

REPORT NO. 3725

COLLECTIVE APPROACHES TO ECOSYSTEM REGENERATION IN AOTEAROA NEW ZEALAND

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COLLECTIVE APPROACHES TO ECOSYSTEM REGENERATION IN AOTEAROA NEW ZEALAND

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EXECUTIVE SUMMARY

There is a growing interest in scaling community-led ecosystem regeneration initiatives to extend, replicate, or coordinate activities across space, and expand or deepen the scope of regeneration activities.

This study characterises the diversity of collective approaches to ecosystem regeneration in Aotearoa New Zealand by drawing on 1) a review of the international literature on scaling restoration and collective action, and 2) a survey of 27 ecosystem regeneration collectives. The insights developed through this research contribute to theory on scaling ecosystem regeneration and may inform the work of organisations involved in collective regeneration.

Key insights from the literature

‘Scaling’ has become a buzzword within the conservation and restoration literature, reflecting widespread perceptions that restoration practice needs to change if we are to reverse the decline of biodiversity on national and global scales. Scaling regeneration implies more than just increasing the spatial extent or frequency of restoration activities; it may also involve improving the efficiency and resilience of regeneration initiatives, and changing wider system rules and values.

Our review of international research identified five models for scaling community-based regeneration. Mass mobilisation, community group formation, network building, collaboration and commons management provide alternative ways for individuals, community groups, iwi/hapū and governance organisations to work together to scale regeneration activities and outcomes.

Key results from survey of ecosystem regeneration collectives

In this study, multiple community groups and other entities working together on a regular basis towards shared regeneration goals are referred to as ‘collectives’. The entities that comprise collectives are referred to as ‘constituent groups’. Collectives provide constituent groups with additional capacity and capability to undertake ecosystem regeneration.

Representatives of 27 collectives were surveyed to gather descriptive information on the composition, structure, purpose, activities and impact of collectives across the country.

The collectives surveyed are comprised of a mixture of government entities, iwi/hapū and local environmental groups; many collectives include a central entity that supports constituent groups and coordinates activities. They are often formed through community efforts, based on a combination of negative (e.g. frustration with existing management) and positive drivers (e.g. existing social ties). Government agencies, NGOs and philanthropic foundations have also played a key role in instigating and enabling collective formation, and in some cases continue to lead collectives. Many collectives have a complex internal structure, featuring variable relationships among constituent groups and between these groups and the collective.

Collectives derive their funding from similar sources to community groups, predominantly government grants and donations. However, they are almost all able to employ paid staff, compared with just over half of the 12 constituent groups surveyed. Participants considered paid staff to be important to the outcomes of collectives, by providing them with capacity to coordinate and communicate with groups and partners.

Most collectives are 'geographically' or 'ecologically' defined, having been brought together by their shared connection to a socio-political or natural area. Social connections were identified as important in shaping the identity of some collectives. A wide range of context-specific purposes were attributed to collectives, including objectives for places, ecosystems, communities and species, as well as aspirations for how groups would work together and engage the public. Relative to constituent groups, collectives' purpose and goals were more often recorded in a guiding document, such as a plan, strategy, or vision statement.

Both collectives and their constituent groups undertake monitoring, public education and engagement, pest control and planting activities. Compared to constituent groups, collectives are more likely to undertake strategic activities, such as providing advice and support to other groups, fundraising and lobbying. Collectives use a combination of regular meetings and online communication to maintain relationships with constituent groups. Most collectives also have written agreements with constituent groups and/or partners, which set out their respective roles and responsibilities and how they will work together.

All survey participants perceived that involvement in a collective enables constituent groups to have greater impact. Participants reported that membership in a collective increases the: capacity and resources available to groups; connectivity between groups and with the environment; constituent groups' sense of identity and purpose, and their pride and confidence in their work; and groups' regeneration scope and objectives.

Participants were more hesitant in claiming that their collective has improved 'on the ground' outcomes for biodiversity, largely due to the recent creation of the collective, or limited monitoring data. Where collectives had undertaken monitoring, participants reported improvement in at least some biodiversity metrics; several reported greater and more rapid improvements in biodiversity than had been expected.

Typology of collective approaches to ecosystem regeneration in Aotearoa New Zealand

Analysis of the composition, structure, purpose, activities and resourcing of collectives in the survey reveal several distinct groups of collectives. Based on this grouping, as well as models of collective action in the literature, we propose a typology of five collective approaches to ecosystem regeneration in Aotearoa New Zealand: community networks; tangata whenua-led collectives; project-based collectives; agency-led collectives; and partnership initiatives.

Our typology reveals that collectives use distinct combinations of amplification processes to scale ecosystem regeneration. From our analysis of these processes, we suggest three pathways for enhancing collective ecosystem regeneration in Aotearoa New Zealand:

1. Strategic investment in collectives that are effective at building the capacity, capability and connectivity of community groups and landowners.
2. Collectives invest in relationship-building and collaboration between groups to grow their capacity to work together into the future.
3. Empower tangata whenua to engage in regeneration initiatives and institutions as partners, with a view to reshaping the wider conservation landscape.

In concluding, we offer some research questions that we believe can support the work of collectives to scale ecosystem regeneration in Aotearoa New Zealand into the future.

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GLOSSARY

Amplification processes	The actions deployed by sustainability initiatives together with other actors (e.g., from government, business, or society) to purposively increase their transformative impact (e.g., initiating a new initiative in another region) (Lam et al. 2020)
Collective action	People with shared interests acting in concert towards a common objective
Collectives	Multiple community groups and other entities working together on a regular basis towards shared regeneration goals
Community-led conservation	Initiatives that are initiated outside of national and local governance organisations. They may take advice or receive assistance from expert organisations, but they are led by members of the community (Shanahan et al. 2021)
Community-based ecosystem regeneration	Restoration or regeneration initiatives that are driven by community entities (e.g. iwi, hapū, local environmental groups) and centre community voices, interests and actions in their activities, though government and other organisations may also play an influential role
Constituent groups	The entities that comprise collectives, including local environmental or social groups, tangata whenua, national NGOs, government agencies, and industry organisations, among others
DOC	Department of Conservation
NGO	Non-Governmental Organisation (e.g. Forest and Bird)
Regeneration	Regeneration goes beyond restoring ecosystems to a past state by seeking to re-align human activity with ecosystem evolution so that natural systems regain their ability to sustain and nourish life (Regenesis 2015)
Restoration	The process of assisting the recovery of damaged, degraded or destroyed social-ecological systems in changing environments, for the benefit of people and nature across scales
Scaling	Increasing the impact of initiatives, for example by extending, replicating, or coordinating restoration activities across space, or expanding or deepening the scope of community initiatives
Social-ecological system	Complex, integrated systems in which humans are part of nature (Berkes & Folke 1998)
Tangata whenua	Local Māori with ancestral connections to a place
Te taiao	The natural world

1. INTRODUCTION

1.1. Background

Community-led ecosystem restoration has become a dominant approach to improving biodiversity outcomes in Aotearoa New Zealand in the last 20 years (Peters et al. 2015). A large and growing proportion of New Zealanders now participate in ecosystem restoration activities, supported by substantial investments in community initiatives by government, industry and philanthropic organisations (Shanahan et al. 2021). The centrality of community-led action to reversing biodiversity decline is reflected in Aotearoa New Zealand's 2020 biodiversity strategy—Te Mana o te Taiao¹—which lists 'empowering action' as one of three pou (pillars) of transformational change. As the strategy highlights, the scale of effort required to protect and restore our biodiversity exceeds the capacity of central and local governments and necessitates sustained action by all New Zealanders. Community-led approaches are also important vehicles for giving effect to Treaty partnership, by empowering hapū and iwi to achieve their aspirations for te taiao (Norton et al. 2016).

Traditionally, community-led approaches to ecosystem restoration have involved small-scale initiatives focused on the restoration of individual land parcels, natural features (e.g. offshore islands) and taonga species (e.g. kiwi) (Norton et al. 2018). Conservation research has highlighted that the typically local scale and narrow focus of such initiatives do not align with the ecological imperatives for landscape scale, multi-faceted regeneration (Brooks et al. 2013). *Regeneration* seeks broad social-ecological change to realign human activity with ecosystem evolution so that natural systems regain their ability to sustain and nourish life (Regenesis 2015).

The scale mismatch between site-based restoration and the need for widespread social-ecological change has led to a growing interest in scaling community initiatives to extend, replicate, or coordinate restoration activities across space, and expand or deepen the scope of community-led regeneration (Guerrero et al. 2013; Lam et al. 2020; Mumaw & Raymond 2021). Such scaling is represented internationally by catchment restoration programmes (e.g. Columbia River Basin Restoration Programme²) and organisations (e.g. Fraser Basin Council³), forest landscape restoration, urban forest strategies (e.g. Living Melbourne⁴) and large-scale habitat protection initiatives (e.g. Natura 2000⁵, Yellowstone to Yukon Conservation Initiative⁶).

¹ <https://www.doc.govt.nz/nature/biodiversity/aotearoa-new-zealand-biodiversity-strategy/>

² <https://storymaps.arcgis.com/stories/24979f1fd3124cc7bb4c85147d38eedc>

³ <https://www.fraserbasin.bc.ca/>

⁴ <https://resilientmelbourne.com.au/living-melbourne/>

⁵ https://ec.europa.eu/environment/nature/natura2000/index_en.htm

⁶ <https://y2y.net/>

In Aotearoa New Zealand the amplification of community-based regeneration activities is evident in the growing number and range of initiatives that seek to forge connections across communities and organisations to improve social-ecological outcomes (Norton et al. 2016; Peters 2019; Doole 2020). Examples include multi-catchment entities (e.g. Thriving Southland⁷), region-wide predator eradication initiatives (e.g. Predator Free Wellington⁸), multi-hapū/iwi collaborations (e.g. Te Kāuru⁹), the Department of Conservation's community conservation hubs¹⁰ and national organisations that support coordinated community efforts (e.g. New Zealand Landcare Trust¹¹).

Existing research has revealed the diversity of groups and relationships involved in community-based conservation and 'community hubs' (Peters 2019; Doole 2020; Shanahan et al. 2021). We therefore use broad definitions in this study to capture the diversity of collective approaches to regeneration occurring in Aotearoa New Zealand, including tangata whenua-led approaches to collective action.

In this report, community groups and other entities working together on a regular basis towards shared regeneration goals are referred to as 'collectives'. Collectives typically also include leaders and staff who support the work of community groups and may coordinate joint action (Peters 2019). Collectives therefore provide additional capacity and capability to amplify community-based regeneration. The entities that comprise collectives are referred to as 'constituent groups', and may include local environmental or social groups, tangata whenua, national NGOs, government agencies and industry organisations, among others.

To date, most research on community-based regeneration in Aotearoa New Zealand has focused on individuals and community groups as independent entities, rather than collectives (e.g. Peters et al. 2015; Brown 2018; Jones & Kirk 2018; Ovenden & Roberts 2021; Shanahan et al. 2021). There is consequently limited understanding of how regeneration collectives are structured and operate (but see Peters 2019), or what organisational structures are most likely to foster ecologically effective and socially just ecosystem regeneration. While international research provides insight on factors influencing the long-term success of scaling initiatives (e.g. Sewell et al. 2016; Battista et al. 2017; Fastenrath et al. 2020), it is unclear how well internationally-derived models and lessons apply to Aotearoa New Zealand given its unique sociocultural and ecological context. Recent studies of community hubs in Aotearoa New Zealand have questioned their ability to scale-up effort in a coordinated way and highlighted training, capacity and funding constraints (Peters 2019; Doole 2020). These studies highlight a key tension between the bespoke, place-based nature of

⁷ <https://www.thrivingsouthland.co.nz/>

⁸ <https://www.pfw.org.nz/>

⁹ <https://www.facebook.com/tekaureasternmanawaturiverhapucollective/>

¹⁰ <https://www.doc.govt.nz/news/media-releases/2020-media-releases/116-community-conservation-projects-to-get-extra-support-to-back-nature/>

¹¹ <https://www.landcare.org.nz/>

community regeneration initiatives, and the need for improved governance structures to support community-led efforts and direct investments to where they will be most effective.

This study, which attempts to characterise the diversity of collective approaches to ecosystem regeneration in Aotearoa New Zealand, lays the foundation for more in-depth analysis of how collectives operate, with what social and ecological outcomes. The study synthesises insights from the international literature on scaling community restoration, reports findings from a survey of regeneration collectives in Aotearoa New Zealand, and interprets the results in line with the literature to propose a typology of collective approaches to ecosystem regeneration. The study findings are intended to contribute to the theorisation of collectives' role in scaling ecosystem regeneration and inform the work of organisations involved in collective regeneration initiatives.

1.2. Report aims, scope and structure

This report is part of a study commissioned by the Biological Heritage National Science Challenge to critically review social-ecological models in ecosystem regeneration. Social-ecological models are hypotheses about the combinations of entities (e.g. households, trees), relationships (e.g. partnerships) and interactions or behaviours (e.g. communication) that have emerged as driving forces of social-ecological change, including regeneration (Heemskerk et al. 2003). Models are useful tools for parsing the complexity and diversity of people's connections to ecosystems and one another to theorise key pathways toward ecosystem regeneration (e.g. Douglas et al. 2019).

This report seeks to identify common models for *scaling* community-based ecosystem regeneration in Aotearoa New Zealand—that is, the types of social groupings, connections to ecosystems, and group behaviours and relationships that will enable the amplification of biodiversity regeneration activities and outcomes.

Specifically, this report aims to:

1. Identify conceptual models of scaling community-based ecosystem regeneration in the international literature that are of relevance to Aotearoa New Zealand
2. Characterise the range of community-based ecosystem regeneration collectives in Aotearoa New Zealand—including their composition, structure, purpose, activities and impact—based on survey results
3. Evaluate the transformative potential of collectives as a pathway to ecosystem regeneration by examining modes of scaling indicated in the survey results.

Section two of the report synthesises key insights from international research on community restoration, scaling and collective action to distil common processes and

models of scaling. Research on community conservation in Aotearoa New Zealand is summarised alongside international insights, highlighting key questions for scaling community-based regeneration in the Aotearoa New Zealand context. The review reveals that scaling involves more than just increasing the spatial extent of restoration activities, and that individuals and community groups can work together to contribute to scaling through varying arrangements. Common conceptual models of scaling highlight the forms of social connectivity that are likely to sustain community-led, landscape-scale regeneration. This review provides a basis for interpreting and evaluating the contribution of collective initiatives to ecosystem regeneration in Aotearoa New Zealand.

Section three presents key findings from a survey of 27 community-based collectives engaged in ecosystem regeneration in Aotearoa New Zealand. Collective approaches to ecosystem regeneration are characterised according to attributes that include: how constituent groups within collectives relate to each other and other governance actors; collectives' scope and purpose; the types of activities collectives undertake; how they are resourced; and their impact on ecosystem regeneration.

Section four draws together literature and survey findings to assess the potential for collectives to transform community-based ecosystem regeneration in Aotearoa New Zealand. A typology of collective approaches to regeneration in Aotearoa New Zealand is proposed based on analysis of survey data to characterise the variability in collectives' structure and operations. The typology is compared with processes and models of scaling identified in the literature, illuminating the varied contributions collectives may make to scaling ecosystem regeneration. The analysis further identifies key knowledge gaps and research needs relating to how collectives can contribute to—and be supported to—transform community-based regeneration in Aotearoa New Zealand.

1.3. Methodology

This study used a telephone/Zoom survey to characterise the structure and function of a sample of community-based ecosystem regeneration collectives (henceforth 'collectives') in Aotearoa New Zealand. Representatives of 27 collectives were surveyed to gather descriptive information on the composition, structure, purpose, activities and impact of collectives across the country. Since collectives are composed of multiple environmental groups or organisations (hereafter 'constituent groups'), some survey participants also represented a constituent group within their collective. Participants that also belong to a constituent group were asked similar questions about their group, which enabled comparison of attributes between collectives and their constituent groups.

Ethics approval for the study was granted by the University of Waikato's Human Ethics Committee (HREC(HECS)2020#60) in February 2021.

1.3.1. Survey questionnaire

We created a survey that included 28 questions on the composition, structure, purpose, activities, resources and impact of collectives and their constituent groups (see Appendix 1)¹². The questionnaire included a mix of multi-choice (n = 11) and open-ended (n = 17) questions. Three multi-choice questions asked participants to choose a single response option; the remainder of questions allowed participants to select more than one response. All multi-choice questions included a space to record additional information or explanatory comments (e.g. why an option was selected).

To better understand collectives' role in community-based regeneration, we asked participants the same 8 questions for their collective and the constituent group to which they belonged (if any) and then compared patterns in responses between these categories. Participants who did not belong to a constituent group only answered questions relating to collectives. As only 12 participants (out of 27) belonged to a constituent group, any observed patterns in responses between categories are interpreted as indicative only.

The survey questionnaire was pilot tested with representatives of three collectives with whom we had existing relationships, and refined based on their feedback to ensure questions and terminology were clear.

¹²An additional four questions invited participant to identify other collectives that could be invited to the survey, and whether they were interested in being involved in subsequent stages of the study.

1.3.2. Selection of survey participants

To capture the range of collective approaches to regeneration, we defined collectives broadly, as multiple community groups and other entities working together on a regular basis towards shared regeneration goals. We further specified this broad definition by developing inclusion criteria (see Box 1).

Box 1. Inclusion criteria for ecosystem regeneration collectives

1. One or more social or environmental community-based groups[^] should be involved in the collective, among other group/organisation types^{*}
2. Some of the relationships within the collective should be enduring – i.e. persist beyond a short-term project or event
3. The collective was established to scale up/out impact, i.e.:
 - a. to encompass a larger area or more areas (e.g. multiple catchments)
 - b. to expand social-ecological objectives or scope of activities
 - c. to engage a wider range of socio-cultural groups;
 - d. to coordinate action/resources across places or groups
4. Joint action for ecological regeneration^{**} is a central focus of the collective
5. Joint action involves more than statutory planning or consultation activities.

[^]Community-based groups may include Māori entities like iwi, hapū, whānau, and marae; social entities like ratepayers associations; and environmental entities like catchment groups and pest trapping groups

^{*}Other group types may include government, industry, and philanthropic organisations, national-scale NGOs, and businesses. Relationships between different groups in a collective may vary

^{**}Includes protection and restoration of terrestrial and freshwater ecosystems; must have a biodiversity component, but regeneration focus may be broader (e.g. freshwater health, community wellbeing)

Potential collectives were identified using snowball sampling, starting with the research team's knowledge of community conservation organisations in Aotearoa New Zealand. This list was expanded based on recommendations from other researchers, practitioners and research participants; online searches for restoration and conservation initiatives; organisation lists on national and regional conservation websites (e.g. ECO¹³, Department of Conservation¹⁴, NZ Landcare Trust)¹⁵; lists of

¹³ <http://www.eco.org.nz/member-groups/eco-member-groups.html>

¹⁴ <https://www.doc.govt.nz/get-involved/volunteer/groups/>

¹⁵ Where agencies (e.g. NZ Landcare Trust) have supported the creation of multiple collectives, we selected two examples from their website to avoid oversampling one type/origin of collective

recently funded projects (e.g. Jobs for Nature); and groups mentioned in government reports and other publications. Our long list of potential ecosystem regeneration collectives included 64 organisations and initiatives. From this list we excluded several statutory entities (e.g. Guardians of Lake Manapouri) and government collaborations with industry, iwi/hapū and private organisations that do not centre community involvement (e.g. Rotorua Te Arawa Lakes Programme). We then selected a sample of 30 organisations/initiatives that reflected the diversity of collectives around Aotearoa New Zealand, including collectives from most regions, from rural and urban settings, with a range of social-ecological foci (e.g. predator control, fresh water) and with different member bases (e.g. farmers, hapū).

For each collective, we identified a representative with experience and knowledge of the collective's history, institutional arrangements (e.g. funding) and current activities. Most representatives were the leader, manager, or coordinator for the collective. In many cases, the individual who recommended the collective identified an appropriate representative and provided their contact details. In other instances, the research team identified representatives and their contact information from organisational websites, or contacted the organisation directly to request a recommendation.

Participants were recruited via email and/or telephone invitations to identified organisational representatives, depending on the contact information available. Representatives who agreed to participate in the survey signed an electronic consent form prior to the survey taking place. Of our sample of 30 collectives, two representatives declined to be surveyed and one representative's data were removed due to incomplete responses. The final dataset therefore includes responses from representatives of 27 collectives.

1.3.3. Survey method

The survey was conducted via Zoom (n = 23) or telephone (n = 4), according to the preference of the participant, and lasted 45 minutes on average. The researcher read questions aloud to participants from a structured questionnaire and typed their answers into an electronic survey tool. This approach was used to build rapport with participants and to promote consistency in the interpretation of questions and form of responses. Because collective staff and leaders are diverse group who come from a range of backgrounds (government, iwi/hapū, community volunteers), we anticipated a need for researchers to clarify the meaning and intent of some questions, as well as for participants to explain their answers with regard to their collectives' specific context. The survey questionnaire included comment spaces for each question, enabling the researcher to make notes on additional information provided by participants in their response, to aid interpretation of responses and add depth to analysis. Surveys were audio-recorded with participants' permission, and typed responses were reviewed by the researchers against audio recordings to ensure that participants' responses were recorded accurately and consistently.

1.3.4. Analysis of survey results

For multi-choice questions, counts and percentage response data were generated for each response option. As not all participants answered all questions, percentage response was calculated based on the number of completed responses for each question. Counts and percentage response data were used to generate bar graphs, tables and maps using statistical software RStudio (v. 1.3.1073) and Microsoft Office. Where participants were asked the same question for both their collective and constituent group, response data are sometimes displayed in the same table or graph for ease of comparison.

For open-ended questions, responses were analysed using qualitative software Nvivo12 Plus to identify dominant themes in participant responses (see Figure 1). For each question, the lead author read through participant responses and noted down one or more key words or phrases (i.e. codes) that summarised each participant's response to the question. For example, if a participant expressed uncertainty over their collective's biodiversity outcomes but then described evidence of several outcomes, codes would be created to summarise both the uncertainty and the types of outcomes described. This open-ended coding process generated a list of initial codes that summarised the range of responses to each question.

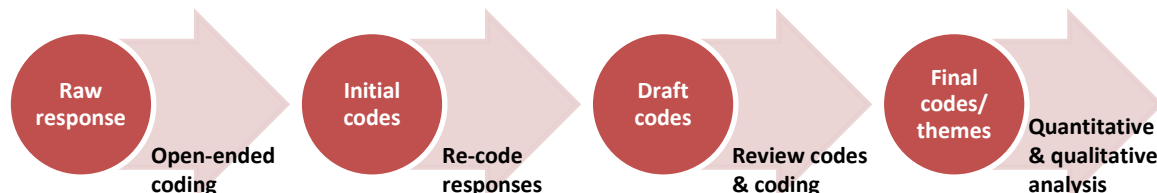


Figure 1. Iterative qualitative coding process (see also Emerson et al. 1995).

Each list of initial codes was then refined by grouping similar key words and ideas together, to generate a shorter list of draft codes for each question. Where participants were asked the same question for both their collective and constituent group, one list of draft codes was created from both sets of responses. The lead author then re-read participant responses to each question and categorised each response according to one or more of the draft codes. The responses grouped under each draft code were then reviewed to ensure that the coding process had generated groups of similar responses that reflected overall commonalities and differences in participant responses to each question. Where necessary, tweaks were made to codes and coding, to generate a final set of codes (i.e. themes) for each question. These final themes, and the frequency with which they occurred among participant responses, are reported under relevant subheadings in Section 3.

For long answer questions, researchers also used qualitative techniques to examine responses in detail. Techniques included word frequency analysis to identify commonly used terms, and narrative analysis to explore the rationales, assumptions and worldviews embedded in participant responses. For example, several participants drew on te ao Māori to explain their collectives' approach to ecosystem regeneration. These qualitative analyses add explanatory depth to the analysis of quantitative trends in participant responses. Where appropriate, parts of participant responses are anonymously quoted in Section 3 of this report to better convey participants' situated perspectives.

2. MODELS OF SCALING AND COLLECTIVE ACTION IN THE LITERATURE

This section reviews research on community restoration and conservation, scaling and collective action to identify conceptual models for scaling community-based regeneration and the socio-cultural, governance and ecological conditions under which these models are expected to succeed. As noted earlier, models are abstractions of the dynamic, place-based interrelationships among people, institutions and ecosystems that comprise our lived realities (Heemskerk et al. 2003). They simplify reality by focusing analysis on the types of social organisation and connections to *te taiao* that researchers consider most important in driving social-ecological change. Conceptual models of social-ecological systems can thus be used to describe and critically analyse different approaches to collective action for ecosystem regeneration.

This review explores common models for scaling ecosystem regeneration to identify forms of connectivity that are likely to promote community-led landscape scale regeneration. First, key models of 'scaling' are summarised from the ecological restoration and broader sustainability literature. These fields highlight that scaling initiatives involves more than increasing the spatial extent or number of regeneration actions, and may take place through a range of amplification processes. Second, important socio-cultural dimensions of scaling regeneration are identified. Research on community conservation reveals considerations regarding the people, relationships and institutions necessary to successfully scale community-based regeneration in Aotearoa New Zealand. Third, common models of collective action are drawn from the environmental management and governance literature, highlighting the range of forms of social organisation that can promote shared environmental action. The applicability of these models to scaling community-based ecosystem regeneration in Aotearoa New Zealand is discussed.

2.1. Models of scaling sustainability initiatives

Informed by the global scale, cross-jurisdictional nature and magnitude of biodiversity loss, discussions of how to achieve large-scale ecosystem regeneration have become increasingly common in the last twenty years (Menz et al. 2013; Guerrero et al. 2015a; Perring et al. 2018). It is widely acknowledged that to reverse biodiversity declines, conservation initiatives must go beyond traditional protection and restoration of individual sites to focus on reducing pressures on systems, restoring ecosystem functions and improving habitat connectivity through landscape scale regeneration (Guerrero et al. 2015a; Norton et al. 2018; Perring et al. 2018). Achieving biodiversity goals will therefore require widespread but strategic and coordinated investments in regeneration.

The rapid growth of restoration initiatives and area restored is commonly referred to as 'scaling' (or 'upscaling'). Norton et al. (2018) define upscaling as 'substantially increasing the area of New Zealand that is subject to restorative activities involving tens to hundreds of thousands of hectares of new restoration' (p.28). While calls to scale conservation and restoration activities frequently focus on increasing the extent of restored area, they typically also recommend (Guerrero et al. 2013; Norton et al. 2018; Perring et al. 2018; Fastenrath et al. 2020):

- large-scale or multi-scalar initiatives that extend beyond protected areas to address landscape-scale ecological processes (e.g. food provision) and threats
- improving ecological connectivity between restored areas and with remnant habitat areas
- restoration of multiple ecosystem *functions* (e.g. pollination, migration), in addition to composition (e.g. species present)
- reducing stressors (e.g. pest species) on protected/restored areas, to improve their chances of success
- targeted restoration of ecologically effective areas (e.g. source areas in catchments, breeding sites)
- long-term active management of protected and restored sites.

The conservation and restoration literature is nested within a much larger and older body of research on scaling sustainability innovations and effecting transformational change (Lam et al. 2020). In this broader body of research, models of scaling include a wide range of socio-technical changes, including individual behaviour change (e.g. public transport use, Shove & Walker 2010), embedding new approaches at higher governance scales (e.g. changes in government policy, Cohen & McCarthy 2015), transfer of policies or approaches to other contexts (Temenos & McCann 2013), shifts in technological regimes (e.g. Geels 2002), and adoption of sustainability innovations (Markard & Truffer 2008). These adjacent framings present opportunities to expand current conceptualisations of scaling by inviting consideration of what is scaled (e.g. area restored, or pest control technology), how scaling occurs (e.g. replication of successful approaches, or overcoming institutional barriers), to what extent a scale (e.g. catchment) is natural or produced through socio-political processes, and what types of scale are sought (e.g. watersheds or floodsheds, Sarna-Wojcicki et al. 2019).

The language of 'scaling' has sometimes been critiqued (e.g. Cash et al. 2006) for appearing to reinforce fixed geographic scales (e.g. catchment, town) or jurisdictional levels (e.g. regional council). However, scaling does not imply attainment of any specific scale or level, and indeed often requires actions and impact to transcend existing geographic and jurisdictional boundaries to be transformative. Recognising the potential for scaling to be conflated with specific scales or levels, Lam et al. (2020) suggest a focus on *amplification processes*, which they define as:

diverse actions deployed by sustainability initiatives together with other actors (e.g., from government, business, or society) to purposively increase their transformative impact (e.g., initiating a new initiative in another city). The emphasis is thus on the extended impact of initiatives, which is created when new ways of thinking, doing, and organizing things (e.g., practices, processes, or products) get adopted and amplified [...]

Lam et al. (2020) reviewed frameworks that identify actions to increase the impact of sustainability initiatives, and from these distilled key processes, strategies, mechanisms and patterns that promote impact. They propose a typology of eight amplification processes, grouped into three categories. Figure 2 summarises the typology along with examples of restoration initiatives to illustrate the range of possible approaches to scaling ecosystem regeneration.

The typology's key contribution is to highlight the diversity of processes for amplifying the impact of sustainability initiatives. Lam et al. (2020) note that the processes are not mutually exclusive, so that a single initiative may employ multiple methods to increase its impact. So far, research has tended to focus on processes for *amplifying out* initiatives by involving more people and places—either by extending the range of an initiative (e.g. growing the area of native plantings) or creating new initiatives (e.g. new catchment groups). Lam et al. (2020) highlight that the relationships and processes involved in amplifying out may be slightly different depending on whether an existing initiative is amplified (e.g. a national organisation creates a new regional branch) or whether new independent initiatives are created (e.g. a new pest group is set up, modelled on an existing initiative). Furthermore, initiatives may need to be adapted to varying degrees to fit the context of the new or extended initiative, depending on its socio-economic and ecological similarity to the existing initiative (e.g. adaptation of lessons from wetland initiatives for lake restoration).

The review reveals that an initiative's impact may also be increased by *amplifying within* the initiative—whereby an initiative may be stabilised (e.g. through stable funding), thus prolonging its impact, or sped up (e.g. through use of novel technologies). These amplification processes therefore highlight opportunities for initiatives to increase their impact by undertaking activities more effectively, efficiently, or sustainably.

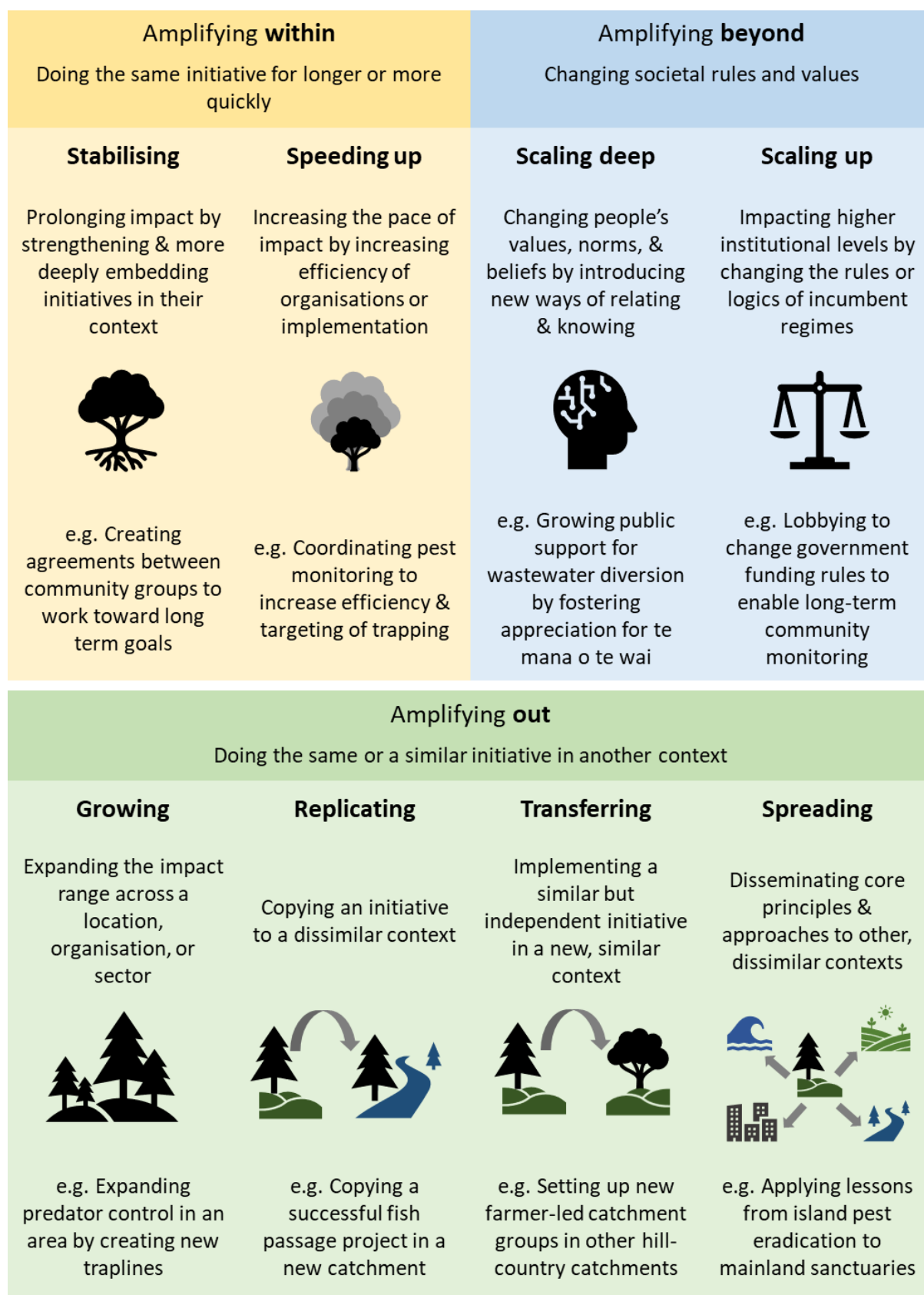


Figure 2. Typology of amplification processes (in bold) organised by category (Lam et al. 2020), with examples from restoration initiatives.

Finally, Lam et al. (2020) find that increasing the impact of sustainability initiatives can also involve *amplifying beyond* the initiative, by changing the rules, values, norms, knowledge and mindsets within which sustainability initiatives operate. They note that while many existing amplification frameworks aim to impact higher institutional levels, for example by changing legislation or funding rules, few explicitly consider processes to change wider societal understanding or attitudes towards sustainability issues. This lack of explicit consideration of 'changing hearts and minds' as a way of increasing an initiative's impact is at odds with the frequent focus on environmental education and engagement within community conservation initiatives (e.g. Peters et al. 2015). The typology thus indicates that researchers should reconsider how ecosystem regeneration initiatives create impact and evaluate the effectiveness of alternative processes for amplifying beyond.

Research suggests that regeneration can be scaled through a range of social and institutional pathways to increase the number, range, longevity and effectiveness of initiatives, and to promote societal and government support for regeneration. Scaling ecosystem regeneration therefore involves far more than is implied by simplified calls to 'increase the area subject to restoration activities' or 'undertake large-scale restoration'. Further, effective scaling will not only expand the extent of regeneration, but also promote ecological connectivity, enhance ecosystem functioning, reduce system stressors and target ecologically significant sites.

2.2. Social dimensions of scaling regeneration

Beyond these ecological imperatives, proponents of scaling highlight the need for greater community involvement, increased collaboration and the development of multi-scalar networks to promote the scaling of restoration. From a practical perspective, it is recognised that large scale regeneration will require both the willing participation of landowners in the restoration of private land and widespread public support and volunteer contributions (Guerrero et al. 2015a; Mumaw & Raymond 2021). Such widespread engagement in turn requires meaningful community involvement in the development of restoration objectives and practices (Wyborn & Bixler 2013). There is also increasing recognition of the need for conservation activities to promote social justice, give effect to the rights and roles of Indigenous peoples, and produce multi-functional landscapes that sustain local livelihoods and wellbeing (Norton et al. 2018; Jellinek et al. 2019; Kockel et al. 2020; Mansuy et al. 2020; Osborne et al. 2021). Scaling is therefore an inherently social undertaking that depends on the strength of relationships between individuals, groups and institutions (e.g. councils), and has the potential to contribute to a range of social and cultural goals (e.g. social cohesion, decolonisation).

In Aotearoa New Zealand, research on the social dimensions of scaling has tended to focus on the growth of community conservation groups and their contribution to

ecosystem regeneration (Peters et al. 2015; Jones & Kirk 2018; Department of Conservation 2021; Shanahan et al. 2021). Much of this work has focused on the social outcomes of community conservation and restoration, as well as the social and institutional factors that facilitate their success. Research demonstrates the benefits of growing participation in community conservation for individuals (e.g. improved physical and mental health, skill development), social groups (e.g. knowledge transmission, identity building) and wider society (e.g. improved social connectivity) (Lyver et al. 2016; Shanahan et al. 2021). These studies thus highlight the potential for scaling community-based regeneration to contribute to improved social outcomes, as well the need for explicit integration of these outcomes in group formation and restoration planning. Community acceptance and ownership of regeneration initiatives are essential to their long-term success, by promoting volunteer and landowner participation in regeneration; enabling integration of community values, aspirations and knowledge; and generating public support for regeneration practices (e.g. pest control) and spending (Norton et al. 2016; Peltzer et al. 2019).

Research also raises questions regarding the equity and sustainability of community-led regeneration. A study by Peters et al. (2015) found that community groups are typically small and dominated by older volunteers, limiting their capacity to undertake large scale or long-term regeneration. Capacity limitations also arise from community groups' struggles to access adequate funding and institutional support to enact their regeneration goals (Brown 2018; Shanahan et al. 2021). Furthermore, the field of community conservation has historically been dominated by pākehā volunteers, scientists and staff, in keeping with a western conservation paradigm that has privileged preservation of nature over living *with* nature (Lyver et al. 2019; Osborne et al. 2021). This lack of diversity in conservation practice limits the scope and human resources available to regeneration initiatives, and can contribute to social exclusion and inequity in regeneration outcomes (Stanford et al. 2018; Sarna-Wojcicki et al. 2019; Kockel et al. 2020; Osborne et al. 2021). The potential for competing or conflicting restoration agendas is of particular concern given the historically inequitable outcomes of restoration for Indigenous communities (Lyver et al. 2019; Osborne et al. 2021).

Building on concerns regarding equity in conservation, a growing body of scholarship explores opportunities to uphold Indigenous rights and interests, meaningfully involve Indigenous peoples, and integrate Indigenous knowledge in community-based regeneration (Blaser 2009; LaBoucane-Benson et al. 2012; Hemming et al. 2017; Wehi & Lord 2017; Jackson 2018; Eufemia et al. 2019; Lyver et al. 2019; Sarna-Wojcicki et al. 2019). Indigenous leadership and partnership in regeneration provide pathways for self-determination and the development of bicultural objectives and approaches, promoting social justice in regeneration outcomes (Peltzer et al. 2019; Osborne et al. 2021). Regeneration initiatives also present key opportunities for Indigenous communities to practice their traditional knowledge and management, and reconnect with valued species and places impacted by processes of colonialism

(Sarna-Wojcicki et al. 2019). In Aotearoa New Zealand, iwi/hapū are leading a range of regeneration initiatives on Māori-owned land and partnering with crown entities, funders and community groups to restore other lands within their rohe (e.g. Warren 2010).

Where Indigenous and settler communities work together to restore degraded environments, regeneration also offers opportunities to build connections, trust and understanding among communities (Norton et al. 2016). Engagement with Indigenous worldviews and knowledge systems further provide opportunities to 'scale deep' by embedding bicultural values and principles in community-led regeneration (Lyver et al. 2019). In Aotearoa New Zealand for example, Māori concepts such as kaitiakitanga, mauri and mana have reshaped mainstream environmental thought.

Finally, research on the social dimensions of scaling increasingly highlights opportunities to scale ecosystem regeneration through collectives of community groups (Wyborn & Bixler 2013; Bird & Barnes 2014; Guerrero et al. 2015a; Kockel et al. 2020; Maynard et al. 2020; Mumaw & Raymond 2021). Collectives vary widely in their composition and structure, featuring a collection of entities (individuals, groups and organisations) working together toward shared goals. In Aotearoa New Zealand for example, collective approaches include regional-scale collaborative restoration initiatives and national-scale tree planting programmes (Norton et al. 2018), hapū collectives (Warren 2010), and collective management of common resources (Duncan & Diprose 2020). Collective approaches are often argued to be a more efficient and effective form of community-based regeneration by enabling:

- *increased access* to funding, resources and other institutional support
- *social learning*, through sharing of information and knowledge among peers
- increased collective *capacity and capability* due to a wider range of skill sets, experience and knowledge, and larger number of volunteers
- *reduced duplication* and *more targeted* interventions through collective coordination of activities
- *extension* of regeneration activities (e.g. monitoring) over a larger area or greater number of areas
- *expansion* of the range of regeneration goals and activities
- building *social cohesion* and identifying *shared goals* among diverse communities and interest groups.

As such, community collectives are increasingly seen as a key pathway for scaling ecosystem regeneration (e.g. Norton et al. 2016). However, the social-ecological outcomes of collective approaches to regeneration are noted to vary widely depending on the types of entities and relationships between entities involved (Wyborn & Bixler 2013; Guerrero et al. 2015b). There is consequently significant interest in the types of social relationships and socio-institutional structures that could support regeneration

collectives. For example, research has raised questions about the respective roles of governments and community groups in scaling processes (e.g. Green 2016), the relationships between non-governmental organisations that could facilitate scaling (e.g. Schoon & Cox 2018; Fastenrath et al. 2020), and the implications of collectivisation for both individual identity and the wider social fabric (e.g. Barrutia & Echebarria 2019).

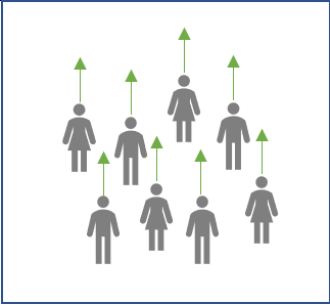
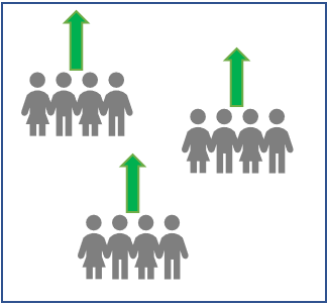
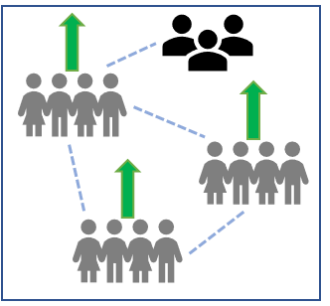
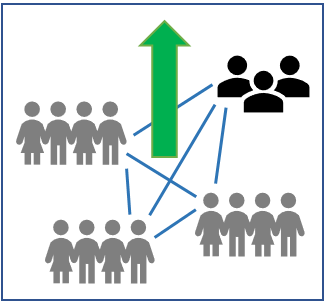
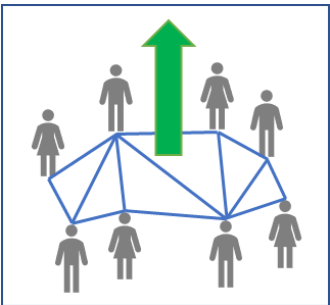
2.3. Models of collective action

Social science research reveals a multitude of socio-institutional models for achieving scaling through collective action—that is, people with shared interests acting in concert towards a common objective (Pfaff & Valdez 2010). Here, we summarise five key models of collective action featured in the environmental management and governance literature. These models were initially identified through analysis of the socio-political and institutional strategies described in articles and reports on collective community-based biodiversity initiatives. Further insights were incorporated from the wider environmental management and governance literature, which features extensive research on participatory forms of environmental management.

The five models we present here are neither definitive nor mutually exclusive and are sometimes referred to using other terminology or slightly different features. However, we see value in distinguishing these models to highlight the wide range of ways that community and other actors can work together to scale ecosystem regeneration. These models also informed our analysis of collective approaches to regeneration in Aotearoa New Zealand in Section 4.

In the following subsections we describe each model according to its constituent entities, the relationships that underpin collective regeneration, and the amplification processes they enable. These features are also summarised in Table 1.

Table 1. Models of collective action. In the illustrations of each model, grey people represent community members or groups, while black people represent partner organisations. Blue lines represent informal (dotted line) or formal (whole line) relationships between groups and organisations. Green arrows signify the mode of collective action for regeneration.

Model	Key actors	Mode of collective action	
Mass mobilisation	Individuals	Individuals undertake independent action	
Community group formation	Citizen groups	Group members work together Groups undertake independent action	
Network building	Citizen groups Government agencies NGOs	Groups, agencies & NGOs cooperate on an informal basis	
Collaboration	Citizen groups Government agencies NGOs	Groups, agencies & NGOs form agreements to work together, undertake joint actions	
Commons management	Individuals (rights holders)	Individuals enter into formal agreements to undertake joint or independent action	

2.3.1. Mass mobilisation

In mass mobilisation, independent individuals undertake cooperative behaviours to achieve a mutually desired outcome (Ostrom 2000). In this model, individuals operate independently, but decide to undertake action that advances their collective (rather than just individual) good. In a regeneration context for example, individual households may engage in backyard native tree planting or predator control to promote neighbourhood bird populations. The types of institutions and relationships that underpin mass mobilisation are widely debated (most famously in the 'tragedy of the commons', Hardin 1968), raising questions over the conditions under which mass mobilisation can help to address large-scale environmental issues (e.g. Wakefield et al. 2006; Shaw et al. 2018). For example, arguments are made that mass mobilisation is more likely to occur when the group involved is small and relatively homogenous, rendering neighbourhood scale urban regeneration more likely than metropolitan. However, Ostrom (2000) points to national scale cooperative behaviours such as voting, donating, or volunteering as empirical evidence that widespread collective action is both possible and—in at least some situations—the norm.

Mass mobilisation primarily contributes to scaling ecosystem regeneration by expanding the number of volunteer actors, amount of regeneration activity, and area across which action is undertaken (i.e. via processes of 'growing'). However, the types of collective regeneration actions possible are likely limited by the knowledge, skills and capacity of the individuals involved. Community monitoring (e.g. Great Kererū Count), backyard trapping and native tree planting provide common examples of collective action for regeneration.

2.3.2. Community group formation

This model is similar to mass mobilisation, but in this model, individuals form community groups or initiatives, which then undertake joint action towards shared goals (Shanahan et al. 2021). Mutual recognition of ecological issues and desired outcomes (e.g. threats to native birds/bringing birds back) promotes repeated independent community group formation, resulting in a growing number of groups and individuals participating in regeneration actions over time (see Mumaw & Raymond 2021). In some cases, group participation and membership may be irregular (e.g. occasional planting days), but in many cases groups formalise over time in order to access resourcing (Peters et al. 2015). This model therefore enhances collective action through regular interactions and relationship building between individuals with shared concerns and goals. Community group formation is arguably the dominant model for scaling regeneration in Aotearoa New Zealand at present (Norton et al. 2016; Shanahan et al. 2021).

The proliferation of community groups may contribute to scaling ecosystem regeneration through processes of 'growing', 'replicating', or 'transferring', depending on how similar the group structure and context are. For example, the rapid growth in

neighbourhood trapping groups within a region may contribute to 'growing' regional regeneration, where the groups undertake similar activities with a shared purpose, using joint resources (e.g. trap provider). The perceived success of neighbourhood trapping groups in one region may also contribute to the establishment of similar groups in another region, amplifying regeneration activities via replication or transferring of insights. Community group formation may also promote 'scaling deep' if participation in group activities and relationship building contribute to wider learning and values shifts (see Shanahan et al. 2021).

2.3.3. Network building

The development of multi-group or multi-organisation networks is an increasingly common response to the perceived magnitude and seriousness of social-ecological issues (Chaffin et al. 2016; Fischer & Jasny 2017; Barrutia & Echebarria 2019; Mumaw & Raymond 2021). Aligned groups and organisations sometimes form networks in recognition that any one group does not have sufficient capability or capacity to achieve its social-ecological objectives on its own (Barrutia & Echebarria 2019). Groups remain independent, and relationships between groups may be more or less formal.

Networks enhance collective action by community groups and organisations through sharing of ideas and information; improving access to resources; enabling cooperative action towards shared goals; and strengthening group and individual identity. Notably, Barrutia and Echebarria (2019) examined organisations' motivations for participating in pro-environmental networks, and found that the key role of networks is not the provision of resources (though this was also important), but rather group identification. They explain that when groups 'identify with their pro-environmental networks, a powerful motivational mechanism emerges: participants merge their own personal identity with the identity of the network, and their self-esteem is affected by the achievements of the network' (ibid, p.108). In an ecological regeneration context then, network building has the potential to add value to individual and community group action by enhancing a sense of shared values and purpose.

Network building may thus contribute to 'scaling deep' (through group identity building), 'speeding up' (through increased access to information and resources), and 'replicating' or 'spreading', where regeneration practices and innovations are shared with and taken up by other groups in the network (Mumaw & Raymond 2021). Effective networks may support both the stabilisation of existing community groups and seed the development of new aligned groups.

However, research highlights that network relationships and participation vary widely, shaping their potential contribution to scaling ecosystem regeneration. Networks range from online communities of loosely related groups that share and receive information, to closely aligned but remote groups (e.g. national issue networks) that

participate in regular events like webinars and annual conferences, to local or regional networks of groups working on related issues. Guerrero et al. (2015a) found that poorly defined roles and relationships within a network reduce the likelihood of proactive collaboration and therefore the effectiveness of networks for scaling regeneration. Similarly, Mumaw and Raymond (2021) identify the empowerment of actors, co-design, connectivity between landscapes and communities, resources, and the network's role in enabling innovation and information sharing as key factors shaping network success in scaling regeneration.

2.3.4. Collaboration

Collaboration is used to describe a range of relationships between individuals, groups and institutions in the conservation literature (Guo & Acar 2005; Wyborn & Bixler 2013; Guerrero et al. 2015a; Kark et al. 2015; Duncan & Diprose 2020), and therefore overlaps with many of the other models described. Here we use collaboration to mean groups with shared interests or responsibilities that proactively work together to pursue complex goals (Kark et al. 2015). Working together may include joint involvement in regeneration activities, projects, programmes, planning, or governance (Wyborn & Bixler 2013), as distinct from networked groups that primarily participate in events and knowledge sharing.

Collaboration therefore involves clearer definition of the groups' shared purpose, goals, and ways of working, and greater coordination of activities than network building. While groups remain independent, they work closely together on initiatives to combine their skills, resources and capacity, as well as to increase their profile and collective capacity to access other resources and institutional support (Peters 2019; Doole 2020). Relationships between groups may vary from cooperation between groups on joint activities, to collaboration on projects, to formal agreements on group roles and responsibilities. Guo and Acar (2005) found that non-profit organisations are more likely to engage in formal collaborations if they are older, have a larger budget, rely on fewer government funding streams, and have more links to other non-profits.

Collaboration contributes to scaling regeneration through a range of amplification processes. It can contribute to 'stabilising' and 'speeding up' regeneration initiatives through relationship building between groups and by combining skills and expertise. Where groups coordinate their activities to increase efficiency and target action to where it will be most effective, collaboration may further speed up ecosystem regeneration. However, Kark et al. (2015) warn that collaboration across jurisdictional boundaries can actually increase the complexity of regeneration planning and decision making, creating new sources of inefficiency. For example, a requirement to gain approval for landscape-scale regeneration from two regional councils could undermine any other administrative efficiency gains. The anticipated efficiency gains and losses of collaboration should therefore be evaluated on a case-by-case basis (Kark et al. 2015).

Collaboration also offers opportunities to ‘grow’ regeneration initiatives by expanding the scope and objectives of ecosystem regeneration (by working with groups with different foci in the same area), or to expand the extent of regeneration (by working with groups with similar foci over a larger area) (Wyborn & Bixler 2013; Norton et al. 2018). Finally, as with networks, collaboration can contribute to ‘scaling deep’ through processes of identification and shared learning (Waterton et al. 2015).

2.3.5. Commons management

Finally, commons management offers a formalised model of collective action that is typically narrowly focused on managing a particular resource but highly effective in coordinating action. In commons management, entities (usually rights holders, such as landowners) commit to undertake well defined actions (e.g. fencing) in order to achieve agreed-upon objectives for a specific ‘commons’ (e.g. lake water quality) (Ostrom 1990).

Actions often require individual entities to give up some rights (e.g. water allocation) or take on substantial costs (e.g. infrastructure maintenance) to achieve shared outcomes. As such, the terms of management are typically set out in a legal agreement or rule (e.g. a water permit) and reinforced through monitoring or other accountability mechanisms to ensure joint compliance. As Duncan and Diprose (2020, p.1) explain, commons management involves ‘binding collaboration, as in each case the governing practices they have used have involved individuals putting “skin in the game” to work together to address water and pest management.’ This model of collective action thus also requires significant trust and relationship building between entities, and typically involves a small group of similar entities with existing place, kinship, historical, or interest-based connections (Ostrom 1990; Franks & Emery 2013). For example, Duncan and Diprose (2020) found that similarities in farm type contributed to the perceived success of commons management, with multi-generational sheep and beef farms more likely to form enduring place-based collectives.

Commons management primarily contributes to scaling ecosystem regeneration by ‘stabilising’ and ‘speeding up’ action. By entering into voluntary binding agreements, entities commit to undertaking significant and carefully coordinated regeneration action. For example, landowners in a catchment may agree to reduce their individual water allocations by set amounts, thereby collectively increasing downstream freshwater habitat and improving water quality and quantity for native fish. Where commons management involves the development of legal rules, precedents, or new forms of agreements (e.g. catchment scale farm plans), it may also contribute to scaling up regeneration through changes to the institutional context. For example, an Environment Court settlement process resulted in the Banks Peninsula Conservation

Trust being granted covenanting authority status,¹⁶ increasing legal options for the permanent protection of areas of high biodiversity value on the peninsula.

Notably, this model of collective action for regeneration is most common in water management in Aotearoa New Zealand (Boone & Fragaszy 2018), and typically involves relatively narrowly defined ecosystem objectives and socio-culturally similar entity types (e.g. sheep and beef farmers). These factors may constrain its potential scope and scale of application. However, existing case studies suggest that where commons management is possible, it holds significant promise for empowering landowner and rights-holder (e.g. iwi/hapū) led regeneration (Boone & Fragaszy 2018; Duncan & Diprose 2020).

2.4. Summary

‘Scaling’ has become a buzzword within the conservation and restoration literature, reflecting widespread perceptions that restoration practice needs to change if we are to reverse the decline of biodiversity on national and global scales. Research reveals that growing community-based regeneration by increasing the number of people involved, the amount of activity occurring, and the spatial scale of activity is by no means the only option.

Lam et al. (2020) identify eight processes for amplifying regeneration by enabling ecologically targeted and effective regeneration, increasing the efficiency and longevity of initiatives, and promoting system-wide change. These processes highlight opportunities to improve the social-ecological outcomes of community-based regeneration by sharing lessons and innovations across initiatives, improving social cohesion and connectivity, and embedding regeneration values and principles within wider societal norms. These diverse forms of scaling are critical for ensuring that regeneration activity is socially just and ecologically effective in the long term.

Research on community-based regeneration reveals a range of socio-institutional models for enacting these amplification processes. Mass mobilisation, community group formation, network building, collaboration and commons management are identified as models through which communities can and do seek to scale community-based ecosystem regeneration. These approaches present alternative ways of coordinating action between individuals, community groups and governance agencies. The models vary in their emphasis on shared action, purpose, knowledge, resources, plans and commitments. Importantly, no one model is inherently better than others—each is likely to be more suited to scaling community-based regeneration in some types of social-ecological contexts.

¹⁶ <https://www.bpct.org.nz/about-us/us>

3. COLLECTIVE APPROACHES TO REGENERATING BIOHERITAGE IN AOTEAROA NEW ZEALAND

This section summarises key findings from survey responses of 27 collectives who participated (see Figure 3)—approximately half of the community-based ecosystem regeneration collectives identified in our nationwide review. These 27 collectives reflect a range of collective approaches to regeneration occurring across the country, including spatial, social and issue-based features. The results of this survey are therefore interpreted as characterising the qualitative *diversity* in approaches, rather than representing the *frequency* of use of specific collective approaches.

The survey examined how groups within collectives relate to each other and other governance actors, their scope and purpose, what types of activities they undertake, how they are resourced, and what impact they have on ecosystem regeneration. The following subsections summarise the results for each of these topics in turn, concluding with key messages.



Figure 3. Locations of ecosystem regeneration collectives included in the survey ($n = 27$). Collectives occur in most regions of Aotearoa New Zealand, though are noticeably more frequent in Te Ika-a-Māui (the North Island). One collective is nationwide in its reach (represented by the dot and bracket on far left of map), while most others are localised to specific regions.

3.1. How are collectives organised?

This section describes collectives' composition and structure, including the types of social and environmental groups that make up the collective, and how they relate to one another.

3.1.1. Composition of collectives

The surveyed collectives are made up of a wide range of community groups and government and industry organisations. Survey participants were asked to name the 'groups or organisations that form part of the collective'; their responses were then analysed to identify categories of common entity types. As Figure 4 illustrates, the most common types of constituent entities are local/regional and central government, iwi/hapū/whānau and local environmental groups. Most collectives include local/regional governments and/or central government agencies (most often Department of Conservation - DOC), highlighting the key role of government entities in supporting collectives. In some cases, participants stated that government entities had driven the formation of the collective or play a lead role in coordinating the collective (e.g. DOC's Ngā Awa river restoration programme). In other cases, government entities are involved in collectives as landowners, funders, part of governance boards or steering groups, providing operational support (e.g. staff time), or partners.

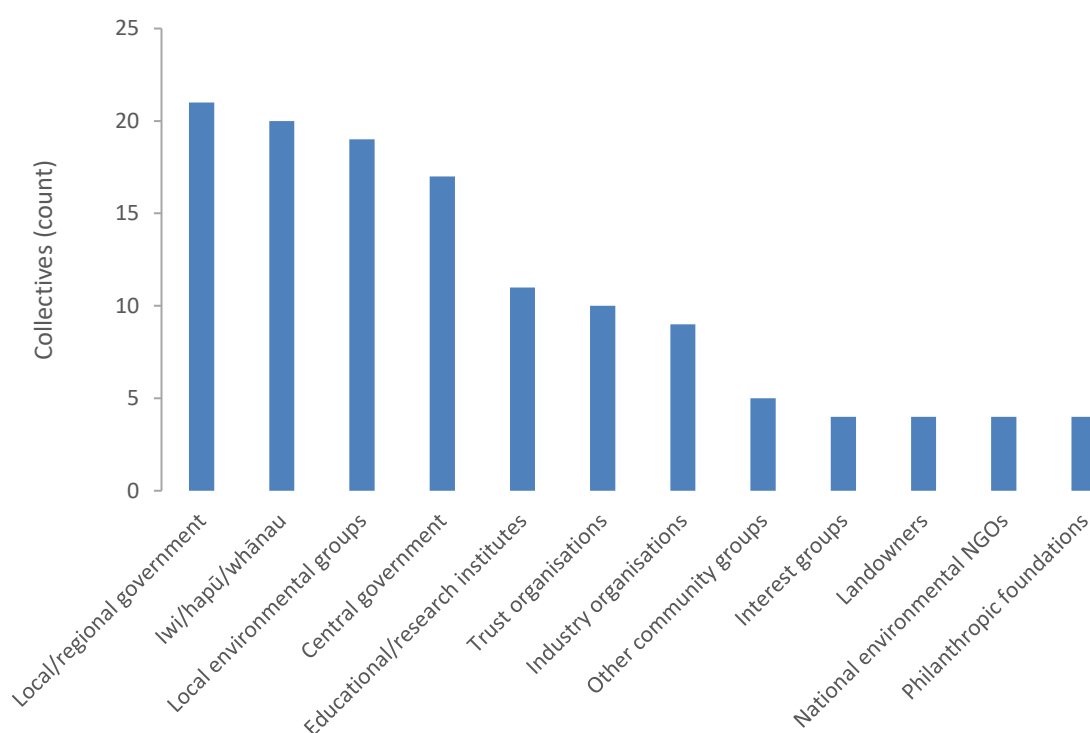


Figure 4. Types of groups and organisations that comprise the collectives surveyed.

Tangata whenua entities (iwi/hapū/whānau/rūnanga) are also key contributors to the collectives surveyed. Twenty of the 27 participants stated that tangata whenua entities are involved in their collective, though their descriptions of the nature of that involvement varied considerably. Some collectives are led by tangata whenua, and feature collaboration among multiple hapū, rūnanga, marae and Māori landowners in governance and operations. Several other collectives were described as involving strong relationships between iwi/hapū, government entities, and other organisations, and centring tangata whenua interests and involvement. In other instances, iwi/hapū or their representatives are listed among many constituent entities.

‘Local environmental groups’, the third most common category, refers to an array of community groups that take action on biodiversity and related environmental issues (e.g. water quality). This may include community-based restoration societies; catchment groups; local environmental trusts; predator control groups and networks; coast care, stream care, ‘friends of’, and wildlife groups; school groups; and local branches/chapters of national organisations. Some collectives also included ‘other community groups’, whose focus was not clearly or only environmental improvement, such as residents’ associations. While some of these local groups are formal organisations with established membership, funding and governance (e.g. local trusts and societies), others are informal groups of local landowners and residents who work together on shared initiatives (e.g. neighbourhood trapping groups).

Collectives also involve a range of national-scale non-government entities, including ‘trust organisations’ (commonly the QEII Trust and NZ Landcare Trust), ‘industry organisations’ (e.g. Dairy NZ), ‘educational/research institutes’ (e.g. universities), ‘interest groups’ (e.g. Fish & Game NZ), ‘philanthropic foundations’ and ‘national environmental NGOs’ (e.g. Forest & Bird). These relationships with diverse national entities highlight a key feature of the collectives surveyed—they engage widely in order to bring in resources, guidance and other forms of support for their regeneration initiatives. It is notable that more than a third of the collectives surveyed have relationships to ‘educational/research institutes’ (including universities, technical institutes and national research programs), allowing them to benefit from research and undertake further training.

3.1.2. Structure of collectives

Collectives surveyed include 2–10 types of entities in their membership; the average collective includes five types of entities. The combination of entities varies significantly across collectives. For example, collectives that were described as led by tangata whenua tended to include a smaller range of entity types, most commonly iwi/hapū/whānau, (Māori) landowners and government entities. Collectives that were described as centring local environmental groups tend to engage a wider range of entity types, including trusts and industry and philanthropic organisations.

Participants also described different levels of engagement across entity types, with some constituent groups included in collective leadership groups, governance boards, or advisory councils, while others are simply involved in action on the ground. These findings highlight variability in the structure of ecosystem regeneration collectives, as well as their composition.

Variability in structure

One survey question asked which of several descriptions most closely resembles the collective in question, presenting five potential options (see Appendix I). These options turned out to be inadequate to grasp the variability in collective structures. Twenty (out of 27) survey participants responded that their collective is made up of 'groups that work together with the guidance or support of an umbrella organisation'. However, participants' comments in response to this question provided two interesting insights on collective structure. First, some participants reacted negatively to the term 'umbrella', which they interpreted as meaning a top-down structure. They argued that collectives are enabling entities, shaped by the needs and activities of their constituent or affiliated groups, and that they do not have authority over these groups. Two of these participants recommended the term 'platform' to describe the collective, because it provided a supporting foundation on which other groups could build. This theme of collectives providing support and connectivity for other independently operating groups recurred in response to several questions, highlighting the delicate balance that collectives must maintain when coordinating action for regeneration at landscape scales.

Second, some participants said that their collective would be better understood as a hybrid of the options we presented. Of the participants who chose Option (a) 'umbrella organisation', two said that a second-choice option would be (e) (a parent organisation that generated smaller groups), two would choose (c) (no fixed arrangement), and one each would choose (b) and (d). These hybrid responses indicate that there is greater variability in collective structures than the multi-choice response implies, and also suggests some fluidity in the relationships between groups in a collective. As participants noted, groups in a collective are often at different stages in their own development process, and while some groups in a collective may work together frequently, others may still be forming, or may only interact with the collective entity. Three groups described themselves as 'collectives of collectives', where a larger entity provided support to multiple place-specific collectives. Some collectives were also reported to have layers of internal structure, with some groups/entities represented in collective leadership, governance, or advisory groups.

Legal status

Participants were asked to report the legal status of their 'collective' (n = 27) and 'constituent group' (n = 12), if they belonged to one; comparison of their responses reveal that collectives are much more likely to have acquired legal status than their constituent groups (Figure 5).

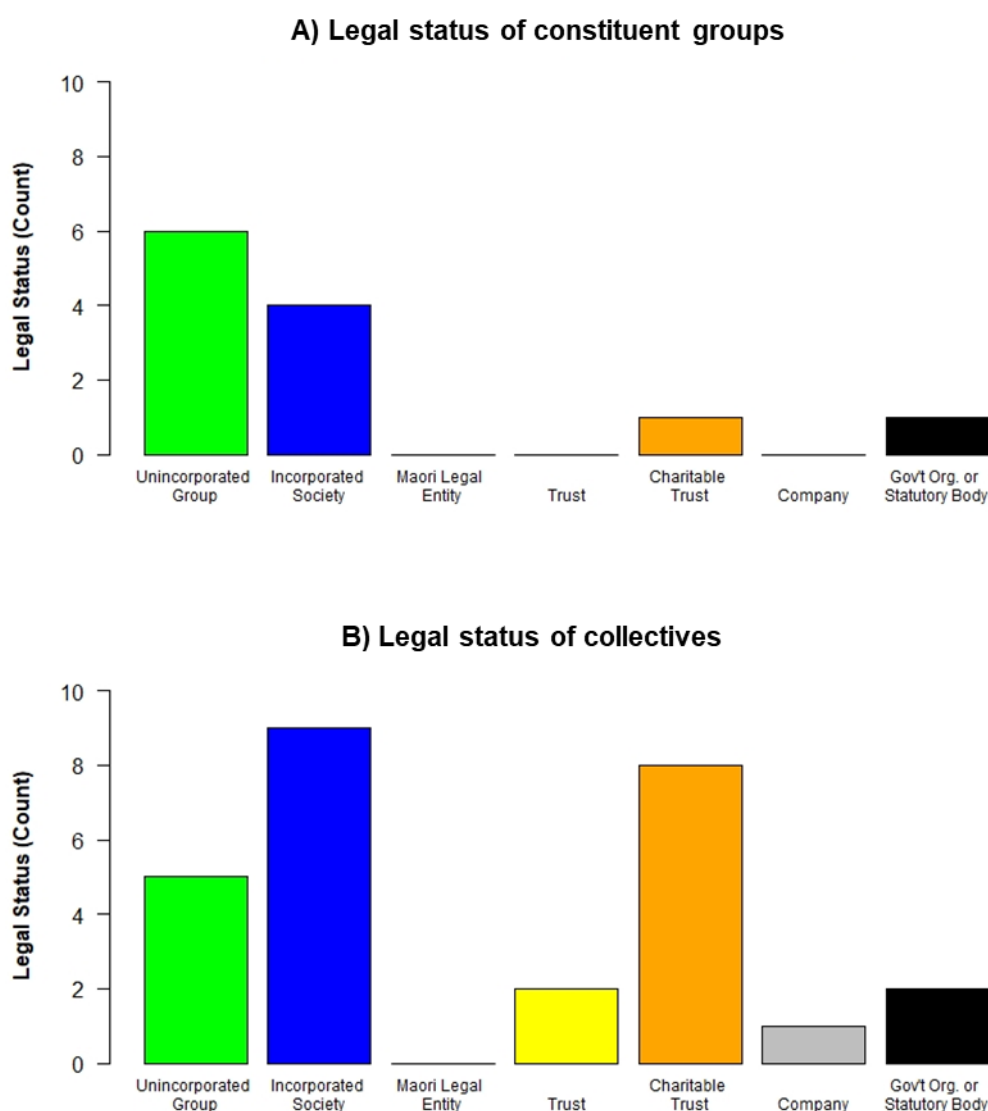


Figure 5. Legal status of survey participants' constituent groups (n = 12) and collectives (n = 27)

Half of participants belonging to a constituent group reported that their group is 'unincorporated' (n = 6), meaning that it has no legal status for tax or contractual purposes. In contrast, most collectives surveyed were identified as legal entities, with the most common legal status being 'Incorporated Society' (9), followed closely by 'Charitable Trust' (8). Seventeen of the 27 collectives are thus not-for-profit legal organisations, which under Aotearoa New Zealand law can access a wider range of funding options but are also subject to additional rules and administrative requirements.¹⁷

¹⁷ For more information on the relative benefits of becoming incorporated, see <https://community.net.nz/resources/community-resource-kit/formal-organisational-structures/>

Participant comments suggest that legal status becomes more important as collectives grow, with incorporated or charitable status enabling them to employ staff, engage in contractual relationships (e.g. with service providers), and apply for funding (for the collective or on behalf of their constituent groups). Two participants recalled that their collective had first applied for funding through a constituent society or trust, and then became incorporated as the collective grew larger and more complex.

The survey also identified five unincorporated collectives, which rely on funding and staffing from their constituent organisations (e.g. regional councils, post-settlement trusts). Among these unincorporated collectives, three were instigated by government entities that continue to play a key role in resourcing the collective, while two operate as inter-agency partnerships that collectively resource shared projects. A participant from one such collective commented that their governance group includes representatives from organisations with the legal status to apply for funding or conduct other legal activities as needed.

Age of collectives

More than half (68%) of the collectives surveyed were formed in the last decade, and almost all have existed for less than 20 years (Figure 6). The only collective to have been operating for more than 30 years is a multi-hapū trust. In contrast, constituent groups represented in this survey are far more variable in age, with half the groups reported to have formed more than 20 years ago. Two of these longstanding constituent groups are hapū.

Comparison of the age profiles of collectives with their constituent groups suggests that most collectives formed relatively recently, building on the efforts of established environmental groups. Indeed, responses to the question 'when did your group join the collective?' reveal that participants' constituent group preceded the collective in 7/12 cases, and in three further cases the collective and constituent group were formed around the same time. In two instances constituent groups were formed following the creation of a collective, to contribute to the 'on the ground' delivery of shared goals.

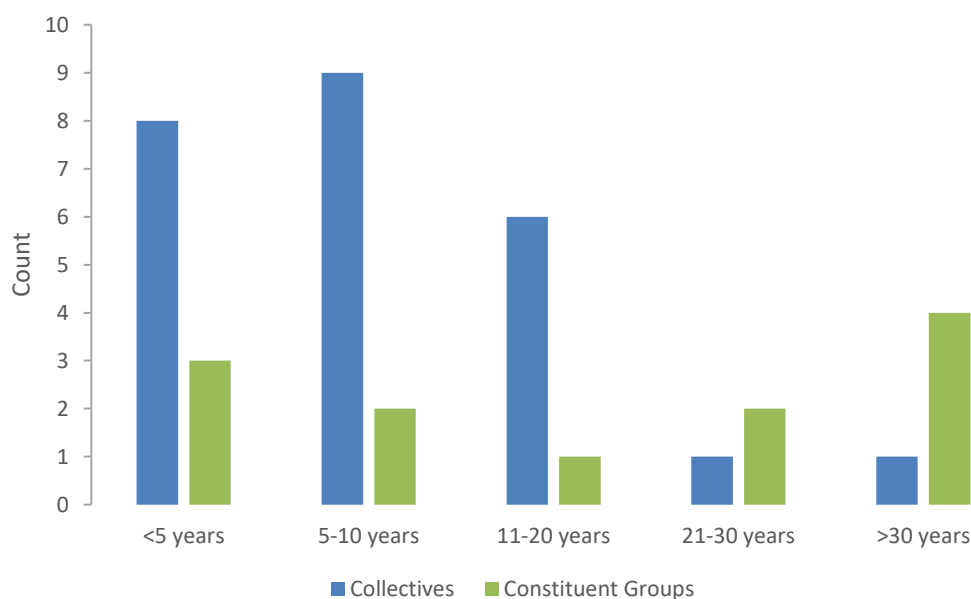


Figure 6. Years since formation for collectives (n = 25) and constituent groups (n = 12) surveyed. Two participants were unsure when their collective was formed.

Collective formation

This growth of collectives over the last ten years is mirrored in participant comments on the drivers of collective formation. The creation of collectives was most often attributed to community efforts, sometimes led by motivated individuals or existing community groups. Participants described frustration with existing ecosystem management and governance; visible environmental degradation; and a desire for greater engagement as key drivers of community-led collective formation. For example, some participants stated that their collective formed due to government agencies' perceived failure to protect and improve valued ecosystems, while others attributed it to frustration with agencies' 'top-down' approach to environmental management, and landowners' desire to take a more active role in improving outcomes on private land.

Collectives established through community efforts also formed due to a sense of common good or purpose. Participants identified social ties, a shared vision or interests, and a perceived need for greater coordination among community groups as key motivators for community-led collective formation. For some hapū-led collectives, recent Treaty settlements were both a significant enabling factor and a driver of collective formation.

Participants also reported that government agencies, NGOs, and philanthropic foundations have played a key role in instigating and enabling collective formation in Aotearoa New Zealand. Seven participants stated that the collective had been formed by a local, regional, or national government agency. In some cases, the agencies continue to lead or coordinate the collective, while in others leadership has passed to

the community. These government agencies were reportedly motivated by new policies and funding, recognition that current management was not delivering environmental protection or improvement, and a desire to improve community engagement. For example, one government agency reportedly saw the collective as a way to broaden biodiversity objectives and initiatives for the area beyond typical mandated planning and implementation activities.

Similarly, several non-government entities (e.g. NZ Landcare Trust and philanthropic foundations) were identified as driving collective formation by bringing groups together and providing funding, guidance and other support for landscape-scale regeneration. Indeed, funding opportunities or the need for improved funding and support were mentioned as key drivers for the formation of a range of collectives. For example, a participant commented that being part of a larger collective expanded their group's funding and advocacy opportunities.

Evolution of collectives

Finally, participants report that collectives can evolve significantly over time through processes of expansion and formalisation. Some participants noted that their collective had started small—for example as a pilot project—and then expanded its scope and spatial scale over time as more groups joined and additional funding and other resources became available. In one case, a collective expanded from a sub-catchment project that was narrowly focussed on biodiversity outcomes to a landscape scale initiative that encompassed a range of biodiversity, freshwater and social objectives. In another instance, a collective retained its freshwater restoration focus, but expanded over time from a local, to a regional, to a national scale initiative. Participants noted that the expansion of collectives involved significant internal capacity building and relationship building with external partners to provide larger-scale coordination of activities and support while maintaining the collective's connection to community.

Other participants described the formalisation of collectives over time. Some collectives followed a pattern of starting out informally, with motivated community members and groups working together in a “grassroots” way, and later became more structured and “professional” as the collective grew and expanded. Participants described this formalisation as necessary to the collective's continued success—“it has to become structured to persist”—and its ability to develop institutional relationships and bring in further funding. Participants also stressed the importance of maintaining relationships and “building on what was already there” as collectives formalised; one participant quoted “change happens at the speed of trust”¹⁸ in their response. However, another noted that more substantial change was sometimes necessary, as “the original people who started it are actually those who can hinder

¹⁸ Original quote by Martin Hunt

growth to the next stage [because they] don't want it to formalise or to leave their realm of influence.”

3.1.3. Key messages: organisation of collectives

- Most collectives were formed in the last decade (2011–2021).
- Collectives are typically comprised of a mixture of local/regional and central government entities, iwi/hapū/whānau and local environmental groups.
- Most collectives involve one or more tangata whenua entities, though the nature of involvement varies.
- Most collectives are made up of independent groups that work together at least some of the time, and a central entity that provides guidance, support and connectivity.
- Some collectives have a complex internal structure, featuring governance or advisory groups and varying degrees of connectivity between constituent entities.
- Collectives are more likely to have legal status than their constituent community groups; participants reported that legal status enables collectives to access a wider range of funding options, though some have not found the need to formalise.
- Collectives were most often formed through community efforts, based on a combination of negative (e.g. frustration with existing management) and positive drivers (e.g. existing social ties).
- Government agencies, NGOs and philanthropic foundations have also played a key role in instigating and enabling collective formation, and in some cases continue to lead collectives.
- Collectives' structure may evolve significantly over time through processes of expansion and formalisation.

3.2. What do collectives seek to achieve?

Collectives seek to enhance a wide range of social-ecological outcomes, across varying ecosystem types and geographic areas. To understand this variability, the survey included questions on the scope, purpose and plans of collectives and their constituent groups.

3.2.1. Scope of collectives

To understand how collectives conceptualise the central focus and scope of their activities, we asked participants to select the *main criterion* (from a choice of five, see Appendix I) that defines their collective. We wanted to know what geographic, social, ecological, or political object brought groups in the collective together and gave them a sense of shared identity. However, participants often struggled to choose one

criterion to define their collective because they felt that several criteria applied and were interconnected. The interviewer took notes on other criteria that participants considered important in defining the scope of their collective.

Participants viewed collectives as being defined by the full range of criteria, with no clear spatial trends; Figure 7 depicts this variability in collectives' scope.

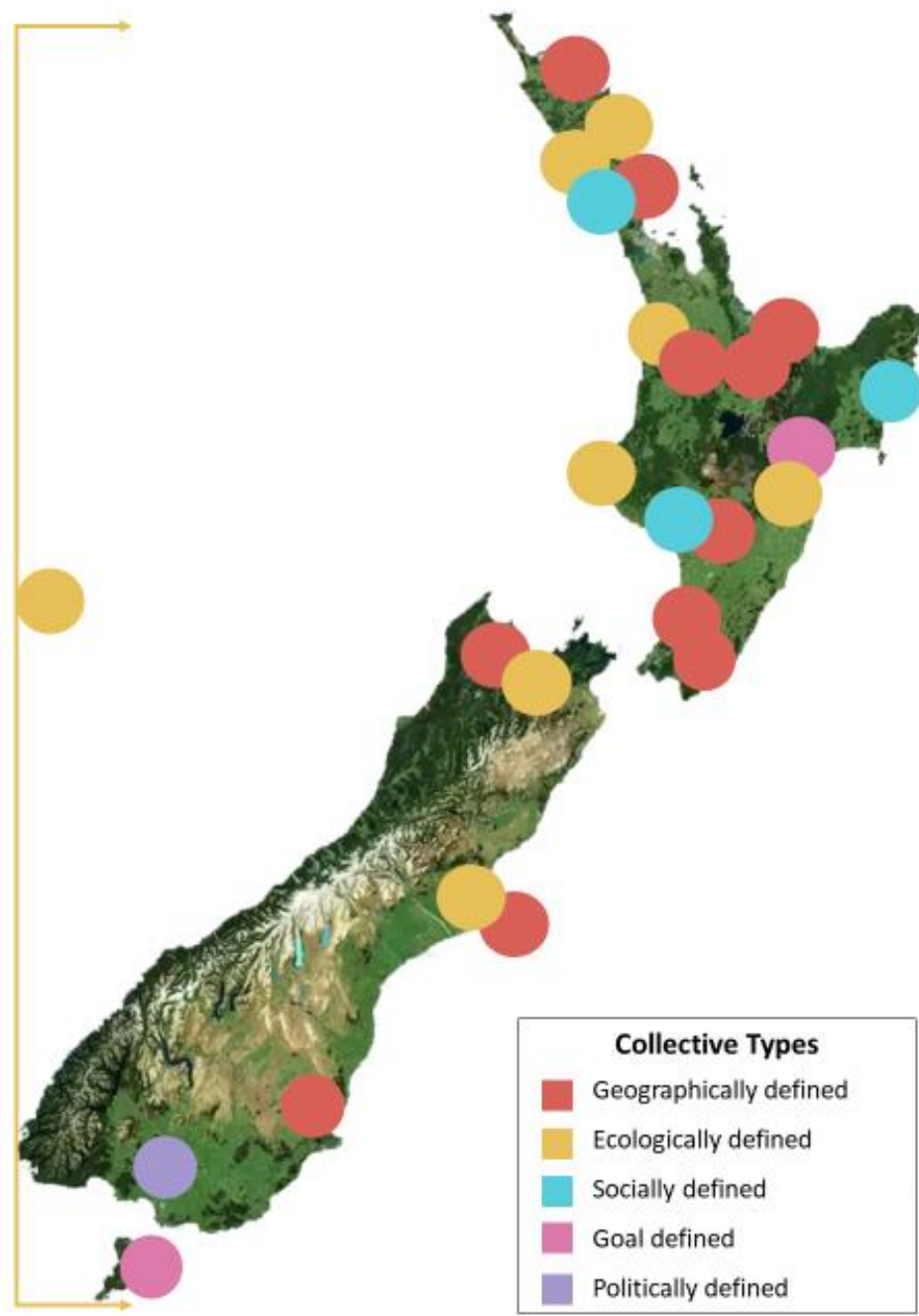


Figure 7. Main criterion defining the scope of collectives in Aotearoa New Zealand (n = 25).

Most participants stated that their collective was primarily ‘geographically defined’ (i.e. groups within a specific region, district, or township; $n = 11$) or ‘ecologically defined’ (i.e. groups connected to a specific natural area, like a catchment or forest; $n = 8$). Both criteria represent spatial definitions of scope, wherein groups in a collective are brought together by their shared connection to a socio-political or natural area. These collectives thus focus on protecting, enhancing, or restoring the biological heritage of an area.

Among those who identified ‘geographically defined’ as the primary criterion, four commented that they also saw the collective as being ‘ecologically defined’. For example, one collective named after a landscape was seen as both geographically defined (because the landscape matched district boundaries) and ecologically defined (because the landscape represented an ecosystem type). This overlap between geographic and ecological definitions of collectives reflects the stated purpose of collective action for regeneration in the literature—to scale regeneration efforts beyond sites to whole ecosystems, landscapes, or even ecosystem types (Norton et al. 2018; Perring et al. 2018).

The primarily geographic identification of collectives is not surprising when viewed through a te ao Māori lens, considering the importance of connection to place (Walker et al. 2019). Indeed, several participants who selected ‘geographically defined’ described their collectives’ scope in terms of place and community:

Anybody with an interest in the [name] Catchment. There are lots of people in this catchment: residents, schools, businesses, community groups, councils, mana whenua... all are welcome to become involved. People who have a connection to place.

The scope is really about creating a vision for community. The vision is about people wanting to see their area thriving with aspirations for the long term.

These participants highlight that place-based social connections are a fundamental aspect of scaling up regeneration efforts to larger geographic areas.

The importance of social connections to collectives is reflected in the five participants who stated that their collective is primarily ($n = 3$) or secondarily ($n = 2$) ‘socially defined’—i.e. groups with a common socio-cultural identity or connection, such as hapū or farmers. One participant commented that “social ties are what contributed to the banding together in the first place”, while another reflected on the importance of “social interaction and bonding” among people in the collective, noting that “community catchments are more than just environmental”.

Finally, some participants commented that the main criterion defining their collective had shifted over time. For example, one participant noted that their collective had

been initiated based on social connections between groups but had become more ecologically defined over time as they progressed their activities. Conversely, another collective began with a clear ecological focus, but had expanded its scope to include social connections and objectives as the interconnections of social and ecological wellbeing became more apparent. This observed evolution of collectives' scope mirrors the changes over time in collective composition and structure noted in Section 3.1.2. Thus, while collectives can be distinguished into types based on their scope, it is important to remember that a key characteristic of collectives is their flexibility and fluidity.

3.2.2. Purpose of collectives

The survey included questions on the main purpose of participants' constituent group and collective, as well as the plans, vision statements and other documents through which this purpose is articulated.

Participants reported a range of context-specific purposes for their collectives, including objectives for:

- specific places (e.g. "to increase the amount and diversity of biodiversity in [place name] and to protect the biodiversity that we have")
- ecosystems (e.g. "to create new wetland habitat")
- species (e.g. "to increase kiwi numbers in [place name] and surrounding areas")
- human communities (e.g. "to create regional economic gains for our iwi, for us to be progressive [...]. Empowering our people and communities")
- how groups would operate (e.g. "To work together and harness the synergies of working together")
- promoting regeneration to the wider public (e.g. "empowering the community to take ownership of and care for their patch of land").

Despite their context-specificity, some clear themes emerged when collectives purpose statements were analysed together, as indicated in Figure 8. Notwithstanding the variation in length of purpose statements, the relatively similar frequency of 'community' to 'biodiversity' and 'restore' in purpose statements suggests a holistic and community-driven approach to ecosystem regeneration. This inference is supported by the prominence of other community-related terms, such as 'people', 'iwi', 'Māori' and 'farmers'. In ecological terms, 'biodiversity' was clearly more central to collectives' shared purpose than landscape, freshwater, species, or predator control goals, though it should be noted that water-focussed purpose statements used a range of terms (e.g. fresh water, water, catchment, river).

The word cloud in Figure 8 also provides clues to the ways in which collectives envision their contribution to ecosystem regeneration. There is clearly a much greater focus on 'restoring' social-ecological systems than 'protecting' them, perhaps

water, community wellbeing) and then grouped similar codes together, revealing four broad purpose types:

- *Ecological* purpose statements are those that identify ecological improvements—whether for a species, population, ecosystem, natural feature, or process—as the main purpose of the group/collective. Many entities with an ecological purpose focus on ecological restoration and improving fresh water, waterways, biodiversity and the health or mauri of particular environments.
- *Social-ecological* purpose statements focus on enhancing relationships between people and environments, such as ‘environmental care’, people’s connection to nature, mahinga kai and holistic concepts of wellbeing that include the health of land, waters and people.
- *Social* purpose statements reference improved outcomes for people and communities, including inter-generational equity, connected communities, employment opportunities and enhanced socio-cultural values.
- Participants often described the main purpose of an entity as improving the way regeneration is undertaken—i.e. as a *way of working*. Such purpose statements focused on enabling, supporting, or empowering communities to undertake regeneration, working together in a more coordinated way, improving efficiency and growing group capability.

Figure 9 shows that over 75% of participants described collectives’ and constituent groups’ main purpose in ecological terms, typically the enhancement of ecological restoration, biodiversity and freshwater. For constituent groups, almost as many participants (58%) described the group’s main purpose in social-ecological terms, emphasising people-nature connections and holistic concepts of wellbeing. For example, one group aspired to “create a space in an urban area where people can immerse themselves in nature”, while another participant responded, “we are the lungs of the repo, so the environmental impact we [...] have had for centuries will impact up and coming generations if we don’t fix it now.” This frequent social-ecological framing may reflect the local scale of most constituent groups, whose objectives are shaped by community relationships to specific places and ecosystems.

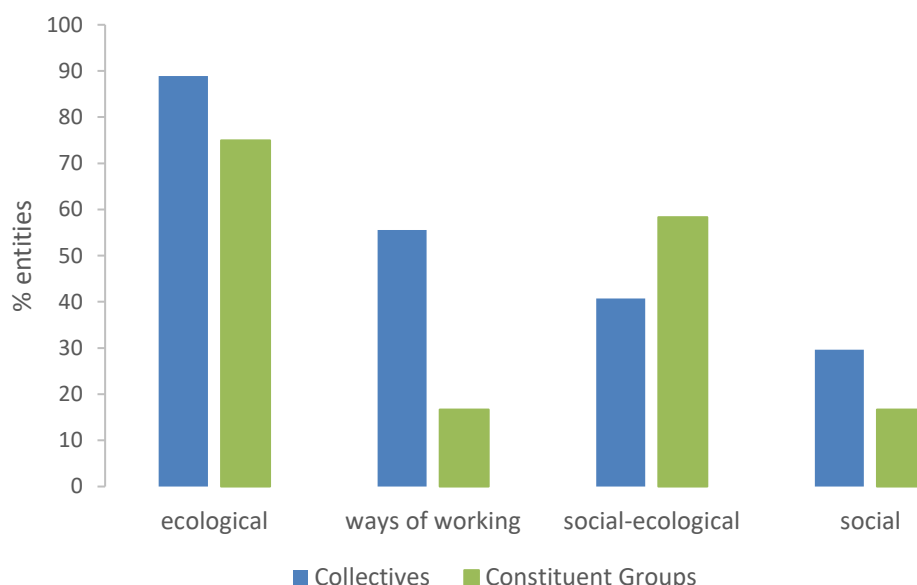


Figure 9. Proportion of collectives (n = 27) and constituent groups (n = 12) whose main purpose (as described by participants) included ecological, social, social-ecological, and/or ways of working dimensions. Descriptions were coded to one or more purpose types.

In contrast, participants were much more likely to articulate the purpose of collectives as improving ways of working (56% of collectives versus 17% of constituent groups). These purpose statements focussed on connecting people/groups and empowering or supporting communities to care for their environment. For example, one participant stated that their collectives' purpose is to bring people together to increase the collective knowledge of communities, agencies and iwi on ecosystem restoration. Another noted that their purpose was about community engagement and supporting communities to get regeneration actions happening on the ground, as "we think they hold the solutions for these problems". This emphasis on improving community connectivity and capacity to undertake regeneration differs from constituent groups' frequent focus on enhancing people-nature connections, suggesting a more governance-oriented role for collectives. This focus on improving ways of working also aligns with participants' identification of frustration with existing management and governance arrangements as a key driver of collective formation (Section 3.1.2).

Participants were least likely to articulate a specifically social purpose for collectives and constituent groups, reflecting their primarily ecological mandate. Nevertheless, participants reported that eight collectives and two constituent groups seek improved social outcomes through their regeneration work. Three representatives of collectives led by tangata whenua spoke about the employment opportunities that regeneration activities create for their communities, and the mana-enhancing nature of this work. For example, "we also want to create regional economic gains for our iwi, for us to be progressive, not settling for the status quo; we're in this for the long haul. [This is

about] empowering our people and communities, to tell the story of our region being a great place.” A participant similarly described the purpose of their farmer-based collective in socio-economic terms, noting that they sought “to lead and get ahead of where society wants us to be operating as farmers in caring for the environment for the long term and with an inter-generational perspective”. These examples provide a reminder that while environmental groups and collectives often focus on their ecological outcomes, they also seek to contribute to important social, cultural and economic objectives.

3.2.3. Guiding documents

Our survey asked participants whether their constituent group and collective have “a plan, strategy or vision statement that guides its activities”. We found that collectives are much more likely to have a guiding document than constituent groups, and in particular are more likely to have a plan, strategy, or vision statement (see Table 2). Indeed, twelve collectives and a few constituent groups, were reported to have multiple documents—typically, a vision or goal, a strategy document and some form of operational or action plan. Some collectives also had other types of plans to support their work, such as business plans, monitoring plans, communication plans, or (sub)catchment plans.

Table 2. Percentage of constituent groups and collectives that were reported to have each type of guiding document.

	Collective (n = 27) %	Constituent group (n = 12) %
No guiding document	7	33
One or more guiding documents:	93	67
• Contract with milestones	4	8
• Plan	44	33
• Strategy	48	33
• Vision statement	52	42

This suggests a greater degree of formalisation of purpose among collectives relative to constituent groups, and that guiding documents are more central to the work of collectives (e.g. for coordination of activities). However, participants expressed differing views on the value and effectiveness of guiding documents. On the one hand, some participants commented on the importance of guiding documents for

ecosystem regeneration, noting that entities need plans or a long-term vision or they tend to lose purpose, and that such guiding documents give the entity more clout when engaging with government agencies. The creation of guiding documents also allowed entities to articulate their shared values and vision, and to set targets or milestones by which they could measure their progress. Several entities led by tangata whenua have incorporated whakataukī into their strategic documents, to guide the entity's activities and capture mātauranga about the environment and how it can be regenerated.

However, participants also noted that the development of guiding documents requires significant time (in some cases years) and effort, and that strategies or plans must be updated or refreshed over time. For example, one participant recounted that their collective developed an ecological strategy through extensive consultation with ecologists regarding what was ecologically possible in the landscape, and then consultation with the community to identify what actions and timeline would work for them. They described it as a "very extensive process" that "has allowed groups to coalesce around a common goal". The time, expertise, relationships, and resources to develop and keep such documents up to date may thus be another reason why guiding documents are more common among collectives. Indeed, two constituent groups stated that they did not have a plan yet, or lacked the capacity to develop one. In some cases, constituent groups relied on the plan/strategy established by their collective.

On the other hand, some entities pushed back against the perceived need for guiding documents. One representative of a collective led by tangata whenua commented that written documents are not of great importance to their regeneration efforts: "We don't have to write a strategy down [...] it's already embedded in te ao Māori. What we need to do is to get the whenua back to how it was and look after it. There is no particular year to attached to this vision, it has always been in existence." Another group that has a strategy in place similarly commented that their work was primarily guided by tikanga. These findings highlight that a range of practices, knowledge and guidance can support collective efforts, beyond formal documents.

Further, while most participants described guiding documents as empowering their work, one noted that such documents can also reproduce the 'top-down' model that many collectives and their members seek to avoid. The participant noted that while the collective has a vision statement and a plan, it is not communicated to farmers, because they want to keep the action directed from the bottom up. Together, these comments suggest that too much formalisation may be inimical to the community-driven basis of collective action for regeneration.

3.2.4. Key messages: scope and purpose of collectives

- Most collectives are primarily 'geographically' (n = 11) or 'ecologically defined' (n = 8), wherein groups are brought together by their shared connection to a socio-political (e.g. region) or natural (e.g. catchment) area.
- Three collectives were identified as 'socially defined' (i.e. brought together by shared social identity, e.g. farmers), highlighting the importance of social connections to collective regeneration.
- Purposes attributed to collectives include the protection and restoration of places, ecosystems, communities and species, and aspirations for how groups would work together and promote regeneration to the public.
- The purpose of both collectives and their constituent groups was commonly described in ecological terms, focusing on the enhancement of ecological restoration, biodiversity and fresh water.
- Constituent groups were more likely than collectives to emphasise people-nature connections and holistic wellbeing concepts (i.e. social-ecological purpose).
- Purposes attributed to collectives were more likely to emphasise improved ways of working, including connecting groups and empowering communities to care for their environment.
- Collectives are more likely than constituent groups to have a guiding document (including a plan, strategy and/or vision statement).
- Some groups said they found guiding documents important or valuable for their work, whereas others stated they were unnecessary or 'top-down'.

3.3. What do collectives do?













This subsection examines the actions, practices and interactions that collectives use to achieve their goals.

3.3.1. Activities undertaken by collectives

The survey asked participants to identify the main regeneration activities that their constituent group and their collective undertakes, from a list of 11 options; they could select as many as applied. Table 3 demonstrates that most constituent groups and collectives undertake a range of activities (7 categories on average), with a shared focus on monitoring, public education and engagement, pest control and planting. Both collectives and constituent groups also engaged in the re-establishment of native species (e.g. kiwi) and clean-up of litter and pollution at similar levels, though less frequently than other activities. These findings mirror trends in other studies of community conservation groups (e.g. Peters et al. 2015).

Some activities were more common among collectives in the survey, relative to constituent groups. A larger proportion of collectives were reported to engage in providing advice and support to other groups (93% vs 67%); public education and engagement (85% vs 75%); fundraising (67% vs 50%); and lobbying government or industry (52% vs 42%). These activities suggest a more strategic, relationship-building role for collectives, and reflect the emphasis on improving ways of working in collectives' purpose statements. In contrast, results suggest that constituent groups are predominantly engaged in 'on the ground' activities, including planting, monitoring, infrastructure development and maintenance, and public outreach.

Table 3. Proportion of constituent groups and collectives engaged in each activity type.

Regeneration activities		Collective (n = 27) %	Constituent groups (n = 12) %
	Providing advice & support to other groups	93	67
	Public education, engagement, or advocacy	85	75
	Monitoring	81	83
	Pest control	70	67
	Planting	67	83
	Weed control	67	42
	Fundraising	67	50
	Lobbying government or industry	52	42
	Building or maintaining infrastructure (e.g. fences)	44	75
	Re-establishment of native species	33	33
	Cleaning up litter, pollution, etc.	30	33
	Other	15	25

In their comments on collectives' activities, participants report that collectives enable the 'on the ground' activities of other groups by providing advice, information, and support and undertaking fundraising and networking activities. For example, one participant noted that their collective only has funding to help identify the most effective regeneration actions—not to actually undertake those actions. The collective therefore focuses on communicating scientific insight, best practice and changing land management requirements to its constituent groups to inform their work. Another participant described their collective's role as "being a supportive friend"—an entity that groups can discuss issues and celebrate achievements with, and a provider of skill-building workshops and networking opportunities. Some participants stated that collectives play an important role in testing and sharing innovative approaches to regeneration and refining best practice. One noted that because of the collective's larger resources, it was able to take risks in trying new techniques on behalf of member groups.

Collectives also report engaging with external actors through education and lobbying activities. Seven participants said their collective undertakes submission-writing and liaising with government agencies on matters of importance to the collective (e.g. regional plan rules). Some collectives provide relevant information to constituent groups to support their submission writing, while others assist groups with making submissions or even write submissions on groups' behalf. Participants expressed different levels of comfort with a political role for collectives; while one collective noted that they steer clear of acting in an advocacy role (to preserve their perceived political independence), others stated that they regularly lobby or advocate for environmental policy change. Collectives also report engaging with school groups, research organisations, and iwi and hapū as part of their outreach activities. One participant explained that collective staff regularly engage with schools and other groups to foster new memberships, build relationships, and "bring others into the fold". While public outreach is clearly important to both constituent groups and collectives, participant comments suggest that collectives are more likely to have the staff time and resources to undertake regular outreach activities.

3.3.2. Collective working arrangements

The survey further asked about collective agreements and the methods through which constituent groups interact.

Written agreements

Participants were asked whether their collective has a written agreement or rules that define how constituent groups or members work together. This question explored how formal the relationships are between the collective and its groups or partners, or among constituent groups, and the nature of those relationships. Of the 27 collectives surveyed, 21 were reported to have some form of written agreement, with several having more than one agreement. Of these 21 collectives, 12 have Memorandums of

Understanding (MoU) or Terms of Reference with (some of) their constituent groups that describe their respective roles and responsibilities and how they would work together. These agreements appear to vary in nature. For example, one participant reported that their collective has “mana-enhancing written documents that each group shapes how they like and then we follow together”. Seven collectives have written agreements with central or local government agencies—most often with the Department of Conservation. Several collectives were noted to have other forms of agreement, such as a collaboration plan, a constitution in te reo Māori, and a document outlining the ‘group culture’ that sets “guidelines for how we operate and share our journey together, with agreed-upon behaviours”.

Some participants said that agreements were time consuming to develop, yet important to the work of the collective, especially as it grew. For example, one participant recalled that their collective had spent a year discussing what they wanted and who they wanted around the table before putting a MoU together. They stated that it was important to spend this time identifying a common purpose and what meaningful involvement might look like to develop the collective relationship. Another participant spoke of the value of having terms of reference between members of the collectives’ governance group, including with key decision makers who could then get matters decided upon and actioned.

However, six collectives were reported to have no written agreement regarding how groups or partners in the collective work together. Some participants noted that their collective had a constitution, meeting protocols, or bespoke contracts as a result of its legal status, but did not consider that these documents defined the relationships or participation of groups in the collective. These collectives appeared to view written agreements as either unnecessary or contrary to the collectives’ ‘platform’ role. One participant considered that agreements were made and signed in order to “get things done”, but that the collective was “mostly quite an organic organisation”. Another stated that the groups comprising the collective are very independent and have their own rules; the collective thus operates on a trust-based model, where groups can withdraw at any time.

Interaction methods

Formal agreements, while important, reveal little about the ways in which groups in a collective interact on a regular basis. Therefore, our survey also asked participants to identify the methods through which groups in the collective interact with one another, for example to make decisions or share information. Participants could select up to ten forms of interaction (see Figure 10).

Survey results revealed consistently common use of eight methods of interaction. All collectives undertake regular meetings between constituent groups, and more than 70% of collectives also use social media, websites, email lists, shared events between groups (e.g. planting days), and newsletters. Collectives’ interactions thus feature a

combination of online information sharing and face to face engagements. Supporting such interactions requires significant investments of time and resources on the part of collective staff and group representatives. For example, one collective was reported to use bimonthly hui for all members of the collective, monthly steering group meetings, a Facebook page and emails between groups to coordinate activities.

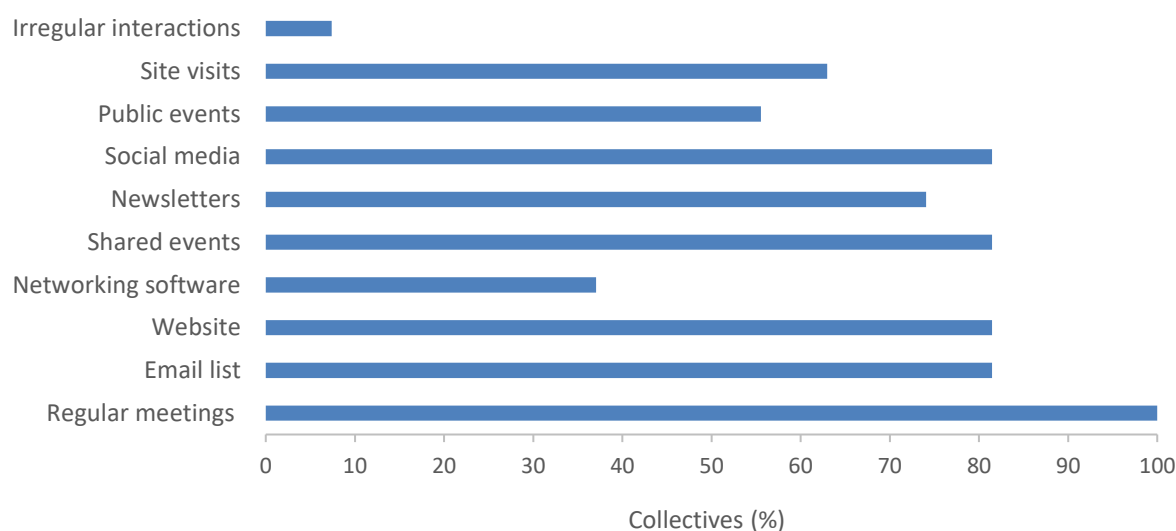


Figure 10. Methods of interaction between groups in collectives (n = 27).

Participants also reported additional methods of interacting that were not already included in the survey. These included phone calls (mentioned by six participants), media releases, posters, generation of reports or scientific papers, collation of group data, and in one instance, the development of their own app.

Participants stressed the value of kanohi ki te kanohi/face to face interactions between members of the collective. One noted, “meetings are most effective in achieving goals”, while another stated “face-to-face is considered of high value and is prioritised”. Depending on the scale at which the collective operated, these face-to-face interactions took different forms. For example, two large-scale collectives used annual events and national wānanga to bring groups together, while more local scale collectives mentioned monthly hui and leadership group meetings. Participants also mentioned that in a Covid-altered world, some of these meetings were now happening over Zoom as well as kanohi ki te kanohi. One participant said that site visits by were an important way of connecting across groups, as well as with place. They described site visits by collective leaders as “vital for diplomacy and relationship building” and stated that visiting regenerating sites helped to acknowledge the groups’ work as well as to befriend them.

3.3.3. Key messages: collective activities

- Common activities pursued by collectives and their constituent groups include monitoring, public education and engagement, pest control and planting.
- Collectives are more likely than their constituent groups to undertake strategic activities, such as providing advice and support to groups, fundraising, public outreach and lobbying government or industry.
- Constituent groups are more likely to undertake 'on the ground' activities, including planting, monitoring, and infrastructure development and maintenance.
- Most collectives (21/27) have written agreements with their constituent groups and/or government agencies, which set out their respective roles and responsibilities and how they will work together.
- Collectives use a range of interaction methods to maintain relationships with and between constituent groups; most collectives report using a combination of regular meetings and online methods of communication.
- Face-to-face interactions were considered particularly valuable to collectives.

3.4. How are collectives resourced?

To undertake the numerous strategic and on the ground activities pursued by collectives, some form of time and/or staff resourcing is required. This subsection therefore explores how collectives are resourced, including key funding sources and number of staff, and compares these findings to resourcing for constituent groups.

3.4.1. Funding

Participants were asked whether their constituent group and their collective receive any funding or other kinds of external support. Participants could select up to eight funding sources or indicate that they receive no funding; one option (in-kind support from other organisations) was included in the option set for collectives but not constituent groups.

Table 4 shows that most collectives and constituent groups derive their funding from government grants, donations and contracts to complete work (e.g. planting contracts). Ninety-three percent of collectives and 83% of constituent groups are funded through local and central government grants, which include regularly allocated annual funding (e.g. funds in council budgets) and one-off contestable funding rounds (e.g. Jobs for Nature). Secondly, more than 40% of groups are funded through donations, typically from a few large philanthropic organisations that invest in ecological restoration and biodiversity initiatives in Aotearoa New Zealand (e.g. NEXT Foundation, Rātā Foundation). Other commonly mentioned funders include Predator Free 2050 and industry organisations (e.g. Beef and Lamb New Zealand, Fonterra).

Some groups also gather public donations through their webpage, email campaigns, and crowdfunding websites (e.g. Givealittle).

Seventy percent of collectives are resourced through in-kind support from other organisations, such as staff support from government, industry and NGO partners. This resourcing is typically in addition to government grants and/or donations, NGO grants, etc. We did not ask whether constituent groups were similarly resourced through in-kind support, but participant comments reveal that at least some are. One constituent group reported that they do not currently receive funding, and instead rely on gear and other support from their collective to undertake predator trapping.

In contrast, less than 20% of collectives or constituent groups are funded through income from trusts or endowments, user fees, or member contributions. Two rare examples of internal funding were a collective led by tangata whenua where member iwi have invested their own money in the collective, and a farmer-led collective that charges participating farmers a user fee. These findings highlight that the majority of groups are reliant on external sources of funding and support, in particular government sources.

Table 4. Types of funding and external support received by constituent groups and collectives in the survey.

Funding type	Collective (n = 26) %	Constituent groups (n = 12) %
Government grants	93	83
In-kind support from other organisations	70	-
Donations	48	42
Contracts to complete work	30	25
NGO grants	22	17
Trust or endowment income	15	17
User fees	11	8
Member contributions	4	8
No, we receive no funding	0	8

Participants also reported additional sources of funding to the options provided in the survey. One reported that their constituent group receives 'mitigation funding' for a private business that uses the group's land resources, while another constituent group

reported that they generate funding by raising and selling native plants from their nursery. Six collectives/groups also reported receive sponsorship funding and in-kind contributions (e.g. printing services, tea and coffee supplies, gear) from local businesses. Several collectives were reported to receive research funding or in-kind contributions to support their regeneration work.

Finally, participants commented on the need for a portfolio approach to resourcing collectives' activities. Some said that it is important to have a diversity of funding streams to keep support flowing for the collective over multiple waves of activities and to be resilient to changes in the funding landscape. For example, groups noted a recent increase in their funding through the Provincial Growth Fund and Jobs for Nature—two government programmes that have provided a significant but short-term financial boost for regeneration efforts. Brown (2018) argues that reliance on such one-off grants can make it difficult for regeneration groups to plan long-term programmes of work and employ staff on a regular basis. Accessing such funding also requires significant investments of time and expertise by groups to seek out and apply for funding. Central and local governments could promote efficient and long-term ecosystem regeneration by creating more sustainable funding pathways for community-based groups and collectives, including for administrative activities and staff time.

3.4.2. Staffing

Participants were asked whether their constituent group and their collective have a leader, coordinator, or any paid staff. The interviewer took notes on the number of paid staff and/or Full Time Equivalents (FTEs), the type of leaders and staff, and any other participant comments on staffing.

Just over half of constituent groups (7 of 12) were reported to have paid staff, while the remainder were made up entirely of volunteers. The number of staff reported among constituent groups ranged from 1.0 to 5.5 FTEs, with a mean of 2.4 FTEs. Paid staff typically included group coordinators, leaders, or managers; the group with 5.5 FTEs also employs plant nursery and weed control staff. In some cases, the FTEs reported were staff from government agencies or other organisations who have time allocated to supporting the group or project. Some groups also employed contractors on a fixed or short-term basis to carry out specific tasks (e.g. fencing, nursery work).

Participants reported that constituent groups' chair, secretary and treasurer roles were typically volunteer roles. One stated that the lack of funding to hire staff makes it hard to make progress in the environmental space: "sometimes there's been some funding but only enough for very very part time [roles] and on and off, so you lose momentum."

By comparison, almost all collectives (26 of 27) were reported to have paid staff. The number of staff reported ranged from 0.2 to 40.0 FTEs, with a mean of 6.4 FTEs. As

with constituent groups, the most common types of paid staff among collectives were coordinators, project or general managers, administrators, contractors and staff time contributed by other organisations. Some collectives were also able to employ part-time facilitators, social media coordinators and advisors to support their work.

These findings highlight that paid staff are both more common and numerous among collectives (compared with constituent groups), providing collectives with the capacity to coordinate and communicate with multiple other groups and partners. However, staffing among collectives is variable. Six collectives are reportedly operating with just a part-time coordinator or administrator, alongside significant volunteer contributions. For example, the collective with 0.2 FTE for example is a large community network with a chair, deputy chair, treasurer, secretary, communication and project manager and administrator, of which only the administrator is paid. The participant commented that paid time is a small but essential component of the collective's work. In contrast, a national-scale collective was reported to employ regional and group coordinators across the country, amounting to approximately 40 FTE. Two collectives reported employing more staff recently as a result of Covid recovery funding.

Again, participants highlighted the importance of paid staff to the work and outcomes of collectives. One considered that it was important to have paid staff to support the work of its constituent catchment groups, which are all led by volunteers with other jobs and which therefore limited capacity to apply for funding, seek guidance, etc. Another participant highlighted that providing employment opportunities for whānau was central to the kaupapa of their collective.

3.4.3. Key messages: resourcing of collectives

- Collectives and their constituent groups derive their funding from similar sources: predominantly government grants, donations and contracts.
- Most groups are reliant on external sources of funding and support; very few receive income from trusts or endowments, user fees, or member contributions.
- Just over half of the constituent groups surveyed have paid staff (2.4 FTE on average), while the remainder rely entirely on volunteers.
- Almost all collectives have paid staff (6.4 FTEs on average), providing collectives with capacity to coordinate and communicate with other groups and partners.
- Staffing varies among collectives; six collectives operate with just a part-time coordinator or administrator, while others employ large numbers of coordinators, managers, administrators and contractors.

3.5. What do collectives contribute to ecosystem regeneration?

This subsection reports survey participants' self-assessment of their collectives' impact, including the extent to which collectives 1) support their constituent groups to achieve their objectives, and 2) improve 'on the ground' outcomes for biodiversity.

3.5.1. Outcomes for community groups

Participants were asked whether they thought that their constituent group (or others) has been able to have greater impact or better achieve its objectives by being involved in a collective. All participants responded with an emphatic 'yes'; their responses offered several explanations for this perceived greater impact.

First, participants stated that being part of a collective increases the capacity and resources available to community groups, including knowledge, advice, facilities and access to funding. For example, one participant recalled that their constituent group relied on the collective's knowledge of predator control to set up an effective bait station network. The collective also dedicated time and energy to helping the group service their trap lines. Collectives were considered to provide groups with valuable knowledge and assistance for running meetings, collating databases, planning and strategy, and in particular applying for funding. Several participants stated that their collective used their staff time and expertise to assist groups to apply for funding that may not have been able to access without this support. Collectives were reported to have the time and skills to apply for funding, and the reputation and scale to be attractive to funders. For example, one participant reported that their collective creates "amazing grant applications that funders can't resist". Another recalled being told by community groups that having an affiliation with the (well known) collective gave the groups greater weight in applying for funding, while yet another reported being able to access additional funding because of the larger spatial scale of the collective programme.

Participants also reported that the way in which collectives engage with constituent groups to provide assistance matters, in addition to the resources themselves. As mentioned in Section 3.1.2, many collectives seek to provide support without exercising authority. For example, one participant stated that their collective "plays a connecting-up, very empowering role [by mediating] between constituent groups and the larger landscape of funding and knowledge." Another considered that collectives are seen as "a friendly face in the room", in contrast with government agencies that may provide similar support but are seen to wield 'carrots and sticks' to shape groups' behaviour.

Second, participants stated that collectives promote increased connectivity between groups, and between people and the environment, enabling them to work together towards shared goals. As one participant commented, the greatest service their

collective contributes to local ecology is to “pull together disparate groups with different drivers to work towards a common purpose”. Another participant considered that being part of the collective had opened conversation about other issues in the catchment (e.g. weed control), and thus identified new opportunities to protect and care for the catchment. By encouraging this catchment-scale perspective, the collective helped to connect groups and people who share common interests. As a further participant explained,

Entities on their own can't really achieve as much by themselves because they all have their own set of values and a different sense of what they strive for. But collectively we have a unified vision with many layers [...]. We are re-connecting all people to the land who had been divorced from it. Changing from ‘conversation’ to ‘restoration’ broadens out the network of who can access this environmental care space and work together.

A representative of a collective led by tangata whenua highlighted that improving connectivity between local groups and partner agencies is particularly important for building trust among Māori. They noted that there are often relationship barriers between government agencies and tangata whenua, but that by working collectively, hapū were no longer “going it alone.” They elaborated that “there is a lot of joint investment to make sure our landowners are ok to open gates and let others come in. Working together and having that trust drives everyone to develop relationships further.”

Three participants added that this increased connectivity gave groups pride and confidence in their regeneration work. They explained that being part of a collective can contribute to a greater sense of identity and purpose for constituent groups, such that regeneration activities become a source of pride for local groups and contribute to wider community wellbeing. For example, one participant noted that their hapū had been struggling through the treaty settlement process, but that coming together to improve te taiao as a collective gave them something positive to focus on.

Participants identified social benefits resulting from enhanced connectivity within and between communities, such as generating a sense of greater confidence among members to stand up and speak out on environmental issues. A participant commented that being part of a collective gave them the resolve to stand up in front of a minister or councillor. Other participants reported that being part of a collective enhanced constituent groups’ representation in policy and political fora. One argued that “it amplifies the voice of everyone to be working together”, while another said that their group came across as “more of a threat generally because we have more power together [...] rather than one alone”.

Third, participants reported that constituent groups were able to undertake more regeneration activities and achieve improved outcomes by being part of a collective. They stated that working together improves the efficiency of regeneration initiatives, provides groups with access to additional resources and opportunities, increases collective skills and knowledge, enables more targeted activities, and “harnesses the power of collaboration”. Participants reported that being part of a collective allows groups to combine their wide array of expertise, abilities and resources, and enables each group to work to their strengths. Diverse capacity and capability are thus put to more effective use—“dividing up work, with different people [doing] different jobs means there is shared responsibility.” One participant shared an example of how working together as a collective had led to improved outcomes for their area: local environmental groups shared their water quality testing information with farmers in the collective, who then fenced more critical source areas in the catchment, leading to a reduction in nutrient run-off into streams. Participants thus consider that collectives enable groups to better achieve their regeneration objectives by “sharing skills and innovations, helping build capacity for what they want to do on the ground, making sense of their results... In so many ways we help them do what they're already wanting to do.”

Finally, collectives were reported to not only enable groups to achieve their objectives, but also grow their scope and objectives. Through shared learning about environmental issues and the enlarged opportunities and capacity available to them as a collective, groups expanded the range of activities they undertook, leading to more holistic regeneration initiatives. As one participant reported, “our primary group objectives have exploded! The constituent group has been able to accomplish so much more by being involved with the collective - research, development, economic development, and growing our networks due to the collective involvement.” Another considered that their constituent group would not exist without the collective, as the collective had instigated and supported the growth of community regeneration groups across the landscape. These findings suggest that collectives not only add to existing group capacity but grow wider network capacity to enact landscape scale change.

3.5.2. Outcomes for biodiversity

In addition to outcomes for constituent groups, we asked participants whether they thought that their collective has improved ‘on the ground’ outcomes for biodiversity. Compared with their emphatic affirmations that participation in collectives increases group impact, participants were more hesitant in claiming biodiversity improvements.

Nine participants responded that it was difficult to determine the impact on biodiversity, either because the collective was still at an early stage in its development and they did not expect to see outcomes yet, or because of a lack of monitoring data. As one participant noted, “ecological impacts take time and a lot of engagement. A lot of time is taken to leverage funds in this beginning stage of programmes”. Another

stated that they “want to say yes” but had only just started monitoring to find out. Several noted that even with monitoring data, it was hard to demonstrate the biodiversity impact of collectives specifically, especially for collectives that are not heavily involved in on-the-ground projects. As one participant noted, a lot of the collective’s input is “unseen work”, making it hard to attribute their actions to outcomes for biodiversity.

Ten collectives had undertaken monitoring that shows improvement in at least some biodiversity metrics. Participants reported evidence of predator eradication, declines in pest species numbers, stabilisation and growth of target bird species populations, reduced foliar browsing, expansion of indicator species into new areas, return of bird and marine species to areas where they have not been seen in decades, improvements in water quality and recovery of macroinvertebrate populations. Several participants stated that the collective had observed greater and more rapid improvements in biodiversity than predicted:

in the estuary [...] monitoring has been showing great signs of recovery that wasn't expected so quickly. Bird life has also been returning even more than we expected—some species that haven't been seen in a long time. And this is only 12 months into the project.

Participants emphasised the importance of robust monitoring programmes, not only to evaluate the outcomes of regeneration activities but also to keep community groups inspired and working towards shared objectives. Collectives were reported to play a key role in supporting effective monitoring, by collating monitoring data from multiple agencies and sharing it in way that is meaningful and accessible to everyone involved. For example, one collective stated that they were developing an app to share information with diverse members of the collective. Monitoring also enables collectives to identify and track how they are contributing to biodiversity outcomes through their support of constituent groups. For example:

We have helped stabilise and increase kiwi numbers by supporting the groups to keep going. Same for pāteke, which has the third highest flock count on record in our area because of our support. Same positive results in our area for kākā and korimako and other native animals. We do monitoring work to find out how biodiversity is doing in the areas we help groups work in. All our KPIs are showing we are on the right track.

Three participants highlighted that through their collective, groups were able to draw on mātauranga Māori together with western science to better monitor and understand changes in ecosystem health. For example, one participant commented that mana whenua had become really involved in the collective and were conducting monitoring of the impacts of pest species removal on the mauri of their river. Importantly,

mātauranga Māori not only provides additional indicators and knowledge of environmental change, but also reframes how the social-ecological outcomes of regeneration are understood:

A lot of the mahi it's hard to see the gains on the ground. But we're aware of it when we see a tree growing, water flowing, a bird flying. These are all taonga we treat with all the respect in the world, that are there for future generations. It's simple thinking, but we must maintain it to keep going and address the big problems. We are passionate people, not scientists, we have a different lens on nature and all these issues.

In the absence of monitoring evidence of biodiversity outcomes, twelve participants detailed the extent of actions that had been undertaken and progress toward regeneration targets. For example, participants reported increases in the number of:

- volunteer hours
- predator traps installed
- native plants planted
- species translocated
- sites or hectares of habitat restored
- kilometres of fencing built

as indicators of their ecological impact. Other participants referred to the number of groups involved, amount of effort invested and spatial extent of activities as evidence of collectives' contribution to biodiversity. For example, "it's enabled more action to happen by the groups. Because catchment groups are supported, they can do more of the work they want to do, including supporting biodiversity." Some groups supplemented their claims with a process-based account of how regeneration activities are improving biodiversity outcomes. For example, one participant explained how riparian spawning site restoration contributes to rapid whitebait population increases, due to their fast life cycles, and increased biodiversity more generally due to whitebait's importance in the food chain. These proxy measures suggest that collectives have been very effective in supporting widespread regeneration activities but provide less insight on whether those activities have been effective in improving ecosystem health or functioning. Further social-ecological research is needed to fully elaborate the relationship between collectives' structure and activities, and their social and ecological outcomes for Aotearoa New Zealand.

3.5.3. Key messages: collective outcomes

- All participants perceive involvement in a collective as enabling constituent groups to have greater impact or better achieve their objectives, by:
 - increasing the capacity and resources available to community groups

- increasing connectivity between groups and with the environment, enabling groups to work towards shared goals
 - enhancing groups' sense of identity and purpose, and fostering pride and confidence in their work
 - enabling groups to grow their scope and objectives.
- Participants were more hesitant in claiming that their collective has improved 'on the ground' outcomes for biodiversity.
- Participants report that it is difficult to determine biodiversity impacts for recently established collectives, for those with limited monitoring data, and for those that primarily provide support services.
- Ten collectives that had undertaken monitoring reported improvement in at least some biodiversity metrics; several reported greater and more rapid improvements in biodiversity than had been expected.
- Participants detailed the extensive nature of actions undertaken and progress toward regeneration targets with the support of collectives.
- Some collectives draw on mātauranga Māori together with western science to monitor and understand changes in ecosystem health.

4. PATHWAYS TO SCALING ECOSYSTEM REGENERATION IN AOTEAROA NEW ZEALAND

This section draws together findings from the literature review and survey to assess the potential for collectives to transform community-based ecosystem regeneration in Aotearoa New Zealand. From our analysis of survey data, we propose a typology of collective approaches to regeneration in Aotearoa New Zealand. We compare this typology with the models of scaling identified in the literature to understand how these collective approaches are contributing to scale ecosystem regeneration. We conclude with suggestions on how future research could support collective pathways to regenerating Aotearoa New Zealand's bioheritage.

4.1. Typology of collective approaches to ecosystem regeneration

Analysis of the composition, structure, purpose, activities and resourcing of collectives in the survey reveal that several distinct groups of collectives share certain clusters of attributes. Key axes of similarity included the number and type of constituent entities, the internal organisation of the collectives, and participants' accounts of collective formation and resourcing.

Based on the grouping of collectives observed in survey data, as well as models of collective action in the literature (Section 2.3), we propose a typology of collective approaches to ecosystem regeneration in Aotearoa New Zealand. Given the diversity and context-specificity of collectives described in Section 3.1, this typology is unlikely to be a perfect fit for all collectives operating in Aotearoa New Zealand. However, we think it captures key differences in approach for the majority of collectives and provides a starting point for understanding their distinct roles and contributions. We distinguish five common collective approaches to ecosystem regeneration:

- Community Network
- Tangata Whenua-Led Collective
- Project-Based Collective
- Agency-Led Collective
- Partnership Initiative.

In Table 5 and following subsections we describe key features each of type of collective approach, including their composition, ways of working together and primary role. Drawing on the typology of scaling developed by Lam et al. (2020), we discuss the main amplification processes by which different collective types contribute to scaling ecosystem regeneration.

Table 5. Typology of ecosystem regeneration collectives in Aotearoa New Zealand. In the illustrations of each collective, grey figures represent community groups, while black figures represent partner organisations and blue figures represent central entities. Blue lines represent informal (dotted line) or formal (whole line) relationships between entities. Green arrows signify the primary mode of collective action for regeneration.

Collective type	Key actors	Mode of collective action	
Community Network	Community groups Central hub entity	Empowering existing initiatives by enhancing: 1) communication, trust building & shared learning; 2) access to resources. Instigating formation of new community groups.	
Tangata Whenua-Led Collective	Iwi/hapū Māori landowners Partner organisations	Collaboration on joint initiatives. Entities exercise their independent authority & resources to achieve shared goals.	
Project-Based Collective	Community groups Landowners Iwi/hapū Partner organisations Central hub entity	Coordination of landscape-scale regeneration projects.	
Agency-Led Collective	Community groups Landowners Partner agencies Central hub entity	Bringing together & resourcing local entities to advance agencies' regeneration goals. Instigating formation of new community groups.	
Partnership Initiative	Community group/iwi/hapū Funder Government agency	Mutual investment in ambitious long-term ecosystem regeneration programmes.	

4.1.1. Community Network

Community Networks are comprised of independent community groups connected by a central 'hub' entity that provides advice, communication, support (e.g. with funding applications), and networking, and organises joint meetings or events (e.g. conferences, planting days). The community groups may undertake their activities independently of one another or choose to collaborate on projects.

Community Networks typically act as a bridge between community groups and partner organisations (e.g. local/regional councils, Māori governance entities, DOC, Predator Free 2050, industry organisations). By improving communication and building relationships between constituent entities, the Network contributes to building trust among entities; provides pathways for sharing information, guidance and new opportunities (e.g. new government programmes); enables shared learning; and may instigate collaborative planning and activities. Central hub entities may also use their expertise and relationships to partner organisations to improve community group access to funding and other resources for regeneration, such as native plant nurseries or predator traps.

Community Networks' primary roles are to 1) support community groups to undertake their self-defined programmes of work, 2) foster relationships between groups and with partner agencies, and 3) provide a high-level overview of the range of community-based regeneration initiatives occurring in a geographic and/or topic area (e.g. kiwi conservation).

Community Networks were the most common type of collective in the survey, with ten Community Networks identified based on available information. Examples include catchment group collectives and regional biodiversity forums.

Amplification processes

The Community Networks identified through this survey appear to be relatively similar in structure and function to the conservation networks described in the academic literature (e.g. Guerrero et al. 2015a; Barrutia & Echebarria 2019; Mumaw & Raymond 2021). Based on survey results on the outcomes of these collectives (Section 3.5), we consider that Community Networks primarily contribute to scaling ecosystem regeneration by *stabilising*¹⁹ existing initiatives. By connecting community groups with one another and providing them with advice, resources and other support, Networks help to sustain and strengthen existing community regeneration initiatives into the future. This is an important contribution to community-based regeneration in Aotearoa New Zealand, which has struggled with volunteer burnout due to the small size, limited resources and typically older demographic of community groups (Peters et al. 2015; Brown 2018; Peters 2019).

¹⁹ "Prolonging the impact of an initiative [...] by strengthening and more deeply embedding initiatives in their context" (Lam et al. 2020, p.11).

Where Community Networks provide groups with significant support for their activities—for example access to funding, or administrative services—they may also help to *speed up*²⁰ community-based regeneration. The time and expertise required to obtain funding and lack of consistent funding over time are identified as key barriers to effective community-based regeneration in Aotearoa New Zealand (Brown 2018; Shanahan et al. 2021). Central hub entities that directly support groups to identify and apply for funding can help to facilitate sustainable resourcing and thus improve the efficiency of community regeneration planning and activities.

Furthermore, as Community Networks grow to include a larger number of groups and individuals over time, they can contribute *growing*²¹ the spatial scale and quantity of regeneration activities within their own range. Some Community Networks (especially those operating at regional or national scales) may also support the *replication*²² of successful regeneration initiatives or *transferring*²³ of insights to new social-ecological contexts.

4.1.2. *Tangata Whenua-Led Collective*

Tangata Whenua-Led Collectives are comprised of multiple iwi, hapū, whānau, marae, Māori landowners, or other Māori entities that work together (often with the support of partner organisations) to regenerate a particular area (e.g. catchment, forest). Collectives are typically built on existing whakapapa and/or whenua-based relationships between groups—i.e. a shared connection to a place or natural feature (e.g. awa/river) and strong social or kinship connections between entities. The formation of Tangata Whenua-Led Collectives may be supported by Treaty settlement processes, Māori land ownership and government funding for Māori economic development and/or environmental initiatives (e.g. Te Mana o Te Wai Fund).

Māori entities in Tangata Whenua-Led Collectives commit to working together toward shared goals for an area by collaborating on joint initiatives and exercising their authority and resources within their respective rohe or lands. The entities are thus full partners in the collective, engaged in joint strategy, decision making, projects and regeneration activities.

Partner organisations help to resource and support the work of the Tangata Whenua-Led Collective, and may include central government agencies, local/regional government, research institutes and philanthropic organisations. For example, partners may provide funding, information and advice; support tangata whenua to apply for grants and resource consents; undertake aligned regeneration planning and

²⁰ 'Increasing the pace by which initiatives create impact or are brought to fruition [...] by increasing the efficiency of organisational or implementation procedures to have more impact over time' (ibid, p.12).

²¹ 'Expansion of the impact range [...] across a geographical location, organization, or sector.' (ibid, p.14)

²² 'Copying of an initiative to a dissimilar context' (ibid, p.15).

²³ 'Taking an initiative and implementing a similar but independent one in a different place, adapted to the new but similar local context' (ibid, p.15).

activities on government land; and provide pathways for tangata whenua to engage in relevant governance processes and forums.

Tangata Whenua-Led Collectives typically have a holistic and long-term regeneration purpose that seek improvements in the wellbeing of the whenua (land), wai māori (fresh water), te taiao (natural world) and ngā tāngata (the people). Regeneration goals typically include socio-economic (e.g. employment), social-ecological (e.g. mahinga kai), cultural (e.g. revitalisation of mātauranga Māori) and spiritual (e.g. restoring mauri) dimensions. Collective operations are guided by local tikanga, entities' self-determining authority and principles such as kaitiakitanga, manaakitanga and whakapapa (see Lyver et al. 2019).

Tangata Whenua-Led Collectives' primary role is to provide a vehicle for neighbouring/aligned Māori entities to work together towards shared regeneration goals and seek funding and other support from partner agencies.

Five Tangata Whenua-Led Collectives were identified based on survey results.

Amplification processes

Based on survey results on collectives' working arrangements (Section 3.3) and outcomes (Section 3.5), we consider that Tangata Whenua-Led Collectives primarily contribute to scaling community-based regeneration by *speeding up* and *stabilising* the regeneration activities undertaken by Māori entities. By creating a platform for aligned Māori entities to connect with one another and draw in resources, staff time and other support from partner organisations, the collective empowers Māori entities to exercise their kaitiaki roles and responsibilities. Our survey indicates that these connections support Māori entities to be effective in their work and overcome bureaucratic or other barriers to regeneration activities, while also providing additional motivation to engage in long-term, large-scale regeneration. For example, several participants from Tangata Whenua-Led Collectives spoke about how involvement in the collective conferred a sense of pride among their community.

Tangata Whenua-Led Collectives also contribute to *growing* community-based regeneration by bringing together iwi/hapū from different rohe, and thus enabling them to expand the spatial scale and/or range of regeneration activities that they collectively pursue. For example, several of the collectives in this study are undertaking catchment-wide monitoring, planning and regeneration activities—beginning with and extending beyond Māori-owned land.

Finally, Tangata Whenua-Led Collectives make an important contribution to *scaling deep*²⁴ by reconnecting Māori communities with their lands, waters and taonga

²⁴ Processes that aim 'to change people's values, norms, and beliefs through the work of the initiative by fostering new mind-sets, changing perceptions, and introducing new ways of relating and knowing as well as new value systems' (Lam et al. 2020, p.16).

species²⁵ and harnessing iwi/hapū/whānau support for ecosystem regeneration in their rohe. Further, Māori leadership has driven significant shifts in the values and principles underpinning environmental management in Aotearoa New Zealand to date.²⁶ Tangata Whenua-Led Collectives' leadership in local/regional regeneration has the potential to further shift the values and norms that underpin wider restoration practice toward more holistic concepts of wellbeing, use, care and responsibility. For example, several Tangata Whenua-Led Collectives surveyed have embedded local whakatuakī and tīkanga into their regeneration purpose and practices.

4.1.3. Project-Based Collective

Project-Based Collectives are comprised of community groups, landowners, iwi/hapū and partner organisations (e.g. government agencies, environmental NGOs, philanthropic organisations industry organisations) that contribute to landscape-scale regeneration *project/s*. Project-Based Collectives typically feature a 'hub' entity or leadership group that coordinates joint projects, facilitates engagement across groups and supports constituent groups to deliver on their objectives.

The key characteristic of Project-Based Collectives is that they lead or coordinate landscape-scale regeneration projects, rather than simply supporting existing initiatives. These joint projects add value to existing regeneration activities by:

- establishing landscape-scale regeneration objectives, action plans, or strategies
- organising dedicated partner funding and providing staff time for the project
- coordinating community action toward project objectives so that it is most ecologically effective.

The coordination of community group and partner organisation input into project planning and delivery requires groups to work together closely over a long period of time. Community groups remain independent and are supported to undertake their own regeneration activities but choose to invest some of their time and resources in collaborating on projects to achieve larger-scale outcomes. Project-Based Collectives therefore typically involve more internal structure, planning and interaction between groups than Community Networks.

The primary roles of Project-Based Collectives are 1) to establish and deliver landscape-scale regeneration projects, and 2) to support the regeneration activities of independent community groups.

Five Project-Based Collectives were identified based on information gathered through the survey. Several of these collectives support multiple landscape-scale projects,

²⁵ Many communities have become disconnected from their traditional lands, species, and places through processes of dispossession, urbanisation, and global migration.

²⁶ For example, the adoption of Te Mana o te Wai as the founding principle of the Freshwater National Policy Statement.

each of which was undertaken by a place-based collective of community groups and other actors.

Amplification processes

Project-Based Collectives resemble a collaborative approach to regeneration (see Section 2.3), defined as groups with shared interests or responsibilities that proactively work together to pursue complex goals (Kark et al. 2015). We consider that Project-Based Collectives contribute to *growing* community-based initiatives by identifying an area and set of objectives that guide joint action towards large-scale, multifaceted regeneration. Through careful planning and resourcing of large-scale, typically long-term regeneration projects, these collectives can grow:

- the area and connectivity of regeneration activities
- the number and diversity of groups contributing to regeneration of the area
- the range of ecosystem functions and social-ecological outcomes enhanced by regeneration activities.

Through the development of shared goals and project plans, fostering of relationships and coordination of regenerative activities within projects, Project-Based Collectives make important contributions to *speeding up* ecosystem regeneration. Notably, most of the Project-Based Collective surveyed have incorporated significant ecological and social science expertise into their project design through the creation of advisory groups or by partnering with research institutes or programmes. By improving access to expert advice, knowledge and scientific resources (e.g. monitoring equipment) to guide regeneration activities, Project-Based Collectives are more likely to be effective at achieving their social and ecological objectives.

The integration of social-ecological goals and Māori concepts in collectives' purpose and vision statements suggests that Project-Based Collectives also contribute to *scaling deep* through relationship-building between groups.

Finally, Project-Based Collectives may help to scale regeneration through *replication*, as illustrated by two collectives in the survey that instigated new local projects based on the success of older projects.

4.1.4. Agency-Led Collective

Agency-Led Collectives are similarly comprised by community groups, landowners and partner agencies. Their defining characteristic is that Agency-Led Collectives are created by and reliant on a lead governance agency (e.g. DOC, local/regional council, New Zealand Landcare Trust, Predator Free 2050) that brings together other groups, leads strategy development and provides or facilitates resourcing.

Agency-Led Collectives typically have a ‘top down’ genesis, where they are formed on the basis of agency objectives, asset ownership, planning, or programmes. For example, a predator control agency may instigate the creation of a collective to deliver its predator control programme at a landscape scale with community involvement. In some instances, the collective will bring existing community groups together to coordinate regeneration action, while in others the collective may also instigate the formation of new community groups (e.g. new neighbourhood halos). Over time, Agency-Led Collectives may evolve to become more community-driven, especially where collective leadership passes from the agency to community actors.

Agency-Led Collectives are typically well resourced. Lead agencies provide staff time, funding, information and other institutional resources to support the work of the collective. If the collective is incorporated, lead agencies may also assist the collective to apply for further funding. Collectives’ goals and operations are typically heavily influenced by the lead agency’s purpose, interests, assets, organisational structure and legal mandate. For example, several Agency-Led Collectives in the survey were created to engage landowners and community groups in landscape-scale planning and restoration, which the agency was not able to achieve on its own. Agency-led collectives may also expand the range of regeneration goals and activities that statutory agencies are able to contribute to.

Agency-Led Collectives’ primary roles are to 1) provide a vehicle for lead agencies to achieve their regeneration objectives through landscape-scale community action, 2) increase the number of community groups or members engaged in regeneration activities, and 3) build stronger relationships with community entities.

Five Agency-Led Collectives were identified among the collectives surveyed. Examples include many landscape-scale Predator Free collectives.

Amplification processes

Our survey results suggest that Agency-Led Collectives adopt both network and collaborative models of collective action, with the degree and type of collaboration varying considerably. In some cases, community groups collaborate with agencies on monitoring, planting and similar ‘on the ground’ activities, while other Agency-Led Collectives bring groups together to engage in collaborative planning and project development. We therefore consider that Agency-Led Collectives can make significant contributions to *stabilising* and *speeding up* regeneration activities through increasing alignment between community-based regeneration activities and regional or national regeneration goals and strategies. Agencies also provide important knowledge, skills, staff time, funding and other resources to support effective collective action. However, because agencies play a central role in the collective, it is possible that the stability of Agency-Led Collectives may be affected by shifts in agency agendas.

Our survey also revealed an emphasis on *transferring, spreading*,²⁷ and to a lesser extent *replicating* regeneration initiatives across Aotearoa New Zealand among Agency-Led Collectives. For example, several agencies involved in these collectives are mandated to support community-based regeneration at a national scale and have used their resources and social networks to instigate and grow new community groups to add to the collective.

Agencies are also able to draw on the knowledge and experience they gain through collectives to make changes in agency rules, practices, funding, etc. to support effective community-based regeneration. For example, councils engaged in collective regeneration of a waterbody may change local bylaws to prevent pollution or inappropriate uses of the waterbody. Alternatively, a council or government agency could establish a long-term fund or governance body to address a wider ecological issue identified through the collective's work. Agency-Led Collectives are thus uniquely positioned to contribute to *scaling up*²⁸ ecosystem regeneration.

4.1.5. Partnership Initiative

Partnership Initiatives are comprised of one or more community entities (environmental groups or iwi/hapū) that partner with a funder and/or government agency to undertake landscape or ecosystem-scale regeneration. In contrast with other collective types that include a large number and range of entities, Partnership Initiatives involve intensive engagement between a small number of partner entities. Other community groups, governance entities, research institutes, industry organisations, etc. may be involved, but typically play supporting roles.

Partnership Initiatives are highly structured collectives with clear agreements setting out the roles and responsibilities of each partner entity, as well as comprehensive regeneration plans. Entities decide to enter into partnerships based on recognition of their aligned objectives and complementary resources and mandate. Each entity brings significant resources to the partnership, which may include governance authority, statutory responsibilities, land ownership, funding, volunteer or staff time and expertise. Partnership Initiatives may engage with other entities to draw in further support and resources to the initiative, or to support and coordinate with other entities undertaking aligned regeneration activities.

In Aotearoa New Zealand, Partnership Initiatives may be created between iwi/hapū and government agencies to give effect to Treaty partnership in the restoration and management of culturally significant landscapes or natural features. Iwi/hapū may also enter into Partnership Initiatives with other partners to engage in a co-governance approach to large-scale ecosystem regeneration in their rohe.

²⁷ 'Disseminating core principles and approaches to other places with a dissimilar context' (Lam et al. 2020, p.15).

²⁸ 'Processes that aim to impact higher institutional levels by changing the rules or logics of incumbent regimes [...] by, for instance, advocacy, lobbying, networking, or supporting alternative visions and discourses' (ibid, p.15).

Partnership Initiatives' primary role is to deliver ambitious landscape or ecosystem regeneration programmes by combining substantial long-term financial support with significant 'on the ground' capacity and governance authority.

Just two Partnership Initiatives were identified based on survey results, both featuring large philanthropic organisations, DOC and established community entities.

Amplification processes

Based on the two relevant collectives surveyed, we consider that Partnership Initiatives make significant contributions to *stabilising* and *speeding up* community-based ecosystem regeneration. By drawing together substantial skills and resources to undertake large-scale regeneration, and through the development of formal agreements between parties, Partnership Initiatives can sustain long-term, intensive action for regeneration in an area. Both Partnership Initiatives identified in this study have also engaged mātauranga Māori and/or scientific experts in their planning and operations to enhance the efficiency and effectiveness of regeneration activities.

The Partnership Initiatives identified in this study have made significant efforts to *grow* regeneration by investing in labour-intensive regeneration activities at landscape scales and promoting innovative regeneration practices. However, such Partnership Initiatives are less likely to contribute to expanding regeneration beyond the site (e.g. through replication) than other collective approaches to regeneration, due to their reliance on substantial long-term funding.

4.2. Collectives' contribution to scaling ecosystem regeneration

Our typology indicates that collectives in Aotearoa New Zealand contribute to the full range of amplification processes described by Lam et al. (2020) (see Figure 11).

			Community networks	Tangata whenua-led collectives	Project-based collectives	Agency-led collectives	Partnership Initiatives
Amplifying within	Stabilising		●	○		○	●
	Speeding up		●	●	●	●	●
Amplifying out	Growing		○	●	●		●
	Replicating		●		○	○	
	Transferring		○			●	
	Spreading					○	
Amplifying beyond	Scaling deep			●	●		
	Scaling up					●	

Figure 11. Common ways that collective types contribute to scaling community-based ecosystem regeneration in Aotearoa New Zealand. The top three amplification processes exhibited by each collective type are indicated by filled circles, while amplification processes that are sometimes employed by collectives are indicated by open circles.

Based on our analysis of the main amplification processes employed by different collective types, we suggest three pathways for enhancing collective ecosystem regeneration in Aotearoa New Zealand.

4.2.1. Pathway 1: Strategic investment in collectives that are effective at building the capacity, capability and connectivity of community groups and landowners

Most collective types focus on supporting, empowering and connecting existing community groups to undertake regeneration in line with shared goals, such that their collective contribution to regeneration is greater than the sum of its parts. Collectives thus generally contribute to *stabilising* and *speeding up* community-based regeneration in Aotearoa New Zealand.

This focus on *amplifying within* existing initiatives (i.e. doing the same initiative for longer or more quickly, Lam et al. 2020) diverges somewhat from the restoration literature's focus on increasing the spatial extent of regeneration (e.g. Norton et al. 2018; Perring et al. 2018). While strengthening existing initiatives may not increase the extent or number of regeneration initiatives, improving community groups' training, resourcing, information and connectivity can increase both their ability to undertake effective regeneration activities and to sustain action over the decadal timescales often required for ecosystem regeneration (Guerrero et al. 2015b; Battista et al. 2017; Mumaw & Raymond 2021). Collectives' investment in amplifying within is particularly important in an Aotearoa New Zealand context, where research shows that regeneration is predominantly undertaken by small groups of older volunteers with limited expertise, funding, or staff support (Peters et al. 2015; Norton et al. 2016; Brown 2018; Doole 2020).

Indeed, collectives' focus on amplifying within points to the need for restoration allies (e.g. funders, governments, ecologists) to first attend to—and invest in—the existing capacity and capability of community groups, before considering how to *amplify out* regeneration efforts. As Norton et al. (2016), Guerrero and Wilson (2017), Mumaw and Raymond (2021) and others argue, successful large-scale regeneration of biodiversity relies as much on community empowerment, supportive and enabling institutional structures, resourcing and relationship building between groups and with agencies as it does on the ecological design of regeneration initiatives.

One key pathway to ecosystem regeneration is therefore to identify and invest in community networks, agency-led collectives and others that are already effective at building the capacity, capability and connectivity of members (see also Peters 2019). Investment may include ongoing funding for collective staff time to provide information and support services to community groups. It may also include agencies working with collective staff to provide expert knowledge and advice, connect them with training, and set up community databases and communication infrastructure. This investment

should be targeted at improving collectives' ability to support community action and guide landscape-scale regeneration—not simply improving efficiency (Brown 2018).

4.2.2. Pathway 2: Collectives invest in relationship building and collaboration between groups to grow their capacity to work together into the future

Our results show that collectives also seek to *amplify out* existing regeneration initiatives (i.e. undertake the same or a similar initiative in another context, Lam et al. [2020]) by 1) increasing the spatial extent or social-ecological dimensions of regeneration initiatives, and to a lesser extent 2) instigating the creation of new, similar initiatives in new areas.

Of the collective types identified, our results suggest that project-based, tangata whenua-led and partnership collectives are the most focused and effective at growing the scale and scope of community-based regeneration. These collective types all represent examples of collaboration—groups with shared interests or responsibilities that proactively work together to pursue complex goals (Kark et al. 2015). As discussed in Section 2.3.4, collaboration involves clearer definition of groups' shared purpose and ways of working, and greater coordination of activities across groups than network-based collective action. By committing to working together on *joint projects* or *programmes* to restore ecosystems that cut across rohe, private property, or jurisdictional boundaries, groups are able to achieve outcomes that they could not as separate entities (Wyborn & Bixler 2013; Guerrero et al. 2015a).

Collaborative approaches must navigate the tension between maintaining community group autonomy and coordinating action, as voiced by survey participants (see Section 3.1.2) and noted in other analyses of community-based collaboration (Guerrero et al. 2015b; Green 2016; Peters 2019; Duncan & Diprose 2020; Mumaw & Raymond 2021). Communities' autonomy to define and pursue outcomes of value to them and consequently their ownership of initiatives is viewed as fundamental to community-based regeneration (Coombes 2007; Shanahan et al. 2021). This was clearly expressed by participants who argued that the term 'umbrella organisation' and formal structures and processes (e.g. written agreements) are 'top down' and therefore inappropriate for community-driven collectives (see also Doole 2020). However, scaling regeneration often requires groups to renegotiate their objectives and activities to align with other groups, if duplication and conflicts are to be avoided and efficiencies of scale achieved (Norton et al. 2016). The collectives we surveyed were very aware of the need to support 'bottom up' or 'grassroots' initiatives, while also enabling coordination across initiatives to scale regeneration. For many networks and agency-led collectives, the answer to this challenge has largely been to support community efforts through information and funding, and by helping to connect aligned groups.

At the other end of spectrum, tangata whenua-based and partnership collectives engage community entities in far more intensive collaboration. The entities retain their independence and authority while entering into agreements (whether written or not) to work together for their mutual benefit. Indeed, participants from tangata whenua-based collectives spoke of collaborative partnerships and contributing to shared goals as expressions of the self-determination and mana of their iwi/hapū. Such collaborations require significant relationship-building and trust, as well as resourcing, and may not be possible in many cases.

Project-based collectives therefore provide a ‘middle road’ for negotiating coordination while maintaining autonomy. These collectives support a wide variety of independent entities to pursue their objectives, while also inviting them to contribute to large-scale projects that the collective leads or coordinates. This approach provides a mechanism for coordinating some regeneration activities and building relationships that may support future collaboration (see also Guerrero et al. 2015b).

Thus, a second key pathway for accelerating regeneration is to invest in relationship building and collaboration *within* a collective. Relationship building is a slow but important pathway towards scaling innovation; as one survey participant stated, “change happens at the speed of trust”. Other participants described the time and effort that their collective had invested in developing a joint vision statement, strategy, plan, or memorandum of understanding, but also how valuable these processes had been in uniting their members around a shared purpose and set of values. Collectives can build relationships through processes such as visioning and planning, developing collaborative activities and projects, and in-person meetings and field days. To be effective, such exercises should focus on facilitating learning about other groups, building trust and finding common ground, rather than the outputs (e.g. agreements) alone. Collectives will also need to be sensitive to the power dynamics involved in collaborative initiatives (Nissen 2014; Brisbois & de Loë 2016; Green 2016) if they are to avoid reproducing power structures or allowing them to undermine trust. Collectives may therefore benefit from community engagement support and training.

4.2.3. Pathway 3: Empower tangata whenua to engage in regeneration initiatives and institutions as partners, with a view to reshaping the wider conservation landscape

Finally, our results illuminate collectives’ contribution to *amplifying beyond* regeneration initiatives (i.e. changing societal rules and values, Lam et al. [2020]) by challenging obsolete conservation norms (e.g. separation of people and nature), embedding bicultural values and approaches and reforming inequitable systems.

Community-based regeneration’s potential to shift societal values and mindsets or to contribute to changes in governance institutions (e.g. regulations, funding evaluation, community consultation) is seldom mentioned in literature on scaling restoration (Perring et al. 2018). This study shows however that *scaling deep* and *up* are key

political strategies enacted by some collectives, and implicit in the roles of others. Most collectives surveyed proactively seek to influence public understanding and attitudes toward biodiversity through public education and advocacy (see Section 3.3.1). Some also seek to embed their values and interests in government policies and decisions by coordinating or supporting submission writing, building relationships with influential individuals and lobbying agencies. Other, less politically active collectives contribute to changing mindsets and, in some cases, institutions through long-term relationship building among members of the collective, their partner entities and the wider community. Creating space for diverse actors to interact, learn about and from one another and build trust can foster shifts in the way in which regeneration is socially understood and evaluated over time. This increased awareness of diverse worldviews may in turn generate support for a more expansive range of regeneration practices and outcomes. A participant noted:

It's an evolving space [...] the legislation is not really fit for purpose for Māori, so we have to figure out how to get our point across in a strategic way in a system that doesn't fit te ao Māori. [It's about] the intertwining of us coming together, in this case, to talk to government agencies about what they're doing wrong, and injecting that Mātauranga Māori into their pākehā world.

As this participant highlights, *scaling deep* and *up* are particularly important for regeneration in Aotearoa New Zealand, where dominant restoration narratives and ways of working have often excluded or diminished Māori contributions to regeneration (see Lyver et al. 2016; Norton et al. 2016). If community-based ecosystem regeneration is to succeed in engaging and empowering tangata whenua and achieving socio-cultural and economic objectives for Māori communities, then the dominant values, norms, assumptions, and relationships that underpin conservation need to change (Lyver et al. 2016; Wehi & Lord 2017; Lyver et al. 2019; Peltzer et al. 2019; Osborne et al. 2021).

A third and critically important pathway to ecosystem regeneration is therefore to empower tangata whenua to engage in regeneration initiatives and institutions as partners, with a view to reshaping the wider conservation landscape (see Lyver et al. 2019). Based on the results of this study, collaborative arrangements (e.g. tangata whenua-led and project-based collectives) appear to offer great potential for scaling bicultural values and approaches in community-based regeneration. Realising this potential will require an explicit commitment by collectives and their constituent groups to centre Te Tiriti o Waitangi in their ways of working. Tangata whenua-led collectives provide a clear model of Māori self-determination and leadership in *scaling deep* regeneration; the impetus is therefore on governance and funding agencies to remove barriers and improve support for such collectives. Agency-led and project-based collectives also offer significant potential to *scale deep* bicultural approaches to regeneration through development of Treaty partnership with tangata whenua entities.

Finally, agency-led collectives can contribute significantly to *scaling up* bicultural approaches by co-developing regeneration principles and practices that then become embedded in agency rules, funding criteria and relationships.

4.3. Key research questions arising

This study has highlighted the significant potential of collectives to scale community-based efforts to reverse biodiversity decline. Since restoration collectives have largely developed within the last decade, many collectives and their partner agencies are actively innovating in this space, creating significant opportunities to shape the ongoing development of collective approaches to community-based regeneration.

With this in mind, we offer some research questions that we believe can support the work of collectives to scale ecosystem regeneration in Aotearoa New Zealand into the future. Some of these questions were raised by survey participants, while others were developed by researchers based on analysis of survey responses and the literature.

1. How can collectives promote scaling of regeneration among constituent groups?
 - a. What types of relationships between constituent groups promote collective action?
 - b. What processes or practices can best support effective prioritisation and coordination?
 - c. What types of support do collectives provide to promote scaling by groups, and which are most effective?
 - d. Are there common social or organisational preconditions for—or barriers to—people working together as collectives?
 - e. Do/can collectives evolve over time to enhance scaling?
 - f. How can collectives promote ‘scaling deep’, including integration of iwi/hapū values, concepts & mātauranga?
2. What funding & institutional support do collectives need?
 - a. How can conservation funding best support large-scale, long-term regeneration?
 - b. Where do collective staff & leaders come from, and what skills, experience and expertise do they bring with them?
 - c. What ‘soft’ skills & training do collectives need to facilitate collaboration among groups?
 - d. How can researchers & experts support collectives?
 - e. What role can government entities & national NGOs play in supporting collectives to scale regeneration?

- f. Under what conditions and through what mechanisms are Māori entities able to lead or partner in collectives?
 - g. How do collectives want to connect & learn from one another?
 - h. What data infrastructure would support the work of collectives?
- 3. What are the social-ecological outcomes of collectives?
 - a. Does involvement in a collective make a difference to constituent groups' plans & activities?
 - b. What social-ecological outcomes do different types of collectives prioritise and realise?
 - c. How can collectives evaluate their contribution to social-ecological outcomes?
 - d. How do collectives enable innovation in restoration practice?
 - e. Do collectives contribute to greater social and cultural inclusion within regeneration?
 - f. How do/can collectives contribute to wider social justice & cohesion?

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7. APPENDIX

Appendix 1. Survey Questionnaire.

Questions on Constituent Groups:

1. What is the name of your constituent group? That is, the group that you belong or belonged to, which contributes to the [name of collective] alongside other groups.
For internal use only
2. What is your role within this group?
3. When was the group first formed? (*Prompt: when the group became named or held its first event*)
4. What is the legal status of the group? *Tick all that apply*
 - a. unincorporated group
 - b. incorporated society
 - c. Māori legal entity
 - d. trust
 - e. charitable trust
 - f. company
 - g. government organisation or statutory body
 - h. other [specify]
5. Approximately how many regular members are in your group? (e.g., those who frequently participate in group activities and have been involved for at least 6 months) *Select one*
 - a. <10
 - b. 10-30
 - c. 31-50
 - d. 51-100
 - e. 101-200
 - f. >200
 - g. Unsure
6. What are the main categories of people who make up your group? For example, farmers, local govt representatives, tangata whenua. *Tick all that apply*
 - a. Landowners
 - b. Local residents/community members
 - c. Iwi/hapū/whanau members
 - d. People from other areas/regions/countries
 - e. Members of an interest group (e.g. anglers) – [specify in 'other']
 - f. Business or industry members/representatives

- g. Representatives of other environmental groups
 - h. Central/local government representatives
 - i. Staff
 - j. No regular membership
 - k. Other [specify]
7. Does your group have a leader/s, coordinator, or any paid staff? *If yes, specify*
8. Does your group receive any funding? For example, member or user fees, or government grants. *Tick all that apply*
- a. Member contributions
 - b. User fees
 - c. Donations
 - d. Trust or endowment income
 - e. Government grants
 - f. NGO grants
 - g. Contracts to complete work
 - h. No, we receive no funding
 - i. Not sure
 - j. Other [specify]
9. What is the main purpose of your group?
10. Does your group have a plan, strategy or vision statement that guides its activities? *If yes, specify*
11. What are the main activities your group undertakes? For example, restoration activities, educational activities, citizen science, advocacy. *Tick all that apply*
- a. planting
 - b. pest control
 - c. weed control
 - d. cleaning up litter/pollution/etc
 - e. re-establishment of native species
 - f. monitoring
 - g. fundraising
 - h. building or maintaining infrastructure (e.g. fences)
 - i. public education, engagement, or advocacy
 - j. lobbying government or industry to change policies/practices
 - k. providing advice & support to other groups
 - l. other [specify]

Questions on Collectives:

12. What groups or organisations form part of the collective?
13. We are interested in understanding how these groups relate to one another within the collective. Please tell me which of the following descriptions most closely resembles [name of collective]? Please let me read all the options before responding. The collective is made up of... *Select one*
- a. groups that work together with the guidance or support of an umbrella organisation
 - b. groups that regularly work together toward joint goals but with no umbrella organisation
 - c. groups that occasionally work together with no fixed arrangement
 - d. people who once belonged to separate smaller groups that joined together to form a larger group
 - e. a large parent organisation that generated multiple smaller groups
14. And what is the MAIN criterion that defines the collective - i.e. that identifies the type of groups or organisations that might belong to the collective? Is [name of collective] primarily... *Select one*
- a. geographically defined: i.e. groups within a specific region, district or township
 - b. ecologically defined: i.e. groups connected to a specific natural area, like a catchment or forest
 - c. socially defined: i.e. groups with a common socio-cultural identity or connection, e.g. hapū or farmers
 - d. goal defined: i.e. groups that share an ecological objective (e.g. kiwi recovery) but are highly variable and spread over a large area
 - e. politically defined: i.e. groups that share a political vision and values, like Extinction Rebellion
15. When was [name of collective] formed?
16. *If part of a constituent group:* And when did [name of constituent group] join the collective?
17. What brought these groups together at the time the collective was formed?
18. What is the legal status of the collective? *Tick all that apply*
- a. unincorporated group
 - b. incorporated society
 - c. Māori legal entity
 - d. trust
 - e. charitable trust
 - f. company
 - g. government organisation or statutory body

- h. other [specify]
19. Does your collective have a leader/s, coordinator, or any paid staff? *If yes, specify*
20. Does the collective receive any funding or other kinds of external support? For example, member or user fees, government grants, in-kind support. *Tick all that apply*
- a. Member contributions
 - b. User fees
 - c. Donations
 - d. Trust or endowment income
 - e. Government grants
 - f. NGO grants
 - g. Contracts to complete work
 - h. In-kind support from other organisations
 - i. No, the collective does not receive funding/support
 - j. other [specify]
21. What is the main purpose of the collective?
22. Does the collective have a plan, strategy or vision statement that guides its activities? *If yes, specify*
23. What kinds of activities does the collective undertake together? For example, restoration activities, educational activities, citizen science, advocacy. *Tick all that apply*
- a. planting
 - b. pest control
 - c. weed control
 - d. cleaning up litter/pollution/etc
 - e. re-establishment of native species
 - f. monitoring
 - g. fundraising
 - h. building or maintaining infrastructure (e.g. fences)
 - i. public education, engagement, or advocacy
 - j. lobbying government or industry to change policies/practices
 - k. providing advice & support to other groups
 - l. other [specify]
24. Does the collective have a written agreement or rules that define how groups and/or its members work together? *If yes, specify*
25. Through what methods do groups within the collective interact with one another - e.g. to make decisions or share information? *Tick all that apply*
- a. Regular meetings (among members of collective)

- b. Email list
 - c. Website
 - d. Networking software (e.g. Microsoft Teams, Slack)
 - e. Shared events
 - f. Newsletters
 - g. Social media
 - h. Public events
 - i. Site visits
 - j. Irregular interactions
 - k. Other [specify]
26. *If part of a constituent group:* Do you think [name of constituent group] has been able to have greater impact or better achieve its objectives by being involved in a collective? *If yes, specify*
27. *If only part of collective:* Do you think the groups that make up the collective have been able to have greater impact or better achieve their objectives by being involved in a collective? *If yes, specify*
28. Do you think the creation of a collective has improved 'on the ground' outcomes for biodiversity? *If yes, specify*

Questions for continuing research:

29. Could you recommend any environmental collectives that we should include in our study? *If yes, specify*
30. *If yes:* Can you recommend a knowledgeable representative of that group that we should get in touch with? Do you have a contact email address or phone number for them?
31. Do you think your group might be interested in participating in further research for this project? Please note that we are only seeking expressions of interest – being added to this list will not commit the group or researchers to engaging in further research
32. Do you have any ideas on what sort of information or research might be helpful to support the work of your group/collective?