McFarlane, K., K. J. Wallace, D. F. Shanahan, and J. E. Clapcott. 2024. Working together to scale ecosystem restoration: collective approaches to community action in Aotearoa New Zealand. Ecology and Society 29(2):17. https://doi.org/10.5751/ES-15152-290217

Research

Working together to scale ecosystem restoration: collective approaches to community action in Aotearoa New Zealand

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ABSTRACT. Community groups are key drivers of ecosystem restoration in many countries. However, there is increasingly recognition that small scale restoration efforts are often insufficient to reverse ongoing biodiversity declines, and questions have been raised regarding the sustainability and efficiency of community-based initiatives. In Aotearoa New Zealand, collectives that bring together multiple community groups and other actors have arisen as a mechanism to scale restoration activities and support community restoration efforts. This article examines the nature, role, and contribution of ecosystem restoration collectives in Aotearoa, based on a survey of 27 collectives in 2021. Collectives generally engage in governance activities like funding, administration, and advocacy, adding to the typically "hands on" work of community groups. Similarly, they improve ways of working by increasing connections and communication between groups, agencies, and the wider public. This study indicates that collectives contribute to scaling restoration by improving the efficiency and sustainability of community initiatives, increasing the spatial scale and social-ecological scope of restoration, and increasing the range of actors involved in restoration.

Key Words: *collaboration; collective action; community-led conservation; networks; restoration; scaling*

INTRODUCTION

The scale of restoration required to reverse widespread, global declines in biodiversity requires collective action on the part of public and private sector organizations, landowners, and ordinary citizens (Guerrero et al. 2015a, Mumaw and Raymond 2021). Environmental initiatives must extend beyond traditional protected areas to focus on reducing pressures on systems, restoring ecosystem functions, and improving habitat connectivity through landscape scale restoration (Menz et al. 2013, Norton et al. 2018, Perring et al. 2018). The ecological and institutional complexity of such large-scale restoration—transgressing jurisdictional, private-public, urban-rural, and even human-nature boundaries—means that collective action for biodiversity must also be strategic and coordinated (Menz et al. 2013, Muñoz and Branzei 2021).

Previous studies reveal both the necessity and limitations of community-based restoration for addressing ecological crises (Menz et al. 2013, Mace et al. 2018, Usher 2023). The necessarily social determination of ecosystem baselines and need to live in and with restored landscapes highlight the importance of community participation for successful and just restoration (Perring et al. 2018, Osborne et al. 2021, Usher 2023). However, community-based restoration often occurs at the site scale, determined by socio-political boundaries, and lacks the spatial extent and ecological connectivity needed to improve biodiversity outcomes (Menz et al. 2013, Norton et al. 2018, Usher 2023). Without adequate expertise or information on ecosystem functioning, many community-based restoration initiatives are inadequately attuned to local conditions, limiting their ecological outcomes (Menz et al. 2013, Jones and Kirk 2018).

Recognizing these limitations, there is growing interest in scaling community-based ecosystem restoration to extend, replicate, and coordinate activities across space (Guerrero et al. 2015a, Norton et al. 2018, Fastenrath et al. 2020, Kockel et al. 2020, Mumaw and Raymond 2021). However, scaling implies more than just increasing the spatial extent of restoration; it also involves improving the efficiency and resilience of restoration initiatives, cross-scale collaboration, and changing societal norms and values (Menz et al. 2013, Guerrero et al. 2015a, Norton et al. 2018). It is therefore important to understand the social as well as ecological dimensions of scaling, to examine whether and how novel approaches may overcome, or reproduce, the limitations of traditional community restoration.

In this paper we examine one emerging approach to scaling community-based restoration: the creation of second-order organizations (e.g., networks, collaborative projects) that bring together diverse interests and dispersed community actors to work toward shared goals (Wyborn and Bixler 2013, Guerrero et al. 2015a, Maynard et al. 2020, Sinner et al. 2022a). These second-order entities involve a greater degree of social organization and coordination than traditional grassroots collective action (Dupuits et al. 2020) and have the potential to amplify community-based restoration. This trend is highly visible in Aotearoa New Zealand (henceforth Aotearoa), where a growing number of entities are forming to connect and support community groups (Norton et al. 2016, Doole 2020). However there have been few attempts to conceptualize the role and contribution of these second-order entities beyond the case study (e.g., Mumaw and Raymond 2021) or an entity type (e.g., Prager 2015). Given the diversity of entity structures and activities (e.g., Peters 2019), it is important to examine how second-order entities relate to traditional community groups and how their form and function shapes their role in scaling restoration.

We refer to these second-order entities as "restoration collectives" because of their role in connecting groups and promoting joint responses to shared goals. Based on a survey of 27 restoration collectives in Aotearoa we ask: What are common features of restoration collectives, and how do they differ from traditional

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community environmental groups? What are the key roles and outcomes of collectives for community-based restoration? We believe that Aotearoa is well placed to provide national scale insights on collectives' forms and functions because of its being a small country subject to significant biodiversity loss and its reliance on community restoration efforts (Department of Conservation 2020a). Our discussion draws together our findings with international case studies to examine the potential for collectives to scale community-based ecosystem restoration.

LITERATURE REVIEW

Growth of community-based restoration

The last 30 years have been marked by the growing prevalence of and interest in community-based conservation and restoration, often through the formation of community groups to address biodiversity and other environmental crises (Pretty and Ward 2001, Bode et al. 2011, Peters et al. 2015). In Aotearoa, for example, a recent survey identified 940 community environmental groups (Sinner et al. 2022b), while more than 5000 community entities have registered for predator control since 2016[1] (Department of Conservation 2020b).

Whereas earlier conservation initiatives focused on preserving minimally disturbed natural places and maintaining biodiversity, these community environmental groups typically focus on repairing degraded ecosystems and restoring ecological functioning to a desired state (Wiens and Hobbs 2015). Working in highly modified environments (e.g., cities, agricultural areas), they engage in a wider range of activities with more varied objectives (e.g., stream daylighting, reforestation) than traditional conservation. We therefore focus on community-based ecosystem restoration, defined by Perring et al. (2018:1018) as "the process of assisting the recovery of damaged, degraded or destroyed socio-ecological systems in changing environments, for the benefit of people and nature across scales." Community involvement ensures restoration is appropriate for its social-ecological context and produces multi-functional landscapes that enhance both biodiversity and local livelihoods and well-being (Perring et al. 2018, Usher 2023).

However, community environmental groups face challenges in undertaking effective and efficient environmental action because of personnel, funding, and knowledge constraints, combined with significant administrative demands (Brown 2018, Shaw et al. 2018, Sinner et al. 2022b). Four surveys of community environmental groups and volunteers in Aotearoa (Table 1) reveal that groups are typically small (comprising less than 25 members) and largely comprising volunteers who are over 50 years of age and of New Zealand European descent. Although most groups are formally constituted, a 2022 survey found that 40% have no legal status, limiting their funding and contracting capabilities. Indeed, many community groups receive limited funding for their activities: 40–50% of groups receive less than $10,000 per year,[2] and only a third have paid staff. Groups' small size and older demographic limits their capacity to undertake large scale or long-term restoration (Peters et al. 2015), as do ongoing struggles to access adequate funding and institutional support (Brown 2018, Shanahan et al. 2021).

Moreover, critics have questioned the efficacy of community environmental action in delivering restoration of the type and at the scale needed to reverse biodiversity declines (Menz et al. 2013, Peltzer et al. 2019, Usher 2023). In Aotearoa, community groups typically undertake a combination of public engagement activities (e.g., advocacy) and weed and pest control, native planting, and environmental monitoring on predominantly public land in rural or peri-urban environments (Table 1). Such activities often lack robust ecological advice, restoration planning, or outcome monitoring (Usher 2023). Community initiatives are also typically site-scale and species-specific, focused on restoring ecosystem composition and natural amenity through "simplistic plantings" and species translocations (Menz et al. 2013, Norton et al. 2016, Peltzer et al. 2019). Mace et al. (2018:448) argue that these approaches are insufficient to address key drivers of environmental degradation or achieve improvements at pace, "amount[ing], at best, to a managed decline."

Scaling community-based restoration

In light of these limitations, there are growing calls to scale community-based restoration (Norton et al. 2018, Perring et al 2018, Kockel et al. 2020, Mumaw and Raymond 2021). Although many calls focus on scaling up restoration to larger spatial scales, others highlight the need to better coordinate action, address key drivers of degradation, and engage a wider range of communities and socio-cultural objectives (Norton et al. 2016, Osborne et al. 2021, Usher 2023).

We find the typology of amplification processes by Lam et al. (2020) useful for conceptualizing how community-based restoration might be scaled. First, as illustrated by landscape restoration, scaling may involve "amplifying out" initiatives by extending their range (e.g., expanding predator control beyond sanctuaries), or creating new similar initiatives (e.g., new stream care groups). Second, the impact of initiatives may be increased by "amplifying within" the initiative, whether by stabilizing an existing initiative (e.g., group formalization) and thus increasing its longevity, or speeding it up (e.g., improving access to resources). Targeted restoration of ecologically effective areas (e.g., breeding sites) may also contribute to amplification within initiatives. Processes that amplify within thus promote more effective, efficient, and sustainable community restoration (cf. Menz et al. 2013). Finally, scaling can be achieved by "amplifying beyond" the initiative, by changing the rules, values, norms, knowledge, and mindsets within which restoration takes place. This emphasis on changing societal norms echoes the growing calls to attend to restoration's social outcomes and the plurality of values involved (Osborne et al. 2021), though processes of social and institutional change are infrequently discussed in the restoration literature (Usher 2023).

A review of research on community restoration, conservation, and natural resource management reveals several social-institutional approaches to scaling community-based restoration. First, community capacity may be enhanced by increasing the number of people and groups involved in restoration, as in volunteer-based projects, backyard restoration initiatives, and landcare groups (Prager 2010, Mumaw and Raymond 2021, Shanahan et al. 2021). This has been the dominant mode of scaling to date and is often what is implied in calls to "upscale" restoration (e.g., Norton et al. 2016). Although growing the number of actors may increase the frequency and extent of restoration activities (i.e., amplifying out), it is not sufficient to overcome other limitations of community-based restoration (e.g., expertise, resources, coordination).

Table 1. Comparison of results from recent surveys of community environmental groups in Aotearoa New Zealand. DOC = Department of Conservation.

	Hardie-Boys (2010)	Peters et al. (2015)	Shanahan et al. (2021)	Sinner et al. (2022b)
Survey group	Community groups working with DOC, including schools & local government entities (n = 208)	Community environmental groups (n = 296)	Adults actively involved in a conservation activity (n = 313)	Catchment & community environment groups (n = 240): 148 biodiversity (BD), 42 waterways (WW)
Age	51% groups established for 10+ years	52% groups established for 11+ years		50% BD groups established 10+ years; 66% WW groups established < 8 years
Size Demograp-hics	35% have ≤ 24 people involved	72% have ≤ 20 active participants 66% group participants are age ≥ 51yrs	56% in projects with ≤ 20 participants 54% respondents are ≥ 55yrs; 33% retired; 71% NZ European; 7% Māori; 72% undergraduate or higher	54% have ≤ 25 participants 37% groups include Māori members; BD groups mostly town residents and "others"; WW groups mostly farmers
Legal status	70% incorporated societies, charitable societies or trusts; 15% no legal status	67% trusts or incorporated societies		> 50% incorporated societies, charitable trust or companies; 40% no legal status
Staff	33% have paid staff; of those groups, 82% have 1–4 paid staff		84% respondents involved in unpaid conservation activity; 25% in paid conservation activity	33% have a paid facilitator or administrator
Resourcing	41% receive < $10,000/year; 56% receive non-government income; 45% DOC funding; 43% other gov't funding	31% receive local gov't support; 21% DOC support		50% receive < $10,000/year; 32% receive local gov't funds; 31% central gov't funds; 27% charitable funds; 27% member funds
Activities	58% ecological restoration; 58% awareness & publicity; 55% pest control	86% weed control; 85% native planting; 75% pest control; 70% advocacy & education	In public spaces: 56% pest trapping; 36% tree planting; 41% predator baiting; 33% weeding	82% pest/weed control; 71% planting; 59% environmental monitoring; 52% wetland restoration
Land tenure & use	80% of groups work on DOC land; 12% also work on private land; 10% on other public land; 5% on Māori land	Of all projects: 68% on public land; 28% on private land; 4% on Māori land; 54% rural; 28% peri-urban; 18% urban	46% involved in rural projects 22% in peri-urban projects	

On the other hand, scaling community-based natural resource management typically involves scaling up from local to city, regional or even transboundary levels (Prager 2010, Shaw et al. 2018, Dupuits et al. 2020). This often involves the creation of new governance institutions (e.g., committees, boards) that bring together agencies and stakeholders to make decisions, agreements, or plans regarding resource use and management over large areas. These higher-level institutions are intended to create an enabling and coordinating framework for community action, and therefore contribute to amplifying restoration beyond local initiatives (e.g., Guerrero et al. 2015b). However, the creation of more formal and distant governance institutions can also reduce local participation and result in the professionalization of community initiatives (Murcia et al. 2016, Dupuits et al. 2020). Intermediaries could help to facilitate communication between local groups and higher-level entities (Prager 2010) and guide collaborative governance arrangements in implementing ecologically effective restoration (Guerrero et al. 2015b).

Finally, case study research has revealed a range of second-order organizations that help to connect and support community restoration groups, including networks (Barrutia and Echebarria 2019), partnerships (Maynard et al. 2020), and collaboratives (Prager 2015). We refer to these diverse organizational forms as "collectives" because they bring together entities with shared interests to act toward common goals (cf. Pfaff and Valdez 2010).

Collectives' roles in community-based restoration can vary widely depending on the types of entities and relationships between entities involved (Wyborn and Bixler 2013, Guerrero et al. 2015a, Doole 2020). For example, "networks" of similar but independent groups can help to share ideas and information, promote cooperation, and strengthen group identification (Barrutia and Echebarria 2019), whereas "collaboratives" bring diverse entities together to work on shared problems or projects (Prager 2015). Collectives' emphasis on supporting community groups to improve their outcomes suggests opportunities to amplify within existing groups (i.e., improving their efficiency and effectiveness) and out by enabling groups to grow or new groups to form.

However, collectives are not immune to the power dynamics involved in scaling restoration (Prager 2015, Green 2016), and in particular tensions between independent, community-led action and efforts to coordinate and prioritize activities. Studies highlight that scaling is often driven by governments, resulting in limited community ownership and governance of restoration initiatives (Murcia et al. 2016, Fastenrath et al. 2020). Even where scaling is initiated by communities, pressures to upskill and improve efficiency can result in the professionalization of community organizations, alienating grassroots support for collective entities (Dupuits et al. 2020). In other situations, collectives face criticism for not doing enough to coordinate and optimize community action while adding layers of complexity,

Table 2. Inclusion criteria for ecosystem restoration collectives.

Definition element	Inclusion criteria
Multiple community groups and other entities ...	One or more social or environmental community-based groups (e.g., catchment groups, ratepayers association, Indigenous groups) should be involved in the collective, among other group/organization types (e.g., national NGOs, government entities, philanthropic organizations).
working together ...	The collective was established to scale up/out impact, i.e., 1. to encompass a larger area or more areas; 2. to expand social-ecological objectives or scope of activities; 3. to engage a wider range of socio-cultural groups; 4. to coordinate action/resources across places or groups.
on a regular basis ...	Some of the relationships within the collective should be enduring, i.e., persist beyond a one off project or event.
toward shared restoration goals.	Joint action for ecological (freshwater and terrestrial) restoration is a central focus of the collective, involving more than statutory planning or consultation activities.

thus creating new sources of inefficiency (Prager 2015, Doole 2020). Collectives must also navigate questions of group identity (Barrutia and Echebarria 2019), problematic designations of scale (Sarna-Wojcicki et al. 2019), competitive relationships among organizations (Maynard et al. 2020), and the unequal distribution of benefits arising from restoration (Prager 2015). Doole (2020) argues that further work is needed to ensure that collectives have the support, resourcing, and skills needed to catalyze landscape restoration, without reproducing the top-down mode of governance agencies.

To date most research on collectives has focused on one organization type, limiting the conceptualization of collectives' diverse forms and functions (see Doole 2020). For example, Prager (2010) demonstrates how differences in membership, geographical scale, and institutional level shape the level of community participation in collaborative organizations and their associated benefits. Further examination of collectives' social and institutional dimensions can reveal how specific entities or governance structures promote or inhibit scaling of community-based restoration (Battista et al. 2017, Fastenrath et al. 2020, Maynard et al. 2020, Mumaw and Raymond 2021). This study contributes to emerging research on the role of collectives in scaling restoration in Aotearoa and beyond through a detailed analysis of the structure, operations, and social-ecological outcomes of collectives.

METHODS

In this study, we refer to multiple community groups and other entities working together on a regular basis toward shared restoration goals as "collectives," and the entities that compose collectives as "constituent groups."

Potential collectives and survey participants were identified based on prior knowledge; recommendations from researchers and practitioners; online searches; and organization lists on conservation websites. Sixty-four entities met our inclusion criteria (see Table 2); from these we selected a diverse sample of 30 collectives from across rural and urban settings in most regions of Aotearoa (see Fig. 1), with varying social-ecological foci (e.g., predator control, water quality) and membership (e.g., farmers, Indigenous communities). For each collective, we identified a representative with knowledge of the collective's history, structure, and activities, usually the manager or coordinator. Representatives were recruited via email and/or telephone invitations; two declined the invitation.

Fig. 1. Locations of ecosystem restoration collectives surveyed (n = 27). One collective operates nation-wide (represented by the bracket), while most others are localized to specific regions.

The survey questionnaire included a mix of multi-choice (n = 11) and open-ended (n = 17) questions on (1) the nature and operations of collectives and their constituent groups; and (2) the structure and purpose of collectives and their impact on restoration (Appendix 1). To compare collectives' nature and operations with their constituent groups, we asked participants who were members of both a collective and group (n = 12) the

same eight questions for both entities. The survey was pilot tested with representatives of three collectives and refined based on their feedback.

Twenty-seven collective representatives completed the survey[3] between February and May 2021 via Zoom (n = 23) or telephone (n = 4).[4] The survey lasted 45 minutes on average. The researcher read questions aloud to participants 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. Comment boxes were used to record additional information from participant's responses, to aid in interpretation and add depth to analysis. Surveys were audio-recorded with participants' permission, and typed responses were reviewed against recordings for accuracy.

Multi-choice responses were analyzed using counts and percentage responses, while responses to open-ended questions were coded using qualitative software Nvivo12 Plus to identify dominant themes and assess their frequency. Narrative analysis was also used to explore the rationales, assumptions, and worldviews embedded in long answer responses, adding explanatory depth to quantitative trends. Where appropriate, responses are anonymously quoted to convey participants' situated perspectives.

RESULTS

Characteristics of collectives

Participant responses revealed that collectives and constituent groups differ from one another in terms of age, legal structure, funding, and staffing (Table 3). Collectives are a relatively recent phenomenon; 68% of collectives surveyed reported forming in the last decade, and almost all in the last 20 years. By comparison, half of the constituent entities reported having formed more than 20 years ago. Responses to the question "when did your group join the collective?" (n = 12) similarly revealed that a majority of (58%) constituent entities were already established when their collective formed.

Collectives are more likely to have legal status than their constituent entities, with most collectives surveyed identifying as not-for-profit legal entities, including Incorporated Societies (n = 9) and Charitable Trusts (n = 8). Under New Zealand law, community groups can adopt a range of legal structures that enable them to enter contracts and access funding, but also subject them to additional rules and administrative requirements.[5]

The survey also asked participants whether their collective and constituent entity receive any funding or external support; participants could select up to eight sources or indicate that they receive no funding. Table 3 highlights that government grants are the most common funding source for both entity types, followed by donations and contracts to complete work (e.g., planting). One constituent group reported that they do not currently receive funding, and rely on gear and other support from their collective. Overall, the results indicate that collectives and their constituent groups receive funding from similar sources, though a larger proportion of collectives received funding from each source. These results suggest that on average collectives draw their resources from a more varied funding portfolio than constituent groups.

Table 3. Comparison of collectives and their constituent groups according to key community group attributes. FTEs = full-time equivalents.

	Collectives (n = 27)	Constituent groups (n = 12)
1. Age of entity:		
< 5 years	32%	25%
5–10 years	36%	16.7%
11–20 years	24%	8.3%
21+ years	8%	50%
2. Legal status:		
Unincorporated group	18.5%	50%
Incorporated society	33.3%	33.3%
Charitable trust	29.6%	8.3%
Other (e.g., company)	18.5%	8.3%
3. Key funding sources:		
Government grants	93%	83%
Donations	48%	42%
Contracts to complete work	30%	25%
NGO grants	22%	17%
4. Staff:		
Employ paid staff	96%	58%
Number of paid staff: average (range)	6.4 FTEs (0.2–40)	2.4 FTEs (1.0–5.5)

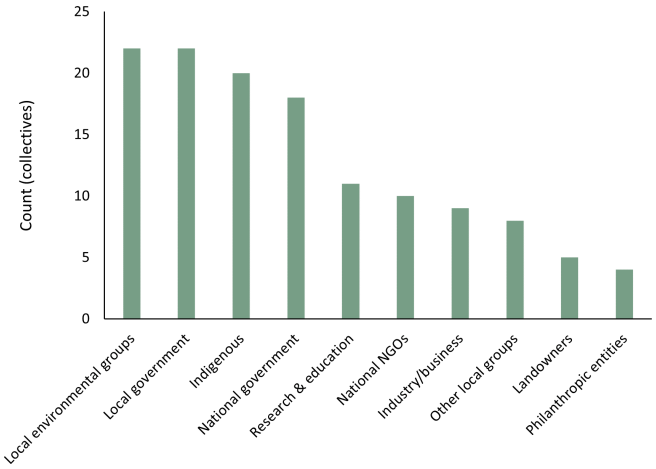
Finally, participants were asked whether their collective and constituent group have any paid staff; the interviewer took notes on the number of staff and types of paid and volunteer roles. Paid staff are both more common and more numerous in collectives compared with their constituent entities (Table 3). Just over half of constituent groups were reported to have paid staff, typically group coordinators, leaders, or managers, with an average of 2.4 full-time equivalents (FTEs). By comparison, almost all collectives (26 of 27) were reported to have some paid staff, employing on average 6.4 FTEs, though staffing was highly variable. Participants frequently commented that the lack of stable funding to hire staff is a barrier to progress, for example: "sometimes there's been some funding but only enough for very very part time [roles], and on and off, so you lose momentum."

Composition and structure of collectives

Collectives are made up of five types of entities on average (range = 2–8 types; Fig. 2). Most collectives include a combination of local environmental groups (85%, e.g., catchment groups), local and regional councils (85%), Indigenous entities (77%, e.g., tribes), and national government agencies (69%, typically the Department of Conservation). Many collectives (42%) also receive support from research and educational institutes, who provide expertise and students. Collectives are also frequently supported by national-scale NGOs (38%, e.g., Forest and Bird, the NZ Landcare Trust) and industry organizations (35%, e.g., DairyNZ), who provide expertise, organizational support, and connectivity. A minority of collectives (15%) include philanthropic foundations as key partners.

The structure of collectives varies based on relationships with and between their constituent groups. For example, some constituent groups are formal members of their collective and are represented in decision making fora (e.g., boards), while other collectives provide communication and support to constituent groups without any formal relationship. Within these more informal collectives, relationships between constituent groups can vary

Fig. 2. Types of entities that compose the collectives surveyed.



significantly, as this participant describes: "[Name] is a loose collective ... Some of the groups in the collective work together, some never will meet each other." Other collectives include a mix of formal and informal relationships:

> *We are not a formalized collective, and our groups are not "members." Some of the programs however are led and organized as a collective (e.g., pest free program where > 10 partners have signed a memorandum of understanding for working together). ... The collective has great flexibility and responsiveness because it can work "to order" with the constituent groups and what they need at the time.*

Yet other collectives are more structured, with clearly defined roles and responsibilities and strong connections between constituent groups. For example, several collectives were described as having a multi-scalar structure, with a regional entity that supports and connects multiple place-based collectives (e.g., catchment collectives), which in turn bring community groups and other entities together to work on local initiatives.

The varying formality of relationships is reflected in collectives' founding documents. Twenty-one collectives surveyed had some form of written agreement, including 12 that have memoranda of understanding or terms of reference with some of their constituent groups. These formal agreements delineate the roles and responsibilities of the collective and constituent groups, and how they will work together. Other collectives have bespoke agreements, including a collaboration plan, an Indigenous language constitution, and "group culture" guidelines. Six participants responded that their collective has no written agreement and viewed such agreements as unnecessary to the collective's "organic" structure. For example, one participant stated that the groups composing the collective are very independent and have their own rules; the collective operates on a trust-based model where groups can withdraw at any time.

Formation of collectives

This variability in collective composition, structure, and formality may reflect the diverse origins and evolution of collectives. Collective formation was most frequently attributed to community efforts, sometimes led by motivated individuals or groups. Some participants described the community joining together because of frustration with existing environmental management, visible environmental degradation, and a desire for greater engagement. For example, several stated that their collective formed because of government agencies' perceived failure to protect and improve valued ecosystems. In others, communities formed collective entities based on a perceived 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 Indigenous-led collectives, recent treaty settlements were a significant enabling factor and driver of collective formation.

Other participants reported that government agencies, NGOs, or philanthropic foundations played a key role in driving their collective's formation. Seven participants stated that their 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 objectives, and a desire to improve community engagement. For example, one government agency saw the collective as a way to broaden biodiversity initiatives for the area beyond mandated planning and implementation activities. Several non-government entities (e.g., Predator Free 2050 and philanthropic foundations) were also identified as driving collective formation by bringing groups together and providing funding, guidance, and other support for landscape-scale restoration.

Participants' descriptions of collective formation also highlighted the evolution of collectives through processes of expansion and formalization. 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 focused on biodiversity outcomes to a landscape initiative that encompassed a range of biodiversity, freshwater, and social objectives. Other participants described how their collective had started out informally, with motivated individuals and groups working together in a grassroots way, and later became more structured and professional as the collective grew and expanded. Participants described this formalization 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. Nevertheless, participants also stressed the importance of maintaining relationships and "building on what was already there" as collectives formalized.

Operations of collectives

Participants' descriptions of their collective's and constituent group's main purpose was coded into four broad themes: ecological, social, social-ecological, and working together (Table 4). These were not exclusive, with some purpose statements being coded to multiple themes. Over 75% of participants described their collective's or constituent group's main purpose in ecological terms, typically the enhancement of ecological restoration, biodiversity, and freshwater. These purpose statements often

Table 4. Proportion of participants who described the main purpose of their collective (n = 27) or constituent group (n = 12) as improving ecological, social-ecological, social, and/or ways of working outcomes. Descriptions were coded to one or more purpose types.

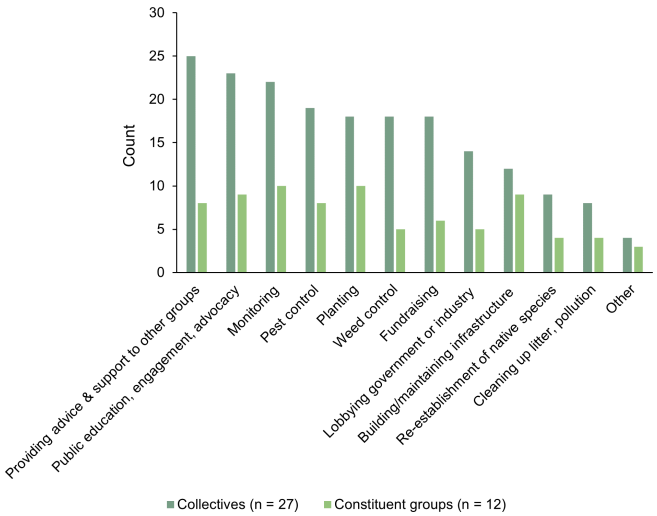
Purpose type	Key themes with example quote	% Purpose statements	
		Collectives	Groups
Ecological	Protecting and enhancing local environments and ecosystems, including: (a) restoring a place, natural feature, or ecosystem; (b) improving freshwater health and well-being; (c) protecting and increasing biodiversity; (d) protecting or re-introducing "icon" species; (e) enhance the *mauri* (life force) of environments; (f) reducing ecological stressors (e.g., predators). "To improve the environmental health of [name] Park and the surrounding catchment."	89 %	75 %
Working together	Improving the way restoration is undertaken, through: (a) enabling, supporting, or empowering communities to undertake restoration; (b) working together in a more coordinated way; (c) improving efficiency; (d) growing group capability. "To work together and harness the synergies of working together."	56 %	17 %
Social-ecological	Enhancing relationships between people and their environment, such as: (a) environmental care, promoting restoration to the wider public; (b) people's connection to nature; (c) *mahinga kai*, the ability to harvest food from particular places; (d) holistic concepts of well-being that include the health of land, waters, and people. "To create a space in an urban area where people can immerse themselves in nature."	41 %	58 %
Social	Improving outcomes for people and communities, including: (a) intergenerational equity; (b) connected communities; (c) employment opportunities; (d) enhanced socio-cultural values; (e) community pride and well-being. "To create regional economic gains for our *iwi*, for us to be progressive, not settling for the status quo ... empowering our people and communities to tell the story of our region being a great place."	30 %	17 %

referenced landscape or ecosystem (e.g., catchment) scale changes. Many participants also described their group's main purpose in social-ecological terms (58% of constituent groups, 41% of collectives), emphasizing people-nature connections and holistic concepts of well-being.

A notable difference between the purposes attributed to collectives and constituent groups is that participants were much more likely to articulate their collective's purpose as improving ways of working together (56% of collectives versus 17% of constituent groups). These purpose statements focused on connecting people or groups, and empowering or supporting communities to care for their environment. For example, one participant stated that their collective's purpose is to bring people together to increase communities', agencies', and Indigenous entities' knowledge of ecosystem restoration.

An emphasis on working together was reflected in collectives' main restoration activities. Both collectives and constituent groups undertake activities like planting, monitoring, public education and engagement, pest control and providing support to other groups (Fig. 3). However, a larger proportion of collectives were reported to engage in providing advice and support to other groups (93% vs 67% of constituent groups); 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. In contrast, constituent groups' most common activity types suggest that they predominantly engage in on-the-ground activities, including planting, monitoring, infrastructure development and maintenance, and public outreach.

Fig. 3. Count of collectives and constituent groups that were reported to engage in each restoration activity.



Collective outcomes

Finally, we explored how participants perceive their collectives' impact on community-based restoration. All participants felt strongly that constituent groups have been able to have greater impact or better achieve their objectives by being involved in a collective. One participant replied "Yes absolutely. My environmental group wouldn't exist without the [collective]," while another responded "No doubt! To the point where our environmental group objectives have exploded! The group has been able to accomplish so much more by being involved with the collective..." Participants described increases in the amount, spatial extent, scope, effectiveness, and efficiency of group restoration activities as evidence that constituent groups have been able to have greater impact through their involvement in the collective.

Many participants also thought that their collective was improving on-the-ground outcomes for biodiversity, although they were more cautious about their claims. Nine participants stated that their collective was still at an early stage in its development, and they did not expect to see outcomes yet or did not have sufficient monitoring data to show improvements. Several participants noted that it can be difficult for collectives to attribute biodiversity outcomes to their actions, especially where a lot of the collective's input is "unseen work" (e.g., administrative support) rather than on-the-ground projects.

Many collectives undertake some monitoring, with a few carrying out extensive monitoring and measurement of progress toward targets. For example,

> *We have helped stabilize or increase kiwi numbers ... Same for Pāteke [Grey Teal] which has the third highest flock count on record in our area because of our support... 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.*

Overall, 10 participants stated that their collective's monitoring shows at least some biodiversity improvements. Evidence of improvements reported include predator eradication, reductions in pest species, stabilization and growth of target species, expansion of indicator species into new areas, return of previously extirpated species, water quality improvements, and recovery of macroinvertebrate populations. Several participants stated that improvements in biodiversity had been greater or more rapid 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.*

Another participant highlighted the importance of even small improvements in biodiversity:

> *A lot of the mahi [work], 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 [treasures] we treat with all the respect in the world, that are there for future generations.*

In the absence of biodiversity monitoring, participants described a range of proxy measures for collectives' ecological impact. Proxies included the number of people or groups involved, amount of restoration activity, and the spatial extent of activities. For example, participants reported increases in the number of volunteer hours, predator traps installed, native plants planted, species translocated, area of habitat restored, and length of fence built. Some participants situated these proxies within a process-based account of how the collectives' activities improve biodiversity outcomes. For example, one described how restoring 100 riparian spawning sites is contributing to rapid population increases for whitebait, due to their fast life cycles.

Together, these results indicate that collectives see themselves as effective in supporting widespread restoration action, and thus ecological improvements. To better understand how and why collectives are perceived as making a difference to community-based restoration, we coded participants' responses to identify themes in their explanations of collective impacts. Our analysis identified 11 common ways in which participants understand their collective as contributing to community-based restoration, summarized in Table 5. Most participants touched on more than one theme, indicating that collectives are perceived as making a multifaceted contribution. Explanations often involved improving groups' access to funding, resources, and information for restoration; fostering connection and collaboration among groups; growing group confidence and support from the community; and enabling innovation and scientifically informed restoration. Participants also indicated that collectives contribute to scaling restoration by enabling increased action by existing groups, growing the number of groups involved, connecting restoration activities, and expanding the scope of restoration.

DISCUSSION

This study sought to understand the role of collectives in scaling restoration in Aotearoa and beyond through a detailed analysis of collectives' characteristics, structure, operations, and outcomes. Our results provide evidence that restoration collectives are a novel and distinct form of community organization with the potential to amplify community-based restoration. Here we summarize key distinctions between collectives and traditional community groups, propose a typology of restoration collectives, and consider their potential to scale ecosystem restoration.

Collective approaches to community-based restoration

Our results demonstrate that collectives differ from traditional community groups in both their form and function. Whereas community groups typically undertake site-based restoration and community engagement (Menz et al. 2013, Norton et al. 2016), the collectives surveyed focus on providing support and facilitating connection and collaboration among entities to achieve landscape outcomes. This emphasis on improving how restoration entities work together—and related strategic activities such as providing advice and support to other groups, fundraising, and lobbying—set collectives apart from the constituent groups in our study, as well as those surveyed by Peters et al. (2015) and Sinner et al. (2022b). Our results also highlight that collectives are more formally organized than their constituent groups, with most collectives having legal status and paid staff. Again, this suggests a significant shift from the traditionally informal and volunteer-driven model of community restoration (Usher 2023). The claim that multi-group collectives are a novel approach to restoration is reinforced by the relative youth of collectives surveyed; most were less than a decade old. Recent government

Table 5. Themes in descriptions of how collectives enable constituent groups to have greater impact and improve biodiversity outcomes. Themes are organized by frequency, with the most cited explanations listed first.

How collectives contribute to restoration	Example quotes
Improving access to funding, resources, and other support	"... the support around running meetings, collating databases, communications, the planning and direction. [Collective] plays a connecting-up, very empowering role between constituent groups and the larger landscape of funding and knowledge." "The ... project has a lot more funding because of involvement with the collective. We don't have time as an environment group to fill out the grant applications, but the paid staff of [collective] make amazing grant applications that funders can't resist."
Enabling more or sustained action by community groups	"Because catchment groups are supported, they can do more of the work they want to do, including supporting biodiversity." "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."
Bringing diverse people or groups together	"... we can pull together disparate groups with different drivers to work towards common purpose. This maximizes efficiency and effort, harnesses power of collaboration across the landscape." "Entities on their own can't really achieve as much by themselves because they all have their own sets of values and different sense of what they strive for. But collectively we do have a unified vision with many layers and are doing a lot more than we could by ourselves."
Improving access to information and advice	"Our collective effort gives us a better understanding of why biodiversity is declining, from Western science and *mātauranga* [Indigenous knowledge] perspectives together." "We ... share the monitoring data that is collected by different agencies ... to make the information meaningful and accessible to everyone."
Restoration activities are more connected or collaborative	"There's more energy around different areas, more potential for groups to link up across the landscape so that it's less fragmented and then expand the work even further." "... being part of a collaboration [improves] access to greater range of resources. It allows each member group to work to their strengths."
Fostering group pride, recognition, and voice	"There is pride from the *hāpu* [subtribes] and *whānau* [extended family] to be part of the collective." "Greater confidence, knowledge, increased representation. We must have resolve to stand up and speak out, to confidently stand in front of a minister, a councillor .... The collective helps with this."
Expansion of restoration goals and activities	"From an *iwi* [tribe] perspective, the collective has opened conversation about other things in the catchment. It has identified and created new opportunities to protect and care for the catchment generally." "Our environmental group has been able to accomplish so much more by being involved with the collective - research, ... economic development, growing our networks due to the collective involvement."
Enabling scientifically informed restoration	"By using scientific methodology to restore, biodiversity has benefited because core ecologically important trees that should be there are re-established and can prosper."
Increasing community support for restoration	"The restoration work has also gained so much connection with the wider community creating ground force behind the biodiversity work we're doing (social re-connection)."
Grow number of groups involved	"The [collective] has also instigated the beginning of many small groups and given them support to activate." "Increasing numbers of groups are coming to be involved now."
Enabling experimentation or innovation in approach	"Testing and sharing innovative ways to do things, taking risks to try new things for member groups."

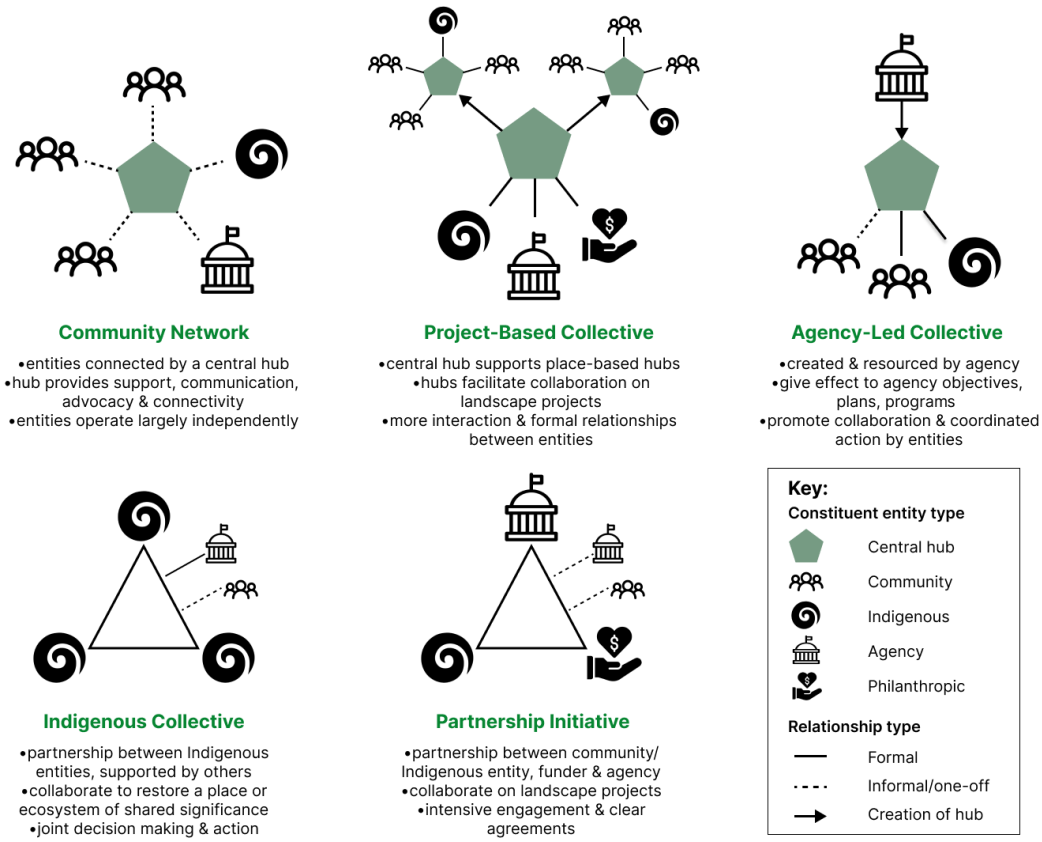
attention and investment in collectives suggests that this model will become more prominent in Aotearoa (Doole 2020) and beyond (Prager 2015).

Our study also revealed variability in the structure, purpose, and operations of restoration collectives in Aotearoa, mirroring the diversity of collaborative structures and relationships in the literature (Wyborn and Bixler 2013, Prager 2015, Guerrero et al. 2015a, Maynard et al. 2020, Sinner et al. 2022a). To understand the forms and functions collectives can take and begin to conceptualize their distinct roles in scaling restoration, we propose a typology of restoration collectives (see Fig. 4). Although our typology is based on collective arrangements observed in Aotearoa, we highlight similar organizations in overseas studies to illustrate the typology's broader relevance.

Key distinctions in collective form include the existence of a central hub entity, which provides support, advocacy, connection, and coordination functions, as well as the formality of relationships between constituent groups. In "community networks," the hub provides a connection point for groups who otherwise operate largely independently (similar to networks described by Maynard et al. 2020 and Mumaw and Raymond 2021); participants emphasized the organic, non-hierarchical nature of these networks. In "project-based collectives" and "agency-led collectives," the hub entities coordinate joint projects, facilitate engagement across groups, and support constituent groups to deliver on their objectives. These collectives resemble the collaboratives that have emerged in Australia and Europe to promote landscape management (Prager 2010, 2015) and typically involve more internal structure, formalization of relationships (e.g., MOU), and interaction between groups than community networks. The defining characteristic of agency-led collectives is that they are created by governance agencies (e.g., local government or large NGOs) to give effect to their objectives, planning, or programs, and rely on agency resourcing. Elsewhere such collectives have been criticized for reproducing top down approaches to restoration, limiting community involvement and outcomes (e.g., Prager 2010, Murcia et al. 2016).

In contrast, some collectives are built on close relationships between a defined set of entities. The "Indigenous collectives" surveyed comprise Indigenous entities (e.g., tribes, landowners) that agree to work together to restore an area of shared significance. The Indigenous entities undertake joint decision making and restoration activities as an expression of their self-determining authority. "Partnership initiatives" similarly involve intensive engagement between a small number of partners that

Fig. 4. Typology of ecosystem restoration collectives based on survey results from Aotearoa New Zealand.



work closely together to undertake landscape-scale restoration. Such collectives have received limited attention to date, though the importance of social identity and governance relationships (Guerrero et al. 2015b, Barrutia and Echebarria 2019) suggests they may play a unique role in scaling community action. In both instances, other community groups, governance entities, research institutes, or industry organizations may help to resource and support the work of the primary partners.

Collectives' contribution to scaling restoration

The amplification processes described by Lam et al. (2020) are useful for parsing the range of ways that collectives can contribute to scaling restoration, highlighting their multifaceted role in community-based restoration. Participant responses suggest collectives make four key contributions to scaling, though some amplification processes are more common among particular collective types. Most notably, collectives help to amplify out restoration by (1) promoting landscape restoration. They also play a key role in amplifying within community initiatives, i.e., improving the efficiency, effectiveness, and longevity of community-based restoration, by (2) improving administrative support and resourcing, and (3) promoting connectivity and collaboration. Finally, collectives can help to amplify beyond community initiatives by (4) advocating for wider system change. These contributions to scaling restoration are briefly summarized below, and their limitations discussed.

First, many collectives surveyed described their activities as occurring at landscape, ecosystem, or regional scales, far beyond the patch or site scale common to community-based restoration (Menz et al. 2013, Norton et al. 2018). Indeed, the spatial extension or connection of restoration initiatives was often identified as a driver for collectives' formation or a key component of their purpose. Landscape approaches were particularly prominent among more formal collectives (e.g., agency-led and partnership collectives) that have the resources and capability to launch large-scale yet intensive initiatives, such as backyard trapping grids. Collectives also promote landscape restoration by scaling out existing initiatives, for example, community networks that support groups to expand their activities, or project-based collectives that catalyze new place-based initiatives. Even where restoration activities remain patchy, the collectives in this study position these patches within large scale visions and strategic plans, promoting greater spatial connectivity and coordination.

However, it is notable that many of the community networks and agency-led collectives are organized in line with socio-political boundaries, including local government areas, property, and public reserves. For example, eight collectives operate within regional government boundaries, while others leverage large public reserves or private landholdings for landscape projects. The retention of socio-politically defined scales is also apparent internationally, where upscaling restoration often focuses on

improving biodiversity in cities, nation states, and other administrative units (Guerrero et al. 2015b, Fastenrath et al. 2020, Mansuy et al. 2020, Mumaw and Raymond 2021). The definition of ecological scales is also deeply political and can reinforce existing jurisdiction and power relations, as critics of watersheds as a "natural" governance scale have observed (Cohen and Bakker 2014, Sarna-Wojcicki et al. 2019). Many of the landscapes targeted for restoration are national or regional parks, while the restoration of landscapes important to Indigenous-led collectives is hindered by Treaty settlement status and fragmented land ownership. These tendencies to re-embed property and governance relations within landscape initiatives can limit collectives' ability to shift restoration toward more ecologically relevant and just scales.

Second, all collective types amplify existing initiatives by centralizing administrative functions and funding procurement (see also Prager 2015). Collectives thus help to mitigate the administrative burden (Sinner et al. 2022b) and resourcing constraints (Brown 2018, Shanahan et al. 2021) commonly experienced by community groups, and improve operational efficiencies. In particular, collectives' legal status and public profile enables them to apply for and succeed in obtaining a wider range of funds, benefits that they pass on to member groups by assisting them with funding applications, securing and distributing funds, or holding funds for groups without legal status. Greater funding also enables collectives to employ staff, who are essential to administering large-scale restoration (Sinner et al. 2022b) and who enable improvements in practice. For example, participants described how staff increase local capacity for restoration by connecting community groups with expert advice, services, and training opportunities. By acting as intermediaries between community groups and funders or agencies (cf. Prager 2010), collectives free up community groups to focus on practical restoration activities (e.g., weeding) and enable more sustainable resourcing of those activities.

These findings demonstrate the potential for collectives to amplify within existing initiatives (Lam et al. 2020) by supplying the administrative infrastructure for more efficient, effective, and sustainable community-based restoration. However, for collectives to succeed in this role, funders, agencies, and communities need to recognize and value this "behind the scenes" support (Peters 2019). Some participants noted that collectives struggle to articulate their contribution in a system where value is often measured by pests caught or trees planted, while others highlighted the lack of funding to support administrative functions. The lack of fit for purpose funding for community-led conservation has been acknowledged as a challenge worldwide (Nelson et al. 2023). Agencies could foster amplifying within by reducing the administrative load on collectives (e.g., by aligning funding application and reporting requirements) and thus freeing them up to focus on innovations in restoration (Doole 2020, Sinner et al. 2022b).

Third, collectives facilitate knowledge sharing, communication, and collaboration among groups, creating pathways for joined-up restoration that is broader in scope than traditional community initiatives (see Peters et al. 2015, Sinner et al. 2022b). More informal collectives such as community networks build awareness of diverse community initiatives and promote information sharing and connection building between groups. Participants indicate that such connectivity supports refinement and innovation in restoration practice, as well as creating a sense of shared purpose and identity among volunteers that helps to invigorate community initiatives. Collectives that feature more formal relationships (e.g., project-based collectives) can promote even greater cooperation and collaboration among groups by instigating joint projects, developing shared plans and visions, and catalyzing new partnerships.

By connecting community groups and other entities that typically operate independently, collectives help to expand the range of values, knowledge, experience, and skills involved in community restoration (Prager 2015). We argue that this diversity contributes to both amplifying within existing initiatives, by increasing their ability to undertake complex restoration, and amplifying out, by broadening the purpose of restoration and activities (Lam et al. 2020). Compared with the "simplistic plantings" often attributed to community restoration (Menz et al. 2013, Peltzer et al. 2019), participants describe collectives as promoting more complex, scientifically informed, and experimental restoration that seeks a plurality of social and ecological outcomes. For example, several collectives amplified their initiatives from single species (e.g., Kiwi) to the wider ecosystem (see also Sinner et al. 2022b), while others supported research on restoration practice, and yet others framed restoration as part of regenerative local economic development. Collectives' promotion of collaborative restoration may even amplify beyond specific initiatives where it enhances social cohesion and cultivates a sense of shared purpose, thereby growing communities' capacity to address complex social-ecological issues (Villamayor-Tomas and Garcia-Lopez 2018, Williams et al. 2018, Barrutia and Echebarria 2019).

However, some survey responses reveal hesitance over more collaborative and strategic community-based restoration. Several participants contested the idea that community groups were "members" and described their collective as an informal or "organic" collection of independent community groups. Collectives in general were very conscious of constituent groups' independence and the need to support rather than direct community restoration, echoing concerns about top-down conservation and the professionalization of community initiatives in other studies (Murcia et al. 2016, Dupuits et al. 2020, Mumaw and Raymond 2021). Successful amplification of restoration therefore requires attention to the power dynamics inherent in community-based restoration, and the role of relationship building, social cohesion, and shared identity in enabling collaboration among grassroots actors (Wyborn and Bixler 2013, Green 2016). Further research could examine whether and how collectives provide the strong social foundations that scaling community-based restoration evidently requires.

Finally, participants identified advocacy as a key function through which collectives argue for system changes that will enable large scale restoration and address local drivers of environmental degradation. Collectives' advocacy ranged from petitioning agencies to making submissions, undertaking promotional campaigns, and developing working relationships with government or NGOs. Such advocacy is something that many small community groups lack the capacity to do themselves, but that is important in gaining support for their work and raising

awareness of community needs and values. Collectives, with their staff capacity, oversight role, and strategic focus, play a key role in identifying broader issues and opportunities and channeling community input on these topics. Participants describe this advocacy as leading to further community participation in and coordination with government initiatives, and as important for breaking down barriers to restoration (e.g., misaligned funding criteria). For example, the Department of Conservation has invested in recent trial projects[6] to identify improved support mechanisms for collective restoration. Following Lam et al. (2020), we therefore contend that collectives' advocacy role enables the amplification of restoration values and knowledge beyond community-based initiatives to catalyze wider institutional and socio-political change.

CONCLUSION

This study provides further evidence that restoration collectives are a new and distinct form of collective action with significant potential to scale community-based restoration in Aotearoa. Our survey of 27 collectives indicates that they contribute to scaling restoration by improving the efficiency and sustainability of community initiatives, increasing the spatial scale and social-ecological scope of restoration, and increasing the range of actors involved in restoration. Collectives thus have the potential to mitigate the resourcing, scale, coordination, and sustainability challenges common to community-based restoration. Indeed, our analysis highlights the potential for collectives to amplify restoration through (1) capacity building and stabilization within existing initiatives, (2) spreading and connecting initiatives out to landscape scales and to encompass more holistic objectives, and (3) advocacy beyond initiatives to change the norms and systems governing community restoration.

However, questions remain over the extent to which these different forms of scaling are or can be realized, especially because of underlying power relations. Our survey results demonstrate that collectives are still relatively new and untested, and that it is too early to be confident that they will realize anticipated efficiencies, let alone hoped-for biodiversity outcomes. However, the shift in restoration discourse toward landscape-scale action, collaboration, and social-ecological outcomes suggests important changes in the ideas and values driving restoration. Crucially, this shift is also echoed in recent initiatives by government and funders, who are increasingly investing in governance infrastructure to enable collectives to play a coordinating and connecting role. Our typology of restoration collectives suggests that collectives' success in scaling restoration may depend on the strength of relationships and shared vision among constituent entities. Success may also vary across different types of restoration and conservation activities, with some (e.g., planting) scalable by large informal collectives while others (e.g., predator fencing) require formal relationships and resourcing. Further research on how collective structures contribute to different modes of amplification and what structures and processes are best suited to different activities would be beneficial in informing how collective action is resourced and supported. International comparisons could also help to theorize whether and how collective approaches vary across restoration, conservation, and resource management contexts.

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[1] In 2016 the New Zealand government launched the nationwide Predator Free 2050 programme, which provides resources and support for community predator control initiatives, resulting in a profusion of new groups, https://www.tuiatetaiao.nz/our-strategy/.

[2] For context, employing a staff member for 10 hours/week at minimum wage ($22.70) costs $11,800 in wages alone.

[3] The 28th participant's data was removed because of incomplete responses.

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

[5] For more information on the relative benefits of becoming incorporated, see https://community.net.nz/resources/community-resource-kit/formal-organisational-structures/ and http://communitytoolkit.org.nz/choosing-the-right-legal-structure-for-your-group/?pdf=598.

[6] Ngā Awa River Restoration programme and GovTech Accelerator project (2022).

Acknowledgments:

This study was funded by the New Zealand Biological Heritage National Science Challenge. We extend our sincere thanks to all the community leaders and coordinators who shared their knowledge and insights on restoration collectives with us and without whom this study would not be possible. Thank you also to our two anonymous reviewers for your thoughtful and constructive feedback that greatly helped us in refining this manuscript.

Data Availability:

The data that support the findings of this study are available on request from the corresponding author, KM. None of the data are publicly available because they contain information that could compromise the privacy of research participants. Ethical approval for this research study was granted by the University of Waikato's Human Ethics Committee (HREC(HECS)2020#60).

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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 organization 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 organizations 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 organization
    b. groups that regularly work together toward joint goals but with no umbrella organization
    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 organization 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 organizations 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 organization 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 organizations
    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 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?