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Beyond despair: Leveraging ecosystem restoration for psychosocial resilience

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Ecosystem restoration has historically been viewed as an ecological endeavor, but restoration possesses significant, yet largely untapped, potential as a catalyst for personal and social transformation. We highlight the opportunity for restoration to enhance community resilience by increasing agency and collective action and countering the pervasive perception that we are powerless witnesses to environmental decline. In this perspective, we take a "bright spots" approach and highlight successful examples of ecosystem restoration that have helped to nurture a sense of place, foster optimism, and cultivate stronger and more diverse social networks. These three individual- and community-level capacities have the potential to lead to increased psychosocial resilience, which is a key component of community resilience. Our aim is to spark discussion and research to better understand how we can transform restoration from a largely technical endeavor to a practice and process through which human–nature relationships are infused with deliberate meaning and human well-being is improved. With current calls to upscale and technologize restoration to meet sustainable development goals, we cannot lose sight of the value of community-engaged ecosystem restoration as a strategy with great potential for psychosocial benefits.

social–ecological systems | community resilience | ecosystem restoration | agency | individual resilience

Human activities are having a profound impact on natural habitats and species (1, 2), which poses a threat to the future resilience of social–ecological systems (3, 4). A symbiotic relationship with the natural world is fundamental to human health and well-being. Exposure to natural areas can generate psychological health benefits (5, 6), provide a place for recreational activities that promote physical health (7), and create cultural and community spaces that foster social cohesion and a sense of belonging (8). Moreover, natural ecosystems provide vital services such as food provisioning, climate regulation, and erosion mitigation (9). However, in return for these benefits and resources, humans have a reciprocal responsibility to care for and sustain nature, an idea that has long been recognized in Indigenous cultures but is often overlooked in modern environmental management (10–12).

Ecosystem restoration is increasingly promoted as a strategy to counteract widespread habitat degradation (e.g., United Nations Decade on Ecosystem Restoration), bolster valuable ecosystem services (13), and reduce hazard risks (14). However, restoration also has great, though largely unrecognized, potential to be an agent of psychological and social change (15). To realize this potential, we must first recognize that it is not just the environment that needs restoration, but also our relationship to the environment (10, 16). Here, we explore how restoration, when conducted with robust community engagement and a focus on restoring our relationship with the environment, can enhance individual well-being and social functioning and build resilient communities that are better able to flourish under change (Table 1). In particular, we focus on the role that restoration can play in building a sense of place, optimism, and stronger and more diverse social networks; these individual and community-level capacities can promote agency and collective action and challenge the prevailing notion that we are helpless bystanders in the face of environmental degradation. As this is an emerging field, we take a "bright spots" approach (17, 18), and focus specifically on documenting successful restoration projects. Focusing on such examples, even if they are outliers, can provide novel insights into the key principles that underpin effective restoration interventions (17). Moreover, this approach aligns with recent calls for "Earth Optimism," or the explicit evaluation of conservation successes, rather than evaluating failures, as is currently the norm (19).

Restoration Is a Fundamentally Human Endeavor

Ecosystem restoration is a human values-based endeavor. Restoration aims to enhance social and ecological systems, whether in relation to biodiversity, ecosystem services, socioeconomic opportunities, or other relational values (26–28).

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Table 1. Key terms and definitions

Term	Definition
Restoration	"Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed" (20). Ecological restoration and ecosystem restoration are often used interchangeably, but ecological restoration focuses predominantly on improving ecological integrity, whereas ecosystem restoration may focus on a broader suite of goals (21), which is why we have chosen to use the latter term in this article. Restoration for direct extractive livelihoods (e.g., food, wood) falls outside of the scope of this paper.
Social–ecological systems	"Integrated complex adaptive systems in which social and ecological subsystems are coupled and interdependent, each a function of the other, expressed in a series of mutual feedback relationships" (22).
Community	"A group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings" (23).
Community resilience	"The existence, development and engagement of community resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability and surprise" (24). Note that there is no common agreed-upon definition of community resilience (25).

Despite the growing importance of ecosystem restoration, there remains substantial debate about how restoration goals should be defined, who should be involved in defining them, how success should be measured, and even what activities qualify as restoration (29, 30). Broadly speaking, ecosystem restoration involves efforts to transform a natural system from its current state to a desired state (31), and it stands out as one of the few human endeavors explicitly aimed at benefiting ecosystems and species. As such, restoration goals and measures of success have historically focused on ecological metrics (e.g., area restored, number of plants transplanted) (32, 33) with a heavy focus on trying to recreate historic conditions that return ecosystems to a more "natural" state (34, 35) (but see ref. 36 for a discussion of the problems with the "wilderness" ideal). Recent perspectives increasingly afford greater appreciation to the complexity and dynamism of natural ecosystems and focus on restoring ecosystem functions and processes rather than just a desired set of species (37, 38). Nevertheless, many Western perspectives and definitions of restoration lack an explicit consideration of the complex and dynamic relationships between humans and nature. The heavy focus on ecological outcomes undermines the potential for restoration to also transform individuals and communities (39–41).

Researchers and practitioners have advocated for a recasting of restoration as a social–ecological endeavor that goes beyond ecological metrics to meaningfully engage with communities and their cultural practices, restore human–environment relationships, and build resilience at multiple levels (10, 16, 42–46). Accordingly, early and sustained stakeholder and rightsholder engagement is now recognized as central to restoration practice (21). It is key to ensuring that local communities have an opportunity to meaningfully contribute to a project, which can build agency, ownership, and vested interest in project outcomes (47, 48). Moreover, continuous community engagement in solving environmental problems has been shown to be vital for addressing environmental justice issues (49). Finally, community engagement can play a crucial role in developing the strengths that underpin resilience (50). In particular, improving human well-being and boosting resilience at the community level have recently become focal points of international and regional conservation and restoration initiatives (e.g., the United Nations Decade on Ecosystem Restoration, the Society for Ecological Restoration's Darwin Call to Action); however, there is limited guidance for how the restoration process can be employed as a resilience-building activity in communities (35).

Restoration as a Resilience-Building Activity

Resilience thinking stands out as a key conceptual framework for managing change (51, 52). It has been proposed as a unifying approach that transcends organizational levels and disciplinary borders to strengthen the capacity of ecosystems, individuals, social–ecological systems, etc. to respond to a variety of shocks and stressors (53). Resilience thinking is increasingly being incorporated into ecosystem restoration (35, 54); however, talk about resilience in restoration is often vague (i.e., resilience for whom and to what?) and most frequently related to ecological resilience (e.g., enhancing ecosystem buffering capacity to avoid tipping points) or disaster resilience (e.g., restoring wetlands to reduce flood risks). In contrast, we focus here on the potential for restoration to bolster three specific individual and community-level capacities that can lead to psychosocial resilience, a key component of community resilience. This topic has not previously received much attention in the restoration field yet could have a profound impact.

Scholarly work on individual resilience emerged from the psychology and mental health fields over the last several decades (55, 56). More recently, this work has been extended to the community level (57–59), with the notion that individuals and their communities are inextricably interconnected. For this reason, we take an integrated approach to understanding resilience, drawing insights from two primary literature bases: 1) the social–ecological systems literature and 2) the health and psychology literature (*sensu* ref. 59). The synergistic links between individual and community resilience can enhance both the strength of communities and the support available to individuals within those communities. In this context, we define resilience as the ability of a community, and the individuals within it, to flourish in an environment marked by change and unexpected events (24) (Table 1).

Foundational work has shown that various individual and community strengths commonly underpin community resilience (59). These include, but are not limited to: people–place connections; knowledge, skills, and learning; social networks; diverse

and innovative economies; and a positive outlook (60–63). These capacities are intricately linked and can work together to bolster different aspects of community resilience (e.g., psychosocial resilience, economic resilience, environmental resilience) (63). Here, we focus specifically on the potential for restoration to enhance psychosocial resilience, which is just one aspect of community resilience focused on individual well-being and social functioning. Psychosocial resilience can be pursued by fostering agency and social cohesion and developing adaptive capacity to thrive in an ever-changing and unpredictable environment. In practice, restoration projects may build psychosocial resilience by encouraging communal engagement and actions that actively enhance individual and community-level strengths (61). In particular, we focus on the potential for community-engaged restoration to enhance sense of place, optimism, and social networks (Fig. 1). We picked these three capacities in particular because they: 1) repeatedly appear in the community resilience literature (60–63); 2) are central to the goal of restoring our relationship to nature (i.e., sense of place); and, 3) are key components of psychosocial resilience (i.e., optimism and social networks) (64, 65).

In the next three sections, we provide a conceptual framing for the importance of sense of place, optimism, and social networks in the resilience literature, highlight "bright spot" examples from the restoration literature, and provide our thoughts on how each capacity could be enhanced through restoration activities. Ultimately, enhancing sense of place, optimism, and social networks through restoration will require community-led or engaged approaches that are sensitive to the unique rights and place-based needs of different communities (54).

Restoring Sense of Place

"Sense of place" is the "collection of meanings, beliefs, symbols, values, and feelings that individuals or groups associate with a particular locality" (66). "Place attachment," "place identity," and "place meaning" are closely related concepts that can be considered nested dimensions of a sense of place (67, 68). Sense of place has been recognized as an important characteristic underpinning individual and community resilience (61, 63, 68), and it can promote the ability to change in the face of various stressors (69, 70).

Sense of place has great potential to provide a bridge between ecosystem science and management (66); in fact, maintaining a sense of place is often the underlying rationale for management and conservation interventions (i.e., people are motivated to protect the places they love) and a strong sense of place can encourage proenvironmental behavior (71, 72). Sense of place is created through human experiences and interactions with the biophysical environment (68), and previous research has shown that it can be enhanced through environmental education (73) and stewardship activities (74). Nevertheless, a better theoretical, local, and

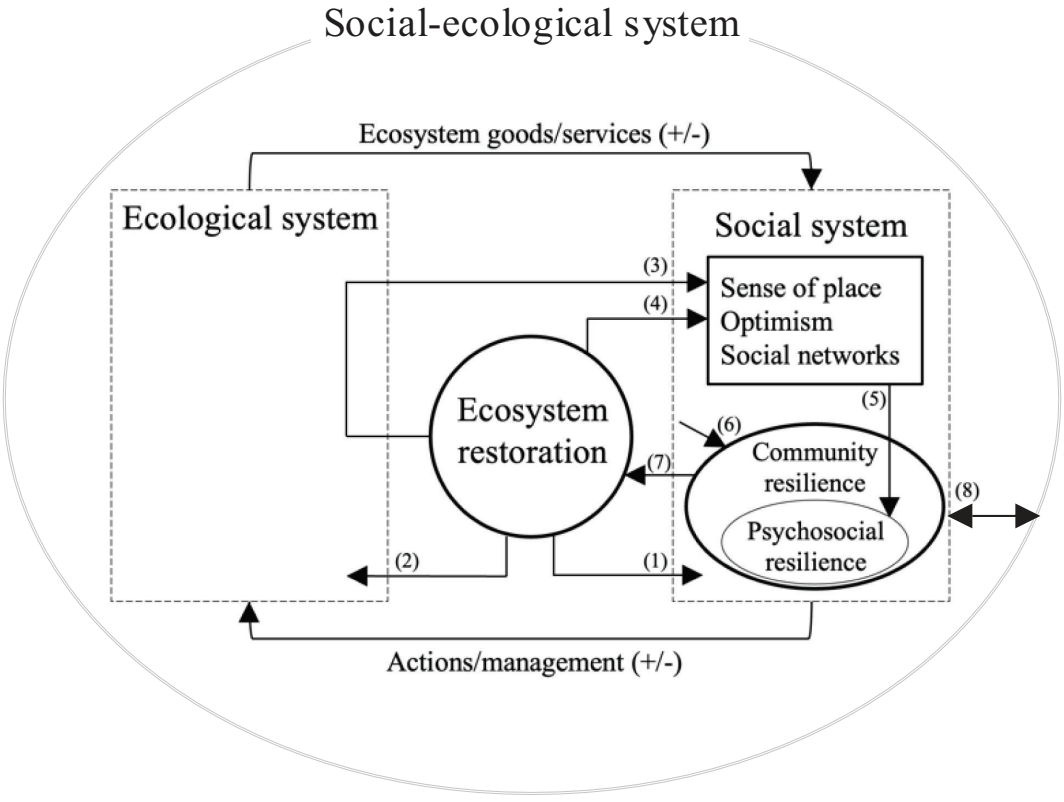

Fig. 1. Conceptual diagram showing the idealized role of restoration as a resilience-building endeavor in a social–ecological system. Restoration can have a variety of impacts on social and ecological systems (1 and 2), and it can be a community resilience building activity by directly enhancing optimism, sense of place, and social networks, or by enhancing the natural system in a way that indirectly bolsters optimism, a sense of place, and social networks (3 and 4). Ultimately, improving individual and community strengths like optimism, sense of place, and social networks can lead to increased resilience (5), but there are many other potential pathways to resilience (6). More resilient communities may exhibit greater environmental stewardship and engagement in the restoration process and initiate a positive feedback between resilience and restoration (7). Communities are embedded in larger social–ecological systems, but the relationship between community resilience and overall social–ecological system resilience merits further work (8).

practical understanding of sense of place is needed so that practitioners do not unknowingly design restoration projects that erode the existing sense of place rather than enhance it (75).

Restoration could play a vital role in helping to reestablish or enhance meaningful connections between individuals and places. Biophysical environments become places when they gain meaning derived from experiences in those spaces (76) and engaging in the process of restoration can provide a direct positive and sensory interaction with nature (77). A study on ecological restoration by Poe and colleagues (74) in Puget Sound, USA, found that a sense of place was derived in part from activities in the environment (e.g., participating in conservation activities, harvesting shellfish). At a basic level, restoration can improve access to and use of natural areas through infrastructure improvements (e.g., docks and boardwalks) and by addressing more systemic issues like property ownership (e.g., by purchasing lands for public use or restoring lands to Indigenous governance) (10). Additionally, direct involvement in the physical process of restoration can be a place-making experience by providing an opportunity for community members to positively engage with the natural environment. There is a long history of volunteerism in restoration, with a variety of demonstrated psychological benefits (78). Moreover, citizen science, which uses volunteers to collect and analyze data, can create meaningful engagement opportunities in ecosystems while also producing valuable data that can inform the restoration process (79). In particular, citizen science initiatives that engage children and youth in restoration could be especially powerful, as strong place attachment and stewardship behavior are often developed early in life (80).

In addition to connecting on a sensory level, restoration may also enhance sense of place by strengthening connections to cultural meanings associated with the environment (74). Sense of place can be enhanced by focusing restoration on cultural keystone species and places (81). For example, Poe and colleagues (74) suggest that the restoration of grass species that are culturally important for basket weaving or ceremonies could help to connect communities to their heritage, ultimately facilitating a sense of place. Similarly, restoring landscapes with high fidelity to historical conditions that a community's ancestors may have experienced can also connect community members to their heritage (75). Finally, many place attachment phenomena are social in nature, and therefore cultural engagement activities at restoration sites (i.e., clambakes in areas where clams are traditionally harvested) could strengthen place attachment while also building valuable social connections (see the following section on social networks) (74). For example, a women's group created around the Baan Bang La mangrove restoration project in Thailand runs community events that demonstrate how to prepare different culturally important mangrove-based foods, which has helped to revive the connection to mangrove ecosystems, livelihoods, and culture (82).

Just as place attachment may be a benefit of restoration, it may also be a motivator to support and participate in restoration projects. Kibler and colleagues (83) proposed a framework to incorporate a sense of place into restoration that identifies a baseline sense of place that will inform restoration actions and then pursues opportunities to enhance place attachment over time. Following this framework, Hawthorne and colleagues (84) developed a tool to map and visualize different stakeholders' emotional attachment to various locations within the Indian River Lagoon in Florida, USA. The authors found that the primary reason coastal residents reported an emotional attachment to an area was because it was the best place for them to do the activities that they enjoy (e.g., fishing, kayaking, swimming). Accordingly, they also found that areas with high emotional attachment were generally close to public access points (i.e., boat ramps) that could facilitate those enjoyable activities. Future mapping projects could be useful for identifying high-priority restoration sites (i.e., sites with existing emotional attachments) likely to garner support in the restoration process. Additionally, knowledge of the values that stakeholders attach to places, can also inform strategies to enhance specific aspects of sense of place (85). For example, if swimming and fishing are desirable place-making activities in a given location, then practitioners could incorporate public access points into restoration designs to facilitate those activities. Conversely, restoration projects that change current land-use practices or cultural meanings will need to be mindful of potential trade-offs or negative impacts on the current sense of place (86).

Direct evidence of restoration as a place-making activity is limited. However, a study in rural Australia found that participants who actively participated in ecological restoration reported a stronger sense of place (87). Similarly, a case study from Huajiang Gorge, China, found that ecosystem degradation caused a slow decline in rural residents' sense of place, but that ecosystem restoration helped some people develop new positive place meanings (88). Additionally, two case studies of European rivers found that place attachment was generally higher in areas that had been restored; this was attributed, at least in part, to the restoration itself, and the fact that it facilitated access to desirable areas (89). While more research is needed to understand how restoration can best serve as a place-making endeavor, engaging stakeholders early in the restoration process to understand their environmental values and reasons for emotional attachment to different places is critically important. Additionally, we need a better understanding of how restoration may alter the values that people have for land- and seascapes.

Restoring Optimism

Optimism is a forward-looking aspect of a positive outlook; it is a valuable psychological trait because it encourages human cooperation, participation, and persistence in the face of adversity (64, 90, 91). Research from disciplines as diverse as medical science, physiology, business management, and sports science has identified the benefits of an optimistic outlook on individual and group performance (92–94). There is a human inclination toward optimism (i.e., the "optimism bias") (95) that is thought to be an evolutionarily conserved human trait to counter the paralysis of pessimism and hopelessness, which predict disengagement and despondence (64, 96). However, too much optimism can have negative outcomes, potentially leading to denial about serious issues and even inhibiting proenvironmental behavior (97). Therefore, it

is important that optimism remains grounded in reality, engendering shared hope for conservation action that is balanced with environmental realities (98). For this reason, restoration activities may be particularly valuable for building community resilience because they bring people together around a shared sense of grounded optimism in the face of environmental degradation and uncertainty.

By its nature, ecosystem restoration can engender optimism and unite people under common values and beliefs, fostering a shared vision of a better future (99). Restoration can be a reminder that not all hope is lost, offering tangible actions in the face of ongoing ecosystem decline. This is particularly powerful in this era of environmental uncertainty and grief because engaging in restoration activities can become a source of hope and personal agency (91). Proactive involvement in restoration enables individuals and communities to contribute positively and concretely to the healing of the earth, and it allows people to feel like their actions make a difference. Importantly, restoration empowers people to believe that, despite the severity of environmental challenges, collective efforts can address past wrongs, healing both nature and ourselves (41). Foundational to this belief is the recognition that individual contributions matter (100, 101). Without this conception, a sense of helplessness for the environment leads to disengagement (102). Therefore, activities like ecosystem restoration, which couple individual contributions to conservation success, are highly valuable not just for the environment, but also for individuals' positive outlook and relationships with nature. For example, following restoration activities, people have been observed to deepen their engagement and appreciation of restored areas, experiencing a range of associated psychological benefits and satisfaction (78, 103).

An example of proactive public engagement that created a strong sense of community empowerment and optimism comes from the restoration of oyster reefs in southern Australia. In this region, oyster reefs are functionally extinct and largely forgotten (104). Consequently, the concept of oyster reef restoration along South Australia's most urbanized coastline was met with both unfamiliarity from the public and political uncertainty among decision-makers. However, a public consultation program provided a forum for all members of society to contribute to the location and vision of the reef restoration. This inclusive process captured public enthusiasm for numerous social and community well-being benefits arising from the restoration (e.g., educational resources, recreation and tourism opportunities, cultural inheritance for future generations) (85). The open-access public and stakeholder consultation process (via online forums, media campaigns, face-to-face meetings, and stakeholder working groups) (48) led to unprecedented cooperation, commitment, and a shared sense of optimism among diverse stakeholder communities (98). The overwhelming public support and shared community vision emboldened the State Government to expand the restoration program to new coastlines (85), instilling newfound optimism that oyster reef restoration can offer a mainstream management solution for addressing multiple social–ecological goals.

For restoration to bolster optimism, people need to be engaged throughout the restoration process. Restoration may help to build optimism when relevant and realistic goals are set with community input at the outset of projects, and when authentic evidence of the restoration process (e.g., pictures, testimonials, stories) is shared widely among community members who can learn together from successes and failures (105, 106). However, restoration may reduce optimism when outcomes are overpromised or inadequately communicated, or when projects fail and there is little discussion or action to learn from the setbacks. Failure of ecological outcomes is common in current restoration practice (107), but this does not have to undermine optimism if there is transparency and adaptive learning informed by past mistakes.

Restoring Social Networks

Social networks are the relationships between individuals, organizations, or other entities that influence the flow of information, resources, and support within society (108). Social networks serve as a source of social capital (109), and they are a key factor underpinning resilient individuals and communities (57, 110). During times of change, they can offer support, operationalize community capacity, and serve as a focal point for renewed optimism. Even when disasters devastate communities, research shows that social networks can remain strong, facilitating solidarity within the community that positively contributes to its recovery (110). Social networks can be strengthened through intentional efforts to build and maintain meaningful connections with others, enhance social gathering functions and places, and foster a sense of community (60).

Community-driven ecosystem restoration projects are an opportunity to unite community members around a shared purpose and increase the level of connectivity to entities within and outside of the community. According to the Society for Ecological Restoration, the first principle for successful restoration is to engage local stakeholders (i.e., individuals or groups that are related to or have an interest in the restoration) (21). At an early stage, engaging diverse stakeholders in goal setting and project design (e.g., through participatory workshops, community meetings, and online forums) can strengthen social networks by promoting inclusive participation and ensuring that a broad range of voices are heard (111). Stakeholders can provide valuable perspectives and knowledge and help to set locally relevant goals for the restoration project. Moreover, inclusive stakeholder engagement can create new network connections among individuals and community groups, facilitate knowledge sharing, build respect and trust among community members, and help redistribute decision-making power (112, 113).

In addition to project planning, direct participation in the restoration process has the potential to strengthen social networks by serving as a catalyst for social interaction and cooperation, strengthening the bonds within a community, and fostering a shared sense of identity and belonging. For example, in Hawai'i, a growing practice of biocultural restoration (also known as ecocultural restoration) (114) involves the simultaneous restoration of biodiversity and human relationships with nature. Biocultural restoration projects often integrate community workdays, youth programs, or internships designed to encourage diverse community participation. Some community workdays begin with "Aloha circles" where all participants come together and introduce themselves

(115), which may help to facilitate relationship building. In a study of the social benefits of biocultural restoration, Bremer and colleagues (116) found that the most important social benefits were associated with the process of restoration itself rather than just the end products. Families that participated directly in the restoration process through volunteering reported that it helped to expand their social networks, by introducing them to other like-minded community members with a shared purpose. Similarly, Grandinetti (115) found that social connection was one of the most prominent motivations for participation in biocultural restoration projects and that participants reported feeling more hopeful after participation because they felt a part of a group where everyone was passionate and willing to help.

In addition to fostering connections among individuals, restoration may foster networks across community organizations. In fact, Constant and Taylor (117) found that a key value held by stakeholders for the restoration of Indigenous forests in South Africa was building new partnerships to empower communities, foster mutual respect, inspire collective action, and provide new expertise and opportunities. In New Zealand, Buchan (118) found that participation in community-based restoration projects increased social capital due to the strengthening of ties among community organizations, business entities, and local as well as central government. Similarly, Cowie (119) found that participants were often drawn to community-based restoration projects for the opportunity to meet new people and build a sense of community. Nearly 90% of surveyed participants in community-based restoration projects reported that they made new social connections with individuals and that they developed relationships with different local and regional institutions as well (119). Finally, in the Omora Ethnobotanical Park, a long-term biocultural conservation project in the Cape Horn region of Chile, central project goals of interinstitutional cooperation, networking, field experiences, guided tours, and education helped to build personal and institutional relationships (120). Altogether this suggests that restoration has the potential to enhance both bridging social capital (i.e., relations between individuals or groups from heterogenous sociodemographic groups) and linking capital (i.e., encompasses power dynamics and institutional relationships, which connect regular citizens with those in power), which could contribute to resilience in different ways (121).

Strategies to enhance social capital in any given community will undoubtedly be most effective if they are community-led, rather than something that comes from outside of the community. At a basic level, enhancing social networks through restoration should include the involvement of local stakeholders in the goal-setting and planning phases of restoration to build ownership and project buy-in. Additionally, restoration could engage community members in project implementation and monitoring, and also provide a physical gathering space for other community functions as use of restored areas is a desirable attribute. For example, network-building activities could include events that use the restored area as a gathering place for social functions (e.g., oyster roasts, barbeques), cultural activities (e.g., Hawaiian lei-making, traditional basket weaving), or recreational opportunities (e.g., group birdwatching, kayaking tours) that bring individuals together. Ultimately, identifying which individuals and community groups are poorly connected within a community and targeting specific engagement strategies toward the inclusion of those groups can optimize benefits.

Conclusions

There is growing global interest in ecosystem restoration as a strategy to counteract widespread habitat and biodiversity decline, but limited technical research or guidance on how restoration can also mutually reinforce individual well-being and social functioning. We have highlighted some of the diverse pathways through which community-engaged ecosystem restoration may enhance sense of place, optimism, and social networks; this may happen directly from physical engagement in the restoration process (e.g., planning, implementation, monitoring), and indirectly by enjoying the various products of restoration (e.g., increased access to natural areas, cultural rejuvenation) (Fig. 2). In contrast, we have also explored some restoration practices that may erode psychosocial aspects of community resilience (e.g., those that fail to engage communities, make undesirable changes to land use, or overpromise and underdeliver on outcomes). More research is needed to understand: the contexts within which restoration is most likely to enhance psychosocial resilience; the effects of different methods of community inclusion at various stages in the restoration process; and, the consequences of noninclusive forms of restoration, especially where there is a misalignment of project goals with community needs. This perspective is not meant as a final word on conducting restoration for community resilience (as there are many potential pathways), but rather as a conversation starter that we hope will spur more interest, research, and specificity around this topic.

Community-engaged restoration that is informed by the values and priorities of local stakeholders and rightsholders could provide an excellent backdrop for psychosocial resilience-building as restoration is a fundamentally optimistic endeavor that can bring diverse groups together and strengthen people–place connections. However, resilience is not an inherently positive attribute (i.e., it may be problematic to suggest that people need to become more resilient when the root of the problem is the processes and actors that necessitate resilience in the first place), and we need to think critically in restoration about why we are trying to build resilience, who we are trying to build resilience for, and whether those groups want to be more resilient (122). We also need a better understanding of how different types of resilience feedback with each other, as they do not always contribute to each other positively (i.e., resilient ecosystems do not necessarily produce resilient communities) (51). Moreover, enhancing community resilience may be meaningless or undesirable without transformations of larger social systems that view humans and the environment as separate entities and continue to enable harmful environmental operations (123).

Finally, there are many potential pathways to resilience, and there will certainly be communities where ecosystem restoration is not the best pathway (e.g., some individuals and communities may benefit more from infrastructure upgrades) (124). In most areas, there will be conflicting pressures on ecosystems (e.g., related to local livelihoods or productive uses

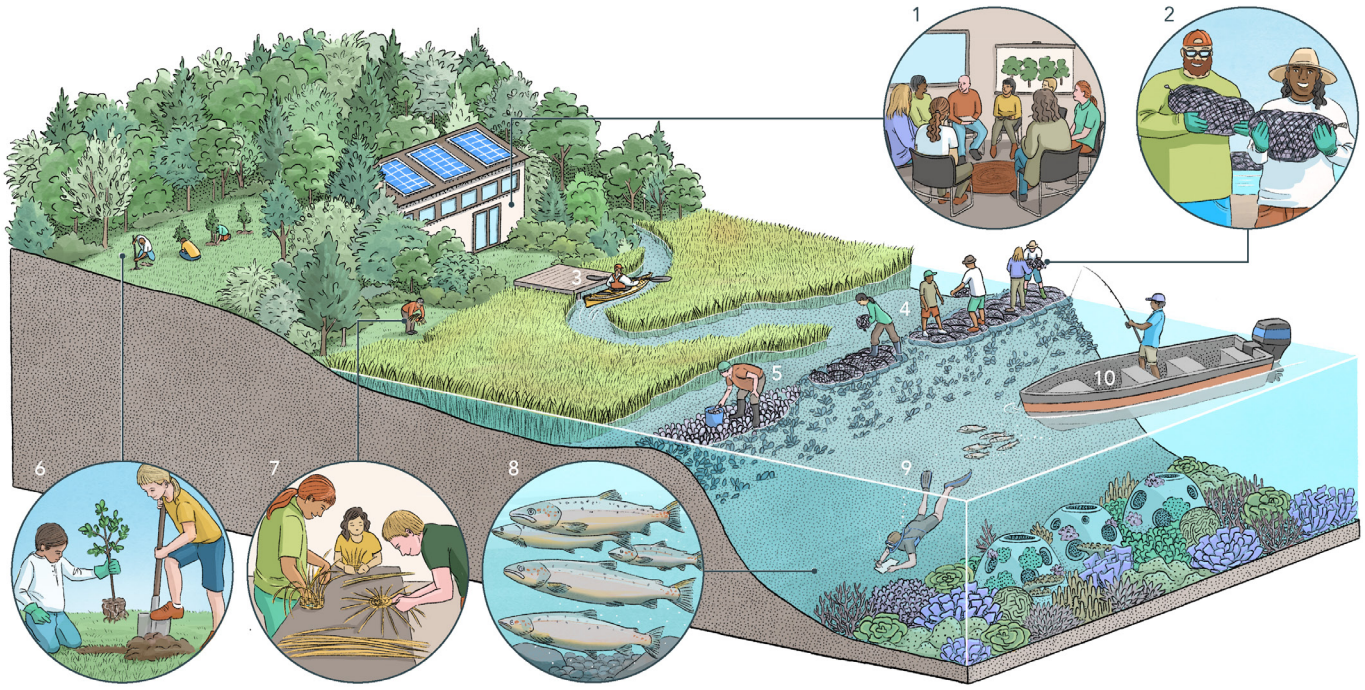

Fig. 2. Schematic depicting multiple ways that ecosystem restoration can build optimism, sense of place, and social networks. Early and frequent engagement of diverse stakeholders in project planning and implementation can build optimism and trust, and help to strengthen social networks by building new network connections and redistributing decision-making power (1). Involvement in the healing process of restoration can build optimism and agency by uniting people under common values, fostering a shared vision of a better future, and countering the perception that we are powerless witnesses to environmental degradation (2). Restoration of degraded ecosystems can create opportunities for people to engage with the natural environment and enhance place attachment by improving the quality of and access to the natural environment [via built infrastructure (e.g., boardwalks, docks) or by addressing more systemic issues (e.g., property ownership)] (3). Community workdays with diverse community participation can build social capital by serving as a catalyst for social interaction and fostering a shared sense of belonging (4). Permitting low-intensity harvesting at restored sites can create strong connections to place, especially where harvesting is culturally meaningful (5). Engaging youth in the restoration process can be particularly powerful as strong place attachment and stewardship behavior are often developed early in life (6). Creating opportunities for cultural learning (e.g., engagement events that teach traditional basket weaving with restored grasses) can help to strengthen sense of place and connect people (7). Focusing restoration on locally and culturally important species can strengthen sense of place by connecting people with their heritage (8). Citizen science can serve as a place-making experience that also creates new network connections (9). Low-intensity fishing activities in restored landscapes can contribute to sense of place (10). Altogether, restoration activities that build optimism, sense of place, and social networks can contribute to more resilient individuals and communities. Illustration by Alex Boersma (www.alexboersma.com).

of ecosystems), and engaging directly with communities will be vital for determining the unique needs of different groups and the best resilience-building strategies (49, 124, 125). Ultimately, with increasing interest in upscaling and technologizing restoration practices to meet global conservation targets (126), now is the time to think critically about how we can restore our relationship to the environment across different scales and contexts, for without this consideration we risk eroding resilience rather than enhancing it.

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