the parent node "change how" as it relates to how rewilding is practiced. These are therefore presented in chapter 6 as principles that are intended to underpin rewilding practice.

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Figure 5.1: The social-ecological aims of rewilding, displaying the landscape-scale or SES, ecological, and socio-cultural aims of rewilding together with qualities that are identified as positively contributing to these aims. These are discussed separately in the relevant sections highlighted in the figure. Filled boxes = rewilding aims; unfilled boxes = qualities contributing to rewilding aims.
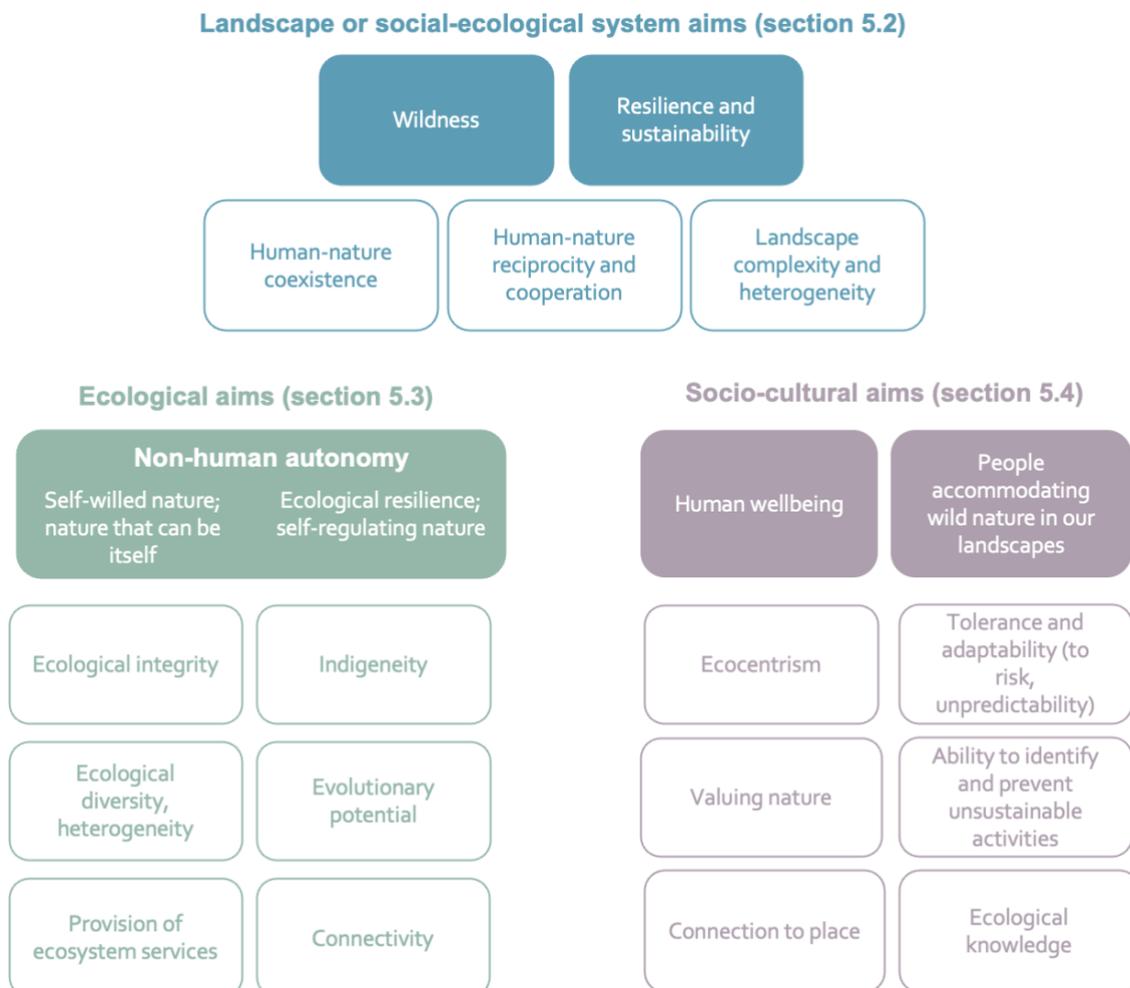
5.2. SES or landscape-scale change

Changes to landscapes or SES are expressed across the data and reflect the trend towards the integration of socio-cultural and ecological factors in an SES framing of rewilding highlighted in the previous chapters. The aims applied to landscapes or SES (wildness, resilience, and sustainability) are not clearly defined in the data, demonstrating the uncertainty and subjectivity related to these concepts. By deconstructing the aims of rewilding and related qualities, this chapter serves to clarify how systemic, ecological, and socio-cultural change are considered to contribute to wildness, resilience, and sustainability in a rewilding context. Coexistence; reciprocity and cooperation; and complexity and

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heterogeneity are identified as qualities of landscapes or SES that contribute to rewilding aims and are presented in this section as they are not wholly ecological or socio-cultural but shared, acknowledging the roles of humans and other-than-human nature.

5.2.1. Wildness

Given the emphasis on "wild" in the term "rewilding", it is unsurprising that a key landscape-scale aim is wildness. For example, Helmer *et al.* (2015) describe the goal of Rewilding Europe to be "a wilder Europe in the twenty-first century," while Terborgh and Soule' (1999) describe their "vision for a restored wild America."

The term wild is thought to stem from the German word for "will," applied to places or creatures not under human control (Snyder, 1990, ch. 1; Johns, 2019). It is therefore most often applied to non-human nature and is equated with non-human autonomy. However, the data indicate that wildness also contains socio-cultural elements, and is therefore considered as a landscape-scale or SES aim (combining both ecological and socio-cultural qualities, as reflected throughout this chapter). It is noted that "wild" is a subjective and multivalent term which is considered both an advantage to rewilding, as it embraces complexity and encourages creativity and contextual approaches (Boitani and Linnell, 2015; Gammon, 2018; Pettorelli, Durant and du Toit, 2019b; Ward, 2019), and also as a risk as it can create uncertainty or misinterpretation in rewilding practice (RPS data). This multivalence is demonstrated across the data. For example, while Soule' and Noss (1998) describe wildness largely in terms of ecological integrity, they also highlight that wildness has relational value[15] or can be influenced by the human experience:

> "Wilderness is hardly 'wild' where top carnivores, such as cougars, jaguars, wolves, wolverines, grizzlies, or black bears, have been extirpated. Without these components, nature seems somehow incomplete, truncated, overly tame. Human opportunities to attain humility are reduced."

It should be noted here that although wilderness is important to the WN group, it is seen as a means to achieving wildness at landscape scale, as highlighted in chapter 3. Wildness is also perceived as a quality that can occur outside of wilderness areas, among humans, or

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[15] Relational values are values that arise from a person's relationship with nature, which can include sense of place, feelings of well-being, and cultural, community, or personal identities (Chan et al., 2016).

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within humans (e.g., Snyder, 1990; Prior and Ward, 2016; Durant, Pettorelli and du Toit, 2019). Given these findings and reflecting those of Ward (2019), the aim is wildness rather than wilderness.

Snyder (1990) also considers the meaning and multivalence of "wild" in his chapter "The Etiquette of Freedom" and reflects that it can be applied to natural elements (including autonomous plants and animals); landscapes (fully functioning with indigenous flora and fauna); food crops; societies (whose cultures, governance, and economic systems are in a close and sustainable relation to the local ecosystem); individuals (connected to place, independent, 'proud and free'); and behaviour (free, resisting oppression, confinement, or exploitation). These reflect many of the themes explored throughout this thesis and in the categories in this chapter.

5.2.2. Resilience and sustainability

While the rewilding literature often focuses on key areas such as ecological resilience or human wellbeing (both discussed separately below), the data reveal that the intention is for wider, social-ecological sustainability, or "a better future for all" (Terborgh and Soule', 1999), reflecting the UN Sustainable Development Goals (UNDP, no date b) and that there is a common goal for mutual flourishing in rewilding, as also demonstrated in chapter 3. This echoes the links between rewilding and global sustainability as highlighted in the previous chapter, but also the integration of the concept of resilience into sustainability science, addressing the dynamics and potential for adaptation of complex SES in the face of disturbance (Kharrazi, Akiyama and Yarime, 2018). This is linked to a concern reflected in the data that the outcomes of rewilding should persist, especially in the context of climate change (e.g., Barlow, 1999; Carver, 2009; Butler *et al.*, 2021) and also links to principles of adaptability and project sustainability discussed in the following chapter (sections 6.2.5 and 6.2.4, respectively).

Resilience and sustainability links ecological resilience and human wellbeing, acknowledging that these contribute to the sustainability and resilience of the system as a whole. Wall Kimmerer (2013, p. 152-153) uses the analogy of weaving a basket to demonstrate these links and reflects how the qualities outlined in this chapter contribute to social-ecological resilience and sustainability:

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"In weaving wellbeing for land and people, we need to pay attention to the lessons of the three rows. Ecological wellbeing and the laws of nature are always the first row. Without them, there is no basket of plenty. Only if that first circle is in place can we weave the second. The second reveals material welfare, the subsistence of human needs. Economy built upon ecology. But with only two rows in place, the basket is still in jeopardy of pulling apart. It's only when the third row comes that the first two can hold together. Here is where ecology, economics, and spirit are woven together. By using materials as if they were a gift, and returning that gift through worthy use, we find balance. I think that third row goes by many names: Respect, Reciprocity. All Our Relations. I think of it as the spirit row. Whatever the name, the three rows represent recognition that our lives depend on one another, human needs being only one row in the basket that must hold us all. In relationship, the separate splints become a whole basket, sturdy and resilient enough to carry us into the future."

This also reflects the trend towards holism and a relational paradigm outlined in previous chapters and in other fields concerned with sustainability, driven by concerns that human-nature disconnection is a driver of ecological degradation and negative impacts on human wellbeing (Redvers *et al.*, 2022; Richardson *et al.*, 2022; Beery *et al.*, 2023). Given that rewilding reflects a shift towards a relational paradigm, as demonstrated by the aims presented here, this chapter may offer some leverage points for achieving SES sustainability, which is highlighted as a requirement for sustainability science by Abson *et al.* (2017).

5.2.3. Coexistence

Coexistence is seen as vital to the success of rewilding in theory and practice (e.g. Prior and Ward, 2016; Durant, Pettorelli and du Toit, 2019). The word can have different meanings depending on the subjects of concern. It is used in ecology to describe the state of two or more species living in the same place at the same time (Holt, 2001). However, in rewilding literature, the concept of coexistence largely stems from concerns with human-wildlife conflict associated with large predators, and so definitions of coexistence reflect a focus on human-carnivore coexistence; e.g., a "dynamic but sustainable state in which humans and large carnivores co-adapt to living in shared landscapes where human interactions with carnivores are governed by effective institutions that ensure long-term carnivore population

persistence, social legitimacy, and tolerable levels of risk," (Carter and Linnell, 2016; Lambert and Berger, 2022). However, responding to notions of control that are highlighted as a driver of dewilding in the previous section, the data reflects concern for human acceptance for other species as well as natural processes, such as predation, death, decay, and disturbance (Groom *et al.*, 1999; Noss *et al.*, 1999; Linnell and Jackson, 2019). This expands the concept of coexistence to include biotic and abiotic elements of SES.

Considering coexistence as a systemic, social-ecological quality, may help with future research on what contributes to coexistence and when intervention may be necessary to maintain coexistence. These studies may draw on existing research on the concept of coexistence in ecology and conservation. Human levels of tolerance and influence can be prejudiced by socio-cultural factors (Cairns, 2006) and therefore humans are particularly influential within the coexistence model, so tolerance and accommodating nature are further explored under socio-cultural aims of rewilding. Given the complexity of SES, coexistence as a social-ecological quality requires further research within system science and in different contexts. This research may have implications for rewilding, for example on how the feasibility of species reintroductions are assessed.

Coexistence is strongly linked to several qualities outlined in this chapter, including reciprocity and system complexity and heterogeneity. There is also evidence that human-wildlife coexistence can improve ecological knowledge and levels of human tolerance and adaptability, with positive correlations between coexistence, nature experience, and human-nature connection (Richardson *et al.*, 2022; Beery *et al.*, 2023). In an example from the IRT data, Monbiot states,

> "Only when I lived among ecosystems which retained many of their trophic levels, their diversity and dynamism, did I begin to understand how the natural world might work."

Here, coexistence is seen as contributing to a virtuous cycle, whereby coexistence fosters ecological knowledge and supports further coexistence. This correlates with a study of human-carnivore coexistence by Lambert and Berger (2022) who show that coexistence is facilitated by having enough experience and knowledge to mitigate fear/naivety, appropriately assess risk, and make informed decisions that foster sharing of landscapes.

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This reflects concerns highlighted in the previous chapter regarding human-nature disconnection and the ineffectiveness of ecotourism or temporary nature experiences in affecting lived ecological knowledge and the ability for humans to tolerate non-human autonomy. This suggests that human-nature disconnection may hinder socio-cultural change presented in section 5.4. Therefore, coexistence is a key factor in rewilding, but this is not reflected in existing rewilding frameworks that promote the reduction of human influence (e.g., Carver, 2014; Perino *et al.*, 2019; Van Meerbeek *et al.*, 2019). This chapter considers a revised continuum for rewilding integrating notions of coexistence and other socio-cultural qualities that may contribute to coexistence (section 5.5).

5.2.4. Reciprocity and cooperation

Drawing from the data, "reciprocity[16] and cooperation" highlights the mutual benefits or symbioses in social-ecological systems; it acknowledges the benefits humans get from nature but critically highlights the requirements of all species in the system and our collective responsibility in maintaining balance that contributes to coexistence. This theme is reflected in Leopold's land ethic (1949, p. 203-204), highlighting the links to coexistence, system science, and social-ecological resilience and sustainability:

> "An ethic, ecologically, is a limitation on freedom of action in the struggle for existence. An ethic, philosophically, is a differentiation of social from anti-social conduct. These are two definitions of one thing. The thing has its origin in the tendency of interdependent individuals or groups to evolve modes of co-operation. The ecologist calls these symbioses. Politics and economics are advanced symbioses in which the original free-for-all competition has been replaced, in part, by co-operative mechanisms with an ethical content... All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. His instincts prompt him to compete for his place in that community, but his ethics prompt him also to co-operate (perhaps in order that there may be a place to compete for). The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land."

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[16] It should also be noted that there is a long history of the study of reciprocity in social sciences, focusing mainly on exchanges between humans (Molm, 2010).

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This suggests that cooperation and coexistence require levels of tolerance for risk, but also require consideration for how and when to intervene to limit risk. This allows for limitations to non-human autonomy, just as there are limitations within society to human autonomy. Certain behaviours or risks related to any actor within a system can become intolerable to other actors, threatening their existence. This might include, for example, human overexploitation of natural resources, the risks related to the presence of large carnivores in suburban areas, the risks related to natural disasters like flooding or fire on habitat, or the competition associated with invasive non-native species.

The concepts of reciprocity and cooperation also improve the potential for positive interactions between humans and other-than-human nature, extending human-nature interaction beyond merely coexisting, to something that is (consciously or unconsciously) interdependent and cooperative. Reciprocity or reciprocal restoration is particularly promoted by Robin Wall Kimmerer throughout *Braiding Sweetgrass*. It encompasses a human-nature relationship based on a gift-exchange, acknowledging the balance of give-and-take, or sharing. The concepts of reciprocity and

> **Reflexive note 5.1.**
>
> *Includes those unintentional, unconscious benefits we create for nature (as nature's benefits are unconsciously given to us). Some assume that economic incentives are essential to promoting rewilding. But nature provides far more than monetary value. Reciprocity addresses the division between anthropocentrism or instrumental value and biocentrism or intrinsic value - it's okay to value what we get from nature, unless it becomes all take and no give. Anthropocentrism alone would create a fragile future for everyone…*

cooperation are highlighted by other authors and in the RPS data, with no distinctions drawn among proponents of different approaches to rewilding.

This theme is positively associated with many of the socio-cultural qualities highlighted in section 5.4, including human-nature connection, valuing nature, and the ability to identify and prevent unsustainable practices. These essentially represent humans' roles in reciprocity, i.e., seeing ourselves as part of an interdependent system; experiencing gratitude for the gifts we receive and understanding our responsibility to reciprocate. Reciprocity, and in particular human responsibilities within this exchange, is seen in contrast to prevalent culture which sees humans as having rights over natural resources or commodities (Wall Kimmerer, 2013). Within the framing of reciprocity, rewilding or restoration can be seen as giving something back to nature and may offer a route to

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alleviating the perceived paradox between non-human autonomy and interventions (as highlighted in the literature review). This is considered in a revised rewilding continuum (section 5.5).

5.2.5. System complexity and heterogeneity

Given that coexistence integrates the needs of all species, including humans, in landscapes, landscape or system-level complexity and heterogeneity is required to accommodate these needs. Taking a holistic approach to landscape and to landscape planning was a motivation for Leopold's *Land Ethic* and for the WN (as discussed in chapter 3). Given the difficulties associated with coexistence, in their 3Cs approach to rewilding they sought to compartmentalise land based on the needs of other-than-human nature, designating core or protected areas where other-than-human nature dominates, and corridors between these areas allowing for sustainable human land use. Similar

> **Reflexive note 5.2.**
>
> *Heterogeneity recognises the diversity of needs across a diverse community (of humans and non-humans), including habitats, species, and even human elements, given cultural diversity and related needs including culturally significant species, food etc. This makes a landscape multipurpose and associating that heterogeneity within sense of place and cultural identity can help towards coexistence and a more social-ecological mindset. By acknowledging that all species have varying needs, we see that equating protected areas with human-nature dualism can be an oversimplification. If we can reciprocate, we can give nature space and freedom, the habitat and food they need to exist, which could entail excluding certain human activities in some areas. If we lived in a truly non-dualistic society, we could accept this form of reciprocity without fearing that it would create more dualism. In many present contexts, however, the concern is justified.*

approaches to designate natural areas or protected areas are reflected elsewhere in the data (Vera, 2000; Helmer *et al.*, 2015; Jepson and Schepers, 2016; Corlett, 2019), but there remain concerns that these approaches align with wilderness preservation, as discussed in previous chapters.

Considering system heterogeneity and complexity may allow us to move away from conflicts related to different value orientations and instead focus on the needs of humans and other-than-human nature across a landscape, acknowledging that these requirements will be different in different contexts and thereby supporting systems-based approaches. Approaches to system complexity and heterogeneity are demonstrated in rewilding projects in the data, for example, Comins (2006) writes that the Tweed Rivers Heritage Project,

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"Recognises that the landscape is a function of natural, social, and economic history and in managing this 'tapestry' it is necessary to look at all the threads that make it up. The 50 projects fall into four main categories: the natural heritage including wildlife and landscape conservation; built and cultural heritage associated with the river; access and recreation improvements in and around this heritage; and education and interpretation of the river and its heritage."

This requires acknowledgement of system complexity,[17] integrating the needs of autonomous nature (which may include spatial and temporal requirements, diet, and habitat) together with the needs of humans (which may include governance, food, housing, recreation, and other needs related to culture and values). This would entail a wide spectrum of land uses in any given landscape, from areas where non-human nature dominates (as in protected or wilderness areas) to areas where humans dominate (as in urban areas). However, it is important to acknowledge that different types of areas provide multiple benefits to multiple species. For example, while wilderness may have reduced human influence, it can provide benefits to humans (Foreman *et al.*, 1992; Cerqueira *et al.*, 2015) and while urban or agricultural areas are predominantly human, they are beneficial to some non-human species (Cortes-Avizanda *et al.*, 2016; Maller, Mumaw, and Cooke, 2019). Integrating complexity and complex systems science into rewilding, landscape planning, policy, and decision making is one of the greatest challenges and will require advances in system science application together with overcoming socio-political barriers to understanding and integrating complexity (San Miguel, 2023). This is an avenue for further research.

5.3. Ecological change

There is much emphasis in the data that rewilding aims for ecological restoration or recovery [e.g., "restoration is at the centre of rewilding practice" (Jepson, Schepers and Helmer, 2018)], reflecting the influence of ecologists on rewilding theory as highlighted in chapter 3. However, the data highlight that this is not restoration in and of itself but that

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[17] "Complexity comes from the Latin word 'plexus' which indicates non-separability in components. Therefore, a good standard definition is that a Complex System is composed of many interacting units showing emerging properties that cannot be understood in terms of the properties of the individual isolated components" (San Miguel, 2023).

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there is the intention to restore certain ecological qualities to contribute to achieving non-human autonomy as well as other rewilding aims, reflecting a paradigm shift from compositional to functional ecological goals. These goals are shared across different approaches to rewilding, although there is some divergence over prioritising indigeneity (related to the use of ecological surrogates and the concept of novel ecosystems), and ecosystems services, given its links to anthropocentrism and neoliberal conservation approaches. The ecological aims and qualities are outlined below.

5.3.1. Non-human autonomy

As per Prior and Ward (2016), non-human autonomy is identified in the data as a key ecological aim of rewilding. However, there are two emphases under this theme and although they are interrelated it is worth noting them separately: self-willed nature (acknowledging the freedom of non-human nature) and ecological resilience (acknowledging the ability to self-regulate and perpetuate). The aim of non-human autonomy emerged mainly in reaction to accelerating human influence associated with the Anthropocene, as discussed in the previous chapter. Rewilding therefore aims for nature that is self-willed i.e., species, natural processes, or terrain that is free to follow its own will or free from human control or management (e.g., Fisher, 2004; Prior and Ward, 2016). However, the data reflect variations on perceptions of freedom, in relation to varied perceptions of human influence. This relates to the perceived conflict between holistic and dualistic ontologies highlighted in the literature review (chapter 1) and is considered further in the conclusion to this chapter (section 5.5).

Ecological resilience relates to ecosystem function and the ability for non-human nature to flourish, self-regulate, and perpetuate, contributing to ecological resilience. This does not require ecosystems to stay the same but acknowledges ecological dynamism and the capacity to adapt to or withstand change. Ecological resilience and freedom are generally considered together, for example, Foreman *et al.* (1992) write,

> "We are committed to a proposal based on the requirements of all native species to flourish within the ebb and flow of ecological processes, rather than within the constraints of what industrial civilization is content to leave alone."

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The concept of non-human autonomy requires further consideration in future research, considering the related qualities of freedom and resilience. Research may seek to interrogate freedom in relation to control, drawing on existing studies (e.g., Dempsey, 2021), or better understand the leverage points for achieving ecological resilience. The ecological qualities outlined below may provide some areas for more targeted studies. These studies could address assumptions that human influence negates non-human autonomy and consider instead more targeted questions, such as at what point or in what circumstances does human influence become incompatible with wildness or negatively influence ecological resilience.

5.3.2. Ecological integrity

Ecological integrity concerns ecological process or function together with structure (Foreman, 2004, p. 125; Cortes-Avizanda *et al.*, 2016), but this quality asks us to consider these holistically and identify integrity based on function, upheld by structure (Snyder, 1990; Simberloff *et al.*, 1999; Wall Kimmerer, 2013, pl. 332). For example, Leopold describes the complex ecological interactions of "land as a biotic mechanism" and refers to the ecological pyramid as:

> "A tangle of chains so complex as to seem disorderly, yet the stability of the system proves it to be a highly organized structure. Its functioning depends on the co-operation and competition of its diverse parts."

This places emphasis on the functioning of the whole system in relation to its parts or individual processes. This demonstrates the shift highlighted elsewhere in this thesis that rewilding is characterised by a shift from compositional to functional ecological goals, but that composition can remain influential given that structure influences function. This shows that reference ecosystems remain important in considerations of how to improve function. However, given the complex requirements of ecosystems, it is suggested that in practice some elements could be prioritised, for example based on project resources, objectives, and the capacity for those elements to have wider impact, for example, umbrella, keystone, or highly interactive species (e.g., Noss, 1992; Soule' and Noss, 1998; Svenning *et al.*, 2016).

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5.3.3. Ecological diversity and heterogeneity

Ecological diversity and heterogeneity include biodiversity and other ecological features, such as habitat diversity. It therefore relates closely to ecological integrity as it regards ecological structure and compositional integrity from which ecological function occurs (Leopold, 1949; Simberloff *et al.*, 1999; Foreman, 2004). Given the influence of the theory of trophic cascades on rewilding (see section 3.3), there is much emphasis on trophic diversity and interactions. For example, Monbiot (2013, p. 84) writes,

> "Restoring trophic diversity means enhancing the number of opportunities for animals, plants, and other creatures to feed on each other; to rebuild the broken strands in the web of life. It means expanding the web both vertically and horizontally, increasing the number of trophic levels (top predators, middle predators, plant eaters, plants, carrion, and detritus feeders) and creating opportunities for the number and complexity of relationships at every level to rise."

This theme is presented separately to ecological integrity given that increasing or conserving abundance, biodiversity, or habitat diversity are often expressed as rewilding aims or as indicators of rewilding success (e.g., Scott *et al.*, 1999; Terborgh and Soule', 1999; Ashmole and Chalmers, 2004; Merckx, 2015; Svenning *et al.*, 2016; Carver, 2019; Sandom and Wynne-Jones, 2019). This is based on rewilding's links to conservation biology (Soule' and Noss, 1998; Noss *et al.*, 1999; Foreman, 2004), the appeal of biodiversity to people (Taylor, 2006), and the potential for rewilding to contribute to international or local biodiversity or habitat goals, such as the Aichi Targets or the EU Habitats Directive (Navarro and Pereira, 2015b). Improving biodiversity through ecological heterogeneity was also one of the driving factors for Vera's wood-pasture theory, to naturally create "a mosaic of grassland, scrub, trees, and groves" (Vera, 2000, ch. 3).

5.3.4. Evolutionary potential

An aim of rewilding expressed in the RPS and IRT data is that of restoring or conserving evolutionary potential (e.g., Foreman *et al.*, 1992; Barlow, 1999; Donlan *et al.*, 2005). It is seen as a key quality and indicator of ecological resilience with its links to adaptation to change. This theme also acknowledges the co-evolution of species within a system, highlighting the importance of species interdependence, stemming particularly from the

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theory of ecological anachronisms (section 3.4), and therefore relates to ecological integrity, especially to ecological structure and missing species. Dave Foreman, quoted in Barlow (1999), highlights these links and equates evolutionary potential with wildness:

> "Wildness is something that permeates all life. It's essentially the evolutionary force. It's the process of evolution. It's the flow of life. And that is what conservationists are really trying to save. It's not a matter of preserving scenery or backpacking parks. It's not even a matter of improving the quality of our life. It's a matter of allowing the process of evolution to continue to flow on, to continue to produce this incredible diversity of species, this beautiful planet."

There is some acknowledgement of the spatial and temporal requirements of evolutionary processes and concerns that evolutionary potential is difficult or impossible to achieve in modern society with increasing human influence (Barlow, 1999; Martin and Burney, 1999; Vera, 2000; Svenning, Munk and Schweiger, 2019). The history of aims for evolutionary potential within the context of rewilding and its implications are considered in a more recent piece by McFarland and Fisher (2023) who argue that evolution should be central to the motivations and moral framework behind rewilding, but that non-human autonomy is fundamental to evolution. This quality therefore warrants further investigation in future research, considering the potential for evolutionary change in a modern context, especially in relation to coexistence and within the context of climate change adaptation.

5.3.5. Indigeneity

Indigeneity, relating to native, indigenous, or "original" ecological composition, is highlighted as a key ecological quality in the data, contributing to other rewilding aims. It is perceived that indigeneity relates to ecological integrity and resilience due to the co-evolution of biota (Leopold, 1949; Martin, 2000). Indigeneity is therefore said to provide guidance for ecological composition when restoring or rewilding areas (such as with reference ecosystems, see section 6.2.6).

However, influenced by the theory of ecological anachronisms (section 3.4) it is highlighted in the RPS and IRT data that rewilding can include the introduction of non-native species as ecological surrogates for extinct species and that rewilding takes into account "new nature" or existing non-native species, acknowledging the potential for continued changes in species

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composition (Miller and Hobbs, 2019). However, there are concerns with this position, as reflected in the literature review (chapter 1), which relate to the role of indigeneity in evolutionary processes (Genes *et al.*, 2019; McFarland and Fisher, 2023). The literature also highlights different roles of non-native species in rewilding practice, for example in Australia non-native species are seen as a barrier to rewilding (Sweeney *et al.*, 2019; Kealley and Burrows, 2022), while non-native species are used as ecological surrogates to aid restoration in island rewilding (section 3.4). Indigeneity can therefore be seen as relative and future research is required to assess indigeneity in relation to other ecological aims highlighted in this section.

5.3.6. Provision of ecosystem services

There is a strong emphasis in the data that healthy ecosystems will provide ecosystem services which underpin many of the other rewilding aims including SES resilience and sustainability, particularly in response to climate change (Cerqueira *et al.*, 2015; Navarro and Pereira, 2015a; Bakker and Svenning, 2018) and has led some to emphasise that improving ecosystem services is an aim of rewilding (Pettorelli *et al.*, 2018) or that ecosystem service provision can be used to monitor rewilding impacts (Cerqueira *et al.*, 2015; Navarro and Pereira, 2015a; Svenning *et al.*, 2016; Carver, 2019; White *et al.*, 2022). However, there remain concerns of anthropocentrism in the concept of ecosystem services and natural capital, as highlighted in chapter 3. Therefore, future studies could evaluate the concept of ecosystem services in an ecocentric or SES framing, considering links between ecological and socio-economic impacts of rewilding.

> *Reflexive note 5.3.*
>
> *The issue is that ecosystem services largely focus on benefits to humans and do not take into account the costs/benefits to other species. If we were to take a more ecocentric view, the benefits of having a "complete" ecological system would mean **equitable** access to the products/services created by the system. This creates questions over competition, when a species or an individual begins to outcompete another and suggests that equitable access to ecosystem services fosters coexistence? This is totally in conflict with neo-liberalism, again noting that there are limitations to self-will in an equitable system. What would an equitable economic system look like? Donut economics?*

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5.3.7 Connectivity

Connectivity looks to improve habitat between existing areas of habitat to allow for natural dispersal. It forms a core part of regional network designs promoted by the WN. Soule' and Terborgh (1999b) note,

> "As inhabitants of a world in pieces, we need to remind ourselves that connectivity is not just another goal of conservation: it is the natural state of things. Connectivity, therefore, is a *sine qua non* for conservation."

It is also promoted in other contexts and can therefore be considered as integral to rewilding in many situations. For example, improved connectivity is discussed as a potential outcome of trophic rewilding (Bakker and Svenning, 2018; Svenning et al., 2019) or as enabling the return of large carnivores (von Arx and Breitenmoser, 2004; Linnell and Jackson, 2019). Carver (2009) discusses connectivity in a UK context and demonstrates influence from mainland Europe:

> "Connectivity of wildlife habitats is a key issue in creating a landscape that is more 'permeable' to wildlife, that allows free movement of both predator and prey species across the country, along corridors between core natural areas and around or over obstacles such as transport routes, urban, industrial, and intensively farmed land. The cooperation of all landowners is essential here, together with appropriately designed and located infrastructure (e.g., eco-bridges), though legislation will be needed to modify planning policies and provide the funds for capital projects. This approach has been successfully demonstrated in the Netherlands and adjoining partner countries in the Pan European Ecological Network (PEEN)."

This demonstrates that this quality is associated with ecological integrity, non-human autonomy, coexistence, and humans accommodating nature in our landscapes. While the theoretical importance of connectivity is highlighted in the data, and landscape-scale projects such as Yellowstone to Yukon and the WN promote connectivity as integral to their approaches (Dobson *et al.*, 1999; Hilty, Chester and Wright, 2022), connectivity remains a challenge in small scale projects and heavily degraded landscapes (Carver, 2006; Whitbread, 2010). Future research may draw on connectivity conservation (Carruthers-Jones, Gregory

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and Guette, 2022) to study potential solutions and trade-offs between fencing and connectivity in rewilding projects (noted as a conflict in rewilding practice in chapter 6).

5.4. Socio-cultural change

The socio-cultural aims of rewilding are less explicitly discussed in rewilding literature than the ecological aims, but they are clearly understood by many participants of the RPS and authors of IRT data as being critical to rewilding, with an understanding that, to achieve ecological or landscape-scale aims, rewilding requires and should therefore incorporate socio-cultural change. For example, Svenning *et al.* (2016); Gammon (2018); a number of authors in Taylor (2011); and several RPS participants call for socio-cultural aspects to be integrated into rewilding. Aims reflect the intention for rewilding to promote socio-cultural change at different scales, from societal to individual level, reflecting the need to address the effects on wellbeing and other causes and effects of dewilding at different levels highlighted in the previous chapter. The socio-cultural aims seek to contribute to human wellbeing and for people to accommodate wild nature in our landscapes. It is suggested that qualities that may contribute to these aims are ecocentrism; tolerance and adaptability; valuing nature; having the ability to identify and prevent unsustainable activities; connection to place; and ecological knowledge (figure 5.1).

5.4.1. People accommodating wild nature in our landscapes

The aim of "people accommodating wild nature in our landscapes" is seen as critical to achieving the ecological aim of non-human autonomy and includes the "letting", "allowing," and "giving" inherent in many descriptions of rewilding from the RPS (e.g., "allowing nature to be itself" or "giving nature freedom"). It denotes humanity's role in coexistence and reciprocity and necessitates acknowledging the spatial and temporal requirements of natural processes together with a willingness to accommodate them. It should be noted that, addressing concerns for human-nature dualism highlighted in the previous chapter, that the "our" here refers to a more-than-human community.

"Accommodating" is a broad term which allows for varying approaches or interpretations by an individual or community of people, and therefore is a term adaptable to different contexts and value orientations [reflected in the life framework of values (O'Connor and Kenter, 2019) discussed in section 1.4.3]. This variety is demonstrated in the data across

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various areas from urban to rural, and includes doing nothing, such as in passive rewilding or land abandonment (e.g., McKibben, 1995; Carver, 2019); tolerating or accepting the presence or return of wild nature (e.g., Bennett, 2006; Linnell and Jackson, 2019); actively withdrawing human influence and/or restoring wild nature which is associated with active rewilding interventions (chapter 6); or embedding wild nature into cultures and landscapes (e.g., Helmer *et al.*, 2015; Prior and Ward, 2016). It also aligns with emerging policies to accommodate nature which are influential to the rewilding concept or vice versa, for example the Nature Needs Half movement (Nature Needs Half, no date) and the ambition for "30x30" in the post 2020 global biodiversity framework which seeks to expand area-based conservation measures to 30% of the land area by 2030 (CBD, 2021).

Given the extent of human influence highlighted as a cause and effect of dewilding (section 4.1), in many contexts accommodating wild nature at a landscape scale will require some degree of withdrawal of human demands or influence together with ecological restoration, ultimately contributing to the other aims highlighted in this chapter, especially ecological heterogeneity and non-human autonomy. This suggests that accommodating nature does not always require total withdrawal of human influence. However, it does imply some responsibility on the part of people to the health of the system, echoing "living with" or "living in" value orientations (section 1.4.3). Taylor (2004) writes,

> "Natural processes occur at all levels in all ecosystems and how far they
> predominate is a matter of degree and, ultimately, a human decision."

It is also highlighted that this withdrawal will require some integration of the needs of humans and other-than-human nature in land use decisions and land management, creating the potential to contribute to system sustainability and resilience. Snyder (1990, ch. 4) writes,

> "A sophisticated post-industrial 'future primitive' agriculture will be asking: is there
> any way we can go *with* rather than against nature's tendency?... Doing horticulture,
> agriculture, or forestry with the grain rather than against it would be in the human
> interest and not just for the long run."

Echoing the quality of system complexity and heterogeneity (section 5.2.5) this would entail a range of areas spanning the spectrum from urban to "wilderness" and this is likely the

source of conceptualisations of rewilding as a continuum or scale (section 6.2.2), with rewilding intending to move systems from human dominated to nature dominated areas, as reflected in the literature review. However, in practice this would entail a diversity of land uses across a landscape.

The aim of "people accommodating nature in our landscapes" is significant as it counteracts the perceived paradox between non-human autonomy and active rewilding or human influence that is highlighted in the literature review (chapter 1). Instead, accommodating nature allows for human presence, active restoration, and stewardship roles for humans. These roles counteract perceptions of humans as negative to nature, although does not negate the potential for humans to be unaccommodating, which is highlighted as a barrier to rewilding in the data and can be affected by dewilding. The theme of accommodating nature is therefore key in developing a revised continuum for rewilding which is presented in the discussion and conclusion to this chapter.

5.4.2. Human wellbeing

There is explicit interest across the data in the potential for rewilding to contribute to improving human wellbeing (Terborgh and Soule', 1999; Comins, 2006; Sandom *et al*. (2013); Maller, Mumaw and Cooke, 2019; Pettorelli, Durant and du Toit, 2019b), such as the suggestion that wild nature "enriches our lives and nourishes our psyches" (Terborgh and Soule', 1999). When viewed in the context of dewilding, rewilding is in part a response to the impact of dewilding on human wellbeing as discussed in section 4.9. However, given the subjective nature of wellbeing, the data reflect a variety of opinions over how rewilding can improve individual or human wellbeing. These reflect differences in the human-focused goals in rewilding discussed as a divergence among participants of the RPS data and reflecting different human-focused goals in wider conservation—neoliberal conservation, transformation, and direct benefits to human wellbeing.

Based on the data, it is theorised that rewilding, nature, or ecological restoration can contribute to human wellbeing in the following ways:

- Improving the provision of ecosystem services and related resilience to change or natural disasters (Terborgh and Soule', 1999; May, Hall and Pretty, 2006; Sandom *et*

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al., 2013; Cerqueira *et al.*, 2015; Jepson, Schepers and Helmer, 2018; Carver, 2019; Maller, Mumaw and Cooke, 2019; Sandom and Wynne-Jones, 2019).

- Opportunities to improve or contribute to livelihoods through nature-based enterprise including ecotourism. This is particularly influenced by the context of land use change and the sustainability of rural communities, with the potential to improve self or community sufficiency and therefore equity (McKibben, 1995; Hetherington, 2006; Taylor, 2011c; Monbiot, 2013; Wall Kimmerer, 2013; Helmer *et al.*, 2015; Jepson and Schepers, 2016; Bakker and Svenning, 2018; Gammon, 2018; Jepson, Schepers and Helmer, 2018).

- Improving opportunities for recreation or nature experiences, contributing to mental and physical health, including enhancing creativity and problem solving, hope, and inspiration (Thoreau, 1862; Snyder, 1990; Browning and Yanik, 2006; Fisher, 2006; Jeeves, 2006; Monbiot, 2013; Jepson, Schepers and Helmer, 2018; Clayton, 2019; Durant, Pettorelli and du Toit, 2019; Maller, Mumaw and Cooke, 2019).

- Improved opportunities for nature experience or coexistence, contributing to improving human-nature connection, i.e., the relational value of wild nature (Holden and Clunas, 2004; Taylor, 2011c; Monbiot, 2013; Wall Kimmerer, 2013; see also section 5.4.3).

- Contributing to enhancing spiritual or cultural aspects of wellbeing, sense of place, or sense of identity (Snyder, 1990; Taylor, 2011c; Saunders, 2011; Wall Kimmerer, 2013; see also section 5.4.7).

Maller, Mumaw, and Cooke (2019) consider a variety of links between nature and human wellbeing:

> "All types of interactions with nature have been shown to have one or more of a range of benefits, including: cognitive, psychological, physiological, social, and spiritual... Experiencing and interacting with nature can also contribute to a person's sense of control and security, inspiration and imagination, feelings of connection and belonging, learning and developing skills, and shaping identity—all dimensions of subjective wellbeing (Russell *et al.*, 2013; Fish, Church, and Winter, 2016; Mumaw,

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Maller, and Bekessy, 2017). Actively taking care of nature, from environmental volunteering to ecological restoration, provides additional forms of subjective and social wellbeing related to 'giving back' or making a contribution not only for nature, but for future generations and/or one's own place and community. Chan *et al.* (2016) make a cogent case for how human relationships with nature and relational values for nature underpin the foundations of social wellbeing and cultural codes of peoples across the globe."

This also suggests that accommodating nature, and stewardship or actions to restore nature can contribute to wellbeing. However, there is some concern that rewilding can negatively impact wellbeing, including livelihoods and sense of place, and therefore there is acknowledgement in the data that rewilding projects must be mindful of these risks, further emphasising the need for place-based approaches (see section 6.2.3). Another concern, highlighted by several RPS participants, is that rewilding can become anthropocentric if it focuses on benefits to humans. This aim must therefore be seen within the context of an SES and balanced with other rewilding aims. As is demonstrated in this section, wellbeing is a broad term which incorporates a number of elements contributing to quality of life, perceptions of which differ across different cultures or contexts and therefore need to be locally assessed (Loveridge *et al.*, 2020). Wellbeing can incorporate many different indicators, which of these relate to and interact with other rewilding qualities (either positively or negatively), and how these vary contextually, temporally, and spatially, is a topic that requires further research.

5.4.3. Changing human-nature relationships: Ecocentrism

The data demonstrates that influencing human-nature relationships has been a concern of rewilding since the concept first emerged. This is true in all regions associated with the emergence of rewilding, as demonstrated in chapter 3. There are acknowledgements in the RPS data and elsewhere (Rawles, 2022) that this is critical in order to achieve rewilding aims. Featherstone (2004), writing of the Trees for Life organisation, states,

"Whether the other elements of our vision, such as the return of a large area of land to 'self-willed' status complete with reinstated large mammals and top carnivores, come to fruition, will most likely be decided decades from now. The task for the

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immediate future is to lay the groundwork for that, to build an irrefutable case for why it should happen, and, by so doing, to play a role in healing the relationship between humanity and the rest of Nature."

Echoing this sentiment, Wall Kimmerer (2013) writes:

> "Restoring land without restoring relationship is an empty exercise. It is a relationship that will endure and relationship that will sustain the restored land. Therefore, reconnecting people and the landscape is as essential as re-establishing proper hydrology or cleaning up contaminants. It is medicine for the earth."

However, given that there are cultural differences in perceptions of nature and human's role within it, reflected in the perceived conflict between dualistic and holistic ontologies or differences in value orientations described in the literature review (chapter 1), there is some uncertainty over the qualities of the intended human-nature relationship. This has also been influenced by evolving definitions of the interrelated concepts of biocentrism and ecocentrism (Johns, 2019). This section intends to provide some clarification.

In response to concerns of anthropocentrism in conservation, many proponents of rewilding promote ecocentrism and a desire for humans to acknowledge the intrinsic value of nature. Reflecting the trend towards a relational paradigm highlighted in the literature review (chapter 1) and in chapter 3, across the data there is much focus on affecting more holistic notions of humans in nature, viewing human's entanglement and interdependence with the natural world. This has been influenced strongly by Leopold's Land Ethic. However, there remain criticisms of the concept related to tensions between anthropocentrism/pragmatism and ecocentrism/transformation discussed in chapter 1. There is therefore reticence from pragmatists to incorporate the concept of ecocentrism into rewilding. For example, Jepson, Schepers and Helmer (2018) disassociate rewilding in Europe from ecocentrism:

> "The literature suggests that in North America, ecocentric worldviews influence the study and practice of conservation biology, restoration ecology, and rewilding. These worldviews foreground the intrinsic value of nature, the value of encounters with wilderness (nature as other), and the restoration of past ecosystems by reducing the impacts of modern pressures. By contrast, the version of rewilding we promote in Europe expresses worldviews identifiable with utilitarianism and pragmatic realism.

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We accept that nature, society, and economy are intertwined and that the 'natural' ecosystems of Europe were transformed and impoverished millennia ago and can therefore only be imagined rather than fully known."

This also highlights concerns over the practicalities of applying ecocentrism in the context of dewilding, which has produced human-dominated landscapes and anthropocentric cultures. Hence, rewilding projects and theories sometimes align with neoliberal conservation approaches, for example promoting economic incentives or ecosystem services to benefit humans (Jepson, Schepers and Helmer, 2018; Pettorelli *et al.*, 2018).

Chapter 3 demonstrates that 3Cs rewilding reflects value pluralism and a shift towards a more relational paradigm, despite the influence of wilderness and motivations of intrinsic value. This may help to alleviate concerns over ecocentrism as a positive rewilding quality, and clarifying a definition of ecocentrism may provide a route to alleviating these conflicts. Ecocentrism is here defined as a holistic ontology that places humans within an interdependent system with the rest of nature, recognising the intrinsic value of all species within a system and prioritising the health of the system as a whole over individual or species-specific wellbeing (Washington *et al.*, 2017; Taylor *et al.*, 2020). Ecocentrism is often equated with biocentrism and the intrinsic value of nature, however, although intrinsic value is inherent in ecocentrism, it is critical and unique to previous moral standings in that it positions people as part of a holistic system and considers that the health of the system as a whole will maintain the wellbeing of populations within that system, including humans (Cocks and Simpson, 2015; Washington *et al.*, 2017). In this way it promotes the intrinsic value of nature while at the same time not denying that healthy systems provide benefits to all the beneficiaries of that system, including humans. In the following passage, Snyder (1990, ch. 3) provides insight into the role of humans from an ecocentric perspective, which may contribute to allaying concerns over rewilding devaluing the role of humans in landscapes:

"Wild nature is inextricably in the weave of self and culture. The 'post' in the term posthumanism is on account of the word human. The dialogue to open next would be among all beings, towards a rhetoric of ecological relationships. This is not to put down the human: the 'proper study of mankind' is what it means to be human. It's not enough to be shown in school that we are kin to all the rest: we have to feel it all

the way through. Then we can also be uniquely 'human' with no sense of special privilege."

This aligns with holistic ontologies discussed previously in this thesis and promoted in the wider literature as being positively associated with SES sustainability (Washington *et al.*, 2017; Cózar-Escalante, 2019; Irwin, 2021). It is also reflected by Browning and Yanik (2006) in the data as they suggest that the intention is for Wild Ennerdale to be both biocentric and anthropocentric, incorporating human and non-human interests. However, ecocentrism may not require this distinction between humans and other-than humans.

Based on this definition, ecocentrism aligns with rewilding's intentions for coexistence at a landscape scale, balancing the needs of humans and nature and aligns with Jepson and colleagues' intentions, as expressed above, that "nature, society, and economy are intertwined". This also alleviates concerns that rewilding is anti-human or anti culture, as ecocentrism places humans within systems. To further elaborate on its suitability for rewilding, it has been equated with Leopold's Land Ethic and also aligns with the worldviews of many indigenous cultures (Berkes, 2017; Washington *et al.*, 2017; Conradie, 2019), potentially reflecting the intention highlighted in the previous chapter for rewilding to counteract cultural and knowledge hegemony. While ecocentrism provides some ethical guidance on the type of human-nature relationship that may contribute to rewilding aims, it is not so prescriptive that it dictates the personal or emotional nature of those relationships, and therefore ecocentrism can be adaptable to different contexts, which aligns with the pragmatic realism proposed by Jepson, Schepers and Helmer (2018) above. Hence, as it is defined here, ecocentrism reflects a relational paradigm that may appeal to diverse value orientations, including pragmatists and those promoting the intrinsic value of non-human nature.

A scale of environmental identity (EID) is considered by Clayton (2019), where a high EID is defined as a stable tendency to perceive oneself as connected to nature. Clayton demonstrates that nature connection can vary along a spectrum from separation and domination (low EID) to more equal and intimate (high EID). Clayton states,

> "Having a strong EID should, consistent with the research by Tang and colleagues
> (2015), affect reactions to wild landscape, leading to a perception that the landscape

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is less strange and 'alien' and that one will be able to effectively thrive in that landscape. It is not clear, though, that a strong EID would predict support for rewilding."

This suggests that there is some correlation between a high EID and the extent that people accommodate or coexist with non-human autonomy, and viewing oneself as part of a system as in ecocentrism. On the other hand, a low EID is associated with human domination and this aligns with anthropocentrism which prioritises human interests above all others (Kopnina *et al.*, 2018). This is considered against the proposed rewilding continuum in the final section of this chapter.

Further engagement with the definition of ecocentrism proposed here may help to shift conversations around people's place in rewilding and contribute to a virtuous cycle of promoting holistic, systems thinking. More place-based studies on how ecocentrism contributes to rewilding, sustainability, and resilience is required to understand what conditions might contribute to ecocentrism and how ecocentrism may contribute to the other rewilding aims or attitudes towards rewilding (Bauer and von Atzigen, 2019).

5.4.4. Tolerance and adaptability

Tolerance and adaptability relate to people's ability to coexist with the risk and unpredictability associated with non-human autonomy and complex SES, reflecting a response against human control over natural processes as a cause and effect of dewilding. Here, people have the knowledge and skills to be able to adapt to change and live with the unpredictability associated with wilder systems. Reflecting the different scales, from individual to societal level, associated with human-nature disconnection and control over natural processes which are linked to tolerance for risk and uncertainty (as discussed in sections 4.6 and 4.8, respectively), tolerance and adaptability can be considered at different scales. Some examples from the data include awareness of how to coexist with large predators in the landscape (Monbiot, 2013; Linnell and Jackson, 2019), with implications for awareness of how to adapt in recreational activities or adapt agricultural practices to mitigate risk to human life or loss of livestock (further demonstrated in section 6.3). Examples also include having to adapt recreation seasonally, such as to allow for breeding

seasons for ground nesting birds, or for society more generally to tolerate and adapt to seasonal fluctuations in the availability of produce (Wall Kimmerer, 2013).

Tolerance and adaptability is critical to coexistence as coexistence does not require the absence of risk but tolerance for an acceptable level of risk (Carter and Linnell, 2016; Pausas and Leverkus, 2023). This is seen as counteracting SBS, human-nature disconnection, and pervasive values for control and order highlighted in the previous chapter. There is also acknowledgement that these factors can influence perceptions of risk and that risk can be real or perceived (Boitani and Linnell, 2015). Tolerance therefore requires some degree of ecological knowledge, contributing to understanding the reality of risks, knowledge of how to mitigate risk (rather than control or prevent risk altogether), and accepting and coexisting with risk. Taylor (2009) demonstrates this when he writes,

> "If you have bears in the woods, the best protection comes from a cultural knowledge (and acceptance) of the risks, not fences with warning signs to the uninitiated."

So, at an individual level, through rewilding people may need to adapt to having more wildlife in their local area, and this may influence adaptability and tolerance for risk at a societal level as people gain the skills and knowledge to adapt to more unpredictable landscapes.

This is seen together with a need for adaptability to natural shifts in levels of risk or uncertainty due to the impermanence and open-ended nature of natural processes (Snyder, 1990; Soule' and Terborgh, 1999b; Taylor, 2004; Russell, 2005; Wain, 2006; Prior and Ward, 2016; Corlett, 2019; Durant, Pettorelli and du Toit, 2019; Hall, 2019). This theme therefore contributes to a virtuous cycle whereby tolerance and adaptability fosters coexistence and vice versa, with links between adaptability and human wellbeing also highlighted (Monbiot, 2013; Maller, Mumaw and Cooke, 2019). Thoreau describes physically growing a callus through "living much out of doors":

> "Living much out of doors, in the sun and wind, will no doubt produce a certain roughness of character—will cause a thicker cuticle to grow over some of the finer qualities of our nature, as on the face and hands, or as severe manual labour robs the hands of some of their delicacy of touch. So, staying in the house, on the other

hand, may produce a softness and smoothness, not to say thinness of skin, accompanied by an increased sensibility to certain impressions. Perhaps we should be more susceptible to some influences important to our intellectual and moral growth, if the sun had shone and the wind blown on us a little less; and no doubt it is a nice matter to proportion rightly the thick and thin skin. But methinks that is a scurf that will fall off fast enough—that the natural remedy is to be found in the proportion which the night bears to the day, the winter to the summer, thought to experience."

The notion of tolerance then counteracts concerns with over civilization or human-nature disconnection discussed as causes and effects of dewilding in the previous chapter. This demonstrates the perception that human tolerance for non-human autonomy is related to experience and knowledge gained by coexistence, reflecting that coexistence is facilitated by co-adaptation of humans in a more-than-human community (Carter and Linnell, 2016), where humans build experience and knowledge to mitigate fear/naivety, appropriately assess risk, and make informed decisions that foster sharing of landscapes (Lambert and Berger, 2022). Given that perceptions of risk and unpredictability are subjective, there is a need for more targeted, place-based studies to interrogate these concepts and their relation to rewilding.

Reflexive note 5.4.

I am fascinated by the culture of "wild swimming" in the UK (or just plain "swimming" as it would be called in any other country). When I first moved here, I looked for opportunities to swim outdoors. But every lake, river etc had signs up saying no swimming. There was no culture for wild swimming in the early 2000s. Most people I spoke to were horrified at the thought of swimming in ponds, rivers, or quarries and I heard many horror stories. Recently I came across the public information film from the 1970s called "Lonely water" – a film intent to strike terror on anyone considering swimming outdoors in an uncontrolled setting. Many people I've spoken to remember this film and surely it has had some influence on perceptions of outdoor swimming. A strange thing about the wild swimming culture is the "safety in numbers" element – it has become a subculture, to belong you buy the right gear and swim in groups. It seems very controlled and cautious. I see groups of people in the Lake District with dry robes and floats even in the safest of conditions. I should add that I'm one of them! One day I was sitting on the banks of Windermere on a gloriously warm day, when a guy walked down to the lake and saw a group of swimmers. He asked me, surprised, "can you swim in here?" When I said yes, he ran and jumped in the lake fully clothed – now that's wild! I still can't understand the intention behind Lonely Water—banning people from swimming will only make it riskier. Is there an element of control here, of mistrust? Were there concerns over water resources? In SA we are taught how to be safe around water rather than being terrified of it.

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5.4.5. Valuing nature

In Hawkins (2022) this theme was labelled as "appreciation for the benefits humans get from nature", however this has been expanded to "valuing nature." This theme remains focused on human appreciation for nature (rather than on how to assign value) and the potential for this to contribute to other rewilding aims and to improve acceptance of rewilding. Expanding the term acknowledges intrinsic value and wider relational values about nature rather than focusing only on direct benefits to humans. Intrinsic, relational, and instrumental values are the three types of value highlighted extensively across the data, and how these are prioritised are influenced by value orientations outlined in section 1.4.3.

Figure 5.2 from Chan, Gould, and Pascual (2018) shows the relationship between these different value types and it is important to note, as highlighted by them, that values can be deeply intertwined and can have varying influences on our attitudes, decisions, or behaviour in different situations. This is demonstrated in the data, for example, Fenton, Fisher, and Taylor (2004), explore value pluralism and its influence on acceptance of rewilding:

> "We will conserve what we like for no other reason than we like it. That liking might include a purely economic motive—such as deer for trophy hunters, or even an economy based upon visitors to the scenery. There are utilitarian and aesthetic values in nature conservation, but curiously, supposedly scientific values of biodiversity, ecosystem stability, and even naturalness, currently hold sway. It is rather like a reverse of the demise of religion—the old paradigm was flawed, a result of special interests, and as the flaws become more widely understood, new values are emerging. The challenge for conservationists is to adapt to these changes. One crucial adaptation will be a pluralistic process, with different management models, involving many interest groups, with the mix varying from place to place, and where participation in the setting of values is paramount."

The potential for value pluralism echoes the sentiment expressed in sections 5.2.5 and 5.4.3 that system complexity and ecocentrism recognises multiple values across complex, interdependent systems.

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Figure 5.2: Relationships between several prominent value concepts (from Chan, Gould, and Pascual 2018). In terms of rewilding, the data suggests that instrumental values, relational values, and intrinsic values are associated with the rewilding concept.
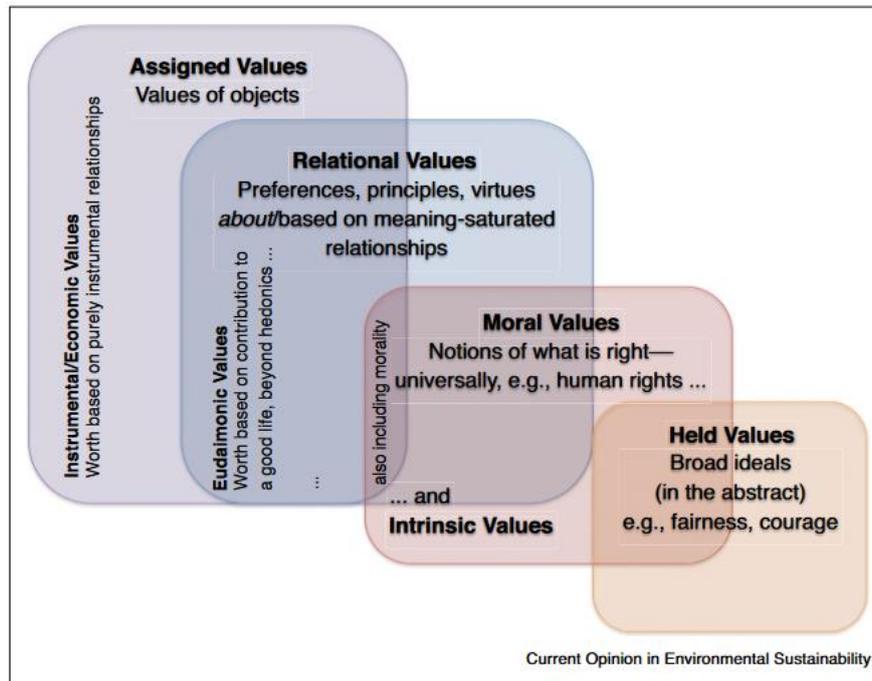
While this theme is about increasing human's appreciation for nature, it also promotes an honest, place-based assessment in order to understand existing values, with a view to increasing the value of nature to influence attitudes, behaviour, land use, or decision making (Clayton, 2019). How values for or about nature can contribute to other rewilding aims, and what types of value are more effective, is an avenue for further research. Below are listed three types of value that are particularly associated with rewilding based on the data:

- **Instrumental values:** Instrumental values describes values assigned to resources based on their direct benefit to humans, and so this is strongly associated with the potential to promote rewilding to people (Cerqueira *et al.*, 2015; Helmer *et al.*, 2015; Pettorelli *et al.*, 2018) and to influence investors or policymakers (Whitbread, 2004; Jepson and Schepers, 2016; Jepson, Schepers and Helmer, 2018; Pettorelli *et al.*, 2018). This is particularly associated with the concept of ecosystem services, with studies demonstrating how rewilding may increase the provision of ecosystem services (Cerqueira *et al.*, 2015; Pettorelli *et al.*, 2018). There are concerns within the data of ascribing value to nature only based on its utility to humans, and calls to

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integrate other forms of value or justifications for conserving nature (Whitbread, 2010). For example, one RPS participant from the US notes,

"I think our conservation language should try to avoid mechanistic metaphors and utilitarian terms that devalue other life-forms."

- **Relational values:** Relational values are preferences, principles, and virtues about human-nature relationships. As such, they are values that arise from a person's relationship with nature, which can include sense of place, feelings of wellbeing, and cultural, community, or personal identities (Chan *et al.*, 2016; Chan, Gould and Pascual, 2018). Promoting the relational value of wild landscapes is emphasised across the data, including by those associated with Wildlands Network (e.g. Snyder, 1990; Foreman, 2004) and groups in Europe (Vera, 2000; Taylor, 2011d; Helmer *et al.*, 2015) who express the potential for wilderness or wild places to affect ecological knowledge, perceptions of nature, connection to place or nature, ecocentrism, and feelings of compassion or humility. It therefore elevates those cultural or spiritual elements which are difficult to explore within a natural capital and ecosystem services framework (Cerqueira *et al.*, 2015). The relational values of wildness are explored by Gammon (2018), Clayton (2019), and Ward (2019). Clayton (citing Hasbach, 2014) writes,

"Wildness offers us the opportunity to experience ourselves embedded in the natural world and reminds us of our place in the order of things. It invites feelings of awe… and a sense of humility."

- **Intrinsic value of other-than-human nature:** This acknowledges that other-than-human nature has value in its own right, independent of its use or value to humans (Soulé, 1985). The intrinsic value of nature is particularly promoted by those associated with the WN in North America. It is seen as a unifying principle of the WN approach to rewilding, as highlighted in chapter 3, and it is intrinsic to ecocentrism, which is discussed more fully in section 5.4.3.

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5.4.6. Ability to identify and prevent unsustainable activities

The quality of the "ability to identify and prevent unsustainable activities" is strongly linked to ecological knowledge as well as other aims and qualities outlined in this section, however it warrants highlighting separately based on the data. This theme is about human understanding of the limitations to human influence or alterations within a system, including limiting overexploitation and other forms of human-caused mortality (Leopold, 1949; Linnell and Jackson, 2019). Snyder (1990) describes this as,

> "working out the details of subsistence and celebration in different landscapes… The line between use and misuse, between objectification and celebration, is fine indeed. The line is in the details."

This theme is explored extensively by Leopold (1949), who considers various aspects of human influence on ecological processes, including the level of violence of man-made changes together with human population density. However, these elements require further investigation, and given the connection between sense of place and ecological knowledge, the means to identify and prevent unsustainable activities are likely to be influenced by the context, and therefore further investigations considering local contexts are paramount (e.g., Zhao *et al.*, 2023). What is understood from the data is that this quality requires some understanding of the complexity of ecological systems and requirements (Leopold, 1949; Terborgh *et al.*, 1999; Linnell and Jackson, 2019), some acceptance on the part of humans to limit behaviour or exploitation highlighting links to accommodating wild nature and reciprocity (McKibben, 1995; Soule' and Terborgh, 1999b; Fisher, 2004; Taylor, 2009; Monbiot, 2013; Wall Kimmerer, 2013; Bauer and von Atzigen, 2019); value for natural resources or gratitude together with not being wasteful (Thoreau, 1862; Wall Kimmerer, 2013, p. 183); local knowledge and monitoring, as well as some form of governance or enforcement (Snyder, 1990; Wall Kimmerer, 2013, p. 307). Wall Kimmerer (2013, p. 179) considers links between TEK, ecocentrism, and limitations to human activity, highlighting the importance of context in how this quality works in practice:

> "The traditional ecological knowledge of indigenous harvesters is rich in prescriptions for sustainability. They are found in Native science and philosophy, in lifeways and practices, but most of all in stories, the ones that are told to help

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restore balance, to locate ourselves once again in the circle… Collectively, the indigenous canon of principles and practices that govern the exchange of life for life is knowns as the Honourable Harvest. They are rules of sorts that govern our taking, shape our relationships with the natural world, and rein in our tendency to consume—that the world might be as rich for the seventh generation as it is for our own. The details are highly specific to different cultures and ecosystems, but the fundamental principles are nearly universal among people who live close to the land."

To inform the potential for this quality to contribute to the systemic aims of rewilding, there is a need for establishing guidelines at various scales from local to international. These may draw on place-based studies (e.g., Zhao *et al.*, 2023) as well as research considering Earth system boundaries (Rockström *et al.*, 2023).

5.4.7. Connection to place

This quality demonstrates the intention to reconnect people and their cultural identity to place (Snyder, 1990, ch. 3; Vera, 2000, ch. 7; Wall Kimmerer, 2013; Helmer *et al.*, 2015; Jepson and Schepers, 2016), and hence for people to commit to a place, with people becoming more mindful of the landscapes they inhabit, and "place" providing the setting for rewilding. This reflects the importance of place-based approaches in rewilding application (section 6.2.3), "living in" value orientations (section 1.4.3), and links to the relational paradigm considering places as human/non-human entanglements (section 1.4.2). The notion of "place" has a history in social geography, reflecting trends towards relativism and considerations of one's environment in perceptions of wellbeing and identity (Drenthen, 2022). Wall Kimmerer writes of becoming indigenous to place, improving knowledge, connection, and sense of identity to place and the community (human and other) to actively contribute to an area's cultural and ecological sustainability (Wall Kimmerer, 2013, p. 207-215). She writes,

"Being naturalized to place means to live as if this is the land that feeds you, as if these are the streams from which you drink, that build your body and fill your spirit. To become naturalized is to know that your ancestors lie in this ground. Here you will give your gifts and meet your responsibilities. To become naturalized is to live as

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if your children's future matters, to take care of the land as if our lives and the lives of all our relatives depend on it. Because they do."

Here we see links between this theme and other rewilding aims and qualities, especially ecological knowledge, ability to identify and prevent unsustainable activities, human wellbeing, and social-ecological resilience and sustainability.

In promoting sense of place and place-based identity, rewilding also promotes cultural diversity as a counteractive to cultural hegemony highlighted in the previous chapter. Snyder (1990, ch. 2) writes,

> "Cultural pluralism and multilingualism are the planetary norm. We seek the balance between cosmopolitan pluralism and deep local consciousness. We are asking how the whole human race can regain self-determination in place after centuries of having been disenfranchised by hierarchy and/or centralized power. Do not confuse this exercise with "nationalism,' which is exactly the opposite, the imposter, the puppet of the state, the grinning ghost of the lost community."

There are also, however, concerns that rewilding can conflict with connection to place and threaten human histories (Benayas and Bullock, 2015; Cerqueira *et al.*, 2015; Gammon, 2018; Sandom and Wynne-Jones, 2019; Ward, 2019). Here we see the impermanence of cultural landscapes, which change as cultures and ecological conditions change. A desire to (re)connect people to place is demonstrated in the data by several case studies which promote local natural heritage and history as part of local identity (Holden and Clunas, 2004; Browning and Yanik, 2006; Wain, 2006; Warrington, Soans and Cooper, 2009; Taylor, 2011b; Saunders, 2011; Johns, 2019). Here there may be tension between history or tradition and SES dynamism which asks people to be tolerant of change, uncertainty, and indeterminacy (sections 5.4.4 and 6.2.5). Drenthen (2022) promotes an "ethic of place" for rewilding, where it is place-based but that the sense of place is critically analysed and deepened, creating new versions of place. Here, reflecting the role of reference ecosystems in rewilding application (section 6.2.6) history is not recreated but looks to the past for evidence to inform a wilder future place.

5.4.8. Ecological knowledge

Ecological knowledge is highlighted as critical to several other socio-cultural qualities and therefore warrants being acknowledged separately. Knowledge is strongly associated with a connection to place and people's ability to identify and prevent unsustainable activities (Snyder, 1990; Wall Kimmerer, 2013). It is also seen as necessary in order to achieve aims for people to accommodate nature in landscapes, which requires an awareness of the needs of other-than-human nature (Soule' and Noss, 1998; Linnell and Jackson, 2019). Clayton (2019, citing Bixler and Floyd, 1997) demonstrates how ecological knowledge can influence tolerance of wildness, as it can make a wild landscape less threatening, and how it can improve understanding of the state of health of a landscape. A desire to improve people's ecological knowledge is demonstrated by the variety of ecological studies and theories which have influenced the practice of rewilding, as highlighted in chapter 3.

5.5. Discussion and conclusion

It is highlighted in the data and wider literature that a better understanding of the aims of rewilding may provide foundations for a holistic rewilding framework, theories, and practice and to improve the capacity to monitor rewilding progress (Corlett, 2019; Pettorelli, Durant and du Toit, 2019b). This chapter provides a broad, empirical study of rewilding aims. Rewilding aims are transdisciplinary, acknowledging the need for social-ecological, ecological, and socio-cultural change. This chapter structures the aims of rewilding under these headings and identifies qualities that would contribute to achieving these aims (figure 5.1).

While the literature often focuses on the ecological aims of rewilding (Prior and Ward, 2016; Torres *et al.*, 2018; Perino *et al.*, 2019; Pedersen *et al.*, 2020), the data highlight that there is a need for a more holistic framing of rewilding aims that acknowledges the need for socio-cultural change and integrates ecological and socio-cultural elements of rewilding. This improves the potential for rewilding to promote transformative or systemic change. Rewilding's transformative potential has been highlighted elsewhere, for example by Butler *et al.* (2021); Hawkins *et al.* (2022); Rawles (2022), and Durant, Pettorelli, and du Toit (2019) who state that rewilding "has the capacity for delivering something bigger and more multidimensional than [its] ecological prescription." This is reflected in the ambitious nature

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of the aims presented here, with many of them promoting profound changes in understanding, systems, cultures, or institutions.

Importantly, the socio-cultural aim of "people accommodating wild nature in our landscapes" is presented as critical for rewilding, and it is suggested that there are varying degrees of accommodation. Considering these degrees and integrating other aims highlighted in this chapter, it is possible to construct a revised rewilding continuum (after Carver, 2014; figure 5.3). This demonstrates that accommodating nature can run from passive to active, and from active transitioning to embedded and self-sustaining. This addresses the perceived paradox between active rewilding and non-human autonomy, and concerns related to notions that rewilding is about the complete withdrawal of human activities, reflected in previous rewilding frameworks (e.g., Torres *et al.*, 2018; Perino *et al.*, 2019) and the wilderness continuum (Carver, 2014).

Figure 5.3: Continuum of people accommodating wild nature in landscapes, demonstrating how this aim contributes to rewilding at a landscape scale and connects to concepts such as protection, restoration, and stewardship (further explored in chapter 6). Also integrating the scale of EID, adapted from Clayton (2019).
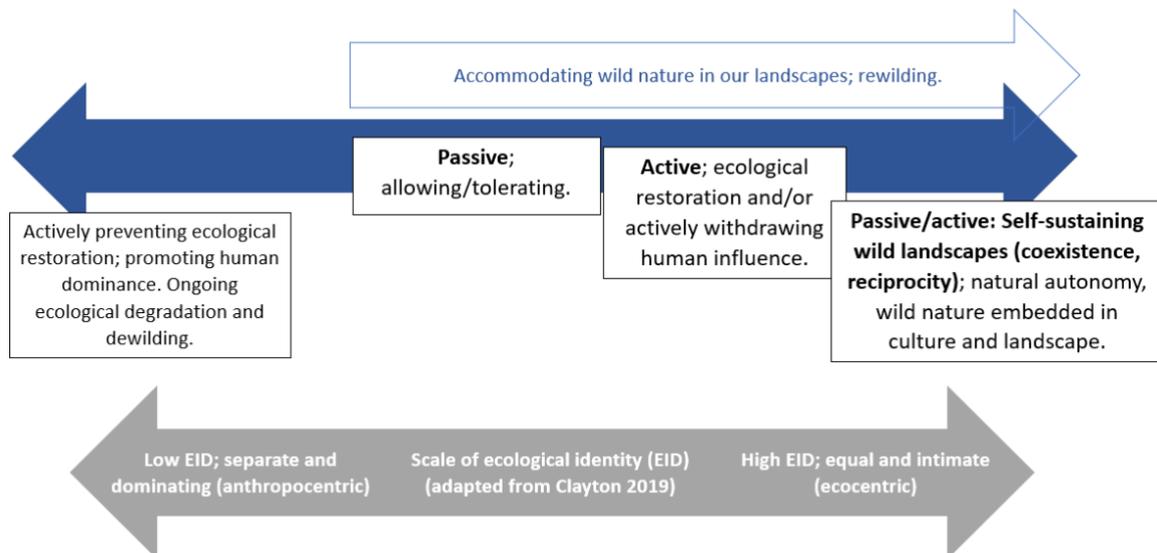
Also highlighted in this image is opposition to accommodating nature in landscapes. Barriers to rewilding, highlighted in the data, are commonly related to policies, individuals, or values which perpetuate unsustainable (or unaccommodating in this context) activities. Such barriers can be integrated into the scale as opposite to accommodating nature. Figure 5.3 also demonstrates coexistence and reciprocity as qualities of wild, sustainable, and resilient

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landscapes, which is a passive/active state maintained through ongoing adaptation to change or to risk. Also reflected are the links suggested above between positive EID and tolerance for rewilding or non-human autonomy. This reflects the potential that dualistic ontologies, which can include anthropocentrism (Cocks and Simpson, 2015; Kopnina *et al.*, 2018), perpetuate human-nature disconnection and dewilding, while holistic ontologies contribute to the sustainability and resilience of SES (Cocks and Simpson, 2015; Washington *et al.*, 2017).

This scale reflects efforts of rewilding projects that seek to improve coexistence, non-human autonomy, and people accommodating nature (along with other rewilding aims) at a landscape scale. An example of such a project is the Yellowstone to Yukon project in North America which seeks to improve connectivity and coexistence between Yellowstone and Yukon national parks in the US and Canada, respectively, using a number of different interventions and place-based approaches to promote landscape heterogeneity, coexistence, and sustainable land use (Hilty, Chester and Wright, 2022). A similar approach is being promoted by the Affric Highlands project which is a partnership between Trees for Life and Rewilding Europe in Scotland, seeking to create connectivity between existing rewilding areas (Trees for Life, no date). These projects are active in that they are actively restoring ecosystem function, improving connectivity, and encouraging sustainable forms of human land use, while their aims are to achieve self-sustaining wild landscapes, reflecting an intended shift along the spectrum from active rewilding to passive/active coexistence.

While this scale is simplistic, it warrants further investigation and development. This could contribute to tools for planning or assessing the feasibility of interventions. For example, this scale could be used to assess how policies or interventions might influence people's willingness to accommodate wild nature in landscapes, and to investigate why differences occur among communities or within individuals, such as why an individual might support reintroductions of some species and not others. This may also serve to improve our understanding of coexistence and to clarify the distinctions between management, stewardship, non-human autonomy, and control.

This chapter serves as a starting point for creating a rewilding ToC (chapter 7), which requires the identification of a vision for the future. By breaking the social-ecological aims of wildness, resilience, and sustainability down into systemic, ecological, and socio-cultural

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aims and qualities, it provides a means to better understand the balance between various rewilding aims. This may help in rewilding practice in certain situations, where projects may find it more effective to focus on one or more of these qualities without having to resolve issues relating to cultural interpretations of the word "wild." While these aims also serve to deconstruct the term wild, the aims and qualities remain broad and therefore may allow for different cultural interpretations of rewilding, but this requires further research in different social-ecological contexts.

It is important to highlight several limitations to the findings of this chapter. Firstly, given the broad overview of this chapter, the aims and qualities identified remain broad and will require further interrogation to enhance understanding of these themes and the interactions between them. For example, the "ability to identify and prevent unsustainable activities" necessitates knowledge of system boundaries, governance, and perhaps commitment to place. In doing so, however, it is also important to maintain the framework's adaptability. So that, for example in the case of identifying and preventing unsustainable activities mentioned above, the type of knowledge and governance is not necessarily prescribed but would be suited to the local culture or differences in value orientations. A second limitation is that the data used to develop this framework is mainly from North America and western Europe as this reflects those areas where rewilding concepts and practice were pioneered. It is essential that the concepts highlighted within this framework are interrogated in different social-ecological contexts.

One assumption which requires further interrogation is the separation of human and ecological systems expressed by most participants, leading to separation of ecological and socio-cultural aims and qualities. By integrating these under a social-ecological framework we can begin to reconcile the interactions between these qualities and concepts with the intention to reflect a shift towards a relational paradigm in rewilding. More holistic ontologies may consider this separation of humans and culture from other species and processes as superficial and a false representation of reality and this may be a key issue that will need to be addressed at some point in the future. This and other issues highlighted here point to the need to continue to interrogate and adapt rewilding aims to changing contexts, especially as the concept of rewilding itself is evolving (as highlighted in the literature review and chapter 3).

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Despite its limitations, the aims presented here provide a useful and evidence-based starting point for unifying rewilding practice under its social-ecological aims and a focal point to enable identification of areas requiring further research or refinement. This would help to broaden understanding of the qualities identified above and of the methods or interventions which could be used to enhance them. By sharing the findings on rewilding's social-ecological aims, the intention is to encourage the rewilding community to work towards common gaols, to further explore the interconnection between ecological and social systems, and to share experiences and lessons learned related to these aims to enhance the potential for rewilding across systems, cultures, and disciplines.

Commonalities are expressed across the data regarding these aims and qualities, whereas divergences are only notable regarding some of the qualities. The social-ecological aims of wildness, sustainability, and resilience are common, along with the qualities of coexistence, reciprocity, and system complexity and heterogeneity. However, there may be some divergence over how coexistence is perceived related to different value orientations, and the concept of coexistence requires further research in different contexts. The functional ecological goals of non-human autonomy are common, as are the qualities of ecological integrity (echoing function), ecological diversity and heterogeneity, evolutionary potential, and connectivity. However, there is some divergence over whether indigeneity or ecosystem services are a priority, reflecting the influence of ecological surrogates and criticisms of anthropocentrism, respectively. These divergences may be addressed by systems-based approaches that support value pluralism, but case studies in different contexts would contribute to improving knowledge of how different priorities influence rewilding goals. There are common socio-cultural aims of "people accommodating wild nature in our landscapes" and "human wellbeing", however there is some divergence over how to address human wellbeing, echoing differences in human-focused goals in the wider conservation movement (section 1.4.3). The socio-cultural qualities of tolerance and adaptability, valuing nature, ability to identify and prevent unsustainable activities, and connection to place are mentioned across the data to varying degrees, but there is limited evidence of how to achieve these qualities, perhaps given that engagement with the human dimensions of rewilding are limited in the wider academic literature (Weber Hertel and Luther, 2023). There are also different emphases on types of value to priorities, reflecting

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different value orientations. There is reflected a desire for people to reconnect and appreciate interdependencies among humans and non-human nature, hence changing human-nature relationships as a quality, although there is some conflict over the definition of ecocentrism, reflected in conflicts between anthropocentrism and ecocentrism and divergences in value orientations highlighted in the literature review. Clarifications of the definition of ecocentrism and further research is suggested to alleviate these conflicts.

5.6. Chapter highlights

Two novel substantive theories emerging from the data are considered in this chapter:

- A theory of the social-ecological aims of rewilding reflecting intentions for SES, ecological, and socio-cultural change. Qualities that the data suggest may contribute to achieving rewilding aims are also highlighted (Figure 5.1.). For the first time (and after Hawkins, 2022), this highlights the aims of rewilding beyond the purely ecological aims. This addresses the need for a framework to represent the subjectivity and multivalence of rewilding as it reflects the diversity and multidisciplinary of rewilding aims while offering aims and qualities on which to focus rewilding practice, metrics, and ongoing research. Commonalities and divergences are also clarified, and this may help to address ongoing tensions or misconceptions highlighted in chapter 3 and promote collaboration among the rewilding community.

- An updated continuum for rewilding, integrating the rewilding aims (figure 5.3). This is novel and important as it addresses concerns that current rewilding frameworks reflect dualistic ontologies and fail to represent human influence or presence in rewilding. This revised continuum is suited to landscape-scale conceptualisations of rewilding where system heterogeneity, reciprocity, and coexistences contribute to accommodating the needs of all species, including humans, in systems. This provides the potential to alleviate conflict over the role of humans in rewilding or in wildness, as it addresses assumptions that human influence negates non-human autonomy. Instead, more targeted questions can be considered, for example at what point or in what circumstances does human influence become incompatible with or unaccommodating of wildness.

Some implications for rewilding are considered:

- Although ecological and cultural elements of rewilding continued to be discussed separately in the data, this study presents the aims in an SES framing and may encourage holistic systems thinking, highlighting the interdependencies among systems.
- When seen together, the aims presented here demonstrate the potential or intentions highlighted in the previous chapters for rewilding to reflect a shift towards a relational paradigm. Aims for system resilience and sustainability link rewilding to sustainability and systems science.

This chapter suggests further research based on these findings:

- Test the aims and qualities identified in different contexts, with the aim to further interrogate these concepts and improve their adaptability and applicability. This research could consider whether these aims and qualities can act as leverage points for achieving system sustainability.
- To consider further the revised rewilding continuum (figure 5.3) which could provide a tool for planning or assessing the feasibility of rewilding interventions.

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Chapter 6: "Change how": Rewilding application

6.1. Introduction

This chapter considers the data coded to the parent node "change how" and therefore relates to the application of rewilding. This parent node was separated into two sub-nodes; interventions—which considers the interventions that have been applied or are recommended in the data (section 6.3); and principles—which are those underlying principles of rewilding practice that have emerged from the data (section 6.2), expressing how rewilding *should* be practiced given limitations to transitioning towards more systems-based approaches as highlighted in the literature review and chapter 3.

6.2. Principles of rewilding practice

As demonstrated in chapters 3 and 4, many drivers of rewilding relate to a desire to change the culture and practice of conservation biology and related institutions. These include concerns that some practices promote human-nature dualism (Ward, 2019), objectives based on pre-determined conditions (Taylor, 2011c), anthropocentrism (Noss, 1992), and ineffective practices that do not acknowledge complex ecological interactions (Soule' and Noss, 1998). In response, a number of principles are expressed in the data with the intention to guide rewilding practice and to address perceived inadequacies with prior approaches. These are largely based on theories of how rewilding *should* be practiced, with limited examples in case studies in the data, given the difficulties in transitioning towards more systems-based approaches to governance (Martin, Fischer and McMorran, 2023; as also highlighted in the literature review and chapter 3). There are some parallels between the principles outlined below and the socio-cultural qualities identified in chapter 5, suggesting that while rewilding aims for societal-level cultural change, these changes should be reflected in rewilding practice, reflecting that goals of transformation are applied outwardly and inwardly (Fougères *et al.*, 2022; also highlighted in chapter 1). For example, the socio-cultural quality of tolerance and adaptability links to a rewilding practice that is adaptive and embraces uncertainty and indeterminacy, and the socio-cultural quality of ecocentrism is linked to systems thinking in rewilding practice. When viewed together, these principles reflect the intention for rewilding to use systems-based governance

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approaches and to support the transition towards a relational paradigm. In each section below, the principles reflected in the data are considered against the existing guiding principles for rewilding published by Carver *et al.* (2021) (referred to as RTG principles throughout).

6.2.1. Proactive, transformative, and visionary

Given the intention for paradigm shifts and transformation expressed in the rewilding aims in chapters 3 and 5, the data reflect the intention for rewilding practice to be transformative and visionary, with aspirations beyond what has previously been sought in conservation or restoration. The ambitions for rewilding are considered by some to be outside of what is accepted or comfortable within a current system or culture (e.g. Soule' and Noss, 1998; Foreman, 2004; Monbiot, 2013), echoing intentions or potential for rewilding to promote paradigm shifts in policy, culture, or nature conservation (Soule' and Terborgh, 1999b; Taylor, 2011c; Pettorelli *et al.*, 2018; Hawkins *et al.*, 2022; Taylor *et al.*, 2022). For example, the goals of rewilding organisation Trees for Life are described as stretch goals, "which may seem overly ambitious viewed from the current paradigm, but can be achieved with bold, creative thinking, strategic planning, and a willingness to think outside the box" (Puplett, 2008). Many rewilding organisations create ambitious visions for the future (e.g., Foreman, 2004; Helmer *et al.*, 2015) and Noss (1992) describes rewilding as a vision toward which to strive over decades. The data show that there is intent behind the use of bold visions, i.e., to promote hope, innovation, and inspiration. As an example, Soule' and Terborgh (1999b) write:

> "An inspiring vision is essential. In the frenetic, noisy years ahead, only such visions will attract attention and kindle hope."

As highlighted in the literature review, there is a perceived conflict between transformation and pragmatism. However, while a vision may seem unachievable in the short term, it provides a focus for rewilding practice. A vision is reconciled with pragmatism through iterative progression (as discussed in section 6.2.2).

In the RTG guidelines, the transformative intent of rewilding is expressed in principle 10, which focuses on a paradigm shift in the coexistence of humans and nature, with related institutional paradigm shifts. In establishing future guidelines to inform rewilding practice,

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the RTG could consider advising rewilding projects or organisations to create visions. This aligns with a ToC framework which is suggested for the use of environmental management (Allen, Cruz and Warburton, 2017). A vision is also integrated into a rewilding ToC that has been established based on the research presented in this thesis (chapter 7). This may be used as a template from which to adapt place-based or project-specific rewilding visions.

6.2.2. Pragmatic and iterative

The visionary and transformative potential of rewilding is reconciled with pragmatism through iterative progression, whereby appropriate interventions are applied successively to progress a system towards a bold vision. Intentions for rewilding to be pragmatic (e.g., Soule' and Terborgh, 1999b; Jepson, Schepers and Helmer, 2018) and to progress iteratively along a scale of rewilding (e.g., Bakker and Svenning, 2018; Butler *et al.*, 2021) are expressed in the data. This reflects conceptualisations of rewilding as a continuum or scale, with the intention to move systems along a scale towards rewilding goals (Holmes *et al.*, 2020; Carver *et al.*, 2021). Jepson and Schepers (2016), for example, suggest that rewilding is:

> "a graduated and situated approach, where the goal is to move up a scale of wildness within the constraints of what is possible, and interacting with local cultural identities… Rewilding is not a state; it is a process. It is about moving up a scale of wildness and giving the ecosystems a functional 'up-grade' whatever their nature, scale, and location."

This is therefore also linked to the intention for rewilding practice to be contextual and place-based (section 6.2.3) as rewilding progresses along a scale of what is possible within the current context. This also aligns with the conceptualisation of rewilding proposed in chapter 4, that it seeks to affect a virtuous cycle to counteract the vicious cycle of dewilding. Figure 6.1 provides an overview of how this may look in practice.

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Figure 6.1: A visual demonstrating the iterative progression of rewilding towards a rewilding vision, counteracting a dewilding vicious cycle.
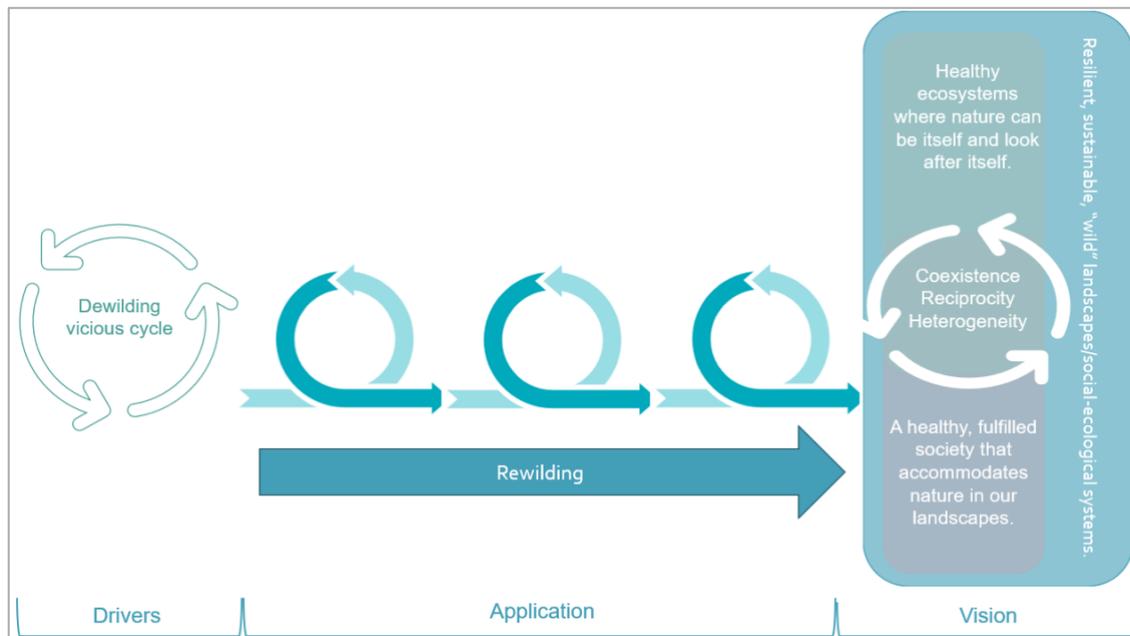
Iterative progression aligns with and promotes adaptability (section 6.3.5), as is reflected in agile project management (which influenced the design of this research; chapter 2) and adaptive governance (Butler *et al.*, 2021). Hence, rewilding application adapts as knowledge and context evolves, allowing for trial and error, creativity, and adaptability in pursuit of the vision (Butler *et al.*, 2021). Projects may, for example, adapt to emerging risks or opportunities, for example funding or opportunities for collaboration. In one example in the data (Ashmole and Chalmers, 2004; Adair and Ashmole, 2022), Carrifran Wildwood started as a small project with limited resources in an area where there was limited support for rewilding. Given these circumstances, they prioritised ecological goals, even avoiding using the term rewilding (Ashmole, pers. comm.). Over time their project gained support due to apparent improvements in biodiversity and ecological function in the project area and due to growing support for rewilding more generally, and these changing conditions have enabled them to broaden the area of their project and seek collaborations with neighbouring landowners (Adair and Ashmole, 2022). Similarly, due to growing awareness of the project, Knepp has partnered with others to improve connectivity in their area in southern England (Weald to Waves, no date). In reality, application is unlikely to be as linear as figure 6.1 suggests, and projects may include a number of different workstreams. The larger and more complex the project, the more workstreams there may be. At a landscape

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scale, this may entail multiple stakeholders, organisations, or projects working towards a shared vision, as is reflected in the Yellowstone to Yukon project (Hilty, Chester, and Wright, 2022) and the Affric Highlands project (Trees for Life, no date).

Iterative progression and pragmatism are implicit in RTG principle 6 which promotes addressing barriers to acceptance and contextual approaches, and in principle 8 which encourages the use of monitoring to respond to emerging problems. However, future rewilding guidelines may wish to draw on agile project management (Fernandez and Fernandez, 2008) and adaptive governance frameworks (Butler *et al.*, 2021) which are both intrinsically iterative to provide guidance for how to integrate iterative progression into rewilding practice.

6.2.3. Contextual and place based

Addressing concerns over a perceived conflict between pragmatism and transformative change highlighted in the literature review (chapter 1), the data show that while rewilding has a vision for the future, it also occurs in the "here and now" and must therefore be contextual and place based. This is reflected in contextual assessments that inform emerging rewilding approaches, as reflected in chapter 3 (e.g., Soule' and Terborgh, 1999b; Foreman, 2004; Cerqueira *et al.*, 2015; Jepson, Schepers and Helmer, 2018). It is also reflected in considerations for ecological or cultural conditions that influence what is possible, e.g., a natural seed source influences the potential for natural regeneration (Navarro *et al.*, 2015), or culturally significant species offer opportunities for species reintroductions (Monbiot, 2013; Jepson, Schepers and Helmer, 2018). Being contextual and place-based aligns with the need for rewilding to be adaptable, considering that every SES will offer a unique context, hence, place-based approaches and thorough assessments of local social-ecological conditions are key to developing rewilding plans and prioritizing interventions (Ceausu *et al.*, 2015; Navarro and Pereira, 2015a; Butler, Young and Marzano, 2019).

Calls for rewilding or conservation to be contextual and place-based are linked to problems associated with command-and-control approaches to conservation that include decision-making made in isolation of focal areas, controlling organizations excluding relevant information or interests, and tendencies to oversimplify complex problems and hence apply

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inappropriate solutions (Holling and Meffe, 1996; Briggs, 2003; Williams, Stewart and Kruger, 2013). These reflect concerns that knowledge and cultural hegemony influence the culture of conservation and related institutions (discussed in chapter 4). These issues can cause rewilding projects to fail. For example, a proposal to reintroduce lynx to the Kielder forest in the UK was proposed and promoted nationally by the Lynx UK Trust prior to any local feasibility studies or consultation taking place, and so the project experienced many contextual setbacks that ultimately caused the project to fail (Hawkins *et al.*, 2020). A lack of engagement and consultation with stakeholders to identify local priorities has also been cited as a reason for the failure of the Summit to Sea rewilding project in Wales (Fisher, 2019; Lewis, 2023). In contrast, the reintroduction of wolves to Yellowstone National Park in the US was proposed based on a number of contextual factors including the lack of predation pressure in the Yellowstone ecosystem. Engagement and policy reform were prioritised for many years to improve the feasibility of the project prior to the reintroduction taking place (Duffield, Neher, and Patterson, 2008; Ripple and Beschta, 2012). These reflect findings or recommendations in the wider literature that place-based approaches are critical for rewilding or reintroduction success (IUCN, 2013; Root-Bernstein, 2022; Stanley-Price, 2022). Here the human dimensions of rewilding are paramount, reflecting increasing engagement with human dimensions in wider conservation (see section 1.4.2). Thorough and genuine place-based assessments of social and political factors influencing acceptance of rewilding among stakeholders allow projects to avoid making assumptions about levels of support or reasons for opposition (Weber-Hertel and Luther, 2023). An example of this is reflected in the lynx project cited above, where the project was promoted for the potential to increase ecotourism as it was assumed that this would be perceived to be a benefit by stakeholders, but place-based assessments found that there was limited support for ecotourism in the target area (Hawkins *et al.*, 2020).

The need for rewilding application to be contextual and place-based aligns with iterative progression, so that even when a certain intervention may be desirable, it is not prioritised or applied ahead of interventions that are more suited to the current context. The list of interventions presented in table 6.1 can aid this process. This may also help to address negative perceptions of rewilding as practitioners are encouraged to address existing socio-cultural barriers to rewilding prior to or in tandem with other interventions. Initial

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assessments provide a baseline for the project, while ongoing monitoring provides the means to assess the impacts of rewilding interventions and to identify emerging opportunities or barriers around which to adapt rewilding plans.

Contextual, place-based approaches to rewilding are implicit in the RTG principles which encourage landscape-scale planning (principle 2), reference ecosystems (principle 3), participatory approaches (principle 6), and the integration of local knowledge (principle 7) to address contextual concerns. However, future guidelines may draw on existing literature or future research on best practice for place-based approaches for rewilding (Root-Bernstein, Gooden and Boyes, 2018; Drenthen, 2022; Root-Bernstein, 2022), considering existing guidelines for community-based conservation (Berkes, 2021) and SES assessments (Berkes, Colding, and Folke, 2002; Fougères *et al.*, 2022). Guidelines for establishing appropriate monitoring are also required, as the practicalities of ongoing place-based adaptations require ongoing monitoring (as proposed in table 6.1). Whilst monitoring is typically viewed as essential to inform practice and improve knowledge of rewilding (Groom *et al.*, 1999; Svenning *et al.*, 2016; Pettorelli *et al.*, 2018; Corlett, 2019), in practice monitoring is limited by the resources available and the skills and priorities of those involved. This is demonstrated in the variety of approaches to monitoring reflected in case studies in the data (e.g., Neale, 2004; May, Hall and Pretty, 2006; Chalmers, 2007; Warrington, Soans and Cooper, 2009). The challenge of establishing monitoring guidance for rewilding in complex systems is highlighted in the wider rewilding literature (Pettorelli *et al.*, 2018; Root-Bernstein, 2022; White *et al.*, 2022). Therefore, this area requires further work to inform rewilding guidelines, including methods for monitoring and minimum requirements. These may seek to provide a toolbox and different levels of monitoring to suit the availability of resources. Although these may be flexible, some level of standardisation would aid knowledge sharing to inform rewilding guidelines. Work towards monitoring guidelines could draw on methods for monitoring complex systems, reflecting principles to encourage systems thinking and adaptiveness (UNDP Strategic Innovation, 2022, 2023).

6.2.4. Large scale, long-term systems thinking

Reflecting a trend towards holism and SES framings of rewilding (as reflected in chapters 1 and 3), systems thinking is increasingly encouraged in rewilding theory (Butler *et al.*, 2021; Jones and Jones, 2023). This began with the emergence of ecological theories that

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highlighted complex interactions in ecosystems (chapter 3), which prompted large- or landscape-scale implications for rewilding (Soule' and Terborgh, 1999a; Carver *et al.*, 2021). Emerging ecological theories also prompted an emphasis on science-based approaches (chapter 3), with the intention to improve understanding of complex ecological interactions (Noss, 1992; Bakker and Svenning, 2018). The emphasis on scale drove the integration of socio-cultural elements of landscapes into rewilding. This is reflected in guidance on how to address social and political factors influencing acceptance of rewilding by stakeholders across the data (e.g., Groom *et al.*, 1999; Foreman, 2004; Linnell *et al.*, 2015; Jepson, Schepers and Helmer, 2018) and reflections on complex interactions between ecological and socio-political factors effecting the potential for rewilding at larger scales (Soule' and Terborgh, 1999a; Taylor, 2011c; Pettorelli *et al.*, 2018; Johns, 2019). In this way, landscapes can be considered as SES. Systems thinking also creates the potential for rewilding to be applied to systems that are not associated with a spatial area, for example, considerations for rewilding the culture of education (Prince, 2022) or recreation and adventure travel (Loynes, 2022). This links to desired changes in the culture of conservation, rewilding, and related institutions, responding to concerns of cultural and knowledge hegemony influencing rewilding application (chapter 4). This offers the potential to "rewild" the culture and practice of rewilding.

Working at a large scale accentuates the complexity associated with nested systems, so that rewilding surpasses geographic, ecological, or disciplinary boundaries, acknowledging the complexity and diversity reflected in the concept of SES (Biggs *et al.*, 2021). This reflects a move from traditional conservation which tended to focus on delimited areas based on habitat type thereby overlooking interactions between these areas (Soule' and Noss, 1998; Taylor, 2011c). This quote from Soule' and Terborgh (1999b), demonstrates the complexity associated with working large scale and long term:

> "A major emphasis in this book is the need to think and plan on scales that transcend traditional political boundaries (counties, states, provinces, nations) and familiar time spans of time (lifetimes). Most planners and politicians are hemmed in by narrow jurisdictional, bureaucratic, and political horizons, including terms of office. Such strictures are too limiting for conservation. The conservationist must cultivate the capacity to shift smoothly from, say, the needs of individual plants and animals—

on seasonal and annual scales—to the temporal and spatial criteria for long-term population viability (centuries and millennia) and the long-distance interchange of material and energy between marine and terrestrial ecosystems. Managers, too, must develop a facility with scale. At the local scale the exotics problem might be manageable, for example, depending on the vigilance and commitment of local authorities and the interested public. At the national level, however, the management of an alien species may involve complex trade negotiations with importers, issues of sovereignty, legislation, and public education."

Thinking large scale requires the understanding of interactions between seemingly distinct parts, and the social-ecological aims of rewilding and the rewilding continuum proposed in chapter 5 reflects this, promoting coexistence within a system and acknowledging the multiple requirements of diverse inhabitants of a landscape, that have different requirements including scale requirements.

An example from the data of a project that seeks to integrate complexity is the Neroche Scheme presented by Saunders (2011), which uses a "complex landscape programme" seeking to address various aspects of landscape heritage across 23 different projects:

"These [projects] invested in the fabric of the heritage (habitat restoration and built heritage conservation), sought to make it accessible to all (physically and intellectually), and improved people's ability to look after it into the future (through true community participation, volunteering, and skills training). The Scheme set out to do more than simply address each of these themes in isolation: it sought to weave together the delivery of overlapping solutions and innovations which require different groups to work closely together. In this way it set out to work with the landscape as a many-faceted whole, and connect that whole to the everyday experience of its people."

This highlights that systems thinking promotes joined up working and transdisciplinarity, where interventions are considered holistically, against multiple factors for feasibility and intended impacts. For example, where a reintroduction might be considered for its ecological impacts, it can also be considered for its potential to affect socio-cultural change

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(Stanley-Price, 2022; Beyers *et al.*, 2023). This also aligns with a shift towards a more relational paradigm, as highlighted elsewhere in this thesis.

Systems thinking also requires long term thinking, which aligns with the transformative intent of rewilding (section 6.2.1, chapter 5). This requires rewilding to be sustainable over the long term and think beyond limitations associated with short-term funding or goals (Johns, 2019). To enhance sustainability, it is suggested that projects are integrated into the fabric of the system (Saunders, 2011; Jepson, Schepers and Helmer, 2018). The data coded here largely relates to financial or resource sustainability. Given the reliance on income, funding can be highly influential on project or organisational objectives and success (Corlett, 2019) and can therefore conflict with principles of uncertainty and indeterminacy discussed below (section 6.2.5). To mitigate this, it is suggested that project funding and resources are integrated into the rewilding process, for example integrating environmentally sustainable entrepreneurship into systems (Jobse *et al.*, 2015). The potential for rewilding to improve livelihoods is highlighted, to foster support for rewilding and promote sustainable alternatives to intensive land use (Groom *et al.*, 1999; Donlan *et al.*, 2005; Gow, 2006; Pettorelli *et al.*, 2018). However, these must be considered against concerns over capitalist hegemony (chapter 4) and while there is common concern for the longevity of the project, there is divergence reflecting tensions between neoliberal approaches and transformation (chapter 1). Reflecting this conflict, Leopold (1949, p. 225), writes,

> "It of course goes without saying that economic feasibility limits the tether of what can or cannot be done for land. It always has and it always will. The fallacy the economic determinists have tied around our collective neck, and which we now need to cast off, is the belief that economics determines *all* land-use. This is simply not true. An innumerable host of actions and attitudes, comprising perhaps the bulk of all land relations, is determined by the land-users' tastes and predilections, rather than by his purse. The bulk of all land relations hinges on investments of time, forethought, skill, and faith rather than on investments of cash. As a land-user thinketh, so is he."

This reflects that long-term project sustainability is not only about economic factors but also about encouraging a culture that is sustainable, echoing the socio-cultural aims of rewilding in chapter 5. This reflects concerns over equity in rewilding application highlighted in

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chapter 4, and a need to consider the aim of human wellbeing in rewilding practice (chapter 5) and therefore further justifies the importance of complex systems thinking in rewilding practice. It is noted that further research is required to understand the costs of rewilding and methods for achieving economic sustainability (Jobse *et al.*, 2015; Jepson, Schepers and Helmer, 2018; Pettorelli *et al.*, 2018). Future research could engage with economic sustainability research in SES, where circular economies are promoted that integrate system sustainability and discourage extractive, unsustainable economic models (UNDP, 2020, no date a). There remain concerns and uncertainty over the sustainability of interventions such as payments for ecosystems services, carbon markets, and economic incentives in conservation and environmental management (Holmes and Cavanagh, 2016; Van Hecken *et al.*, 2021), reflecting concerns in chapter 4 and in the literature review over the potential for neo-colonialism, greenwashing, and inequity in rewilding, and so longitudinal studies are required to understand how economic incentives contribute to rewilding aims.

Based on the data, place-based approaches to inform project sustainability are required, that do not make assumptions about the values or priorities of stakeholders. Place-based approaches to economic sustainability allow for creativity and innovation, partnering with or reforming industries that may seem opposing, for example hunting, forestry, or mining, and considering wider benefits and impacts of interventions (McKibben, 1995; Parfitt, 2006; Jepson, Schepers and Helmer, 2018). For example, Parfitt (2006) highlights the WWF Netherlands Living Rivers project which introduced clay extraction as a new economic driver which could (partly) substitute the declining role of agriculture, contribute to the ecological restoration of the riparian landscape, and contribute to improved and sustainable flood prevention. McKibben (1995) demonstrates the potential for reform in commercial forestry to mitigate rising unemployment and rural poverty while improving ecological conditions in traditional logging areas.

The integration of complexity in practice is hindered by a wider lack of knowledge, methods, or skills for systems thinking since it requires moving from a current paradigm which tends to simplify, towards a paradigm that considers complexity. This is identified as a priority for research to inform rewilding, restoration, and sustainability science (Miller and Hobbs, 2019; Biggs *et al.*, 2021; Butler *et al.*, 2021; San Miguel, 2023). Iterative, agile project management and ToC frameworks seek to address these issues in many different disciplines

(Fernandez and Fernandez, 2008; Allen, Cruz and Warburton, 2017) and may help rewilding projects to integrate complex systems thinking, long-term transformative change, transdisciplinarity, and collaboration. There is also evidence to suggest that holistic, systems thinking is inherent in some indigenous knowledge systems and philosophies (Cusicanqui, 2012; Fenton and Playdon, 2022), highlighting an imperative to address knowledge hegemony and institutional biases in pursuit of rewilding policy and guidance.

6.2.5. Adaptive, accommodating uncertainty and indeterminacy

Complex systems thinking is associated with the need to accommodate greater levels of uncertainty and indeterminacy (Partelow, 2018; Fougères *et al*., 2022). This principle reflects a desire to address values for control, order, and predictability highlighted in chapters 3 and 4. In response, rewilding asks practitioners to accommodate uncertainty, indeterminacy, and change. This can be difficult in practice as stakeholders often want to know how a

> **Reflexive note 6.1.**
>
> *When did humans get so uncomfortable with change? Change is happening all the time – just think of how much the world has changed in the last 100 years… It's normal and yet change seems hard to comprehend. It is not really built into our institutions. We seem able to grasp concepts like evolution but cannot seem to integrate it into our systems.*

rewilding intervention will affect them, and therefore this principle requires some level of socio-cultural tolerance for unpredictability and uncertainty (linking to this quality highlighted in section 5.4.4). In rewilding, people and practitioners are asked to make allowances for ecological and cultural dynamism so that systems can evolve.

This requires approaches that are adaptable to changing contexts and allows for adaptation related to the uncertainty associated with climate change, therefore relating to principle 5 of the existing guiding principles which states that rewilding should anticipate the effects of climate change. For example, Monbiot (2013, p. 221) states,

> "Locking in particular assemblages of animals and plants will become ever less viable as conditions change. If an ecosystem cannot adapt, its richness, structure, and complexity will decline even faster than they are declining today."

This links to the need for ongoing monitoring to help to mitigate risks (Pettorelli *et al.*, 2018), and to integrate uncertainty and change into monitoring processes (Root-Bernstein, 2022). This principle also reflects the intention that rewilding practice has no end point.

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While rewilding has a future vision, that vision is not prescriptive about the composition of the future system, instead it focuses on qualities that would contribute to wildness, sustainability, and resilience. Monbiot (2013, p. 168) writes,

> "Rewilding has no end points, no view about what a 'right' ecosystem or a 'right' assemblage of species looks like. It does not strive to produce a heath, a meadow, a rainforest, a kelp garden, or a coral reef. It lets nature decide. The ecosystems that will emerge, in our changed climates, on our depleted soils, will not be the same as those which prevailed in the past. The way they evolve cannot be predicted, which is one of the reasons why this project enthrals. While conservation often looks to the past, rewilding of this kind looks to the future."

However, this conflicts with some rewilding approaches that set out with the intention to create certain habitat, with decisions made accordingly. For example, projects that seek to create wood pasture (Vera, 2000; Kirby, Robertson and Isted, 2004; Dempsey, 2021). Related projects such as Knepp and OVP have been criticised for being anthropocentric and for limiting the potential for rewilding and non-human autonomy (Kopnina, Leadbeater and Heister, 2022; Leadbeater, Kopnina and Cryer, 2022). However, these projects are also promoted for their positive impacts on ecological function, biodiversity, and non-human autonomy, and are influential on the rewilding concept (Lorimer and Driessen, 2014; Jepson, Schepers and Helmer, 2018; Tree, 2019). Rewilding aims expressed in chapter 5 are not prescriptive and allow for place-based interpretation responding to plural value orientations, while adaptability allows for changing values and knowledge over time. This type of change is reflected in chapter 3, where North American participants reflect on changing perceptions of rewilding, wild, and wilderness. The aims in chapter 5 also suggest that tolerance for adaptability and uncertainty is a key leverage point for achieving a more adaptable, non-determinist rewilding practice. The data shows that while rewilding application seeks to embrace uncertainty and indeterminacy, pragmatism and personal preference are barriers to achieving this in practice. More targeted, longitudinal studies are required to understand whether human preferences and habitat-focused objectives are a barrier to achieving rewilding aims and to identify social or ecological barriers that limit indeterminacy in rewilding application.

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Another concern acknowledged in the data coded to this node is that there remains uncertainty over how best to approach rewilding or improve sustainability and resilience, reflected in the plethora of approaches and guidance emerging in response to the Anthropocene (chapter 3). This principle allows for uncertainty and adaptation as new methods are developed or new knowledge or realisations are made, rather than a desire to know and predict the outcome of an intervention before it is applied. This is reflected on by Jeeves (2006):

> "The truth is that nature conservation is as much an idea as anything else and ideas have changed over time. We look after what we like, especially charismatic and attractive species. Of course, policies and science are both important, but opinions are many and varied on what we are trying to achieve. Long may it be so. Wild land, or wilderness, is certainly an idea and everyone will have an opinion on it."

This reflects the need to "rewild" the culture of conservation and rewilding. Noss (1992) also reflects this need:

> "The principles of conservation biology are not laws; we can expect them to be refined continually as the science matures. To put off implementing these principles until the science is completely developed, however, would be foolhardy, the forces that degrade natural ecosystems will not wait for the advice of scientists. Instead, the most prudent course for conservation is to proceed on the basis of the best available information, rational inference, and consensus of scientific opinion about what it takes to protect and restore whole ecosystems."

As highlighted in the literature review and chapter 3, knowledge and definitions of concepts evolve and this can sometimes cause conflict where different notions of the same idea exist. However, the need to accommodate uncertainty asks us to accept imprecise definitions and concepts. The same can be said for the definition of rewilding itself (Gammon, 2018). Embracing indeterminacy may offer a route to reduce conflict related to different interpretations of rewilding and instead encourage creativity, collaboration, and knowledge sharing to improve understanding. This highlights the need for rewilding guidelines to also be adaptable. The principles suggested here offer the means to find common ground in rewilding practice without being prescriptive.

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Although principle 4 of the RTG principles reflects the need to consider ecological dynamism, future guidelines should look to provide guidance on how to integrate uncertainty and adaptiveness into rewilding plans and application. Here the conceptualisation of rewilding as a virtuous cycle and the intention to work iteratively may help practitioners to accommodate complexity and balance concerns over the uncertainty of rewilding outcomes. As is demonstrated in figure 6.1, and reflecting complex systems thinking (UNDP Strategic Innovation, 2022), even if a rewilded state is achieved, constant adaptation is required to respond to emerging risks. In systems, degrees of dewilding and rewilding are likely to happen simultaneously, and rewilding seeks to find a balance. There is therefore no rewilding end point, the process is never finished, as systems are never complete, they evolve and are constantly changing (Biggs et al., 2021; San Miguel, 2023). This is particularly important if rewilding is to embrace a shift towards a relational paradigm and systems thinking.

6.2.6. Informed by evidence

While the above principle asks practitioners to be adaptable and embrace uncertainty, this principle encourages the use of evidence to inform practice, with the need to balance uncertainty with knowledge and understanding, with evidence informing practice in the absence of proof or certainty. Evidence in rewilding theory initially called for rewilding to be science based, driven by emerging ecological theories (chapter 3). This emphasis continues to be reflected in the RPS data. However, given the desire to address inequity and knowledge hegemony (chapter 4), there are increasingly calls to integrate other forms of evidence, as reflected in principle 7 of the existing guiding principles which states that rewilding is informed by science, TEK, and other local knowledge. This forms part of a movement towards knowledge democracy and transdisciplinarity in conservation and environmental management (Berkes, 2017; Fenton and Playdon, 2022). However, there remain biases in rewilding theory and practice, influenced by inherent biases in academic institutions (Fenton and Playdon, 2022).

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Different types of evidence, reflecting different scales or emphases, are required to inform rewilding application. At a policy level, evidence is provided from research, academic literature, and related policies. At a local scale, and reflecting that rewilding is contextual and place-based (section 6.2.3), there is a need for local evidence to inform the choice and prioritisation of rewilding interventions. This includes historical evidence, i.e., reference ecosystems, reflected in principle 3 of the RTG principles. Given the above call for transdisciplinarity, reference ecosystems could be expanded to reference SES, seeking evidence from past social-ecological interactions that promote system sustainability and resilience. In this way, the intention for rewilding to be informed by evidence combines existing RTG principles 3 and 7. Given that rewilding is future focused, this evidence is used to inform place-based prioritisation of interventions rather than providing the goal for rewilding practice. Reference SES can provide evidence to inform how to integrate rewilding into modern culture and to (re)integrate nature and culture.

> **Reflexive note 6.2.**
>
> *I have been thinking about this quote from Kung Fu Panda 3:*
>
> *"Yesterday is history, tomorrow is a mystery, today is a gift."*
>
> *It has stuck with me as I've found it really helpful to appease anxiety especially around big life decisions. I think it reflects rewilding intentions to be informed by the past, not prescriptive about the future, and enacted in the here and now. History isn't forgotten, it informs what is possible in the present. That's relativism.*

Place-based assessments can draw on different disciplines, stakeholders, interests, etc, potentially integrating diverse ontologies and values. However, as highlighted in chapter 4, there is a need to be mindful of risks of oversimplification, misinterpretation, and cultural and knowledge appropriation (Battiste and Henderson, 2000; Berkes, 2017; Schmitt *et al.*, 2018; Fenton and Playdon, 2022). Hence, evidence must reflect principles for inclusivity discussed below. The term "evidence" is used here as a democratic word, avoiding issues associated with terms that seek to legitimate and distinguish between knowledge types, such as the term "traditional ecological knowledge" (Berkes, 2017; Fenton and Playdon, 2022). However, transdisciplinary assessments of evidence should move beyond what is immediately observable or "evident" in an SES and reflect complex systems thinking, promoting understanding of interactions in SES. This might look to the qualities outlined in chapter 5 for potential metrics, together with emerging research on monitoring complex SES (UNDP Strategic Innovation, 2022, 2023).

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6.2.7. Inclusivity and collaboration

The intention for rewilding to be inclusive and collaborative has emerged in response to calls for conservation and rewilding to be ethical, counteracting exclusivity, injustice, and inequity highlighted as concerns related to dewilding and conservation culture (chapter 3 and 4). For example, Monbiot (2013, p. 208) writes,

> "The forced rewildings which have taken place elsewhere offer a pungent warning of how this project could go badly wrong if we are not mindful of its hazards and antecedents. Rewilding must not be an imposition. If it happens, it should be done with the consent and active engagement of the people who live on and benefit from the land. Governments must not create, as they have done in East Africa and Botswana, a paradise for the rich from the lands of the poor. If a rewilding scheme requires forced dispossession, it should not go ahead. There is no need for coercion… the large-scale restoration of living systems and natural processes can take place without harming anyone's interests."

This is also reflected in chapter 3 where proponents of 3Cs rewilding assert that it should not be forced on people or lead to forced removals, responding to criticisms of 3Cs rewilding based on misconceptions that it promotes wilderness preservation and command-and-control governance.

This principle also reflects the need for practitioners to see themselves as part of a system, rather than external entities that are furnished with power to make decisions effecting the wellbeing of others, as is highlighted as a concern in the literature review (Martin, Fischer and McMorran, 2023). Given a trend towards SES framings of rewilding, inclusivity and collaboration refers to a diverse range of stakeholders, disciplines, and increasingly integrating the perspective and contributions of other-than-human nature reflected in ecocentrism, such as with concepts of ecodemocracy (Kopnina, Leadbeater and Heister, 2022), compassionate conservation (Baker and Winkler, 2020), ecological solidarity (Moyano-Fernández, 2022), and ecoegalitarianism (Irwin, 2021). These inclusive approaches may serve to counteract perceptions that rewilding is exclusive, and improve support for rewilding.

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There are also barriers to inclusion identified in the data, for example, those who benefit most from the current paradigm may avoid participating in movements promoting change.

Rewilding also has negative connotations associated with concerns over neo-colonialism, as highlighted in chapter 4. Inclusion therefore looks beyond superficial notions of inclusivity that aim to demonstrate stakeholder support for interventions or that assume stakeholder interests. Inclusion instead promotes transdisciplinarity and deeper engagement with the human dimensions of rewilding within a system, with

> **Reflexive note 6.3.**
>
> *As there are symbiotic relationships in nature, so there can be symbioses among human communities that consider different community interests rather than creating competition between interests. Developing symbioses doesn't necessarily mean that we must agree about everything all the time, or even have the same intentions/objectives. But it is helpful to have some common ground and knowledge of others' intentions and contributions. These symbioses based on mutualism/commensalism rather than competition/parasitism and reflect an ecocentric point of view not at an individual level. E.g., an action might negatively affect one person but might provide benefit to many. Balancing individual sacrifice with societal wellbeing?*

considerations for multi- or interculturalism (Battiste and Henderson, 2000) and for non-human interests, reflected in ecocentrism and systems thinking (Washington *et al.*, 2017). Transdisciplinarity can inform more constructive and creative solutions, acknowledging system complexity (Fougères *et al*., 2022).

While rewilding may seek to be inclusive, it also looks to counteract cultures, values, or behaviour that drives dewilding, and so there is uncertainty reflected in the data over how to balance promoting change with inclusion. Notions of equity that are discussed in response to dewilding in chapter 4 may help to promote equitable routes to system sustainability, as are reflected by circular economics (UNDP, 2020), systems thinking (section 6.3.4, Fougères *et al*., 2022), and the social-ecological aims of rewilding proposed in chapter 5. In this framing, change is justified as it is promoted in pursuit of equity, holistic wellbeing, and SES sustainability. This approach promotes collaboration in the pursuit of a shared vision. In this sense rewilders become facilitators and empower the community to collaborate. The opportunities for and extent of inclusivity or collaboration will of course vary depending on the scale. Some rewilding projects may be small with no obvious human stakeholders other than those driving the project. However, reflecting the principle to promote large-scale systems thinking, smaller projects may seek to collaborate at a landscape scale to improve the potential for rewilding. Although inclusivity is promoted by

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the existing RTG principles (principle 1 for collaboration with non-human species; principle 6 for local engagement and support), this section suggests that collaboration is integrated into rewilding application more generally and some practical guidelines to promote genuine collaboration and inclusion at various scales, and to address institutional biases, are required.

6.2.8. Nature led, human enabled: balancing non-human autonomy with stewardship

This section encompasses data that considers human's role in rewilding application and the intention to enhance non-human autonomy. As such, this section addresses the perceived paradox between non-human autonomy and rewilding intervention, highlighted in the literature review (chapter 1), and considers whether a stewardship role can alleviate this. There is a clear desire for rewilding to furnish other-than-human nature with the freedom and function to look after itself (as highlighted in chapter 5) and this is reflected in RTG principle 1. However, it is also agreed that rewilding application requires some level of influence, even if it is a decision to protect an area or do nothing. Many proponents of rewilding have been spurred into action in response to dewilding (as demonstrated in chapter 3) and therefore action and intervention are integral to rewilding practice.

Aligning action with the notion of local environmental stewardship may alleviate conflicts, i.e., "the actions taken by individuals, groups or networks of actors, with various motivations and levels of capacity, to protect, care for or responsibly use the environment in pursuit of environmental and/or social outcomes in diverse social-ecological contexts" (Bennett *et al.*, 2018). This aligns with Leopold's definition of conservation, as "our effort to understand and preserve the capacity of the land for self-renewal". However, there may be variations to this role in a rewilding context and these are considered here.

Echoing the rewilding continuum proposed in chapter 5, this principle reflects the potential for humans to take stewardship roles. However, the data also reflect a desire for humility in this role, acknowledging that humans may not know the most appropriate way to intervene, and hence requires an emphasis on nature-led restoration. This is noted as especially critical where dewilding has caused SBS and human-nature disconnection as humans have lost the knowledge and experience of ecological processes associated with coexistence (chapter 4). The data show concerns that human interventions that seek to mirror natural processes are

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unlikely to be sufficient proxies given limitations to human understanding and resources. For example, prescribed burning is done in the wet season whereas natural fire disturbance would usually occur in the dry season, and these interventions can negatively impact those species that have coevolved with natural disturbance (Navarro *et al.*, 2015). In response to these concerns, rewilding seeks to improve ecological function and the capacity for ecosystems to be self-sustaining (chapter 5) by "giving nature a helping hand" (as reflected in the RPS data). Alan Watson Featherstone suggests asking, "What's Nature seeking to do here? That is crucially different from the ethos of human domination. Rewilding is about humility, about stepping back" (Monbiot, 2013, p.105).

The concept of non-human autonomy may conflict with holistic ontologies that see humans and culture as part of nature. In such cultures, human activities such as burning, cutting, or conservation grazing may be viewed as part of system function. Wall Kimmerer (2013, p. 164) for example, notes symbioses between humans and sweetgrass,

> "With a long, long history of cultural use, sweetgrass has apparently become dependent on humans to create the 'disturbance' that stimulates its compensatory growth. Humans participate in a symbiosis in which sweetgrass provides its fragrant blades to the people and the people, by harvesting, create the conditions for sweetgrass to flourish."

She notes that regional declines in sweetgrass may be due to underharvesting, not overharvesting as is often assumed. On the other hand, Noss *et al.* (1999) prefer "nature untainted by human hands" in core areas, although they admit it is unlikely in a modern context and therefore promote moving towards minimal management. The data reveal concerns, for example, that interventions to supress natural succession are anthropocentric or may end up being controlling, as is reflected in studies related to control in the literature (Dempsey, 2021; Thomas, 2022b). In reference to the continuum suggested in figure 5.3, here we see that interventions can be seen as controlling or unaccommodating of some ecological processes (e.g., burning to suppress natural succession), while accommodating of others (e.g., burning to accommodate moorland species). This also demonstrates that total withdrawal of human influence is likely to be impossible in many situations, as decisions over how to manage or intervene within a system are influenced by social or political factors.

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As highlighted in the previous chapter, it is suggested that holistic ontologies or ecocentrism promote more sustainable practices, with connection to place enhancing ecological knowledge and increased mindfulness of the requirements of other-than-human nature. This has increased the importance of paradigm shifts, "personal rewilding," or the "rewilding of hearts and minds" promoted in the data and elsewhere (Carver *et al.*, 2021; Rawles, 2022) and considerations for how these might be applied in practice (Maffey and Arts, 2022; Taylor *et al.*, 2022). This also demonstrates that levels of intervention are acceptable or are likely to be more acceptable and sustainable where they are informed by holistic ontologies. However, given the conflict between transformative change and paradigm shifts highlighted in the literature review, there remain conflicting ideas over the level of influence that is considered compatible with wildness. Promoting place-based approaches may help with this and further longitudinal studies are required to understand how holistic ontologies, or transitions towards a relational paradigm, influence system sustainability and resilience. This may inform the qualities of a stewardship role in a rewilding context and to identify potential trade-offs between stewardship and non-human autonomy.

6.3. Interventions used in rewilding

While an aim of rewilding is to reduce the need for continued management by enhancing systems sustainability and resilience (chapter 5), the data and wider literature reflect that rewilding often entails active intervention. This aligns with the revised rewilding continuum proposed in chapter 5 that includes active rewilding in pursuit of sustainable coexistence at a landscape scale. Historically, definitions or conceptualisations of rewilding have often focused on the interventions used, as is highlighted in chapter 3, such as 3Cs rewilding (Soule' and Noss, 1998) or trophic rewilding which emphasises species reintroductions (Svenning *et al.*, 2016). Case studies in the data or literature (e.g. Desilvey and Bartolini, 2018; Pettersson and de Carvalho, 2021) provide information on the interventions used in rewilding, but the literature does not contain a holistic study of interventions used in rewilding application, as holistic studies have tended to focus on definitions of rewilding or targets (e.g. Pettorelli *et al.*, 2018) or have focused on one type of intervention (Svenning *et al.*, 2016). To address this, it is an aim of this chapter to provide a list of interventions associated with rewilding extracted from the data, either those that are suggested or that

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have been applied. These are listed in table 6.1 which considers the actions associated with each intervention and their potential for contributing to rewilding aims. This is a novel contribution to the rewilding literature and an important step to identifying commonalities in rewilding practice and developing guidance for rewilding practitioners. Projects and existing guidelines are also suggested. Due to its substantial size, table 6.1 is included at the end of this chapter. This provides a useful tool to inform rewilding practice and can be used as a starting point for planning. However, due to the constraints of this study, the table draws on a limited data set and so further work on this is warranted to inform RTG guidelines. As rewilding is contextual (as discussed in section 6.2.3) the interventions may not be suitable in all contexts and there may be other suitable interventions that are not listed here.

A key point to note is that this table demonstrates that rewilding uses a suite of interventions in pursuit of rewilding aims, it is therefore more than one intervention or more than the sum of its parts. This can help to encourage more place-based, holistic thinking in rewilding, addressing tendencies to equate rewilding with an intervention, e.g., reintroductions, grazing, or wilderness (a concern highlighted in chapter 3). As table 6.1 demonstrates, interventions that are highlighted in the data relate both to ecological restoration and socio-cultural change. This further reflects the multidisciplinarity of rewilding that is highlighted throughout this thesis. While some studies consider "passive rewilding" as an approach to rewilding (e.g., Lorimer *et al.*, 2015), the opportunities for passive rewilding emerge indirectly from changing environmental, economic, or agricultural policies (McKibben, 1995; Boitani and Linnell, 2015; Navarro and Pereira, 2015a; Carver, 2019), for example due to land abandonment. As such, passive rewilding is not listed as an intervention in table 6.1, but this may be influenced by other interventions, for example interventions to influence policy. Spontaneous responses to the (unintended or intended) removal of human influence has had significant influence on rewilding theory and practice (Carver, 2019; Locquet and Carver, 2022), and future examples may continue to provide guidance for if, how, and when to intervene.

Table 6.1 demonstrates potential conflicts between rewilding interventions. These relate to the uncertainties highlighted throughout this thesis regarding the degree of human influence in rewilding and the need for pragmatism. For example, interventions to promote

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connectivity can include removing fencing (Foreman, 2004), while fencing is also used to limit unwanted herbivory (Ashmole and Chalmers, 2004; Featherstone, 2004) and to limit the movement of reintroduced animals (Taylor, 2008). Another conflict noted is between interventions that seek to limit successional processes [which include introducing wild, de-domesticated, or domestic grazers, burning, or cutting (Navarro *et al.*, 2015; Svenning *et al.*, 2016)] and interventions that seek to promote succession and afforestation, including limiting over grazing and over browsing by wild or domestic animals (Ashmole and Chalmers, 2004; Featherstone, 2004). This reflects the conflict between herbivore-focused rewilding and afforestation noted in chapter 3 (e.g., Fenton, Fisher and Taylor, 2004). Variations in the perceptions or roles of non-native species are also noted, i.e., the use of ecological surrogates and the lethal control of non-native invasive species, both to aid rewilding (Sandom *et al.*, 2013; Cidrás and Paül, 2022). These conflicts highlight the difficulty in achieving non-human autonomy or total withdrawal of human influence, with human preferences influencing practice and ongoing intervention needed to address perceived ecological inadequacies, such as a lack of habitat, missing species, or non-native species. Sandom and Wynne-Jones (2019) describe how varied interpretations or contextual responses have led to seemingly conflicting approaches to rewilding in the UK,

> "Ecologically we see a preference for greater afforestation in upland environments that have been denuded and degraded from various forms of land clearance and heavy grazing, while in lowland areas there is an emphasis upon increasing herbivory to disturb tree encroachment in conservation areas. Despite taking opposing actions, in both cases, decisions are being made in an effort to restore what are perceived to be more natural interactions between vegetation succession and disturbance; practitioners are coping with differing starting points and ecological conditions. The specific ecological aspirations of different rewilding projects then connect with particular socioeconomic and cultural issues, depending on the levels of trade-off between stakeholders' preferred land uses. However, rewilding is not all about trees… neither is it about striving towards a particular habitat type, but rather creating diverse ecological systems that are dynamic and variable. Rewilding in Britain reflects this diversity, including mixed mosaic lowland habitats, marine and wetland environments, and often aspiring to catchment-scale approaches which

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explicitly aim to connect ecosystem processes through the landscape from upland to coast."

This demonstrates that a number of factors influence the choice of rewilding interventions. Principles are intended to guide the planning and prioritisation of interventions (section 6.2 and Carver *et al.*, 2021), but personal or stakeholder preferences and priorities continue to influence rewilding (as demonstrated in chapter 1, Sandom and Wynne-Jones, 2019; Holmes *et al.*, 2020). As is highlighted in the literature review, there is a question over whether rewilding should be flexible and allow for "creative pluralism" (Deary and Warren, 2017). This is reflected in the intention for rewilding to be contextual and place-based (section 6.2.3) and adaptable (section 6.2.5). Table 6.1 may help practitioners to consider a wide suite of interventions to encourage creative pluralism and respond to contextual factors, rather than to approach rewilding with pre-conceived ideas of which interventions to apply.

6.4. Discussion and conclusion

This chapter offers two tools to aid rewilding application: 1) a list of principles of practice extracted from the data related to how rewilding should be practiced and 2) a list of interventions used in rewilding practice noting links between rewilding aims and interventions. These highlight the diversity of interventions available to rewilding practitioners to promote creativity and dynamism in application, while the principles promote more holistic thinking and paradigm shifts in the culture of rewilding practice, reflecting intentions for systems-based governance approaches in rewilding application. In many cases, rewilding is still driven by human decision making and individual preference. There is inherent difficulty in applying rewilding, as the rewilding community continue working with (their own or others') extant values and assumptions while promoting transformative visions. While rewilding is intent on outwardly shifting paradigms, i.e., in wider society, much of the work needs to be done inwardly, focusing on the paradigms and institutions within the culture of conservation, restoration, and rewilding. As such, the principles outlined here are novel and important because they collate principles of practice from a wide range of sources and provide a starting point for developing rewilding guidelines. These address concerns highlighted in the literature review that rewilding theories are being developed in limited studies of rewilding application. Across the data,

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and common among data sources, there is clearly a desire to shift towards more systems-based approaches to governance and the principles proposed here will help with this shift by clarifying the intentions for rewilding governance. What is especially interesting is that there is common support for both transformation and pragmatism across the data, to varying degrees, which addresses a perceived paradox between transformation and pragmatism highlighted in the literature review. The list of interventions is also important as they provide a list to inform rewilding practitioners, allowing them to consider interventions that they may not have readily considered, and to demonstrate links between interventions and aims. These two tools are important when considering the RTG's work towards guidelines for rewilding and some of the limitations inherent in research and policy environments. One of the barriers to maintaining adaptability is that published guidelines themselves are usually limited by time and resources and are fixed for a certain time rather than adaptable. In this time of uncertainty, it may be prudent to consider the adaptability of published guidelines and frameworks. This chapter compares principles of practice highlighted in the data with the existing RTG principles (Carver *et al.*, 2021), and suggests some improvements and areas that require further consideration to inform future rewilding guidelines.

Part of the process of "rewilding" the culture and practice of rewilding will need to include long-term commitments to adaptable approaches to rewilding that focus on finding place-based responses to dewilding. This means that projects must adapt around social-ecological assessments of rewilding areas to inform plans, rather than approaching rewilding with pre-conceived ideas of what interventions to use. Responding to concerns related to command-and-control approaches to conservation (Holling and Meffe, 1996; Briggs, 2003) and the need for critical reflection in the wider conservation movement to aid a shift towards a relational paradigm (Chignell and Satterfield, 2023), the principles of practice highlighted in this chapter ask those driving rewilding to consider their own intentions and consider themselves as part of the systems within which they are operating, rather than as external and temporary "experts". Barriers to incorporating these principles into practice are highlighted, for example many of the institutions that inform and influence rewilding, such as funding mechanisms, are not adaptable or long-term. In this sense, long-term commitments to achieving rewilding aims are needed, along with longitudinal studies to

understand what contributes to the success or failure of rewilding projects. Time will tell whether rewilding will affect a virtuous cycle and paradigm shift towards more ecocentric or relational ways of thinking about rewilding application, embracing uncertainty and indeterminacy, and releasing expectations over the outcomes of rewilding.

6.5. Chapter highlights

This chapter offers two novel and important substantive theories to guide the application of rewilding. These reflect desires for systems-based governance approaches in rewilding and the diverse interventions used in rewilding application. These offer routes to allowing for value pluralism or rewilding application in diverse contexts, and can support a shift towards a relational paradigm in rewilding theory and practice.

- A list of principles of practice. These are considered against the existing RTG guiding principles for rewilding (Carver *et al.*, 2021) and recommendations are made to inform the development of rewilding guidelines. These promote more holistic thinking and paradigm shifts in the culture of rewilding practice ("rewilding" the culture of rewilding). They address concern that rewilding theories are based on limited case studies as they draw on broad sources of data.

- A list of interventions used in rewilding application is presented along with associated actions, examples and guidance, and considerations for how these align with rewilding aims. This forms a starting point for establishing future guidelines for rewilding and can offer a tool for practitioners to consider a wide range of interventions suited to the context.

The principles presented in this chapter suggest that:

- Rewilding visions are reconciled with pragmatism through iterative progression and contextual, place-based application, addressing a perceived conflict between transformative change and pragmatism in the literature.

- Contextual, place-based assessments are critical to inform rewilding application and the choice and prioritisation of interventions.

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- Systems thinking encourages holistic thinking to address complex drivers of dewilding at scale and over long terms. Implications related to "rewilding" the culture and practice of rewilding are identified, to address barriers to long-term, large-scale systems thinking, including the need to consider how to accommodate levels of uncertainty and indeterminacy in rewilding and promote inclusivity and collaboration more generally.

- Evidence is needed to inform rewilding practice, and it is suggested that the democratic term "evidence" can be used to accommodate different types of knowledge and to mitigate conflicting understanding of the role of reference ecosystems in rewilding. It is also suggested that the term "reference ecosystem" is expanded to "reference SES", seeking evidence from past social-ecological interactions that promote system sustainability and resilience.

- The concept of stewardship may offer the potential to alleviate perceived paradox between non-human autonomy and rewilding interventions, so that rewilding is nature-led, human enabled.

- A conflict is identified between principles of accommodating uncertainty and indeterminacy and rewilding goals associated with habitat or ecological composition.

This chapter suggests that further research in different social-ecological contexts and guidance is required:

- To inform the development of adaptable monitoring guidelines, which will improve place-based assessments and inform ongoing knowledge sharing.

- To improve understanding of the economics of rewilding and how different economic models may influence the potential for rewilding and the sustainability of projects or SES.

- To inform guidelines for integrating systems thinking into rewilding theory and application.

- More targeted, longitudinal studies are required to understand whether human preferences and habitat-focused objectives are a barrier to achieving rewilding aims

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and to identify social or ecological barriers that limit indeterminacy in rewilding application and society more generally.

- Some practical guidelines to promote genuine collaboration and inclusion at various scales, and to address institutional biases, are required.

- More consideration for the stewardship role in the context of rewilding considering different social-ecological contexts and the potential for holistic ontologies and ecocentrism to promote more sustainable practices.

- Further guidance from the wider literature is needed to inform guidelines on applying rewilding interventions.

Table 6.1: A list of interventions that are associated with rewilding or ecological restoration as extracted from the RPS and IRT data, demonstrating how these are intended to contribute to rewilding aims and the actions that are associated with these interventions. Related projects and guidance are suggested for further reference.

*This column has been extracted from the data, other known projects, and guidelines. Given the limitations of this study (as described in chapter 7), the projects and guidelines referenced are based on limited sources and a more thorough review of the literature and case studies for each intervention could be done in future to improve the table.

Interventions	Contributions to rewilding aims	Actions associated with intervention	Project examples and relevant guidance*
Protected areas: restoring or repurposing existing protected areas or establishing new protected areas	To protect areas (of land or sea) from unsustainable human activities, to promote non-human autonomy or other ecological aims of rewilding, forming core areas of regional network designs, and contributing to achieving other rewilding aims. The different protected area categories are noted (Johns, 2019; IUCN WCPA, no date) and how each relates to rewilding is a topic for future research.	- Purchasing, reallocating, or legally protecting areas of land to create protected areas for rewilding. - Engaging existing private landowners, managers, communities, or other relevant stakeholders/decision makers to promote protection of areas for nature and rewilding, including restoration or improvements of existing protected areas. - Engage landowners, managers, communities, or other relevant stakeholders/decisionmakers to restrict development, exploitation, or activities that cause ongoing ecological degradation. - Limit access or certain types of use, for example through fencing, signage, or law enforcement.	- IUCN WCPA guidelines for protected areas and other guidance (Noss *et al.*, 1999; Carruthers-Jones, Gregory and Guette, 2022; IUCN WCPA, no date) - Rewilding Argentina (Pettersson and de Carvalho, 2021; Donadio, Zamboni and Di Martino, 2022) - Trees for Life, Scotland (Featherstone, 2004) - Carrifran Wildwood, Scotland (Ashmole and Chalmers, 2004; Adair and Ashmole, 2022) - Gorongosa National Park, Mozambique (Pringle, 2017; Pringle and Goncalves, 2022) - Terai Arc Landscape, Nepal/India (Ram Bhandari and Raj Bhatta, 2022).

Connectivity, corridors, and buffers	Expand habitat to accommodate nature around or between existing areas of habitat or protected areas, promoting connectivity, non-human autonomy, and coexistence.	• Remove barriers to natural processes, especially dispersal, e.g., fencing, dams, or reducing anthropogenic disturbance. • Constructing wildlife bridges or underpasses. • Engaging with stakeholders in target areas to influence land use decisions. • Mitigating human-wildlife conflict in target areas, including engagement to promote coexistence. • Restoration of habitat in target areas. • Identifying opportunities for corridors, e.g., riparian zones, and influence land use in target areas. See landscape mapping.	• Connectivity guidance (Dobson *et al.*, 1999; Hilty *et al.*, 2020; Carruthers-Jones, Gregory and Guette, 2022) • Yellowstone to Yukon, US/Canada (Hilty, Chester and Wright, 2022) • Affric Highlands, Scotland (Trees for Life, no date) • Weald to Waves, England (Weald to Waves, no date) • Terai Arc Landscape, Nepal/India (Ram Bhandari and Raj Bhatta, 2022).
Regional network designs and landscape mapping	To provide top-down influence on policy and land-use decisions in target areas, improve ecological knowledge, encourage landscape-scale approaches, and contribute to monitoring.	• Creating maps to monitor change and identify opportunities and barriers to rewilding or natural movement. • Using maps to engage with stakeholders in target areas to influence land use decisions. • Promote other rewilding interventions in target areas. • Promote collaboration and networking across target areas.	• Guidance for opportunity mapping (Ceausu *et al.*, 2015; Zoderer *et al.*, 2019; Carver, 2022) • The Wildlands Network, US (Soule' and Terborgh, 1999a; Foreman, 2004) • Yellowstone to Yukon, US/Canada (Hilty, Chester and Wright, 2022).
Restoration of habitat, natural disturbance, and/or natural succession	Restoring ecological structure, function, and heterogeneity based on reference ecosystem or conditions; accommodating nature; improving human-nature or human-place	• Reintroduce fauna that can contribute to natural regeneration, improving and maintaining habitat, e.g., apex predators to limit grazing pressure, beavers to improve riparian habitats, herbivores to limit succession, or seed dispersers.	• Guidance on habitat restoration via reintroduction (Barlow, 2000; Sandom *et al.*, 2013; Svenning *et al.*, 2016; Bakker and Svenning, 2018)

	connection and provision of ecosystem services. Includes a wide range of habitats including marine, coastal, wetland, riparian, soil.	• Planting of trees and shrubs (can include seed collection and propagation). • Remove barriers to natural regeneration or disturbance, e.g., reduce mowing; reducing anthropogenic disturbance; reducing grazing using fencing, culling, or grazing reform. • Interventions to promote or imitate natural disturbance or limit succession, e.g., prescribed burning, grazing. • Removal or thinning of non-native invasive or dominant species, e.g., sitka spruce in areas that were previously used in commercial forestry. • Promoting habitat restoration or natural disturbance to landowners, users, or managers. • Protecting areas where natural disturbance or habitat does not conflict with human land use.	• Guidance on habitat restoration (Soule' and Noss, 1998; Simberloff *et al.*, 1999; Merckx, 2015) • Trees for Life, Scotland (Featherstone, 2004) • Carrifran Wildwood, Scotland (Adair and Ashmole, 2022) • Gelderse Poort, the Netherlands (Jepson, Schepers and Helmer, 2018) • Wild Ennerdale, England (Browning and Yanik, 2006) • Shotpouch Creek, US (Wall Kimmerer, 2013) • the restoration of Onondaga Lake, US (Wall Kimmerer, 2013) • Rangelands Restoration, Australia (Kealley and Burrows, 2022) • Terai Arc Landscape, Nepal/India (Ram Bhandari and Raj Bhatta, 2022).
Species reintroduction or	To promote the recovery of viable populations of extirpated species, restore their ecological function, to achieve ecological aims of	• Missing species assessments to clarify which species are missing, and an understanding of their ecological roles or cultural value to aid prioritisation, i.e., as keystone, highly interactive, umbrella, or culturally significant species. • Ecological and social feasibility studies.	• Guidance and guidelines for (re)introductions (IUCN, 2013; Bakker and Svenning, 2018; Seddon and Armstrong, 2019; Stanley-Price, 2022)

conservation introduction[18]	rewilding and contribute to other rewilding aims. Where missing species are extinct, ecological surrogates can be considered for introduction, to fulfil the ecological roles of extinct species.	• Reintroductions of locally extirpated species or, where necessary, introductions of ecological surrogates to fulfil the ecological roles of extinct species [following the IUCN (2013) "guidelines for reintroductions and other conservation translocations" or other local or international legal requirements (see Eagle et al., 2022)]. • Ongoing monitoring to understand ecological, social, economic impacts of translocations. • Mitigate risk of human-wildlife conflict, e.g., fencing to limit the movement of reintroduced species or limit access by humans; ongoing engagement and consultation.	• Rewilding Argentina (Donadio, Zamboni and Di Martino, 2022) • Rangeland Restoration, Australia (Kealley and Burrows, 2022) • beaver reintroductions, UK (Gow, 2006, 2011; Prior and Ward, 2016) • guanaco reintroductions, Chile (Lindon and Root-Bernstein, 2015).
Management of invasive or dominant species	To reduce over-dominant species or remove invasive non-native species that hinder progress of rewilding or related interventions.	• Prioritise the removal or management of dominant or invasive species based on their potential to hinder rewilding or to disperse or to control regionally (would need to be controlled everywhere to be effective). • Assess different methods of control. • Remove or reduce number of invasive or dominant species, e.g., thinning of sitka spruce plantations; removing invasive eucalyptus; culling or deer fencing. • Reintroduce species that may contribute to managing the number or movement of dominant or invasive species.	• Guidance on invasive species management in rewilding (Simberloff et al., 1999; Kirby, Robertson and Isted, 2004; Sandom et al., 2013; Sweeney et al., 2019; Cidrás and Paül, 2022) • Trees for Life (Featherstone, 2004) • Carrifran Wildwood (Ashmole and Chalmers, 2004; Adair and Ashmole, 2022) • Rangelands Restoration, Australia (Kealley and Burrows, 2022)

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[18] Seddon and Armstrong (2019) note that the type of translocations [following IUCN (2013) definitions] associated with rewilding are reintroductions and conservation introductions where releases take place outside the indigenous range to provide an ecological replacement for an extinct species.

		• Promote reduction of stocking densities of domestic livestock, or grazing reform.	• Fragas do Eume Natural Park, Spain (Cidrás and Paül, 2022)
		• Raise awareness of the impacts of domestic, dominant, or invasive species on ecological function.	• Wild Ennerdale (Browning and Yanik, 2006).
		• Prevent the introduction of invasive species, e.g., limiting access, targeting policy on wildlife trade, raising awareness.	
Mitigating human-wildlife conflict	To enhance potential for coexistence and human tolerance, avoid lethal control of species, and promote non-human autonomy.	• Implementing strategies to mitigate conflict, including traditional methods (such as shepherding), modern techniques (e.g., electric fences, green fences, livestock protection collars, GPS tracking of predators), or reform of hunting quotas. • Translocation or lethal control of animals where they are negatively impacting coexistence and tolerance. • Providing compensation for loss of crops, livestock etc, or incentives for implementing mitigation strategies. • Public and policy engagement promoting coexistence, legal protection, mitigating SBS, and improving tolerance and willingness to obey laws and restrictions. To understand local motivations for persecution and mitigate these risks. • Land-use zoning or planning or influencing the distribution of human activities at a landscape scale to reduce potential conflict. Promoting corridors, connectivity, and buffer zones especially where there is likely to be high conflict.	• Guidance on coexistence (Boitani and Linnell, 2015; Carter and Linnell, 2016; Linnell and Jackson, 2019; Lambert and Berger, 2022) • wild boar coexistence, England (Gow, 2002; Goulding, 2004, 2008) • Andhari Tiger Reserve, India (Johns, 2019) • lynx reintroductions, Europe (von Arx and Breitenmoser, 2004) • Velebit Mountains, Croatia (Jepson, Schepers and Helmer, 2018) • wolves in the French Alps (Bennett, 2006) • bears in Austria (Rauer, 2004).

Networking and knowledge sharing	Promoting collaboration of rewilding organisations or projects to share learning, extend area for rewilding, and increase influence. Improve the sustainability of results of rewilding. Foster trust, collaboration, and best practice.	• Creating maps or lists of projects and organisations working in areas to promote collaboration, partnerships, and connectivity. • Seeking and encouraging collaborations across different organisations, land managers, policy makers, researchers, disciplines etc. • Aligning visions or aims across rewilding projects. • Sharing knowledge and experiences, e.g., through webinars or publications. • Communication and transparency of organisational/project aims. • Communication of research requirements to promote collaboration with researchers.	• Rewilding Europe (Helmer *et al.*, 2015; Jepson, Schepers and Helmer, 2018) • Rewilding Britain (Rewilding Britain, no date) • the wildlands network group, UK (Taylor, 2011b) • Rewilding Institute (Foreman, 2008) • Wildlands Network (Foreman *et al.*, 1992; Soule' and Terborgh, 1999a) • Tweed Forum (Comins, 2004)
Promoting or implementing sustainable land management or resource use	Improving habitat and increasing autonomous nature (usually in traditionally anthropogenic areas, e.g., agricultural, commercial forestry, or urban areas), preventing overexploitation, and limiting unsustainable activities to promote connectivity and coexistence.	• Implementing or promoting regenerative or wildlife-friendly farming, including restoring habitat such as hedges or field margins, reforming livestock grazing, ending the use of insecticides, or diversifying crops/polyculture. • Implementing or promoting reforms to commercial forestry, including ending clear-cutting, selective logging, sustained yield, limiting heavy machinery, increasing species and age diversity in commercial forests, and promoting local use of timber. • Promoting the reform of mining or other extractive practices.	• Sustainable land use guidance/proposals (McKibben, 1995; Groom *et al.*, 1999, 1999; Fisher, 2004; Benayas and Bullock, 2015; Merckx and Pereira, 2015) • urban rewilding (Maller, Mumaw and Cooke, 2019; Owens and Wolch, 2019) • proposed policy reform (Kirby, Robertson and Isted, 2004; Pettorelli *et al.*, 2018) • Knepp Wildland, England (Taylor, 2006; Tree, 2019) • Neroche, England (Saunders, 2011)

		• Legal species protections, no-take zones (or protected areas), or limitations to hunting or foraging.	• Tweed Rivers Heritage Project (Comins, 2004)
		• Improving habitat, promoting non-human autonomy, or rewilding in urban areas.	• Rewilding Europe (Helmer *et al.*, 2015; Jepson, Schepers and Helmer, 2018).
		• Providing or promoting incentives to encourage landowners or managers to restore habitat or accommodate nature, e.g. through compensation schemes for losses caused by natural disturbance or predation or payments for ecosystem services provided by habitat restoration.	
		• Limiting recreational access or other activities to areas when it may negatively impact natural processes, e.g., during nesting season, when there is risk of disease spreading, or when paths are being degraded through overuse.	
		• Public engagement to improve ecological knowledge and raise awareness to promote responsible use of land or resources.	
		• Promoting the reform of policies that promote intensive agriculture or other unsustainable activities.	
Public engagement and education	Generally promoting rewilding and its aims, and involvement in projects. Aims to improve ecological knowledge and	• Use of cultural heritage or the arts to raise awareness of missing species or to achieve other rewilding objectives, e.g., through sharing folk music, storytelling, popular fiction or non-fiction books, spiritual practices, or traditional skills.	• Guidance for community conservation and involvement (RARE, 2014; Charles, 2021) • Terai Arc Landscape, Nepal/India (Ram Bhandari and Raj Bhatta, 2022)

	human-nature connection, mitigate SBS, encourage or inform people to better accommodate or coexist with nature in landscapes, and ultimately (re)integrating nature into culture.	• Demonstrating sustainable practices or ecocentric cultures, for example sharing the values or practices of indigenous cultures or anarcho-primitivism. • Promoting or offering (sustainable) nature experiences, e.g., nature walks, ecotourism, safari-style experiences, forest schools, or outdoor education and play. • Informational signage in rewilding or nature areas to educate and raise awareness. • Advocating for rewilding in local, national, or international policy. Promoting the benefits of rewilding to human wellbeing and assisting the public to benefit from rewilding-related incentives. • Promoting ecological science and improving ecological knowledge through science communications. • Involving communities or other stakeholders in rewilding, for example through volunteering, consultation, advisory groups, or citizen science.	• Yellowstone to Yukon, US/Canada (Hilty, Chester and Wright, 2022) • community nature conservancies (Johns, 2019) • Abbots Hall, England (May, Hall and Pretty, 2006) • beaver reintroduction, Scotland (Prior and Ward, 2016) • Neroche, England (Saunders, 2011) • Moor Trees, England (Griffin, 2004).
Monitoring	Improve knowledge of the impacts of rewilding interventions, share learning and promote best practice, feed into adaptive planning (linked to principle in section 6.3.6).	• Setting project goals which will provide a basis for monitoring. Establish ecological reference ecosystem for monitoring ecological progress, e.g., historical or palaeoecological evidence. • Determine needs of focal species/ecological processes. • Setting up monitoring programmes appropriate to available resources, ensuring that these are sustainable over time.	• Guidance for monitoring rewilding (Groom *et al.*, 1999; Pettorelli *et al.*, 2018; Corlett, 2019; Beyers and Sinclair, 2022; Root-Bernstein, 2022) • Natural Capital Laboratory at Birchfield, Scotland (White *et al.*, 2022)

		• Look for potential areas to act as comparison areas where no rewilding action is taken, e.g. neighbouring land (Ashmole and Chalmers, 2004) or exclosures (Bakker and Svenning, 2018).	• Carrifran Wildwood, Scotland (Adair and Ashmole, 2022) • Abbots Hall, England (May, Hall and Pretty, 2006) • Hafod y Llan, Wales (Neale, 2004) • monitoring of bears in Austria (Rauer, 2004) • Wicken Fen, England (Warrington, Soans and Cooper, 2009).
Securing and managing funding or other resources for rewilding	To support the economic viability and sustainability of rewilding (to support long-term viability as discussed in section 6.3.4).	• Securing public or private funding for rewilding, e.g., crowd funding, charitable donations, philanthropists, government funding, legacy donations. • Securing land for rewilding, e.g., legacy donations, landowner agreements. • Promoting policy to incentivize restoration or rewilding or to encourage charitable donations, e.g., payments for ecosystem services, agri-environment schemes, tax relief, carbon tax credits. • Using natural capital accounting to demonstrate the value of ecosystem services to promote incentives. • Integrating funding for rewilding into rewilding practice or promoting sustainable livelihoods as part of rewilding, e.g., income from ecotourism or recreational activities, income	• Rewilding Europe Capital (Rewilding Europe, no date) • Carrifran Wildwood, Scotland (Ashmole and Chalmers, 2004) • Tweed Rivers Heritage Project (Comins, 2004) • Great Bustard reintroduction, England (Dawes, 2006) • Mar Lodge, Scotland (Holden and Clunas, 2004) • several projects led by Rewilding Europe (Jepson, Schepers and Helmer, 2018) • Neroche, England (Saunders, 2011).

| | | from breeding of animals or plant nurseries for rewilding, Community Nature Conservancies (Johns, 2019).

• Establishing central funding resources to facilitate green investments for rewilding.

• Promoting projects to secure volunteer time.

• Gaining awareness of and utilising existing potential funding streams, e.g., European Commission Natural Capital Financing Facility, Forestry Commission Woodland Grant Scheme, Scottish Forestry Grants Scheme, Heritage Lottery Fund.

• Establishing compensation funds. | |

Chapter 7: Grounded theories of change for rewilding

7.1. Introduction

This chapter draws on the theories emerging from the empirical chapters of this thesis to construct grounded ToCs for rewilding. ToC is an outcomes-based framework which was initially developed to aid agencies concerned with creating long-term social change (see chapter 2). The framework encourages the creation of a vision for the future which can be used to plan interventions and demonstrate causal links and sequences of events needed to lead to desired outcomes associated with that vision (Biggs *et al.*, 2017; Centre for Theory of Change, no date). A ToC framework is used to map steps that must be taken between the present context and the desired future. The use of ToC frameworks has increased and they are recommended for use in conservation and environmental decision making and conflict management (Allen, Cruz and Warburton, 2017; Baynham-Herd *et al.*, 2018). The models or instructions for creating ToCs vary, but the main components are similar (figure 7.1).

Figure 7.1: Suggested components of a ToC (adapted from Biggs *et al.*, 2017; Ghate, 2018; Reinholz and Andrews, 2020).
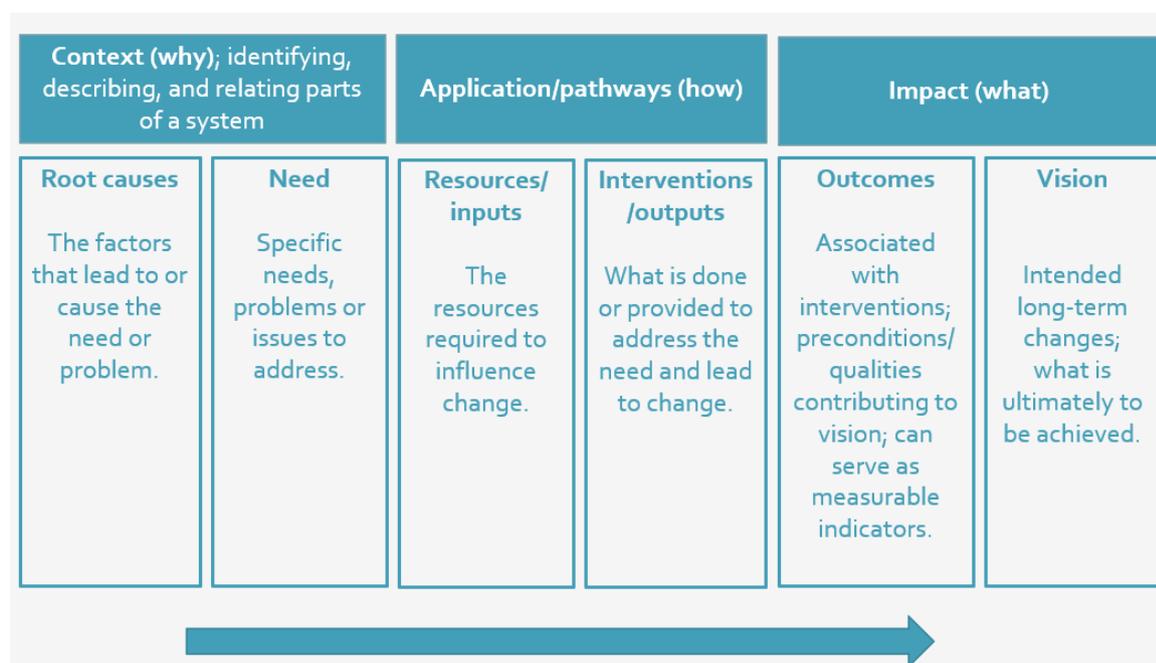
As figure 7.1 demonstrates, a ToC reflects the drivers, application, and intended impacts associated with desired change and these align with the empirical chapters in this thesis

(chapters 4, 6, and 5, respectively). Hence, these empirical chapters each present theories related to different aspects of change in the context of rewilding, while this chapter combines these theories into a holistic ToC for rewilding (figure 7.2).

7.2. General ToC for rewilding

Figure 7.2 demonstrates how the theories emerging from the empirical chapters in this thesis fit a ToC framework.

Figure 7.2: A proposed grounded ToC for rewilding which has emerged from the data and reflect the empirical chapters that consider the drivers (chapter 4), vision (chapter 5), and application (chapter 6) of rewilding based on the data.
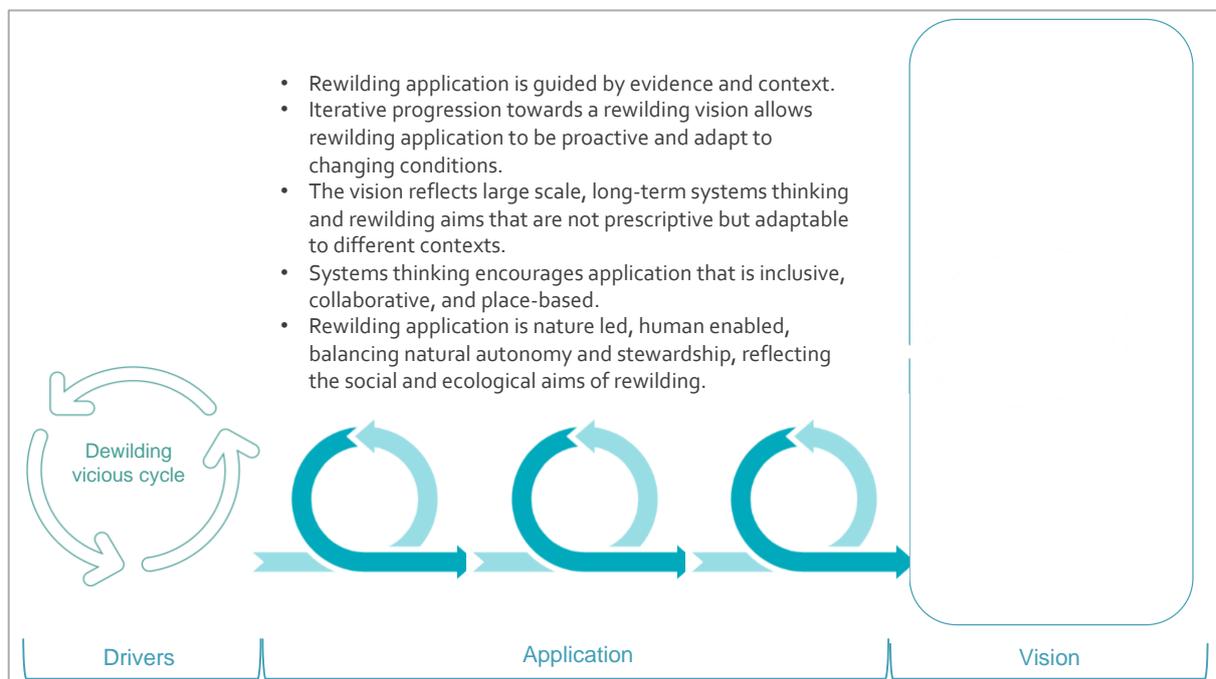
Aligning with the "context" section of a ToC (figure 7.1), figure 7.2 reflects that a vicious cycle of dewilding is a key driver of rewilding (chapter 4). Considering the intended "impact" (figure 7.1), the social-ecological aims identified in chapter 5 serve as the vision of a ToC, while the qualities identified in chapter 5 can serve as the measurable indicators or outcomes. The rewilding principles suggested in chapter 6 represent the "application" stages (figure 7.1) and are integrated into the framework as principles to guide rewilding application (figure 7.2). Reflecting these principles, this demonstrates that rewilding works iteratively as a virtuous cycle to move a system from a dewilded to a rewilded state. Figure 7.2 represents a broad study of rewilding drivers, aims, and application and so this ToC is

itself general. As such it is useful for informing international policy and guidelines for rewilding that are not place-specific.

This ToC enables us to consider how rewilding may differ from conservation, a history of which is considered in chapter 1. Most notably are the functional ecological goals of rewilding, and this is reflected throughout this thesis and in the data as it is considered that rewilding characterises a paradigm shift from compositional to functional ecological goals. As described in chapter 3, a focus on functional goals necessitated landscape-scale considerations for rewilding which has supported a shift towards systems thinking and a relational paradigm. The implications for rewilding are that social and political factors influencing the potential for rewilding have been considered inherent in rewilding since its inception. This is reflected in the data across different conceptualisations of rewilding (e.g., Snyder, 1990; Vera, 2000; Taylor, 2011d; also demonstrated in chapter 3). Hence, considerations for the root-causes of dewilding have been considered in rewilding from the outset and motivated the shift from conservation—which is seen as perpetuating human control over natural processes or lacking considerations for complexity—to rewilding (chapters 3 and 4). This has influenced rewilding aims of non-human autonomy and coexistence which combines a need for functional restoration alongside socio-cultural change. This has meant that socio-cultural change is inherent in rewilding, while it might be seen as a secondary goal in conservation or ecological restoration. Here it is considered necessary for people to accommodate wild nature in landscapes, which is different from conservation for which human-focused goals tend to focus on providing benefits to humans (section 1.4.3). This also had implications for governance, and rewilding characterises a desired shift from command-and-control to systems-based governance approaches, which echoes a relational paradigm and necessitates value pluralism. However, it should also be noted that this ToC is based on intention, and throughout this thesis is demonstrated the difficulties of achieving these shifts in goals and governance approaches, largely due to the influence of extant conservation paradigms. It should also be noted that conservation itself is an evolving and diverse field and some emerging approaches to conservation may align with rewilding goals and processes outlined here, for example transformative conservation also considers paradigm shifts needed to progress towards a more systems-based, relational conservation practice (Fougères, *et al.*, 2022).

7.3. ToC framework to inform rewilding application

The theories emerging from this study and reflected in figure 7.2 can help to address the above-mentioned limitations to a paradigm shift as it supports a systems-based approach to governance. This section and figure 7.3 consider steps that can be taken by those driving rewilding to develop project- or place-specific ToCs, reflecting the principles of practice in section 6.2. This ToC framework to inform rewilding application is adaptable to different contexts. The purpose of each stage is outlined below. An early version of this framework based on the RPS data was published in Hawkins (2022).

Figure 7.3: A proposed rewilding ToC framework to inform rewilding application. An earlier version of this framework, based on the RPS data, was published in Hawkins (2022).
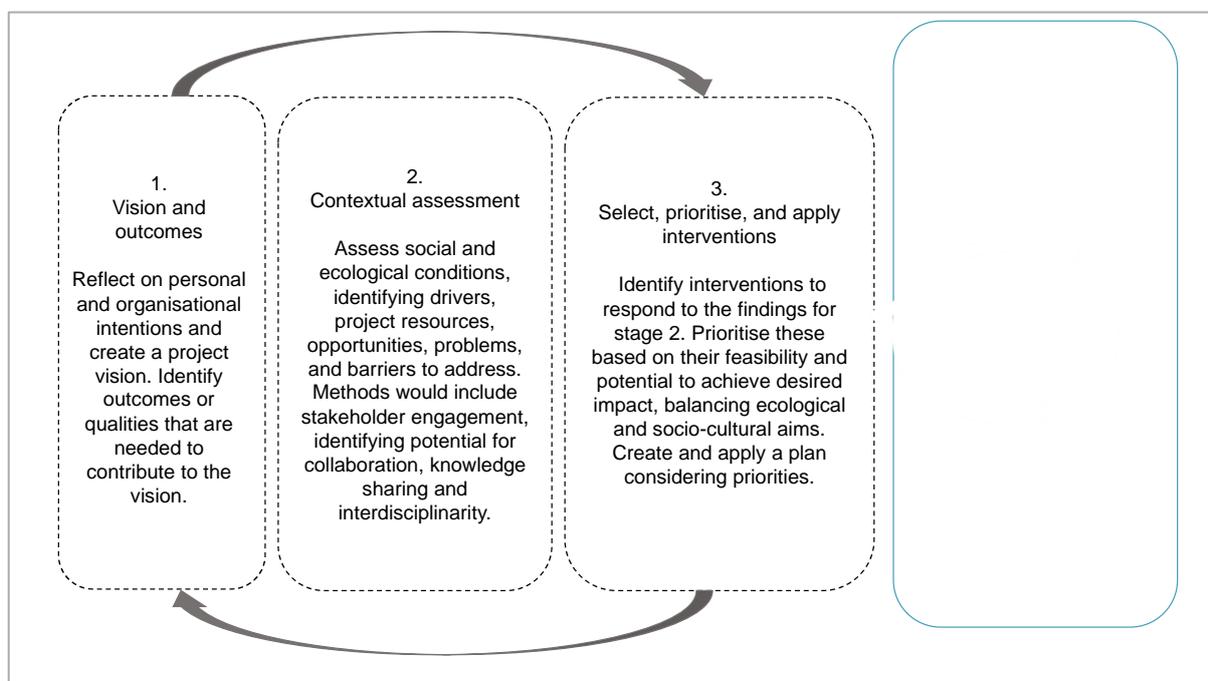
Stage 1: Vision and outcomes

A defining principle of a ToC is that a vision for the future related to the intended change is created to provide a focus for the project or organisation (Reinholz and Andrews, 2020; Centre for Theory of Change, no date). This is related to the intention for rewilding to be transformative and visionary (section 6.2.1). As such, the social-ecological aims of rewilding identified in chapter 5 can be used as a template from which to adapt a context-specific rewilding vision (figure 7.3) that represents what is ultimately to be achieved. Here those driving rewilding are asked to reflect on their intentions and are encouraged to think long

term and systemically (section 6.2.4), considering the ecological, socio-cultural, and systemic change required to achieve their vision.

Following the creation of the vision, outcomes can be identified, which are the pre-conditions or qualities that are needed to achieve the vision (figure 7.1). These qualities can serve as measurable indicators to monitor the impacts of rewilding application. The qualities identified in chapter 5 (figure 5.1) have been highlighted in the data as having the potential to contribute to rewilding aims. Therefore, these may be used as guiding indicators that can be adapted to suit the context of the project.

Stage 2: Contextual assessments

Reflecting intentions for rewilding to be contextual and place-based, the second stage entails a thorough assessment of social and ecological conditions in the focal area or system. This would include the drivers of change and specific needs, problems, or barriers to address (figure 7.1, 7.2). Chapter 3 of this thesis demonstrates how contextual influences led to the emergence of different approaches. This stage therefore encourages projects to assess the conditions to inform rewilding plans, rather than adopting approaches that were developed in other contexts. Chapter 4 identifies interacting causes and effects of dewilding (figure 4.1), namely escalating human influence, biodiversity loss and ecological degradation, colonialism, cultural and knowledge hegemony, human-nature disconnection, SBS, values for control and order, and negative impacts on human wellbeing. These could be used as broad categories to identify context-specific drivers of dewilding. These consider historic land use and conditions related to ecological and social and political factors and so would encourage interdisciplinary collaborations (section 6.2.7) and systems thinking (section 6.2.4). This stage may also include the identification of opportunities and resources available, such as available land or sources of funding.

This stage is critical for creating the evidence required to inform rewilding plans and establish ongoing monitoring (section 6.2.6); it integrates monitoring into rewilding, a crucially important step towards improving rewilding application and to inform rewilding policy and guidelines (Corlett, 2019; Pettorelli, Durant and du Toit, 2019b). In the first iteration of a project, the assessment would provide a baseline while further iterations would monitor change over time. As is identified in section 6.2.6, there is a need to develop

clear guidance for monitoring. In the absence of such guidance, table 6.1 provides some examples of monitoring in rewilding projects and some guidance from the literature. The qualities identified in figure 5.1 (chapter 5) may serve as metrics for monitoring of ecological, systemic, and socio-cultural change. Methods for assessments and monitoring highlighted in the literature vary and are influenced by project priorities and resources available (chapter 6), from less intensive, traditional ecological survey methods such as those undertaken at Carrifran Wildwood (Adair and Ashmole, 2022) to intensive, innovative monitoring techniques including remote sensing, eDNA surveys, and natural capital accounting approaches as undertaken at Birchfield (White *et al.*, 2022). The proposed rewilding frameworks identified in the literature (chapter 1) also offer some options for monitoring during this stage. The frameworks proposed by Perino *et al.* (2019) and Van Meerbeek *et al.* (2019) both address ecological indicators and social barriers, Dempsey (2021) offers a method for measuring different types of human control over natural processes, and Pettersson and de Carvalho (2021) offer a framework for assessing and monitoring change to different types of value. Inclusion of stakeholders and different types of evidence are critical for this stage, as is reflected in sections 6.2.6 and 6.2.7 above and as highlighted by Carver *et al.* (2021, principle 7) and Butler *et al.* (2021) in their framework to encourage adaptive co-management.

Stage 3: Selecting, prioritising, and applying interventions

Based on the above assessments, a list of potential interventions can be created. These would ideally look to take advantage of opportunities and work to overcome barriers identified in stage 2. Table 6.1 demonstrates the variety of interventions used in rewilding and can be used to inform the selection of interventions, although there may be other suitable interventions that are not reflected in this list. This list also includes related guidance to improve the effectiveness of these interventions, but wider evidence to inform interventions should be considered given the limitations to this table.

The initial list of potential interventions must then be prioritised based on current feasibility, aligning with intentions for rewilding application to be contextual and pragmatic (chapter 6). Interventions that are most feasible are prioritised, recognising their potential to enhance the feasibility of other intended interventions. As an example, in the Rangelands Restoration project in Australia, non-native species have been identified as a major barrier to rewilding

and therefore non-native species management has been prioritised over species reintroductions (Kealley and Burrows, 2022). Another example would be using public engagement as a tool to increase the feasibility of future apex predator reintroductions, which may offer a more efficient route to ecological restoration than attempting to implement an apex predator reintroduction where there is very low public acceptance for rewilding (Hawkins *et al.*, 2020). As interventions are prioritised, they provide the basis to map steps from the present context to the desired future, as is encouraged by a ToC framework (Centre for Theory of Change, no date). High priority interventions are then applied first and others applied successively. Considering the example of Carrifran Wildwood (Adair and Ashmole, 2022), priority interventions included seeking funding and purchasing land, these were followed by interventions to address barriers to habitat restoration (removing grazing sheep, constructing deer fencing, and culling of deer), followed by interventions to restore habitat (seed propagation, sourcing of saplings, tree planting). Application should consider existing guidelines for each intervention to ensure that these are applied ethically and effectively (informed by table 6.1 and other existing guidance). Depending on the scale of the project and resources available, several interventions may be applied simultaneously, and the time scale of this stage will depend on the complexity of the project and the interventions applied.

Successive iterations

Reflecting agile project management (Fernandez and Fernandez, 2008) and the adaptive governance framework for rewilding identified in the literature review in chapter 1 (Butler *et al.*, 2021), stages 1-3 are repeated iteratively. Hence the project goals, project context, and application are reassessed, and plans updated in an adaptive approach. This allows ongoing monitoring of change and effectiveness of interventions which will contribute to the growing rewilding knowledge base. ToC iterations are critical as they encompass the adaptability and uncertainty (section 6.2.5) inherent in rewilding. Rewilding remains adaptable, as in reality projects are likely to adapt plans around emerging opportunities or barriers that were not identified in stage 2. Rewilding application is unlikely to be as linear as suggested by this framework (figure 7.3) but it provides a useful tool to guide application nonetheless.

Reflecting intentions for rewilding to be inclusive and collaborative (section 6.2.7), project leaders will need to consider who to include in decision making and project governance related to each stage. Some interventions listed in table 6.1 are done with the aim of promoting inclusion and collaboration, including networking and knowledge sharing which are promoted by organisations including Rewilding Europe, Rewilding Britain, and the Rewilding Institute. Given the iterative nature of this framework, who is included in decision making can be adapted depending on the progress of the project or the resources available. Smaller projects with limited resources and space, or existing projects which have not previously identified as rewilding projects, are encouraged to embrace systems thinking and consider several aims and outcomes as part of the rewilding vision suggested by this framework (figures 5.1 and 7.3). They can adapt plans as opportunities arise to extend the area and/or impact of their project. Examples of two projects highlighted in table 6.1 can help to demonstrate how the ToC can be adapted to suit different scales or to different priorities or resources. Firstly, Hilty, Chester and Wright (2022) demonstrate that a large-scale rewilding vision (stage 1) was critical for the Yellowstone to Yukon project. This organisation does not own any land and interventions relate to engaging with people to influence land use or management decisions over a large spatial scale to promote connectivity and coexistence. In contrast, Adair and Ashmole (2022) demonstrate how even small-scale projects can expand their aims over time. Carrifran Wildwood initially focused funding and ecological restoration to achieve a rewilding vision, but later sought to expand the influence and impact of the project beyond the original boundary by approaching local landowners and forming collaborations.

7.4. Conclusion

While the preceding empirical chapters (chapter 4, 5, and 6) consider theories about change emerging from the data in the context of rewilding, this chapter combines these to propose a broad-scale rewilding ToC to inform international and adaptable rewilding policy and guidelines (figure 7.2). A more targeted rewilding ToC framework to guide those driving rewilding application to create project-specific ToCs and encourage systems-based governance (figure 7.3) is also constructed. This ToC framework to guide rewilding application addresses the need for a framework that reflects plurality and is adaptable to different contexts. This is in response to concerns that current frameworks (e.g., Carver,

2014; Perino *et al*., 2019; van Meerbeck *et al*., 2019) reflect human-nature dualism associated with the Romantic or Transcendentalist movements (discussed in section 1.4.2). The adaptive qualities of this framework promotes systems-based governance, aligning with the adaptive governance framework suggested by Butler *et al.* (2021), as iterative progress and adaptiveness are integral to both frameworks. However, the ToC here presented provides a vision for rewilding which can be adapted to different projects. It promotes reflective practice and the "inward" transformation that is needed in conservation practice (as demonstrated throughout this thesis) while Butler et al. (2021) call for neutral governance, which is unlikely to be achievable given the nature of how actor networks emerge with a purpose in response to perceived negative conditions (Cózar-Escalante, 2019; demonstrated in chapter 3).

The frameworks proposed here are based on a limited data set and will therefore require testing against case studies to improve their usability and adaptability to different contexts. Despite these limitations, the frameworks provide a useful and evidence-based starting point for unifying rewilding policy and practice under social-ecological aims and a focal point for identifying areas requiring further research or refinement. Areas for further research regarding drivers, aims, and application of rewilding are highlighted throughout this thesis and summarised in chapter 8. Considering one of the research questions addressed by this research over whether a ToC could be constructed for rewilding that could highlight common ground among rewilding concepts while allowing for plurality, these frameworks and the related principles (chapter 6) encourage the rewilding community to work towards common goals, to adopt complex systems thinking considering social-ecological interactions, and to collaborate and share experiences and lessons learned across systems, cultures, and disciplines to enhance the potential for rewilding. Finally, while the framework proposed in figure 7.3 is aimed at rewilding practitioners who are looking to apply rewilding interventions on the ground, if the field truly intends to affect paradigm shifts in conservation, it must also look more widely at the systems and institutions in which rewilding research and practice operates (Fougères, *et al.*, 2022). This is reflected in the principles presented in chapter 6 and are inherent in the holistic ToC in figure 7.1. If rewilding is to be a large-scale, multidisciplinary undertaking embracing a shift towards a

relational paradigm, it must embrace and encourage change across the multiple systems that affect it.

7.5. Chapter summary

This chapter offers two grounded theories of change emerging from the previous empirical chapters:

- Figure 7.2 represents a broad study of rewilding drivers, aims, and application and so this ToC is itself general and can be useful for informing international policy and guidelines for rewilding that are not place-specific. It demonstrates that key differences between rewilding and conservation are related to transitions from compositional to functional ecological goals, which have implications for application, particularly making the human dimensions and socio-cultural change inherent in rewilding.

- Figure 7.3 offers a ToC framework to inform rewilding application and the development of project- or place-specific theories of change which encourage iterative progression, place-based approaches, systems thinking, monitoring, and inclusivity, reflecting the rewilding principles (chapter 6). This process can help in the selection and prioritisation of rewilding interventions (table 6.1) and influence more reflective, systems-based approaches to governance which will support a shift towards a relational paradigm.

These frameworks and the related principles (chapter 6) might help to address conflict among rewilding proponents and encourage the rewilding community to work towards common goals, to adopt complex systems thinking considering social-ecological interactions, and to collaborate and share experiences and lessons learned across systems, cultures, and disciplines to enhance the potential for rewilding.

However, further research to interrogate these frameworks is suggested as the study draws from a limited data set and the resulting ToCs require testing in case studies to improve their usability and adaptability to different contexts.

Chapter 8: Thesis conclusion

8.1 Introduction

This chapter summarises the research presented in this thesis and revisits and evaluates the research aims outlined in chapter 1. The quality of the study and emerging theories are then discussed using the criteria for assessing grounded theory studies proposed by Charmaz (2014), namely credibility, originality, resonance, and usefulness. Key findings and emergent theories are summarised, reflecting on their implications for rewilding theory and practice. Finally, the study limitations are acknowledged together with areas for further research.

8.2. Summary of key findings and emergent theories

This study offers a broad study of the concept of rewilding considering different aspects of change. Given the breadth and diverse sources of data, the study addresses an issue highlighted in the literature review that extant theories are based on personal preferences or biases and limited case studies. Several emergent theories that provide novel insights to inform rewilding theory, research, and practice are suggested:

- Chapter 4 presents a novel theory of dewilding as a vicious cycle of intra-acting causes and effects. This reflects rewilding's multidisciplinarity; how rewilding considers root causes of ecological degradation and how these have influenced rewilding aims and practices. It reflects calls to decolonise rewilding (Ward, 2019) and offers some intra-acting causes and effects of colonialism that may offer areas on which to focus action to decolonise rewilding practice. It notes that different approaches to rewilding (as reflected in chapter 3) were influenced by different contexts, experiences of, and responses to the dewilding process, hence different approaches to rewilding.

- Chapter 5 presents a novel theory of rewilding's social-ecological aims (figure 5.1). They reflect SES framings and a shift towards a relational paradigm reflected in rewilding. Together, they provide a potential vision to consolidate rewilding theory and practice while allowing for value pluralism and multivalence reflected in the concept of wild (informing theories highlighted in chapter 7). A revised rewilding continuum (figure 5.3) is proposed which addresses a perceived paradox between

non-human autonomy and human influence or interventions as highlighted in the literature review (chapter 1). This is an important step in addressing conflict over the concept of wilderness and perceptions of rewilding as promoting human-nature dualism.

- Chapter 6 offers two important tools to inform rewilding application and the development of rewilding guidelines: 1) a list of principles of practice that reflect intentions for how rewilding should be practiced, 2) a list of interventions used in rewilding application suggesting how these can contribute to rewilding aims. Recommendations are made to contribute to the development of internationally applicable rewilding guidelines.

- Chapter 7 combines the above into two proposed ToCs for rewilding, one intended to guide international policy and the other to influence place-specific ToCs. These encourage critical reflexivity and systems-based governance which are highlighted as critical in rewilding and in the wider conservation movement.

These theories are outlined and implications for rewilding are highlighted in the chapter summaries presented at the end of each chapter.

8.3. Considering the research outcomes against the stated aims

Below, the aims of this research (chapter 1) are listed, and it is demonstrated how the aims were addressed in this thesis.

Aim 1: Deconstruct the concept of rewilding using a constructivist grounded theory approach, providing a broad representation of rewilding considering context (why), application (how), and goals/impact (what) based on the elements of a ToC framework.

As outlined in chapter 2, the research was designed according to a constructivist grounded theory approach and was adapted to respond to setbacks and to influential concepts including agile project management and ToC frameworks. Informed by an initial literature review and initial coding of the RPS data, it was decided to code data under three parent nodes to deconstruct the concept of rewilding under its drivers ("change why", chapter 3 and 4), rewilding aims ("change what", chapter 5), and rewilding application ("change how", chapter 6). This highlighted the breadth of the rewilding concept and prompted emergent

theories. Chapter 4 considers the concept of "dewilding" and intra-acting causes and effects, namely escalating human influence, biodiversity loss and ecological degradation, colonialism, cultural and knowledge hegemony, human-nature disconnection, SBS, values and control for order, and negative impacts on human wellbeing. Chapter 5 presents the aims of rewilding, reflecting that rewilding considers landscape/SES-level change, ecological change, and socio-cultural change. The deconstruction of rewilding application in chapter 6 informs a list of principles of practice and a list of interventions used in rewilding and table 6.1 considers how these interventions are used in pursuit of rewilding aims.

Aim 2: Use these findings to identify areas of divergence or pluralism and areas of common ground in different conceptualisations of rewilding.

The literature review in chapter 1 and the empirical chapter 3 provides an initial assessment of areas of divergence/consensus in rewilding theories and approaches. Some key areas of conflict in recent literature are highlighted, namely: 1) a perceived conflict between dualistic and holistic perceptions of culture and nature; 2) a perceived paradox between rewilding interventions and goals of non-human autonomy; 3) a perceived paradox between pragmatism and transformation.

Chapter 3 highlights areas of common ground and divergence. Namely it notes that consensus is reflected in functional ecological goals and intention to use more systems-based governance approaches, while some divergence is reflected in human-focused goals (reflecting divergences in wider conservation) and value orientations. This reflects the pluralism and subjectivities inherent in the term "wild" and hence supports a more holistic framework for rewilding and a shift towards a relational paradigm. These findings support more critical and nuanced studies deconstructing the drivers, aims, and application of rewilding in the remaining empirical chapters.

There is common consideration for the causes and effects of dewilding, to varying degrees across the data, although there is some divergence over capitalist hegemony as a priority, reflecting divergences between neoliberal conservation and transformation in the wider conservation movement (as demonstrated in the literature review). It is also demonstrated that while these factors are common in the data, how they play out in a system is very different, so there are diverse experiences of dewilding among individuals and populations,

hence diverse rewilding approaches. This has led to divergences between rewilding theories and application, given than rewilding theories are based on limited case studies and influenced by personal experiences or preferences.

Regarding consensus/divergence across the social-ecological aims of rewilding, the data show that the intention to achieve SES wildness, resilience, and sustainability is common among conceptualisations of rewilding, but that these terms are subjective and therefore may reflect different value orientations or goals. Hence, the identification of distinct ecological and socio-cultural aims is helpful to inform rewilding frameworks that can support more holistic and adaptable theories and practical guidelines while allowing for pluralism. The functional ecological goals of non-human autonomy are common, as are the qualities of ecological integrity (echoing function), ecological diversity and heterogeneity, evolutionary potential, and connectivity. However, there is some divergence over whether indigeneity or ecosystem services are a priority, reflecting the influence of ecological surrogates and criticisms of neoliberal conservation, respectively. These divergences may be addressed by systems-based approaches that support value pluralism, but case studies in different contexts would contribute to improving knowledge of how different priorities influence rewilding goals. There are common socio-cultural aims of "people accommodating wild nature in our landscapes" and "human wellbeing", however there is some divergence over how to address human wellbeing, echoing differences in human-focused goals in the wider conservation movement (section 1.4.3). The socio-cultural qualities of tolerance and adaptability, valuing nature, ability to identify and prevent unsustainable activities, and connection to place are mentioned across the data to varying degrees, but there is limited evidence of how to achieve these qualities, perhaps given that engagement with the human dimensions of rewilding are limited in the wider academic literature (Weber Hertel and Luther, 2023). There are also different emphases on how to increase the value of non-human nature among people, reflecting different value orientations. There is reflected a desire for people to reconnect and appreciate interdependencies among humans and non-human nature, hence changing human-nature relationships as a quality, although there is some conflict over the definition of ecocentrism, reflected in conflicts between anthropocentrism and ecocentrism and divergences in value orientations highlighted in the

literature review. Clarifications of the definition of ecocentrism and further research is suggested to alleviate these conflicts.

Chapter 6 reflects rewilding application and considers principles to underpin rewilding practice. These are common principles across the data; however, it is noted that divergences occur between intent and application, given limitations imposed by working with extant conservation paradigms. What is especially interesting is that there is common support for both transformation and pragmatism across the data, to varying degrees, which addresses a perceived paradox between transformation and pragmatism highlighted in the literature review.

Aim 3: (Re)construct the concept of rewilding using a ToC, particularly attentive to the plurality of rewilding theory and practice.

The findings of the empirical chapters related to aims (chapter 5), drivers (chapter 4), and application (chapter 6) are considered holistically in chapter 7 and two ToCs are suggested. Figure 7.2 offers a general ToC for rewilding to inform international rewilding policy and guidelines, while figure 7.3 offers a ToC framework to guide those driving rewilding application to create project-specific ToCs. Chapter 8 (below) considers the emergent ToCs in relation to Charmaz's (2014) criteria for assessing grounded theories. Given the limitations of this study, it is suggested that these ToCs should be tested out in different contexts to improve their usability and applicability. Additionally, a revised rewilding continuum is suggested in chapter 5 based on the concept of coexistence and focusing on aim of people accommodating wild nature in our landscapes.

These theories are attentive to the need for a holistic framework that reflects rewilding's plurality. Particularly important is that these (re)constructions of rewilding represented by the ToC and revised continuum address the three key conflicts identified in the rewilding literature.

(1) A perceived conflict between dualistic and holistic perceptions of culture and nature: Systems-based approaches to governance are suggested by the ToCs which are mindful of diverse value orientations among stakeholders, while also encouraging

critical reflection among those driving change and mindfulness of their own value orientations and how these may influence decisions.

(2) A perceived paradox between rewilding interventions and goals of non-human autonomy: the ToCs and the continuum reflect that intervention and participation is inherent in rewilding and that non-human autonomy is not negated by human presence or intervention but is influenced by the type of presence or intervention.

(3) A perceived paradox between pragmatism and transformation: the ToCs reflect that rewilding can be both transformative/visionary and pragmatic, balancing goals of transformation with place-based pragmatism.

8.4. Assessing the emergent theories

The substantive theories emerging from this research are considered in this section using Charmaz's (2014) criteria for assessing grounded theories. Together, these demonstrate how this research aligned with a constructivist theory approach (as outlined in chapter 2) and that the research meets the expectations for rigour associated with research at this level. Reflecting its suitability across these criteria, the research aligns with Charmaz's (2014, p.22) description of process and its constructivist and relativist positions are demonstrated: the present understandings of the rewilding concept is described as arising from multiple past events that are linked as part of a larger whole, with some degree of indeterminacy. Charmaz (2014, p. 10) suggests,

> "that any theoretical rendering offers an interpretive portrayal of the studied world, not an exact picture of it… Research participants' implicit meanings, experiential views – and the researchers' finished grounded theories – are constructions of reality."

This thesis, emergent theories, and ToCs presented reflect this notion, emphasising that this research is progress towards a continually evolving theory (or multiple theories) of change for rewilding.

8.3.1. Credibility

Aligning with the criteria of credibility, methodology and methods were consistent with a constructivist grounded theory approach and were applied with rigour. This included

constant comparison of emergent nodes, transparency of decision making using reflexive notes (some of which are included throughout the thesis and in Appendix 4). The amount of data used was sufficient and aligned with theoretical sampling, i.e., the sourcing of rich data to explain the social phenomenon (Charmaz, 2014), although it is highlighted that future case studies would enhance the applicability and usability of the emergent ToCs. To further determine credibility, Charmaz (2014) suggests that familiarity with the data and the influences on and experiences of participants will improve the credibility of the empirical observations made by the researcher. Considerations for the experiences of and influences on RPS participants and authors of the IRT data are considered throughout the thesis and chapter 3 particularly provides profiles of rewilding groups and context, forming a source of reference for comparative analyses in the other empirical chapters (4, 5, and 6). Finally, transparency and detail demonstrated throughout the thesis show that the emergent theories are not forced, and the reader is given the information to form their own opinions over the emergent theories.

8.3.2 Originality

The research provides fresh insight into the concept of rewilding. While detailed studies of each topic are limited, the broad overview of rewilding is itself a novel approach and can inform more specific studies in the future. The grounded theories were also positioned in relation to extant literature to show how it has addressed remaining uncertainties or conflicts in rewilding theory and practice (chapter 1). The adapted rewilding continuum suggested in chapter 5 responds to a perceived conflict between non-human autonomy and rewilding application; the ToCs presented in chapter 7 respond to a perceived conflict between transformation and pragmatism; and chapter 5 presents rewilding aims in a holistic SES framework that allows for plurality and reflects a shift towards a relational paradigm, which may help to address a perceived conflict between dualistic and holistic ontologies. Findings in chapter 6 consider how this research can contribute to rewilding guidelines and in chapter 4 a novel study of dewilding and implications for rewilding are presented. The findings presented here demonstrate that this research can have significant and novel impact on rewilding research and practice.

8.3.3 Resonance

The criterion of resonance relates to how the fullness of the studied experience is portrayed and the degree to which participants can relate to this portrayal, i.e., whether the emerging theories are a true reflection of participants' experiences (Charmaz, 2014). Resonance in this study was supported by the broad nature of the study and the nodes related to change (drivers, aims, and application). Connections were drawn between conceptualisations of rewilding, influences, emergent groups, priorities, and approaches. The significance of the research to remaining uncertainties highlighted in the literature review (demonstrated in the above section) also shows that the study could have resonance in the rewilding community, and relationships between rewilding and other fields, such as system science, are highlighted that demonstrate that it may have resonance in other fields. However, assessing resonance is limited in this study as the ToCs emerging have not been tested or formally assessed by the participants. It is therefore suggested that future case studies to test the ToCs could improve their usability and applicability.

8.3.4 Usefulness

The criteria of usefulness relate to the extent that the findings can influence those within the phenomenon, and the extent that emergent theories stimulate further enquiry (Charmaz, 2014). The ToCs presented in chapter 7 are expressly designed to be useful to the rewilding community, including policymakers, researchers, and practitioners. These theories provide a basis to inform future case studies to consider the theories in various contexts and importantly can inform the development of rewilding guidelines, which was a key focus of this reserach. It is also suggested that the ToCs are general and adaptive to different contexts, echoing intentions for rewilding to be adaptable, inclusive, and place based.

8.5. Study limitations and areas for further research

Given the constructivist nature of this grounded theory, the acknowledgement of limitations is essential to demonstrate reflexivity with regards to research design, data collection, and the emergent theories (Charmaz, 2014). Key limitations relate to the broad nature of this study. While the breadth of study is useful and presents a novel approach to conceptualising rewilding, it also limited the amount of time and space for considering each individual element that emerged in this study. Therefore, each element is discussed in relation to a

limited review of related literature and guidelines. As a result, more detailed studies of each element would enhance understanding of these topics and improve the applicability and usability of the ToCs. Studies of the relation between rewilding and fields or concepts mentioned in the study, such as sustainability and conservation, are also suggested to inform more joined up working across fields and disciplines.

A second limitation relates to the data set. Reflecting the emergence of rewilding in western Europe and North America, the data is biased towards these areas and future studies testing the concepts emerging from this study in other social-ecological contexts would be beneficial to improve understanding of the elements identified in the study, the applicability of the ToCs, and enhance the adaptability of guidelines intended to influence rewilding.

Several areas for further research are highlighted in this study:

- Case studies in different social-ecological contexts are suggested to further interrogate the elements of dewilding (chapter 4), social-ecological aims and proposed rewilding continuum (chapter 5), principles and interventions (chapter 6), and ToCs (chapter 7) emerging from this study. This would also help to understand whether these aims and qualities can act as leverage points for achieving system sustainability.

- Genuine engagement with decolonisation and multiculturalism in rewilding would improve understanding of how to effectively shift paradigms and work with plural values and ontologies. This study offers some cause/effects related to colonialism that could be used to develop routes to decolonisation in theory and practice.

- Identifying commonalities and distinctions among different fields and policies would promote joined up working and may help to identify more effective routes to sustainability, paradigm shifts, or transformative change.

- Further work is required to develop adaptable monitoring guidelines, which will improve place-based assessments and inform ongoing knowledge sharing.

- Further research is required to improve understanding of the economics of rewilding and how different economic models may influence the potential for rewilding and

the sustainability of projects, mindful that the data reflect divergences in concerns over neoliberal conservation approaches and capitalist hegemony.

- More targeted, longitudinal studies are required to understand whether human preferences and habitat-focused objectives are a barrier to achieving rewilding aims and to identify social or ecological barriers that limit indeterminacy in rewilding application and society more generally.

- Some practical guidelines to promote genuine systems-based governance at various scales, and to address institutional biases, are required.

- Further guidance from the wider literature is needed to inform guidelines on applying rewilding interventions and integrate or align learning and practice from different fields.

8.6. Conclusion

This chapter demonstrates how the aims of the research have been met. The quality of the emergent theories is assessed using Charmaz's (2014) criteria of credibility, originality, resonance, and usefulness. This study provides a novel conceptualisation of rewilding, establishing its complexity and breadth by considering it in relation to notions of change: drivers, aims, and application. Each empirical chapter presents novel substantive theories in relation to these categories. These are outlined in the chapter summaries at the end of each chapter. It is demonstrated that these respond to several uncertainties highlighted in the literature review. Given its broad nature, the research has limitations, but areas for future research are proposed to enhance the usability and applicability of the emergent theories. Despite these limitations, this research offers several novel findings and substantive theories which provide significant contributions to the rewilding community.

Appendix 1: Rewilding Pioneer Survey

What happens if I change my mind during the study?

Your participation in the study is entirely voluntary. You are free to withdraw from the study at any time without having to provide a reason to do so and your data will be withdrawn from the project. Please contact the researcher (details below) if you wish responses to be excluded from the study.

How can I find out more information?

Please contact the researcher directly: Sally Hawkins, Department of Science, Natural Resources and Outdoor Studies, University of Cumbria, Ambleside, LA22 9BB; Email: sally.hawkins@uni.cumbria.ac.uk; Telephone: 01539 430242.

What if I want to complain about the research?

Initially you should contact the researcher directly. However, if you are not satisfied or wish to make a more formal complaint you should contact Diane Cox, Director of Research Office, University of Cumbria, Bowerham Road, Lancaster, LA1 3JD; Email: diane.cox@cumbria.ac.uk.

This information can be sent direct to you for your reference on request.

1. By ticking 'I agree' you consent that you have understood the information provided about this study, and wish to take part in the research.

 O I agree

We will now ask you 19 questions about Rewilding "then", Rewilding "now" and Rewilding in practice. This will be followed by some standard demographic questions.

Rewilding "then"

These questions relate to the period when you first became aware of 'rewilding'.

2. When, where and how did you first hear about rewilding (please include a year if possible)?

3. At that time, what did you understand rewilding to mean?

4. Who were the influential people/organisations involved in rewilding at that time?

5. At that time, what were your expectations for the field of rewilding?

6. What in your opinion were the circumstances/drivers at the time that you think gave rise to the concept of rewilding?

7. Back then, what were the most significant barriers to rewilding?

8. In your opinion, who are the rewilding pioneers we should be contacting?

Rewilding "now"

The questions on this page relate to your current understanding of rewilding and opinions on the future of the field.

9. Thinking about now – what do you understand rewilding to mean?

10. Do you have a preferred definition of rewilding, e.g. one from academic or practitioner literature?

11. Do you think rewilding has lived up to your expectations (as listed in question 5)?

12. Who would you consider to be the influential people/organisations involved in rewilding now?

13. What would you consider to be the most significant contemporary barriers to rewilding?

14. Please list any words or phrases you know, from any language, that you feel are synonymous with rewilding?

15. Do you think there are language and/or cultural barriers with the term 'rewilding'? Please elaborate.

16. The term rewilding generates a wide range of opinion in popular media. The list below has been drawn from various media sources – which of these words would you associate with rewilding? (tick all that apply)

- Bold

- Innovative

- Misanthropic

- Flawed

- Contradictory

- Exciting

- Promising

- Controversial

- Ambitious

- Powerful

- Threatening

- Destructive

- Other (please specify):

17. To what extent would you agree with the following statement: *Rewilding is a positive term within the 'conservation community'*

    - Strongly agree

    - Agree

    - Neither agree nor disagree

    - Disagree

    - Strongly disagree

    - Other (please specify):

18. What do you see in the future of rewilding?

Rewilding in practice

These questions relate to the practical application of rewilding, if you have not been involved with any such projects then you can skip this page.

19. In which country/countries have you worked (or continue to work) on rewilding projects?

20. How has the concept of rewilding been received in communities you have worked with?

Just a few questions about you…

21. Please give your name.

22. What is your normal country of residence?

23. What is your gender?

    - Female

    - Male

    - Other (specify)

24. Please input your affiliation(s) in the textbox below.

25. What is your age?

    - 17 or younger

    - 18-20

- 21-29

- 30-39

- 40-49

- 50-59

- 60 or older

26. If you would like to receive email updates from the IUCN Rewilding Task Force, please add your preferred email address below

Thank you!!

Thank you so much for taking the time to complete this survey, your input is greatly appreciated. Remember that you can contact Sally Hawkins if you have any queries or concerns about this research, or if you would like to raise major concerns or make a complaint you can contact Diane Cox, Head of Research at the University of Cumbria. Please take note of the contact details below.

Sally Hawkins, Department of Science, Natural Resources and Outdoor Studies, University of Cumbria, Ambleside, LA22 9BB; Email: sally.hawkins@uni.cumbria.ac.uk; Telephone: 01539 430242

Diane Cox, Director of Research Office, University of Cumbria, Bowerham Road, Lancaster, LA1 3JD; Email: diane.cox@cumbria.ac.uk

Appendix 2: Full list of IRT data sources

Ref citation	Year of publication	Authors	Title	Type	Source/publisher
Thoreau, 1862	1862	Thoreau, Henry David	Walking	Magazine article	The Atlantic
Leopold, 1948	1948	Aldo Leopold	The Land Ethic	Book chapter	A Sand County Almanac, Oxford University Press: Oxford
Janzen and Martin, 1982	1982	Janzen, D.H. and Martin, P.S.	Neotropical Anachronisms: The Fruits the Gomphotheres Ate	Journal article	Science, New Series. 215(4528), pp. 19-27
Newmark, 1987	1987	Newmark, W.D.	A Land-bridge Island Perspective on Mammalian Extinctions in Western North-American Parks	Journal article	Nature, 325 pp. 430-432
Snyder, 1990	**1990**	**Snyder, Gary**	**Practice of the Wild**	**Book (monograph)**	**Berkeley: Counterpoint**
Snyder, 1990, Chapter 1	1990	Snyder, Gary	The Etiquette of Freedom	Book chapter	
Snyder, 1990, Chapter 2	1990	Snyder, Gary	The Place, the Region, and the Commons	Book chapter	
Snyder, 1990, Chapter 3	1990	Snyder, Gary	Tawny Grammar	Book chapter	
Snyder, 1990, Chapter 4	1990	Snyder, Gary	Good, Wild, Sacred	Book chapter	
Snyder, 1990, Chapter 5	1990	Snyder, Gary	Blue Mountains Constantly Walking	Book chapter	
Snyder, 1990, Chapter 6	1990	Snyder, Gary	Ancient Forests of the Far West	Book chapter	
Snyder, 1990, Chapter 7	1990	Snyder, Gary	On the Path, Off the Trail	Book chapter	
Snyder, 1990, Chapter 8	1990	Snyder, Gary	The Woman Who Married a Bear	Book chapter	
Snyder, 1990, Chapter 9	1990	Snyder, Gary	Survival and Sacrament	Book chapter	

Foreman, 1992		1992	Foreman, Dave	Around the campfire	Magazine article	Wild Earth, Special Issue, p. i-2
Foreman *et al.*, 1992		1992	Foreman, David et al	The Wildlands Project Mission Statement	Magazine article	Wild Earth, Special Issue, pp. 3-4.
Noss, 1992		1992	Noss, Reed	The Wildlands Project: Land Conservation Strategy	Magazine article	Wild Earth, Special Issue, pp. 10-25
Newmark, 1995		1995	Newmark, W.D.	Extinction of Mammal Populations in Western North American National Parks	Journal article	Conservation Biology, 9(3), pp. 512-526
McKibben, 1995		1995	McKibben, Bill	An explosion of green	Magazine article	The Atlantic, April. Available at: https://www.theatlantic.com/magazine/archive/1995/04/an-explosion-of-green/305864/
Soule' and Noss, 1998		1998	Soule', M. and Noss, R.	Rewilding and Biodiversity: Complementary Goals for Conservation	Magazine article	Wild Earth, Fall, pp. 18-28
Barlow, 1999		1999	Barlow, C.	Rewilding for Evolution	Magazine article	Wild Earth, Spring.
Martin and Burney, 1999		1999	Martin, P.S. and Burney	Bring back the elephants	Magazine article	Wild Earth, Spring, pp. 57-64.
Soule' and Terborgh (eds), 1999 (a)		**1999**	**Michael E. Soule' and John Terborgh (eds)**	**Continental Conservation: Scientific Foundations of Regional Reserve Networks**	**Book (edited)**	**Island Press: Washington DC**
Soule' and Terborgh, 1999		1999	Michael E. Soule' and John Terborgh	Preface	Book chapter	
Soule' and Terborgh, 1999 (b), Chapter 1		1999	Michael E. Soule', John Terborgh	The Policy and Science of Regional Conservation	Book chapter	
Scott *et al.*, 1999		1999	J. Michael Scott, Elliott A. Norse et al.	The Issue of Scale in Selecting and Designing Biological Reserves	Book chapter	
Terborgh *et al.*, 1999		1999	John Terborgh, James A. Estes et al.	The Role of Top Carnivores in Regulating Terrestrial Ecosystems	Book chapter	

Simberloff et al., 1999	1999	Daniel Simberloff, Dan Doak, Martha Groom et al.	Regional and Continental Restoration	Book chapter	
Noss et al., 1999	1999	Reed F. Noss, Eric Dinerstein, et al.	Core Areas: Where Nature Reigns	Book chapter	
Dobson et al., 1999	1999	Andy Dobson, Katerine Ralls et al.	Connectivity: Maintaining Flows in Fragmented Landscapes	Book chapter	
Groom et al., 1999	1999	Martha Groom, Deborah B. Jensen et al.	Buffer Zones: Benefits and Dangers of Compatible Stewardship	Book chapter	
Terborgh and Soule', 1999	1999	John Terborgh, Michael Soule'	Why We Need Mega-Reserves - and How to Design Them	Book chapter	
Barlow, 2000	**2000**	**Connie Barlow**	**The Ghosts of Evolution: Nonsensical Fruit, Missing Partners, And Other Ecological Anachronisms**	**Book (monograph)**	**Basic Books: New York**
Martin, 2000	2000	Paul S. Martin	Foreword	Book chapter	
Barlow, 2000, Chapter 1	2000	Connie Barlow	Ghost Stories	Book chapter	
Barlow, 2000, Chapter 2	2000	Connie Barlow	Ecological Anachronisms and Their Missing Partners	Book chapter	
Barlow, 2000, Chapter 3	2000	Connie Barlow	The Megafaunal Dispersal Syndrome	Book chapter	
Barlow, 2000, Chapter 4	2000	Connie Barlow	Advancing the Theory	Book chapter	
Barlow, 2000, Chapter 5	2000	Connie Barlow	A Fruitful Longing	Book chapter	
Barlow, 2000, Chapter 6	2000	Connie Barlow	Extreme Anachronisms	Book chapter	

Barlow, 2000, Chapter 7	2000	Connie Barlow	Armaments from Another Era	Book chapter	
Barlow, 2000, Chapter 8	2000	Connie Barlow	Who Are the Ghosts?	Book chapter	
Barlow, 2000, Chapter 9	2000	Connie Barlow	Consequences	Book chapter	
Barlow, 2000, Chapter 10	2000	Connie Barlow	The Great Work	Book chapter	
Vera, 2000	**2000**	**Vera, Frans**	**Grazing Ecology and Forest History**	**Book (monograph)**	**CABI Publishing: Oxford**
Vera, 2000, Preface	2000	Vera, Frans	Preface	Book chapter	
Vera, 2000, Chapter 1	2000	Vera, Frans	General Introduciton and Formulation of the Problem	Book chapter	
Vera, 2000, Chapter 2	2000	Vera, Frans	Succession, the Climax Forest and the Role of Large Herbivores	Book chapter	
Vera, 2000, Chapter 3	2000	Vera, Frans	Palynology, the Forest as Climax in Prehistoric Times and the Effects of Humans	Book chapter	
Vera, 2000, Chapter 4	2000	Vera, Frans	The Use of the Wilderness from the Middle Ages up to 1900	Book chapter	
Vera, 2000, Chapter 5	2000	Vera, Frans	Spontaneous Succession in Forest Reserves in the Lowlands of Western and Central Europe	Book chapter	
Vera, 2000, Chapter 6	2000	Vera, Frans	Establishment of Trees and Shrubs in Relation to Light and Grazing	Book chapter	
Vera, 2000, Chapter 7	2000	Vera, Frans	Final Synthesis and Conclusions	Book chapter	
Taylor, 2002	2002	Peter Taylor	Beavers in Britain - laying the foundations	Magazine article	ECOS, 23(2), pp. 23-26.
Gow, 2002	2002	Derek Gow	Wild Boar in the Woods - a wallowing good time	Magazine article	ECOS, 23(2), pp. 14-22.
Panaman, 2002	2002	Roger Panaman	Wolves are returning	Magazine article	ECOS, 23(2), pp. 2-8.

Taylor, 2002 (b)	2002	Peter Taylor	Big Cats in Britain: restoration ecology or imaginations run wild?	Magazine article	ECOS, 23(3/4), pp. 30-64.
Taylor, 2003	2003	Peter Taylor	Living on the edge. The risks of going wild	Magazine article	ECOS, 24(3/4).
Foreman, 2004	**2004**	**Dave Foreman**	**Rewilding North America: A Vision for Conservation in the 21st Century**	**Book (monograph)**	
Foreman, 2004, Introduction		Dave Foreman			
Foreman, 2004, Part 1		Dave Foreman			
Foreman, 2004, Part 2		Dave Foreman			
Foreman, 2004, Part 3		Dave Foreman			
Taylor, 2004	2004	Peter Taylor	Editorial	Magazine article	ECOS, 25(3/4), pp. 1-3.
Fenton, 2004	2004	James Fenton	Wild thoughts... A new paradigm for the uplands	Magazine article	ECOS 25(1), pp. 2-5.
Fisher, 2004	2004	Mark Fisher	Self-willed land: Can nature ever be free?	Magazine article	ECOS 25(1), pp. 6-11.
Taylor, 2004 (b)	2004	Peter Taylor	To wild or not to wild: The perils of 'either-or'	Magazine article	ECOS 25(1), pp. 12-17.
Fenton et al., 2004	2004	James Fenton, Mark Fisher, Peter Taylor	Wild thoughts followed up...	Magazine article	ECOS 25(1), pp. 18-24.
Kirby et al., 2004	2004	Keith Kirby, Heather Robertson, Rebecca Isted	Fresh woods and pastures new	Magazine article	ECOS 25(1), pp. 26-33.
Kirby, 2004	2004	Keith Kirby	Rewilding and the role of large herbivores	Magazine article	ECOS, 25(3/4), pp. 59-62.
Whitbread, 2004	2004	Tony Whitbread	The Weald	Magazine article	ECOS 25(3/4), pp. 46-49.

Griffin, 2004	2004	Adam Griffin	Dartmoor	Magazine article	ECOS 25(3/4), pp. 50-54.
Chalmers and Ashmole, 2004	2004	Hugh Chalmers, Philip Ashmole	Carrifran	Magazine article	ECOS, 25 (3/4), pp. 11-19.
Featherstone, 2004	2004	Alan W. Featherstone	Glen Affric	Magazine article	ECOS, 25(3/4) p. 4-10.
Holden and Clunas, 2004	2004	Peter Holden, Alister Clunas	Mar Lodge	Magazine article	ECOS, 25(3/4), pp. 20-23.
Neale, 2004	2004	Richard Neale	Snowdon	Magazine article	ECOS, 25 (3/4), pp. 39-41.
Goulding, 2004	2004	Martin Goulding	Wild Boar: what should DEFRA do?	Magazine article	ECOS, 25(1), pp. 34-38.
Reinhardt and Kluth, 2004	2004	Ilka Reinhardt and Gisa Kluth	Wolf territory in Germany	Magazine article	ECOS, 25(3/4), pp. 73-77.
Von Aux and Breienmoser, 2004	2004	Manuela Von Aux, Urs Breitenmoser	Reintroduced lynx in Europe: their distribution and problems	Magazine article	ECOS, 25(3/4), pp. 64-68.
Rauer, 2004	2004	Georg Rauer	Re-introduced bears in Austria	Magazine article	ECOS, 25(3/4), pp. 69-72.
Donlan et al, 2005	2005	Donlan et al.	Rewilding North America	Journal article	
Yalden, 2005	2005	Derek Yalden	Aliens among the British mammal fauna	Magazine article	ECOS, 26(3/4), pp. 63-71.
Russell, 2005	2005	David Russell	Wild by Nature: activating the wild psyche	Magazine article	ECOS, 26(1).
Pearce, 2005	2005	Hannah Pearce	Wild Roots to wild wings	Magazine article	ECOS, 26(1).
Harris, 2006	2006	Neil Harris	Ecosystem effects of wild herbivores - lessons from Holland	Magazine article	ECOS, 25(3/4), pp. 58-60.
Wain, 2006	2006	Geoffrey Wain	Editorial	Magazine article	ECOS, 27(1), pp. 1.
Cairns, 2006	2006	Peter Cairns	Britains predators in tooth and claw	Magazine article	ECOS, 27(3/4), pp. 17-22.

Fisher, 2006	2006	Mark Fisher	Future Natural - the unpredictable course of wild nature	Magazine article	ECOS, 27(3/4), pp. 1-3.
Oates, 2006	2006	Matthew Oates	Grazing systems and animal welfare - matters of life and death	Magazine article	ECOS, 27(3/4), pp. 52-57.
Ward et al., 2006	2006	Victoria Ward, Mark Fisher, Steve Carver	The data base: Re-wilding projects in the UK	Magazine article	ECOS, 27(3/4), pp. 5-7.
Taylor, 2006	2006	Peter Taylor	Knepp Estate	Magazine article	ECOS, 27(3/4), pp. 44-51.
May et al., 2006	2006	Andrew May, John Hall, Jules Pretty	Managed retreat in Essex	Magazine article	ECOS, 27(3/4), pp. 36-43.
Jeeves, 2006	2006	Michael Jeeves	Rewilding Middle England	Magazine article	ECOS 27(3/4), pp. 8-16.
Carver and Samson, 2006	2006	Steve Carver, Peter Samson	Eeh, its wild oop North	Magazine article	ECOS, 25(3/4), pp. 29-33.
Comins, 2006	2006	Luke Comins	Tweed Rivers	Magazine article	ECOS, 25(3/4), pp. 24-28.
Browning and Yanick, 2006	2006	Gareth Browning, Rachel Yanick	Ennerdale	Magazine article	ECOS, 25(3/4), pp. 34-38.
Sidaway, 2006	2006	R. Sidaway	Alladale's fenced wilderness - making a breakthrough?	Magazine article	ECOS, 27(3/4), pp. 30-35.
Carver, 2006	2006	Steve Carver	Connectivity	Magazine article	ECOS, 27(3/4), pp. 61-64.
Parfitt, 2006	2006	Alison Parfitt	New nature	Magazine article	ECOS, 27(3/4), pp. 65-69.
Gow, 2006	2006	Derek Gow	Bringing back the beaver	Magazine article	ECOS, 27(1), pp. 57-65.
Goulding, 2006	2006	Martin Goulding	Decision time for wild boar	Magazine article	ECOS, 27(1), pp. 49-56.
Bennett, 2006	2006	Troy Bennett	Wolves in the French Alps - lessons in acceptance	Magazine article	ECOS, 27(3/4), pp. 23-29.

Hetherington, 2006	2006	David Hetherington	The lynx in Britain's past, present and future	Magazine article	ECOS, 27(1), pp. 66-74.
Wilson and Castelluci, 2006	2006	Charles Wilson, Ciro Castellucci	The Apenine brown bear and the problem of large mammals in small populations	Magazine article	ECOS, 27(1), pp. 75-79.
Dawes, 2006	2006	Alasdair Dawes	Good news from the Plain - the reintroduction of Great Bustards to the UK	Magazine article	ECOS, 27(1), pp. 41-48.
Taylor, 2007	2007	Peter Taylor	UK wildlife and climate change: Nature's disaster or dynamics?	Magazine article	ECOS, 28(3/4), pp. 33-39.
Frith and Massini, 2007	2007	Matthew Frith, Peter Massini	The Wolf at the door - Imagine urban nature running wild	Magazine article	ECOS, 28(1), pp. 67-72.
Ellis, 2007	2007	Samantha Ellis	Facing the Predator - the inner drama	Magazine article	ECOS, 28(1), pp. 51-55.
Chalmers, 2007	2007	H. Chalmers	Ecological restoration without all the pieces - early news from carrifran	Magazine article	ECOS, 28(3/4), pp. 89-95.
McGowan, 2007	2007	Jonathan McGowan	Big cats in Dorset: the evidence and the implications	Magazine article	ECOS, 28(1), pp. 73-78.
Gow, 2007	2007	Derek Gow	Water vole reintroduction projects - the lessons and the success factors	Magazine article	ECOS, 28(1), pp. 98-103.
Colston, 2008	2008	Adrian Colston	Wicken Fen	Magazine article	ECOS, 28(3/4).
Taylor, 2008	2008	Peter Taylor	Alladale	Magazine article	ECOS, 29(3/4), pp. 18-24.
Puplett, 2008	2008	Dan Puplett	Our once and future fauna	Magazine article	ECOS, 29(3/4), pp. 4-17.
Goulding, 2008	2008	Martin Goulding	Living with wild boar in middle England - lessons from abroad	Magazine article	ECOS, 29(3/4), pp. 39-44.
Goulding, 2008 (b)	2008	Martin Goulding	The wild boar action plan - shooting in the dark?	Magazine article	ECOS, 29(1), pp. 98-100.
Blake, 2009	2009	David Blake	The return of large carnivores to Britain - the hunters and the hunted	Magazine article	ECOS, 29(3/4), pp. 25-32.

Carver, 2009	2009	Steve Carver	Native behaviour - the human and land-use implications of returning key species to Scotland	Magazine article	ECOS, 29(3/4), pp. 2-8.
Taylor, 2009	2009	Peter Taylor	Rewilding the political landscape	Magazine article	ECOS, 30(3/4).
Warrington et al., 2009	2009	Stuart Warrington, Chris Soans, Howard Cooper	The Wicken Vision (and the Great Fen)	Magazine article	ECOS, 28(2), pp. 58-65.
Whitbread, 2010	2010	Tony Whitbread	Thinking big - a better deal for connecting nature	Magazine article	ECOS 31(3/4), pp. 18-24.
Taylor, 2010	2010	Peter Taylor	Lakeland valleys and Somerset Hills - a tale of two managements	Magazine article	ECOS 31(3/4), pp. 40-44.
Goulding, 2010	2010	Martin Goulding	Hindsight in the management of Britain's wild boar	Magazine article	ECOS, 31(2), pp. 36-41.
Taylor (ed), 2011 (d)	**2011**	**Taylor, Peter (ed)**	**Rewilding: ECOS writing on wildland and conservation values**	**Book (edited)**	**Ethos: Oxford**
Taylor, 2011 (c)	2011	Peter Taylor	Rewilding – The realisation	Book chapter	
Taylor, 2011(b)	2011	Peter Taylor	Development of a wildland strategy: a short history	Book chapter	
Saunders, 2011	2011	Gavin Saunders	Neroche	Magazine article	ECOS, 32.
Gow, 2011	2011	Derek Gow	Tayside beavers - rights in the watershed	Magazine article	ECOS, 32.
Taylor, 2011 (a)	2011	Peter Taylor	Re-introduction of iconic species	Magazine article	ECOS, 32(1), pp. 74-80.
Sandom et al., 2013	2013	Sandom et al.	Rewilding	Book chapter	Key Topics in Conservation Biology, D.W. MacDonald and K.J. Willis (eds), Wiley: London
Monbiot, 2013	**2013**	**Monbiot, George**	**Feral**	**Book (monograph)**	**Penguin: London**

Monbiot, 2013, Chapter 1	2013	Monbiot, George	Raucous Summer	Book chapter	
Monbiot, 2013, Chapter 2	2013	Monbiot, George	The Wild Hunt	Book chapter	
Monbiot, 2013, Chapter 3	2013	Monbiot, George	Foreshadowings	Book chapter	
Monbiot, 2013, Chapter 4	2013	Monbiot, George	Elopement	Book chapter	
Monbiot, 2013, Chapter 5	2013	Monbiot, George	The Never-spotted Leopard	Book chapter	
Monbiot, 2013, Chapter 6	2013	Monbiot, George	Greening the Desert	Book chapter	
Monbiot, 2013, Chapter 7	2013	Monbiot, George	Bring Back the Wolf	Book chapter	
Monbiot, 2013, Chapter 8	2013	Monbiot, George	A Work of Hope	Book chapter	
Monbiot, 2013, Chapter 9	2013	Monbiot, George	Sheepwrecked	Book chapter	
Monbiot, 2013, Chapter 10	2013	Monbiot, George	The Hushings	Book chapter	
Monbiot, 2013, Chapter 11	2013	Monbiot, George	The Beast Within (or How Not to Rewild)	Book chapter	
Monbiot, 2013, Chapter 12	2013	Monbiot, George	The Conservation Prison	Book chapter	

Monbiot, 2013, Chapter 13	2013	Monbiot, George	Rewilding the Sea	Book chapter	
Monbiot, 2013, Chapter 14	2013	Monbiot, George	The Gifts of the Sea	Book chapter	
Monbiot, 2013, Chapter 15	2013	Monbiot, George	Last Light	Book chapter	
Wall Kimmerer, 2013	**2013**	**Wall Kimmerer, Robin**	**Braiding Sweetgrass**	**Book (monograph)**	**Penguin: New York**
Wall Kimmerer, 2013, Preface	2013	Wall Kimmerer, Robin	Preface		
Wall Kimmerer, 2013, Chapter 1	2013	Wall Kimmerer, Robin	Skywoman Falling		
Wall Kimmerer, 2013, Chapter 2	2013	Wall Kimmerer, Robin	The Council of the Pecans		
Wall Kimmerer, 2013, Chapter 3	2013	Wall Kimmerer, Robin	The Gift of Strawberries		
Wall Kimmerer, 2013, Chapter 4	2013	Wall Kimmerer, Robin	An Offering		
Wall Kimmerer, 2013, Chapter 5	2013	Wall Kimmerer, Robin	Asters and Goldenrod		

Wall Kimmerer, 2013, Chapter 6	2013	Wall Kimmerer, Robin	Learning the Grammar of Animacy		
Wall Kimmerer, 2013, Chapter 7	2013	Wall Kimmerer, Robin	Maple Sugar Moon		
Wall Kimmerer, 2013, Chapter 8	2013	Wall Kimmerer, Robin	Witch Hazel		
Wall Kimmerer, 2013, Chapter 9	2013	Wall Kimmerer, Robin	A Mother's work		
Wall Kimmerer, 2013, Chapter 10	2013	Wall Kimmerer, Robin	The Consolation of Water Lillies		
Wall Kimmerer, 2013, Chapter 11	2013	Wall Kimmerer, Robin	Allegiance to Gratitude		
Wall Kimmerer, 2013, Chapter 12	2013	Wall Kimmerer, Robin	Epiphany in the Beans		
Wall Kimmerer, 2013, Chapter 13	2013	Wall Kimmerer, Robin	The Three Sisters		
Wall Kimmerer, 2013, Chapter 14	2013	Wall Kimmerer, Robin	Wisgaak Gokpenagen: A Black Ash Basket		

Wall Kimmerer, 2013, Chapter 15	2013	Wall Kimmerer, Robin	Mishkos Kenomagwen: The Teachings of Grass		
Wall Kimmerer, 2013, Chapter 16	2013	Wall Kimmerer, Robin	Maple Nation: A Citizenship Guide		
Wall Kimmerer, 2013, Chapter 17	2013	Wall Kimmerer, Robin	The Honorabe Harvest		
Wall Kimmerer, 2013, Chapter 18	2013	Wall Kimmerer, Robin	In the Footsteps of Nanabozho: Becoming Indigeous to Place		
Wall Kimmerer, 2013, Chapter 19	2013	Wall Kimmerer, Robin	The Sound of Silverbells		
Wall Kimmerer, 2013, Chapter 20	2013	Wall Kimmerer, Robin	Sitting in a Circle		
Wall Kimmerer, 2013, Chapter 21	2013	Wall Kimmerer, Robin	Burning Cascade Head		
Wall Kimmerer, 2013, Chapter 22	2013	Wall Kimmerer, Robin	Putting Down Roots		
Wall Kimmerer, 2013, Chapter 23	2013	Wall Kimmerer, Robin	Umbilicaria: The Belly Button of the World		

Wall Kimmerer, 2013, Chapter 24	2013	Wall Kimmerer, Robin	Old-Growth Children		
Wall Kimmerer, 2013, Chapter 25	2013	Wall Kimmerer, Robin	Witness to the Rain		
Wall Kimmerer, 2013, Chapter 26	2013	Wall Kimmerer, Robin	Windigo Footprints		
Wall Kimmerer, 2013, Chapter 27	2013	Wall Kimmerer, Robin	The Sacred and the Superfund		
Wall Kimmerer, 2013, Chapter 28	2013	Wall Kimmerer, Robin	People of Corn, People of Light		
Wall Kimmerer, 2013, Chapter 29	2013	Wall Kimmerer, Robin	Collateral Damage		
Wall Kimmerer, 2013, Chapter 30	2013	Wall Kimmerer, Robin	Shkitagen: People of the Seventh Fire		
Wall Kimmerer, 2013, Chapter 31	2013	Wall Kimmerer, Robin	Defeating Windigo		
Wall Kimmerer, 2013, Chapter 32	2013	Wall Kimmerer, Robin	Epilogue: Returning the Gift		

Pereira and Navarro (eds), 2015(b)	**2015**	Pereira and Navarro (eds)	**Rewilding European Landscapes**	Book (edited)	**Springer: Amsterdam**
Pereira and Navarro, 2015(a)	2015	Henrique Pereira, Laetitia Navarro	Preface	Book chapter	
Navarro and Pereira, 2015(a)	2015	Laetitia Navarro, Henrique Pereira	Rewilding Abandoned Landscapes in Europe	Book chapter	
Ceausu et al., 2015	2015	Silvia Ceausu, Steve Carver et al.	European Wilderness in a Time of Farmland Abandonment	Book chapter	
Cerqueira et al., 2015	2015	Yvonne Cerqueira, Laetitia M. Navarro, et al.	Ecosystem Services: The Opportunties for Rewilding in Europe	Book chapter	
Boitani and Linnell, 2015	2015	Luigi Boitani, John D.C. Linnell	Bringing Large Mammals Back: Large Carnivores in Europe	Book chapter	
Cortes-Avizanda et al., 2015	2015	Ainara Cortes-Avizanda, Jose A. Donazar, Henrique Pereira	Top Scavengers in a Wilder Europe	Book chapter	
Merckx, 2015	2015	Thomas Merckx	Rewilding: Pitalls and Opportunities for Moths and Butterflies	Book chapter	
Benayas and Bullock, 2015	2015	Jose Maria Rey Benayas, James M. Bullock	Vegetation Restoration and Other Actions to Enhance Wildlife in European Agricultural Landscapes	Book chapter	
Navarro et al., 2015	2015	Laetitia Navarro, Vania Proenca et al.	Maintaining Disturbance-Dependent Habitats	Book chapter	

Helmer et al., 2015	2015	Wouter Helmer, Deli Saavedra et al.	Rewilding Europe: A New Strategy for an Old Continent	Book chapter	
Jobse et al., 2015	2015	Judith C. Jobse, Loes Witteveen et al.	Preparing a New Generation of Wilderness Entrepreneurs	Book chapter	
Navarro and Pereira, 2015 (b)	2015	Laetitia Navaro, Henrique Pereira	Towards a European Policy for Rewilding	Book chapter	
Prior and Ward, 2016	2016	Prior and Ward	Rethinking rewilding: A response to Jorgensen	Journal article	Geoforum, 69, p. 132-135
Svenning et al., 2016	2016	Svenning et al.	Science for a wilder Anthropocene: Synthesis and future directions for trophic rewilding research	Journal article	PNAS, 4(113), p. 898-906
Jepson and Schepers, 2016	2016	Jepson and Schepers	Making space for rewilding: Creating an enabling policy environment	Policy brief	Rewilding Europe
Jepson et al., 2018	2018	Jepson, Schepers and Helmer	Governing with nature: a European perspective on putting rewilding principles into practice	Journal article	Philosophical Transactions of the Royal Society B: Biological Sciences, 373(1761).
Gammon, 2018	2018	Gammon, Andrea	The Many Meanings of Rewilding: An Introduction and the Case for a Broad Conceptualisation	Journal article	Environmental Values, 27(4), p. 331-350
Pettorelli et al., 2018	2018	Pettorelli et al.	Making rewilding fit for policy	Journal article	Journal of Applied Ecology, 55(3), p. 1114-1125.
Bakker and Svenning, 2018	2018	Bakker and Svenning	Trophic rewilding: impact on ecosystems under global change	Journal article	Philosophical Transactions of the Royal Society B: Biological Sciences, 373(1761).
Pettorelli et al. (eds), 2019 (a)	**2019**	**Pettorelli et al.**	**Rewilding**	**Book (edited)**	**Cambridge University Press: Cambridge**

Pettorelli et al., 2019 (b)	2019	Nathalie Pettorelli, Sarah M. Durant, Johan T. du Toit	Rewilding: a captivating, controversial, twenty-first-century concept to address ecological degradation in a changing world	Book chapter	
Johns, 2019	2019	David Johns	History of rewilding: ideas and practice	Book chapter	
Ward, 2019	2019	Kim Ward	For wilderness or wildness? Decolonising rewilding	Book chapter	
Du Toit, 2019	2019	Johan T. du Toit	Pleistocene rewilding: an enlightening thought experiment	Book chapter	
Svenning et al., 2019	2019	Jens-Christian Svenning, Michael Munk, Andreas Schweiger	Trophic rewilding: ecological restoration of top-down trophic interactions to promote self-regulating biodiverse ecosystems	Book chapter	
Carver, 2019	2019	Steve Carver	Rewilding through land abandonment	Book chapter	
Miller and Hobbs, 2019	2019	James R. Miller, Richard J. Hobbs	Rewilding and restoration	Book chapter	
Bauer and Atzigen, 2019	2019	Nicole Bauer, Aline von Atzigen	Understanding the factors shaping the attitudes towards wilderness and rewilding	Book chapter	
Maller et al., 2019	2019	Cecily Maller, Laura Mumaw, Benjamin Cooke	Health and social benefits of living with 'wild' nature	Book chapter	
Clayton, 2019	2019	Susan Clayton	The psychology of rewilding	Book chapter	
Hall, 2019	2019	Marcus Hall	The high art of reiwlding: lessons from curating Earth art	Book chapter	
Sandom and Wynne-Jones, 2019	2019	Christopher J. Sandom, Sophie Wynne-Jones	Rewilding a country: Britain as a case study	Book chapter	

Linnell and Jackson, 2019	2019	John D.C. Linnell, Craig R. Jackson	Bringing back large carnivores to rewild landscapes	Book chapter	
Owens and Wolch, 2019	2019	Marcus Owens, Jennifer Wolch	Rewilding cities	Book chapter	
Seddon and Armstrong, 2019	2019	Philip J. Seddon, Doug P. Armstrong	The role of translocation in rewilding	Book chapter	
Hayward et al., 2019	2019	Matt W. Hayward, Sarah Edwards et al.	Top-down control of ecosystems and the case for rewilding: does it all add up?	Book chapter	
Delibes-Mateos et al., 2019	2019	Miguesl Delibes-Mateos, Isabel C. Barrio et al.	Rewilding and the risk of creating new, unwanted ecological interactions	Book chapter	
Corlett, 2019	2019	Richard T. Corlett	Auditing the wild: how do we assess if rewilding objectives are achieved?	Book chapter	
Butler et al., 2019	2019	James R.A. Butler, Juliette C. Young, Mariella Marzano	Adaptive co-management and conflict resolution for rewilding across development contexts	Book chapter	
Durant et al., 2019	2019	Sarah M. Durant, Nathalie Pettorelli, Johan T. du Toit	The future of rewilding: fostering nature and people in a changing world	Book chapter	

Appendix 2: Parent nodes and related themes after initial coding stage

Parent node and description	Related themes
Aims of rewilding – potential or intention to change what?	Self - Personal rewilding Ecocentrism/biocentrism Coexistence Human-nature relationship Biodiversity Recolonisation Conservation practice/culture Mitigate climate change Ecological processes Reduce human impact Self-sustaining or autonomous nature Wilderness Wildness
Barriers to rewilding (to change)	Apathy or attitudes Capitalism Consumption Cultural landscapes Fear or persecution of carnivores Human control or dominance Ignorance Changing climate Conservation culture Cultural barriers Ethical concerns Invasive species Lack of application/evidence Lack of resource Lack of rewilding definition Land use – agriculture Land use – forestry Land use – common land Land use – private land ownership Land use – recreation Multiple values Policy or politics Poor landscape planning Rewilding culture Shifting baseline syndrome
Context of rewilding – change why. Factors driving the emergence and evolution of the concept of rewilding.	Activism Anthropocene Climate change Dewilding Extinction crisis Reaction against existing conservation culture/policies Emerging ecological theories

	Increased awareness of complexities and human-nature interdependencies
	Influential people/projects/literature
	Land abandonment/urbanisation
	Public interest
	Successes
	Wilderness movement
	Human wellbeing
	Tackling shifting baseline syndrome
Interventions or methods for rewilding – change how?	3Cs (cores, corridors, carnivores)
	Connectivity
	Cores or protected areas
	Methods for cultural rewilding (hearts and minds)
	Degrees or continuum
	Habitat restoration
	Invasive species management
	Passive rewilding or reduce management
	Policy reform
	Reduce or remove evidence of humans from landscape
	Species translocation
	Sustainable land use

Appendix 4: Final codebook extracted from Nvivo

This includes all codes relevant to this PhD thesis. The "Description" column provides definitions for the nodes together with reflexive notes considering the nodes and how they could be refined (July 2023).

Rewilding framework elements	These are elements of change - what is rewilding intending to change, how will it change, why does it need to change.
Change how	Interventions or methods used to achieve rewilding aims. Separate this chapter into principles and interventions - but where does monitoring/assessment fit in?
Interventions	about expanding opportunities or potential. Purpose of this section is to list all potential interventions - not to debate which is the best intervention - as the best interventions will depend on the local conditions.
Corridors and buffers	Direct reference to the use of corridors or connectivity to achieve rewilding aims. Sustainable land use separate as this theme can be separate to buffers or habitat restoration.
Habitat restoration	Direct reference to habitat restoration to achieve rewilding aims. Can "habitat" extend to human habitat - e.g. Wall Kimmerer chapter putting down roots?
Invasive species management	Conflict with ecological surrogates identified.
Mitigating human-wildlife conflict	Promoting coexistence or tolerance for wildlife, establishing tolerable levels of risk, to achieve rewilding aims. Finding compromises - including for example effects on things that people value, like bluebells and wild boar. This creates compromise putting people first? These values would be part of initial place-based assessment.
Monitoring	Included in here that first assessment stage - need to be more specific about how and why this step is done, what is assessed? Maybe fits under context specific? This step can include interdisciplinary and local knowledge re natural history and change in human-nature relationships over time, land use etc. Conflict here between expectations of scientific research standards (treatments, research design) and pragmatics.
Networking, knowledge sharing	In terms of groups and people. Creating or expanding opportunities through alignment across groups/organisations.
Protection of areas, cores	Using core areas or protected areas to achieve the aims of rewilding. As well as issues/opportunities relating to the use of these to enhance rewilding aims. Includes protection (ie policies or private protection, e.g. purchasing land, reclaiming land, e.g. Eastern Cape Tourism, South Africa?)
Public engagement and education	Conservation advocacy. Including communities and stakeholders in rewilding plans, getting 'buy in'. A strong emphasis on experiencing nature as a means to appreciate or value it (Barlow 1999). Probably need separate for experience, Thoreau - mindfulness and awareness? Expanding opportunities through education and raising

		awareness, gaining support. Includes preservation of cultural heritage features.
	Regional networks of protected areas (TWP approach)	An amalgamation of cores, corridors, carnivores, landscape-scale mapping and plans/opportunity mapping.
	Species translocation or species related interventions	species translocation in general. Find definitions for reintroductions, translocations etc.
	De-extinction or domestication	Reversing extinction or back breeding to de-domesticate species to use in re-introductions/translocations.
	Taxon replacement or ecological surrogates	Reference to using replacement species for extinct species. To understand which species are missing we must take into account anachronisms of extant species, but this doesn't necessarily mean that introducing a replacement will be possible or high priority. Are the functions (e.g. seed dispersal) being served adequately by existing species or is there a threat that the species in question will go extinct in the long-run because of missing anachronisms.
	Sustainable land or resource use, including species protections	Should this be under connectivity or habitat restoration? Or combine all three? Purchasing power - choosing to buy sustainably produced things (Wall Kimmerer honourable harvest)
Principles, conservation and scientific paradigms (affect change to)		Need for change to conservation or scientific paradigms. Initially under "change what" but more suitable in "change how" as this informs how rewilding is practiced.
	Active and inspiring, vision	Make tangible change that is inspiring or inspires more positive change, a reaction to doom and gloom or action that isn't effective. Including radical or innovative. Challenging, creating debate. Inspiring change in society or conservation biology. Transformative change. Need a vision to work towards and unify collective application (Foreman p 4)
	Adaptive and dealing with uncertainty	Not pre-determined future. Also about giving in to the collaborative process rather than basing goals on your own intentions/desires. Link to innovative/inspiring/proactive - we're getting to the point where we have to push the levels of risk to find effective solutions. Slight contradiction here with pragmatism or just that we need both in tandem. Tolerating vs embracing? Linked to relativism, constructivism, there is no one truth (complexity, value pluralism).
	Balance of stewardship and non-human autonomy	No pre-defined outcomes or maintaining certain desirable features. Humility must then also extend to our perceptions of time - we are short-sighted in comparison to nature's timescales and evolutionary requirements. If we are to let nature decide they must have the means to do so - but how far back do those means extend? Balance between humility and stewardship. human barriers include administration/funding/red tape etc of conservation.
	Based on science and evidence	Ecological theories but also reflecting holism, i.e.social-ecological considerations
	context dependent place based	Adaptive management, iterative. Including embracing uncertainty, ability to adapt to unexpected events. Context dependent. Also includes the evolution of concepts related to rewilding/conservation, i.e. contexts change as understanding changes, therefore links to

		tolerating uncertainty. Move "adaptive" to risk and uncertainty and have context-specific separate. linked to monitoring. here and now
	Degrees or continuum, iterative, pragmatism	Reference to degrees of rewilding or near rewilding. Or reference to a variety of means. This also captures that rewilding can be top down or bottom up - i.e. working at the regional affecting local, or working at the local with the intention to affect regional in the long term. Phased approach. With no fixed end point.
	Economically viable/sustainable	Entrepreneurial - not necessarily a bad thing when harnessing funding for the purposes of ecological restoration/rewilding, but funding or income can become the main aim – then becomes unsustainable? Not just economic sustainability but integrating project into fabric of system. Link to long-term thinking. (move to systems thinking?)
	Inclusive collaborative	Challenge exclusivity of science. Inclusive, collaborative, including other perspectives. Collaborative across disciplines, knowledges, individuals, organisations, with communities and other stakeholders. Including the needs of people - not divorced from the needs of people. Working together to make change happen. But also need to realise limitations to local knowledge - esp if influenced by SBS and anthropocentric values.
	Large scale (systems thinking, holistic)	Including landscape scale. Not beholden to political or superficial spatial boundaries. Complexity reflecting social-ecological interactions and SES framings.
Change what		Potential or intention to change what, aims or intentions of rewilding.
	Cultural change	Which extends in many instances to our economic and political systems. Culture must evolve as ecosystems evolve. If humans are part of nature (holistic ontology) then we are part of evolution/change. Ecocentrism is not to revolt against humanity but to understand our humanity and accept it is part of a whole and be mindful of that whole in our actions. Something in here about that argument that everything is nature even bulldozers etc? See snyder chapter 5. due to pluralistic nature of values, culture and perceptions of nature, the qualities are grey areas but to accommodate at very least.
	Accommodating nature, making space	This node is the human role in coexistence and reciprocity - involves giving physical space and time to natural processes but also cultural elements related to coexisting with nature, such as acceptance/tolerance. Relates to question of withdrawing human influence. Appreciating also the connections - so ecocentric link. Stewardship. Less demand on natural resources. changing perceptions of nature. Continuum between merely tolerating to actively restoring, making space, kinship etc.
	Custodian, stewards, responsible	
	H-N relationship	Ecocentrism: Position that other living things/ecological processes have intrinsic worth and can be the direct objects of moral concern. We can act on behalf of an "other's" interests. psychological and spiritual (Snyder) reconnection of H&N, coexistence more physical. rejecting "society" that's disconnected and wasteful. bring in welfare issues of biocentrism. also linked to practice. May need to separate

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		Ecocen and Reconnection? - reconnect on many levels incl economics. Connection requires understanding.
	Sense of place, cultural and natural heritage	Linked to place-based solutions. "Place" is not fixed or constant - it can change as systems change, as culture changes, including from outside influences. Currently a detachment from places i.e. access to its natural resources - telecoupling. Economic value outweighing relational value or sense of place. Conflict between sense of place and sense of loss associated with rewilding changes in the landscape. commitment to here and now. Linked to ecological knowledge/awareness. More than relational value - local knowledge.
	Sustainable use, knowledge of and accepting limitations	Also include cultures that are not wasteful or that have knowledge of and live withing their means and needs (including reducing consumption). Understand the "rules" of living wild, the "etiquette of freedom"; with rights come responsibilities. Self sufficiency.
	Ecological knowledge (opp shifting baseline)	including wider functioning and interconnectedness not just favoured species - so more than just value for nature.
	Tolerance of risk, natural processes we have previously controlled	Unpredictability, tolerance. What Thoreau states is physical tolerance - harder skin etc. By continuing to control, we take away potential to understand and to coexist. Therefore nature becomes other, risky and feared. Also about changing, evolving culture over time to suit the current conditions - see example from Snyder page 114. To coexist with nature we must... Connection between controlling nature and being in a controlled society. impermanence. sense of practicality or pragmatism/unconscious - nature simply is.
	Valuing wildness	Understanding the value of nature and integrating it into decision making. Not just monetary value but appreciation for nature. learning the value of natural resources that have been picked/processed by hand (Kimmerer) – so connection. Also value it for the services it provides our "kin" also value feeling of wildness. gratitude. Difficult to divide these as there is an overlap between instrumental and relational value (see Chan et al 2018)
	Assigned or instrumental	
	Intrinsic value	
	Relational	while relational value may account for relationship to and a sense of responsibility towards a place, sense of place also includes local knowledge which contributes to the capacity to sustainably use resources - knowing when to stop before tipping point is reached. These tipping points must then also be cultural as well as ecological - to negatively impact cultural attachment and knowledge of place. value/tolerance for unpredictability, surprise can contribute to wellbeing?
	Wellbeing incl. resilience, thrive	A more fulfilled, aware, happy society. And reinvigorated communities. Resilience to change. Issue here with short vs long-term impacts on wellbeing and perceptions of wellbeing. Rewilding diversifies natural resources/ecosystem services and therefore contributes to societal resilience and wellbeing, where value for those increases are felt by society - i.e. values are diversified. If extant values don't coincide people will feel they're losing out, so

		fundamentally need change to values where they potentially conflict? Virtuous cycle?
Ecological change		
	Diversity heterogeneity	Abundance
	Ecological integrity	Restoring/renewing/improving and maintaining natural processes/ecological function, interactions, processes, dynamics, integrity and/or structure; includes acknowledgement of degraded systems, allowing land to fulfill ecological potential, maintain ecosystem balance, novel function. Includes functions specific to a species.
	Abiotic or disturbance	Specific reference to abiotic processes eg fire
	Dispersal	
	Trophic or species interactions	Still under aims - change what - as many highlight this as an aim (rather than an intervention/change how i.e. species translocation). There will be some crossover - restore trophic interactions (what) by species translocation (how). Regulatory roles of carnivores.
	Viable populations	
	Ecosystem services and climate change mitigation	Direct reference to restoring ecosystem services as an aim of rewilding. Also references to the need to incorporate climate change and climate change mitigation. People don't provide the ecosystem services, but they will need to value them in order to feel benefits so on the socio-cultural side we need to increase value for a more diverse range of ecosystem services, esp. relational values which contribute to H-N connection and desire to restore/preserve ecosystem services - virtuous cycle.
	Evolutionary processes	Direct reference to evolutionary processes (restoring).
	Indigenous	With an emphasis on coevolution. Conflicts with novel ecosystem concept.
	non-human autonomy, self-willed, undomesticated	Reference to self-sustaining, self-willed, autonomous, self-regulating, self-managing, self-organising nature, nature in control (although this implies ecological function). Let nature redirect itself, allow to take own course, space and time to determine own patterns. Spontaneous nature. non-human autonomy as apposed to nature dominated and controlled by humans. Free natural movement of species (to an extent). self-regulating, thereby needing minimal management. RWK takes this to the next level eg 129.
	Ecosystem resilience	Resilience/sustainability of a system - to withstand change.
Landscape or systemic		
	Coexistence	Physically existing in the same time and place. Blurring lines between humans and nature. Coexistence means policies and projects which balance the NEEDS of people with the needs of wildlife.
	Complexity, multipurpose, reintegration, for all	Of habitats, species, even a human element, i.e. cultural diversity? Also purposes that include the need for food production - so farming etc. When moving towards a more multipurpose landscape, sense of place and cultural identity can help towards more sustainable forms of agriculture. moving towards use of SES concept rather than separating them.

	Reciprocity cooperation	Includes those unintentional, unconscious benefits we create for nature (as nature's benefits are unconsciously given to us). Some assumption (Rewilding Europe and related) that economic incentives are essential. But nature provides far more than monetary value. Reciprocity addresses the division between anthropocentrism and biocentrism - it's okay to value what we get from nature if we reciprocate. Anthropocentrism alone will mean a fragile future for nature. Interdependence.
	Resilience and sustainability	resilience and sustainability is something that is intentionally created by humans and upheld together with nature.
	Wildness or wilderness	Not entirely sure this isn't an overarching theme - ie rewilding - to make wild again. But other aims are compartmentalized, so... There are aspects of wilderness that align with rewilding aims (ecological integrity, space for apex predators etc) but others that are not necessary - e.g. removing evidence of human habitation - there doesn't seem to be any scientific reasoning behind these elements, they are purely aesthetic so would only appease aesthetic values. Wildness and wilderness are social-ecological concepts.
Change why (drivers and context)		context, factors driving the emergence and evolution of rewilding.
	Advances in ecological science	Ecological knowledge/theories that informed ecological restoration/rewilding.
	Anthropocene (outcome of below)	The concept as well as negative impacts of the Anthropocene. Need to look within this for elements that make activities unsustainable - potentially movement and sense of place? Wanting to go back to simpler times or right the wrongs - here not just in the sense of ecological dewilding but cultural dewilding too (h-n disconnection). dewilding process demonstrates that human-nature connection is essential for rewilding in the long term, but that protection will be required in the meantime to halt or slow dewilding?
	Colonialism, cultural hegemony	Culture of colonisers causing degradation. Colonialism/imperialism and related forced land removals lead to human-nature detachment - which is root of concerns of land-sparing management strategies and buying up land privately which can lead to exclusion, e.g. SA safari parks for the wealthy foreigner. Includes feelings of over civilization and extinction of experience. Cultural repression and disenfranchisement of non landowners; cultural loss, loss of knowledge of how to persist sustainably.
	Escalating human influence (influence exerted, cause)	Constantly outstripping natural resources and moving on (linked to colonialism). While issues with wilderness protection are acknowledged, nature continues to need protection from humans in many places, and therefore protected areas are still a relevant method. Better to emphasise the needs of nature than human values in the protection. Incr. scale of overexploitation. When was the tipping point?
	Human nature detachment; extinction of experience	Linked to tolerance/risk as detachment means we lose knowledge of how to coexist. sterilisation of environment. Something here about keeping cultural practices that sustain connection to a species - for example the salmon fishing from Parks Canada and the wild boar example from Gow 2002. Also physical separation between humans and nature e.g. urban/agricultural vs unproductive. Othering

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		including nostalgia for frontier/tourism/adventure; impacts on wellbeing.
	Knowledge hegemony and culture of science	
	Overcivilisation, wellbeing	linked to value for control and order - civilization meant no need to follow instincts in the wild, follow only well-worn paths and roads between cities, no need to leave the house or villages and therefore not physically (or emotionally/psychologically) ready for risk.
	shifting baseline	
	species and habitat loss and wider impacts (effects)	Declines in biodiversity. Including causes of, such as habitat degradation, pollution, overconsumption. Also evolutionary ghosts or extinction of single species, i.e. missing puzzle pieces. Through losses we have also lost the ability to learn from or connect with other species. Causes include moving away from traditional practices e.g. hedgerows or traditional farming practices.
	Value for control and order	
	Conservation activism or advocacy, momentum	Conservation activism influencing conservation biology or the emergence of rewilding. Support based on different values - values for wilderness based on nostalgic view of frontiersmen etc vs value for cultural identity/sense of place of indigenous people
	Policy shifts	
	Wilderness movement	Reference to the roots of rewilding in wilderness movement. Driven by deforestation.
Culture of conservation or science		Specific to field of conservation or science/scientists. Not Anthropocene culture in general. look back at RPS survey comments re this node.
	Ad-hoc approach	
	Doom and gloom messaging	Evidence that conservation practice was not stemming extinction crisis. Species-specific or ex-situ conservation references (i.e. they're not working).
	Extractive focus	
	Historic marginalisation of indigenous people	As an influence/driver of rewilding emergence and concept.
	Humanist policies	Might fit under culture of conservation - i.e. conservation that is anthropocentric.
	lack of policy-science integration	
	Predictability, pre-determined conditions	Not dealing with uncertainty, reliance on positivistic approaches, disciplinary barriers and hangovers from trad science.
	Separating humans from nature	
	shifting baseline	
Ecosystem services understanding		Also then increased funding opportunities - but this means rewilding must obtain certain requirements for ecosystem services.
History of rewilding		as opposed to context, history is specific to the birth of rewilding - specific events and people/organisation.

Influential people or organisations	Specific personalities and organisations that are mentioned as influential. May need to break these down by specific individuals/organisations? Also policy. Or publications or concepts.	
Historic moments	Specific events related to establishing rewilding - largely from pioneer survey data.	
Influential texts		
Land abandonment and urbanisation	Creating opportunities for rewilding through land abandonment and passive or spontaneous rewilding. Can we see land abandonment as a symptom of the process of dewilding being unsustainable?	

Appendix 5: RPS respondents

List of respondents to the Rewilding Pioneers Survey undertaken in 2018, the first set of data used in this research.

#As answered in the survey.

*Participants may have been identified by more than one method, but this is the reason they were first contacted.

| Participant	Normal country of residence#	Affiliation#	Method of identification as a "pioneer"*
Annon. (incomplete)	USA		
Karina Aguilar	Mexico		RTG recommendation
Paul Beier	USA	Northern Arizona University	Snowball
Liesbeth Bakker	The Netherlands	Netherlands Institute of Ecology (NIOO-KNAW)	Snowball
Connie Barlow	USA		Author – WildEarth
Marc Bekoff	USA	Independent	Author – book
Keith Bowers	USA	Founder and principal of Biohabitats, Inc.	Snowball
Rob Brewster	Australia		RTG recommendation
James Butler	Australia	CSIRO	Snowball
Susan Clayton	USA	College of Wooster, Department of Psychology	Snowball
Rachel Corby	England		Author – book
Eileen Crist	USA	Virginia Tech, Associate Professor, Department of Science, Technology, and Society	Author – WildEarth
Kim Crumbo	USA		Author – WildEarth
John Davis	USA	The Rewilding Institute (executive director), Eddy Foundation (board member), RESTORE: The North Woods (board member), Champlain Area Trails (board member)	Author – WildEarth
Kristin DeBoer	USA	Northeast Wilderness Trust, board. Kestrel Land Trust, Executive Director, Land Trust Alliance Leadership Council.	Author – WildEarth
Josh Donlan	Spain and USA	Advanced Conservation Strategies/Cornell University	Author – journal
Martin Drenthen	The Netherlands	Associate Professor of Environmental Philosophy, Radboud University	RTG recommendation
Johan du Toit	USA	Utah State University	Expression of interest
Sarah Durant	UK and Tanzania	ZSL, WCS	Expression of interest

John Elder	USA	Professor Emeritus of Environmental Studies, Middlebury College	Author – WildEarth
Caroline Fraser	USA	Freelance writer	Author – book
Andrea Gammon	The Netherlands, USA	Lecturer, TU Delft	RTG recommendation
George Gann	USA	Society for Ecological Restoration, The Institute for Regional Conservation	Snowball
Tom Gray	Cambodia	Wildlife Alliance	Expression of interest
Owen Lee Griffiths	Mauritius	Managing Director BCM Ltd; Research Associated Australian Museum	Author – journal
Dennis Hansen	Switzerland	1) Zoological Museum of the University of Zurich; 2) Department of Evolutionary Biology and Environmental Studies (also UZH)	Author – journal
Wouter Helmer	The Netherlands	Rewilding Europe	Snowball
Eric Higgs	Canada	School of Environmental Studies, University of Victoria & Institute for Evolutionary Life Sciences, University of Groningen	Snowball
Jack Humphrey	USA	Director of Digital Outreach, Rewilding Institute	Author – WildEarth
Paul Jepson	UK	School of Geography and the Environment, University of Oxford	Expression of interest
Ignacio Jiménez Pérez	Argentina and Spain	The Conservation Land Trust, Tompkins Conservation	Snowball
Alexandros A. Karamanlidis	Greece, The Netherlands	Rewilding Europe	Expression of interest
Jozef Keulartz	The Netherlands	Wageningen University, Radboud University	RTG recommendation
Keith Kirby	UK	Department of Plant Sciences, University of Oxford	Snowball
Christopher Klyza	USA	Middlebury College	Author – WildEarth
Mike Letnic	Australia	University of New South Wales	RTG recommendation
Robert T. Leverett	USA	Co-founder Native Tree Society	Snowball
Jaime Lorimer	UK	School of Geography, University of Oxford	Author – journal
Brendan Mackey	Australia	Griffith University, Great Eastern Ranges Initiative	RTG recommendation
Cecily Maller	Australia	RMIT University	Snowball
Brian Miller	USA	Retired	Author – WildEarth
Susan Morgan	USA	The Rewilding Institute, Rivers and Birds, New Mexico Wilderness Alliance, NPCA	Snowball

Laetitia Navarro	Germany	German Center for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig	Author – journal
Reed Noss	USA	Florida Institute for Conservation Science and Southeastern Grasslands Initiative	RTG recommendation
Mark Pearson	USA	Executive Director, San Juan Citizens Alliance, Durango, Colorado	Snowball
Nathalie Pettorelli	UK	ZSL	Expression of interest
Meredith Root-Bernstein	France	INRA, France	Author – journal
Michael Soule'	USA	Prof. Emeritus, University of California	Author – WildEarth
Mark Stanley-Price	UK	Senior Research Associate, WildCRU, University of Oxford	RTG recommendation
Philip Stephens	UK	Durham University	Expression of interest
Jens-Christian Svenning	Denmark	Center for Biodiversity Dynamics in a Changing World (BIOCHANGE), Department of Bioscience, Aarhus University, Ny Munkegade 114, DK-8000 Aarhus C, Denmark; Section for Ecoinformatics and Biodiversity, Department of Bioscience, Aarhus University, Ny Munkegade 114, DK-8000 Aarhus C, Denmark	Author – journal
Oisin Sweeney	Australia	Senior Ecologist, National Parks Association of NSW	RTG recommendation
Peter Taylor	UK	British Association of Nature Conservationists; Wildland Research Institute, Leeds University; British Ecological Society; Royal Anthropological Institute; Institute for Life-based Architecture (Germany).	Author – book
John Terborgh	USA	University of Florida – Gainesville; James Cook University, Cairns, Australia,	Author – WildEarth
Stephen C. Trombulak	USA	Department of Biology, Middlebury College	Author – WildEarth
Erwin van Maanen	The Netherlands	Rewilding Foundation	Expression of interest
Howie Wolke	USA	Wilderness Watch, Montanans for Gallatin Wilderness, co-founder of	Author – WildEarth

		the original wilderness-oriented Earth First!, not the entity that's out there now by the same name.	
Rebecca Wrigley	UK	Chief Executive of Rewilding Britain	Expression of interest
George Wuerthner	USA	No affiliations	Author – WildEarth

Appendix 6: Pajek network analysis

This figure is the original Pajek network analysis based on the RPS data and participant's answers to questions 2 and 3 regarding influences. Arrows show the direction of influence from the influencer to the participant.
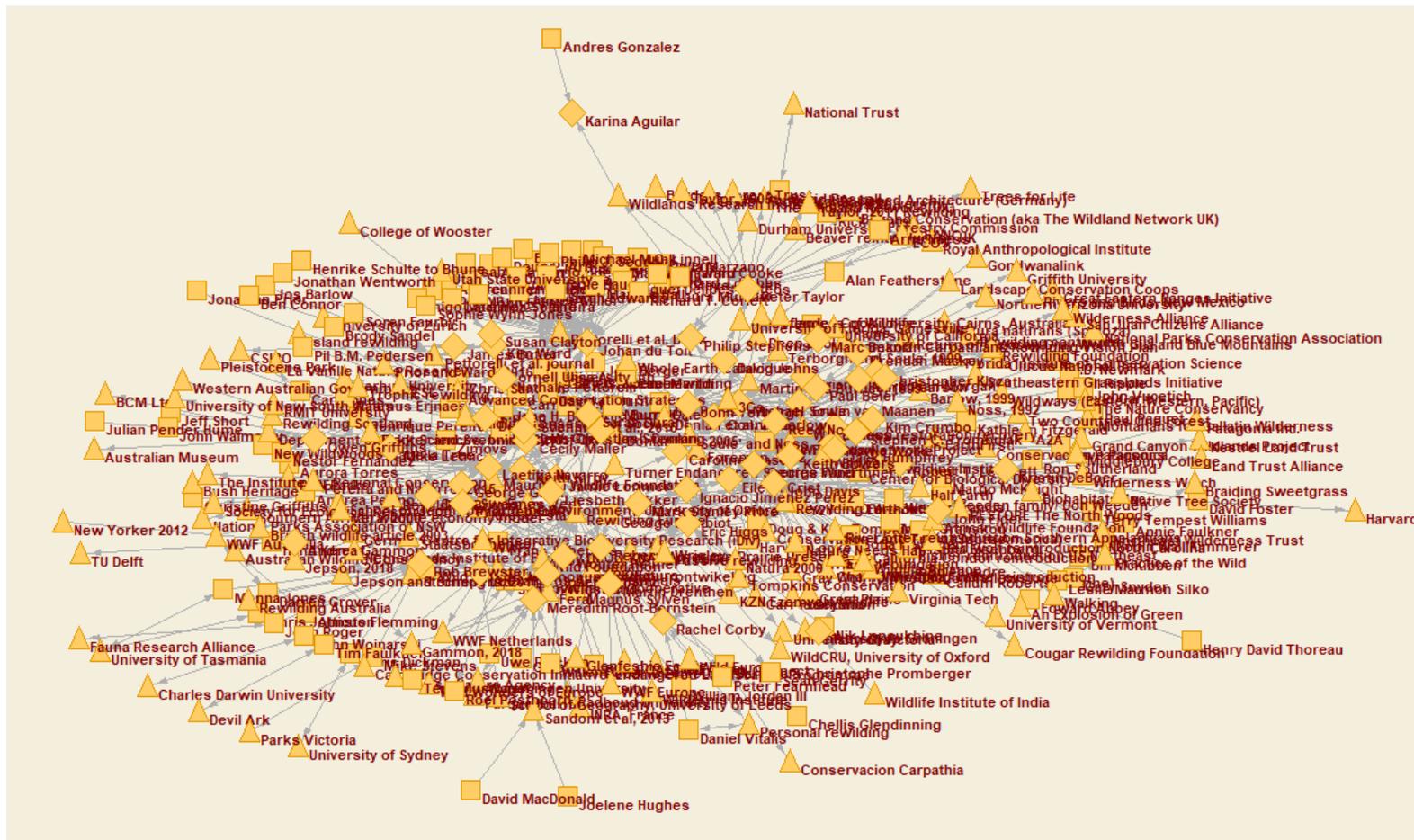
Glossary and abbreviations

Abduction: Similar to induction, abduction makes logical inferences about the world, however the outcomes are plausible explanations based on limited knowledge or observations (Given, 2008).

Anthropocene: Originally coined by Crutzen and Stoermer (2000), the "Anthropocene" refers to the proposed geological epoch characterized by significant human impact on the Earth's geology and ecosystems.

Anthropocentrism: Anthropocentrism denotes beliefs that value is human-centred and that all other beings are means to human ends, and therefore reflects a dualistic ontology (Kopnina *et al.*, 2018).

CGT: Constructivist grounded theory

Command and control: A top-down management style where decisions are made by a central authority. It is considered a simplistic approach to problem solving that is not suitable for complex problems (Holling and Meffe, 1996; Fernandez and Fernandez, 2008). It remains influential in environmental management and is considered a barrier to achieving long-term sustainability (Holling and Meffe, 1996; Briggs, 2003).

Complexity: "Complexity comes from the Latin word 'plexus' which indicates non-separability in components. Therefore, a good standard definition is that a Complex System is composed of many interacting units showing emerging properties that cannot be understood in terms of the properties of the individual isolated components" (San Miguel, 2023).

Cultural hegemony: This concept is defined within the data as "the way in which ideas and concepts which benefit a dominant class are universalized. They become norms, adopted whole and unexamined, which shape our thinking" (Monbiot, 2013, p. 154) and "assumptions of the most powerful that their views are correct and should be acted upon" (Gow, 2006).

Ecocentrism: Ecocentrism is a holistic ontology that places humans within an interdependent system with the rest of nature, recognising the intrinsic value of all species

within a system and prioritising the health of the system as a whole over individual or species-specific wellbeing (Washington *et al.*, 2017; Taylor *et al.*, 2020).

Human-nature disconnection: Beery *et al.* (2023) propose that human-nature disconnection in individuals is the lack of a sense of identity or belonging coupled with one's perception of nature, whereas societal disconnection looks at the collective, institutional, and social forms and drivers of this disconnection.

Land sparing and land sharing: The "land sparing" versus "land sharing" debate is ongoing in the field of conservation biology and focuses on evaluating whether approaches integrating agriculture or anthropogenic land use or approaches that separate anthropogenic land use and nature conservation will be most effective in conserving or restoring biodiversity (Kremen, 2015).

Leverage points: Leverage points refer to specific points within complex systems where interventions or changes can result in significant and often nonlinear impacts on the system's behaviour or outcomes, providing strategic areas where focused effort can bring about substantial shifts in system dynamics, structure, or overall functioning. Identifying and understanding leverage points can be crucial for effectively managing and influencing complex systems (Abson *et al.*, 2017).

Novel ecosystems: Due to human activities, novel ecosystems differ in species assemblage from those that prevailed historically and cannot be restored to a historical state (Miller and Hobbs, 2019).

Ontologies: In social anthropology, "ontologies" refer to diverse ways that people understand the nature of reality, existence, and the relationships between different entities (Kohn, 2015). In this thesis, dualistic ontologies refers to the position that humans are separate from nature, while holistic ontologies refers to the position that humans are part of nature.

OVP: Oostvardersplassen

Relational values: Relational values are values that arise from a person's relationship with nature, which can include sense of place, feelings of well-being, and cultural, community, or personal identities (Chan et al., 2016).

Relativism: Relativism rejects the notion of absolute truth and views reality as conditional, local, personal, and able to take on different forms depending on the perspective of each individual person (Lincoln, Lynham, and Guba, 2018).

RPS: Rewilding pioneer survey

RTG: IUCN Commission for Ecosystem Management Rewilding Thematic Group

SBS: Shifting baseline syndrome

SDGs: Sustainable development goals

SES: Social-ecological systems

TEK: Traditional ecological knowledge

Theoretical sampling: A feature of CGT that encourages the sourcing of rich data to explain the social phenomenon (Charmaz, 2014).

ToC: Theory of change

Traditional conservation: Associated with preservationist approaches to conservation, seeking to maintain natural areas in a pristine state, limiting human influence.

Transdisciplinary: Transdisciplinary approaches integrate knowledge and methods from multiple disciplines to address complex problems (Mauser *et al.*, 2013).

Transformative change: Transformative change is described as a "fundamental, system-wide reorganization across technological, economic, and social factors, including paradigms, goals, and values and is promoted as essential to achieving global sustainability" (IPBES, 2019).

Induction: Induction is a process of reasoning that establishes a relationship between observations and theory, moving from particular instances to conclusions about general principles (Given, 2008).

Intra-action: "Intra-action" is a term replacing "interaction," which necessitates pre-established bodies that then participate in action with each other. Intra-action understands

agency as not an inherent property of an individual or human to be exercised, but as a dynamism of forces (Barad, 2007, p. 141) in which all designated "things" are constantly exchanging and diffracting, influencing and working inseparably.

IRT: Influential rewilding texts (the secondary data used in this research).

Methodological sensitivity: Defined by Bryant (2017, p. 36) as *"the skill or aptitude required by researchers in selecting, combining, and employing methods, techniques and tools in actual research situations."*

UoC: University of Cumbria

US: United States

UK: United Kingdom

Vicious and virtuous cycles: In SES science, the concepts of vicious and virtuous cycles are used to explain how systems can amplify either detrimental or beneficial effects over time. A vicious cycle refers to a negative self-reinforcing loop spurred by intra-acting detrimental events or conditions, while a virtuous cycle refers to a positive self-reinforcing loop spurred by intra-acting beneficial events or conditions (Jones, Jiggins and Pimbert, 2011; Turnbull, Clark and Johnston, 2021).

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