12

Conservation

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Advancing environmental justice in conservation requires undoing colonial relationships, centering traditional ecological knowledge and sovereignty in research that informs policy and practice, and shifting decision-making power to Indigenous and other communities so that they can thrive on their lands. In this chapter, we critique the history of conservation science and policy, and reflect on how Indigenous and other marginalized communities have reclaimed research to conserve nature on their own terms. We show how a small but growing body of community-engaged research (CER) has provided an alternative understanding of conservation of forests, freshwater and marine ecosystems, and wildlife in places such as the Putumayo watershed in the Amazon, and the Klamath Basin and the Great Bear Rainforest on the Pacific coast of North America. We offer guidance on how to navigate the fraught relationships between conservation and environmental justice (EJ) by presenting key lessons from these case studies.

Throughout the chapter, we foreground the role of CER that involves Indigenous-led research and that centers traditional ecological knowledge, for several reasons. Indigenous peoples have been harmed most powerfully by conservation policies that have removed or restricted people's access to land and their self-determination. Indigenous nations and tribes are also crucial contributors to conservation because around 80 percent of the planet's remaining biodiversity resides on Indigenous lands, covering over 20 percent of the world's land surface (Whyte 2021). In addition, because many Indigenous peoples' identities and livelihoods are inextricably rooted in their ancestral lands, focusing on the impact of conservation policies on Indigenous communities highlights most clearly how access to healthy land is central to peoples' cultural and economic well-being. Indigenous conservation also holds expansive views of intergenerational and interspecies justice, which

TABLE 12.1. CER for EJ in Conservation

Dimension of Justice	In CER for EJ in Conservation
Distribution *Who ought to get what?*	Devoting research resources to conserving and restoring access to land for Indigenous cultural, spiritual, and economic sustenance, and healing nature
	Funding Indigenous and community-led researchers and initiatives directly
Procedure *Who ought to decide?*	Exercising Indigenous self-determination and other affected communities' rights to influence conservation research and policies
	Promoting Indigenous knowledge sovereignty and control over data gathered on their ancestral lands
Recognition *Who ought to be respected and valued?*	Centering traditional ecological knowledge
	Recognizing responsibilities to past and future generations to care for land
	Recognizing reciprocal kinship relationships to nature
Transformation *What ought to change, and how?*	Decolonizing knowledge, institutions, and systems in conservation science to restore nature and self-determination to Indigenous peoples

include obligations to past and future generations of humans, and to the Earth, to care for lands and species in reciprocal kinship relations. Moreover, the historic exclusion of Indigenous ecological knowledges from Western science, as well as their complex rapprochement in some current conservation science, points to the importance and challenges of reconciling local knowledges with dominant forms of expertise. Table 12.1 summarizes how the main issues discussed in this chapter relate to the dimensions of justice common to CER and EJ.

THE LEGACY OF FORTRESS CONSERVATION

Historically, the conservation movement in the United States and around the world has often worked against the interests of marginalized people. Conservation science and policy were developed in the 19th and 20th centuries by people who saw human activity as largely incompatible with environmental conservation (Cronon 1996). Racism was often central to this project. Conservation policy was built to protect nature for the enjoyment of wealthy white settlers, to the exclusion of Indigenous people, people of color, and poor white people (Jacoby 2014). John Muir, the founder of the Sierra Club and an early "preservationist" and advocate for national parks, viewed Indigenous North Americans as nuisances to be removed so that landscapes might thrive. Muir described Indigenous Californians in the Yosemite Valley region as "mostly ugly, and some . . . altogether hideous" people who "seemed [to have] no right place in the landscape" and complained that he could not feel the "solemn calm" of wilderness when he was in their presence

(Spence 1999, 109). The other major stream of environmental ideology during this period, the "conservationist" movement, viewed nature as useful insofar as it delivered goods that would feed the engines of the growing capitalist economy. For example, Gifford Pinchot, the first head of the U.S. Forest Service, sought to manage and conserve the forests of the United States not for their beauty, spiritual value, biological diversity, or cultural value, but to maximize the production of timber—and to ensure that business interests could continue to profit from its availability (Rinfret and Pautz 2014).

While their objectives differed, neither Muir's preservationists nor Pinchot's conservationists were interested in learning from the traditional ecological knowledge of Indigenous North Americans, nor in sharing the benefits of nature with poor people of any race. Although early preservationists and conservationists helped pass policies to conserve some important ecosystems, these movements marginalized and removed Indigenous people from the lands they had managed for centuries, to preserve a mythologized "pristine" nature. They replaced Indigenous land management practices, including the strategic use of fire to maintain healthy mixed-aged forest stands that allow for high biodiversity and promote multiple ecological functions, with Western "scientific" management that focused solely on producing timber reliably. Similarly, the conservation science of white settlers ignored the deep connections that Black people in the U.S. had to nature, even as they became integrally involved in the work of building national parks, farming, and managing land, both as enslaved people and as legally freed folks (Finney 2014; Taylor 2016).

The United States exported this model, known as fortress conservation, to the rest of the world (Baletti 2011; Brockington 2002). Following this logic, countries in the Global South moved in the latter half of the 20th century to establish protected areas by displacing local people who had historical claims to these lands. From Southeast Asia, to the Congo Basin, to the Amazon, environmental nonprofits based in the United States often abetted these conservation schemes (Hance 2016; Myers and Muhajir 2015). These initiatives were ostensibly undergirded by science: in particular, ecologists from or trained in the Global North would prioritize regions for conservation based on biodiversity indicators. For much of the 20th century, and into the 21st century, research on how people used natural resources was absent from conservation science, and the preferences of local people were sublimated to the dogma of conserving biodiversity by removing people from the land.

Between 1970 and 2010, countries in the Global South would also create environmental ministries tasked with establishing and overseeing protected areas, enforcing pollution standards, and regulating industries through environmental permitting (Busch and Jörgens 2005). The World Bank conditioned loans to developing and newly decolonized countries upon their having national environmental protection strategies (Busch and Jörgens 2005). In the 1990s and 2000s, large environmental nonprofits grew to wield great influence over the conservation policies of the Global South (Hance 2016).

At the same time, a new movement emerged that some scholars call "neoliberal environmentalism." Neoliberal environmentalism eschewed top-down regulations on industry in favor of consumer action and market-based solutions, such as payments for ecosystem services (Clark 2015). International agencies, including the United Nations and the World Bank, have pushed this approach to tropical forest conservation through the REDD+ program (*r*educing *e*missions from *d*eforestation and forest *d*egradation + enhancing forest carbon stocks), which aims to conserve tropical forests by paying their owners to leave them standing. To date, the vast majority of funds for tropical forest conservation have been channeled through environmental nonprofits into local projects, without yielding major reductions in tropical deforestation (Angelsen et al. 2018). Indigenous communities have in many instances opposed REDD+ and market-based conservation programs, calling instead for non-conditional funding to support Indigenous priorities and cosmovisions (Osborne 2015).

COMMUNITY-ENGAGED CONSERVATION RESEARCH ACROSS CONTEXTS

Some researchers recognize an obligation to use their platforms and resources to support Indigenous-led movements for conservation around the world. Taking a community-engaged approach to this research can make an especially valuable contribution to decolonizing knowledge and building conservation policy that centers and supports Indigenous communities and other people who steward important ecosystems, while repairing historical harm done by states and the environmental movement.

Indigenous and allied scholars have created important scaffolding for researchers to understand how Indigenous cosmologies—including kinship relationships with land (Goeman 2015; Whyte 2021) and animals (Hessami et al. 2021; Todd 2014)—differ dramatically from more narrow and anthropocentric Western conceptions of "natural resource management" and "wildlife conservation." These scholars have also chronicled histories of resistance and environmental activism (Gilio-Whitaker 2019), innovative land stewardship and governance (Carroll 2015), and ethical research and data collaborations (Carroll, Rodriguez-Lonebear, and Martinez 2019; Smith 2021). These works lay out theoretical frameworks for understanding and carrying out decolonial research in the context of campaigns led by Indigenous communities, and for finding common policy ground among Western-trained and Indigenous conservationists.

As this body of work underscores, research is not confined to studies conceptualized and funded by universities and other formal institutions. We understand research to encompass the sum of ways that people systematically and intentionally gather information and disseminate knowledge. Through this lens, research includes activists and organizers collecting information to support their campaigns.

It also includes Indigenous people experimenting with horticultural, fishing, and farming techniques and passing this knowledge on to children who accompany adults while they work. In some cases, these communities may not need the sort of research produced by formal scientific institutions at all. While formal research has not always been beneficial to communities who live in and manage ecosystems, a growing body of CER has helped support conservation that empowers communities and uplifts their agendas in a variety of ecosystems that humans use.

Some of this research has addressed the struggles of forest-dwelling communities. For example, Fisher (2021) collaborated with farmers, youth, local village planners, and others in the Kajang community to analyze how they became the first Indigenous people to gain recognition of their land rights from Indonesia's forest authorities. Demeulenaere (2021) integrated ethnographic methods and participatory action research with CHamoru people to document their efforts to preserve access to their forested terraces, medicinal plants, and sacred sites threatened by construction of a U.S. Navy firing range in Guam/Guahan. Kuan (2021) examined the Tayal people's use of community mapping and dialogue with state agencies to integrate Indigenous agroforestry and state-sponsored land management strategies in Taiwan. Varese (2006) and Chirif and Hierro (2007) recount the history of social science as a tool for securing land rights for Indigenous people in the Peruvian Amazon. Lake and Long (2014) describe collaborations between Native American tribal governments and the U.S. Forest Service to apply Indigenous fire stewardship for social and ecological resilience.

CER has also focused on freshwater and marine ecosystems. Ayre, Wallis, and Daniell (2018) draw recommendations for conducting ethical and impactful CER on freshwater conservation from the literature on Indigenous community-based natural resource management and estuary management in Australia, management of flood and drought risks in Bulgaria, and climate resilience and water management in the Pacific. Ban and Frid (2018) examine relational dynamics and tensions among Indigenous peoples and other researchers involved in the creation and management of marine protected areas in Canada, Australia, Vanuatu, the Cook Islands, Palau, Hawai'i, and Samoa. The authors found that the majority of successful collaborations emphasized cultural and social benefits more than ecological ones. McGreavy et al. (2021) summarized insights from multiple participatory projects on forest conservation, river restoration, and co-management of fisheries by an interdisciplinary team of Native and White settler scholars with the Penobscot Nation, including recommendations for addressing tensions between Indigenous cultures and Western science and academic cultures.

Across ecosystems, CER has also begun to contribute to studies of climate justice. For example, Work et al. (2021) collaborated with local justice advocates and residents to analyze "green grabbing" of Indigenous land in Cambodia for climate mitigation projects. This is but one example of the growing problem of large environmental NGOs and governments using the urgent need to respond to

the climate crisis as a new rationale for denying Indigenous peoples' rights to participate in decision making and access their ancestral lands (Whyte 2020). More hopefully, Manning and Reed (2019) review the process by which the Yurok Tribe made one of the largest tribal conservation land acquisitions in the U.S., funded in part by carbon offsets and accomplished through a web of partnerships with tribal, conservation, private, and public agencies. This was also a victory for tribal sovereignty, as the Yurok expanded recognition of Indigenous values and rights in California's natural resources policy, and engaged in diplomacy with Indigenous nations in other states that may adopt carbon cap-and-trade policies like California's. The Yurok's land management is informed in part through their rich history of CER on conservation issues, including forest management (Marks-Block, Lake, and Curran 2019), food sovereignty (Sowerwine, Mucioki, et al. 2019; Sowerwine, Sarna-Wojcicki, et al. 2019), and remediating river water contamination (Middleton et al. 2019).

These and other conservation studies increasingly advocate for "biocultural" approaches to conservation that put the well-being of communities, as defined by those communities themselves, at the core of conservation research (Sterling et al. 2017). While many researchers who are not from these communities have been working to center their values, priorities, and knowledge, there is still a long way to go. Researchers from the Global North, postcolonial governments, and nonprofit organizations still too often set research agendas, with community "participation" only rising to the level of a second-order consideration (Sterling et al. 2017). We argue that researchers should take further steps towards community-engaged EJ research that defers to the political aspirations of communities, centers and uplifts Indigenous knowledge, and builds real power for communities with the most at stake in conservation. Fully adopting a decolonizing approach to research is especially important.

DECOLONIZING CER FOR INDIGENOUS-LED CONSERVATION

Decolonization is not a metaphor—it is not a matter of changing language and attitudes, but one of shifting resources and power to Indigenous people (Tuck and Yang 2012). Decolonizing the academy is not just about bringing in Indigenous knowledge, but also about bringing the power of the academy to Indigenous communities themselves, and transforming academic structures to support respect and reciprocity with Indigenous partners. As climate change continues to threaten the well-being of Indigenous peoples, it is ever more important to mobilize the resources, capacity, and finances of academic institutions to solve environmental problems with communities, while finding ways to turn over power and land (Smith 2021). This orientation towards decolonization is explicitly counter to what some academics view as the role of the academy: namely, that of an "unbiased"

and "apolitical" scientific force—a view that has long been critiqued by feminist scholars and political ecology (Rocheleau, Thomas-Slayter, and Wangari 2013). Instead, decolonization requires that academics work in support of Indigenous campaigns, carry out applied research that uplifts Indigenous knowledge systems, and explicitly acknowledge researchers' commitments and loyalties (Estes 2019).

In practice, decolonizing research involves several characteristic arrangements. Research partners often develop Indigenous research advisory boards and review systems, share co-authorship, create copyright agreements, and institute data-sharing agreements that allow for Indigenous communities to retain the rights to their contributions in a way that uplifts their cultural sovereignty (see chapters 4 and 5). These practical steps stem from an underlying commitment to respecting knowledge sovereignty.

Knowledge Sovereignty

Across biomes, Indigenous sovereignty over knowledge is central to solidarity research for conservation. Knowledge sovereignty is the ability for communities to meaningfully control the production, interpretation, use, and distribution of information that pertains to their territories (Norgaard 2014). Community-engaged researchers have made efforts to work with, rather than suppress, Indigenous knowledge. One of the concepts that has emerged from these efforts is traditional ecological knowledge (TEK). This term is used to describe the deep ecological and geographic knowledge woven throughout Indigenous peoples' culture, governance, and practice. *TEK* describes the vast and expansive knowledge Indigenous people across the world have formed about their respective homelands. It is also a useful term when describing these knowledge systems at a large scale and when uniting groups working on the resurgence and reclamation of Indigenous culture, practice, and land stewardship in different parts of the world. At the same time, it is important to acknowledge Indigenous science's distinct place- and culture-based contexts, as well as its dynamic and relational nature (Wyndham 2017). These are important tensions that can often come up in natural resource stewardship collaborations (Nadasdy 1999).

TEK is rooted in concepts of land, which is central to Indigenous identity, culture, and social movements (Goeman 2015). Indigenous knowledge of the flora, fauna, and ecosystem dynamics present in their homelands is a powerful toolbox that can support environmental decision making. However, this knowledge can only be successfully implemented by including Indigenous knowledge keepers as leaders, not merely as consultants (Norgaard 2014). For this reason, shared decision making and knowledge sovereignty are key to any collaboration, and are important for subverting settler colonialism (Gilio-Whitaker 2019). Collaborations with Indigenous people, organizations, and tribal governments can be experiments in decolonizing knowledge to the degree that they subvert knowledge hierarchies that privilege Western science and, instead, return power

and resources to Indigenous people (Neale and Smith 2019). Several additional conceptual tools can help advance knowledge sovereignty.

Two-Eyed Seeing

Diverse Indigenous communities in the Global North and the Global South have found ways to produce knowledge that align with their own culture and values, often without any need for outside assistance. However, in some instances scholars from outside of the community can provide helpful support. Just as non-Indigenous research institutions have strict guidelines for how legitimate knowledge should be created, Indigenous communities often have expectations about knowledge production (Batz 2018). Reconciling both sets of expectations, worldviews, and knowledge systems can be a challenge.

One framework that can support collaborations attempting to include multiple knowledge systems is "Two-Eyed Seeing," a Mi'kmaw concept taught by elder Dr. Albert Marshall (Reid et al. 2021). It encourages "learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of mainstream knowledges and ways of knowing, and to use both these eyes together, for the benefit of all" (Barlett et al. 2015, quoted in Reid et al. 2021, 245).

Whereas many Western scientists have sought to "incorporate" Indigenous knowledge into their research to some degree, Two-Eyed Seeing calls upon them to defer to Indigenous knowledge by treating it as an equal or greater way of knowing. This provides a means to dismantle the unequal power dynamics that pervade conventional Western conservation science. When Western scientists seek only to incorporate and integrate Indigenous knowledge into non-Indigenous systems, they assume that there are parts of Indigenous knowledge that fit their aims and other parts that may not. Subsequently, this can lead non-Indigenous researchers to compartmentalize or selectively tap Indigenous knowledge systems to fit within colonial ways of organizing knowledge (Nadasdy 1999). Two-Eyed Seeing reminds non-Indigenous researchers that they are likely to be novices at a significant portion of the collaborative work they undertake with Indigenous partners, and need to honor these partners' expertise.

In addition, while scholars have organized to increase open access to data and research, many Indigenous communities hold their knowledge collectively and govern it with their own organizations. To respect knowledge sovereignty, researchers should defer to Indigenous authorities with respect to data management, and clarify with Indigenous authorities which knowledge must be kept confidential and which data might need to be made public based on the rules and regulations of funders and non-Native collaborators. Ensuring that Indigenous organizations and nations are making decisions around the collection and dispersal of data is critical to knowledge sovereignty (Carroll, Rodriguez-Lonebear, and Martinez 2019).

TABLE 12.2. The CARE Principles as a Guide for CER

CARE Principles	Description	Evaluative Questions
Collective benefit	Data ecosystems shall be designed and function in ways that enable Indigenous peoples to derive benefit from the data	Do communities' political and policy agendas drive research design and implementation? What policy or political agenda does the research support? How does it impact access to land, resources, funding, and political power?
Authority to control data and knowledge	Indigenous peoples' rights and interests in Indigenous data must be recognized and their authority to control such data be empowered	Who controls existing data? Who will collect new data? What form do the data take? Who can access the data and how? Are there any limits to how people could access data?
Responsibility	Those working with Indigenous data have a responsibility to share how those data are used to support Indigenous peoples' self-determination and collective benefit	What do researchers do to demonstrate that their work delivers on promises, provides benefits, etc.? What steps do researchers take to be accountable to Indigenous communities and to convey the story of this work to a wider audience?
Ethics	Indigenous peoples' rights and well-being should be the primary concern at all stages of the data life cycle and across the data ecosystem	Do researchers understand that the well-being of communities is paramount? Are any outside stakeholders bringing in priorities that are in tension with community goals?

To this end, researchers at the Global Indigenous Data Alliance created the CARE Principles for Indigenous Data Governance (Research Data Alliance International Indigenous Data Sovereignty Interest Group 2019). Building on earlier work (Wilkinson et al. 2016), the CARE framework encompasses the principles of *c*ollective benefit, *a*uthority to control data and knowledge, *r*esponsibility, and *e*thics. The principles emphasize justice, Indigenous data for governance and governance of data, capacity building, and minimizing harm. In table 12.2 we build on the CARE principles and present several specific questions that researchers should ask themselves as they approach conservation work in places where Indigenous people live.

CASES IN DECOLONIZING CONSERVATION RESEARCH

Academic research in ecology, and the policy and social sciences, has overwhelmingly prioritized scholarly publication and "scientific objectivity" over transferring resources to support the political priorities of Indigenous organizations. In contrast, some scholars have looked to re-orient their research and deploy their platforms and resources in the service of Indigenous campaigns and decolonial projects. Here, we offer three examples of how CER has served

to empower Indigenous people around protected areas and supported grassroots Indigenous movements. We chose the Putumayo and Klamath Dam case studies from our firsthand experience carrying out CER in the regions where the research occurred. We added the Great Bear Rainforest case as an emerging example of strong collaboration between Indigenous and non-Indigenous researchers in North America.

Protected Areas in the Putumayo Watershed

Background. Since 1999, more than 10 million hectares of tropical forest land in the Peruvian Amazon have been legally protected (Wali et al. 2017). Many of these protected areas were supported by Indigenous organizations. Protected areas have colonial roots, and have historically been deployed to exclude rather than empower Indigenous communities (Spence 1999). Throughout the 20th century, Peru was no exception to this global pattern (Orihuela 2020). Despite this, in recent decades researchers have worked with Indigenous communities to advocate for community interests through collaboratively managed protected areas (Wali et al. 2017). While many communities have gained more rights to land and resources by collaborating with researchers and the government, some Indigenous groups, including some Wampis and Awajún communities, resist collaboration with the state and pursue alternative legal pathways to greater autonomy (Gómez Perochena 2019).

In this context, Indigenous communities have worked with researchers to support their demands for cultural autonomy, land rights, and economic resources. Here we describe the case of the Putumayo watershed, where Indigenous organizations have advanced their goals by strategically enlisting the help of environmental nonprofits, research institutions from Peru and the United States, and international environmental foundations.

The presidency of Juan Velasco Alvarado in Peru (1968–1975) saw a significant land reform and, for the first time, collective land titles for Indigenous communities (Varese 2006). In the 1970s, Amazonian communities in Peru began organizing themselves into watershed level federations and regional organizations in order to fight for land rights and resources from the state. In the Putumayo watershed (see map 12.1), regional conservation areas and Yaguas National Park have been created since 2005 as a result of advocacy by Indigenous organizations and allied environmental groups. The regional conservation areas are collaboratively managed and used by communities, while Yaguas National Park (shown in dark green in map 12.1) has more restrictive legal uses.

Four major Indigenous federations led the charge to establish the park in 2018: the Federation of Native Peoples of the Putumayo Frontier (FECONAFROPU, for its initials in Spanish), the Federation of Native Peoples of the Ampiyacu-Apayacu Basin (FECONA), the Federation of Native Peoples of the Lower Putumayo (FECOIBAP), and the Federation of Native Peoples of the Maijuna Ethnicity (FECONAMAI). Of these organizations, FECONAMAI and FECONA both co-manage

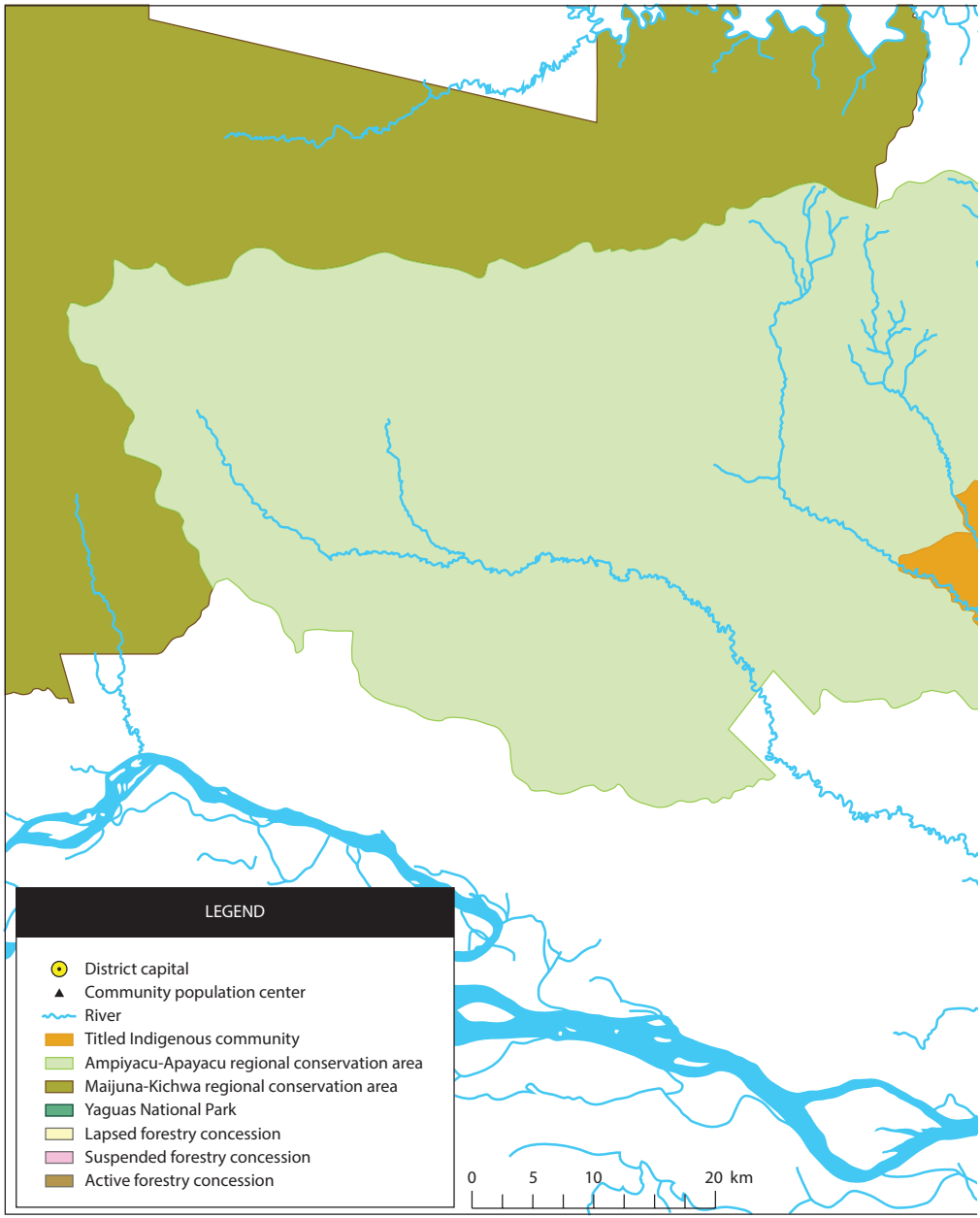
regional protected areas and built their constituents' interest in protected areas through these experiences (Pitman et al. 2016).

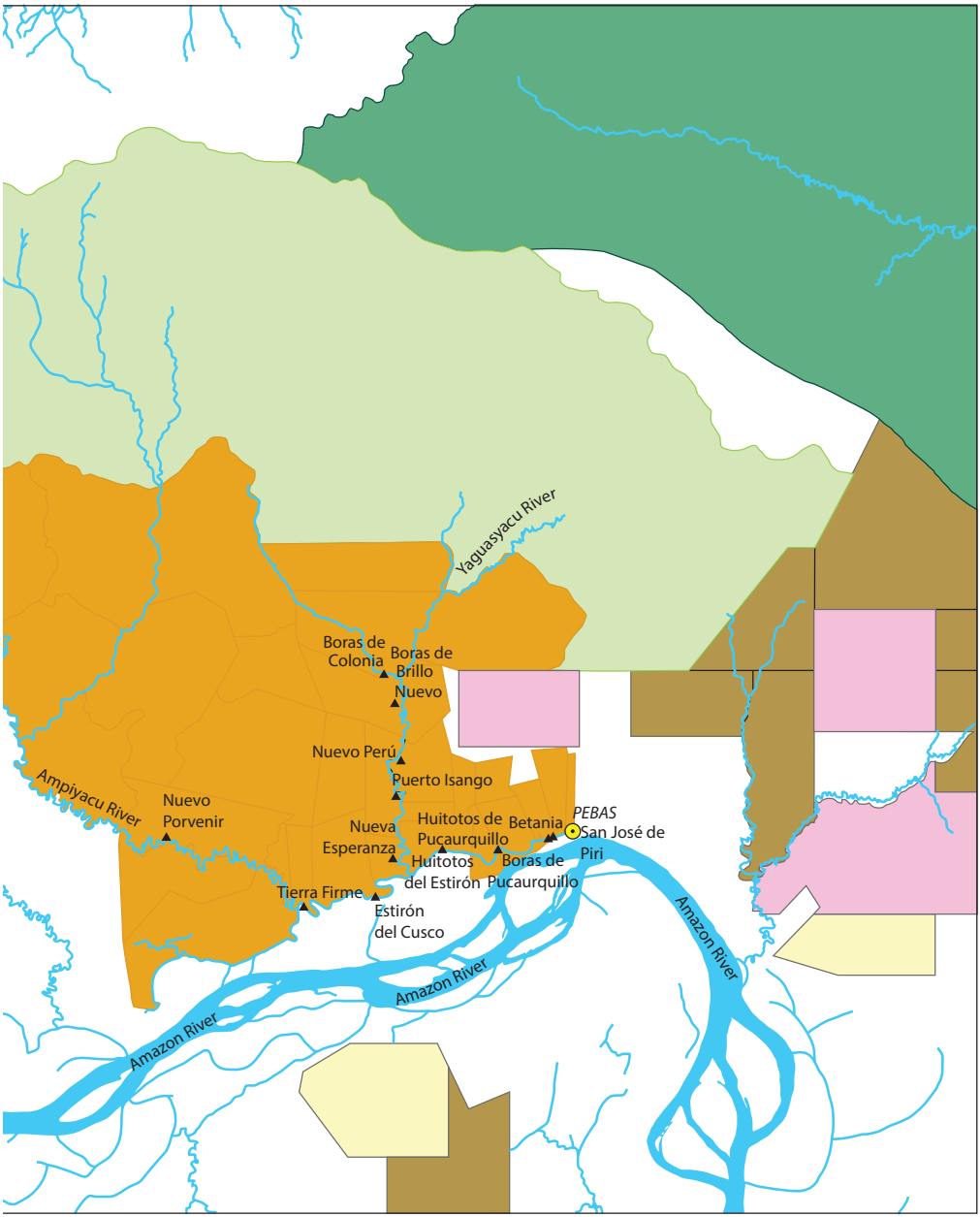
In 2021, Liz Chicaje Churay was awarded the Goldman Environmental Prize for her efforts to establish collaboratively managed protected areas in the region (Praeli 2021). She and other Indigenous leaders have for many years taken a strategic approach to working with outside researchers and organizations. They recognized early on that the titles that their communities held were not adequate to protect the lands that they actually used, valued, and cherished from extractive interests of loggers, gold miners, and large agribusinesses, among others. In this context, they needed to convince the government not only that these extended territories needed protection, but that they ought to be collaboratively managed by the Indigenous communities who had in fact steered them for generations.

Approach and Participants. To gather the information that they needed to make the case for Indigenous-led conservation in the region, the Indigenous organizations worked with national and international partner organizations to carry out "Rapid Social and Biological Inventories." These rapid inventories are intensive interdisciplinary data collection campaigns that bring Indigenous experts and Western scientists together to build a common understanding of the landscape, a shared vision for its future, and a strategy to advocate for this vision.

For support in these campaigns, Indigenous groups looked to organizations including the Peruvian nonprofit Instituto del Bien Común; the Field Museum of Natural History based in Chicago, IL; several national and regional government agencies; the Colombian nonprofit Foundation for Conservation and Sustainable Development; the National University of San Marcos based in Lima; and the National University of the Peruvian Amazon. Crucially, the Instituto del Bien Común had built long-standing relationships with Indigenous communities in the region, and elsewhere in the Amazon, by supporting their campaigns to title lands.

To collect data, a team of biologists led by the Field Museum and bolstered by Indigenous experts and Peruvian scientists carried out rapid field assessments of flora and fauna in key locations in the forest identified by communities. Meanwhile, a team of social scientists led by the elected leader of the Indigenous federation carried out a rapid social inventory. These social inventories involved the following elements: documenting stories and legends from elders; participatory mapping of natural resources use with focus groups of men, women, and youth; interactive exercises to visually depict the relationships between the community and state agencies; household economic surveys focused on the economic value that people derive from forest products and natural resources; interviews with knowledgeable community members to catalog key plant and animal species that they use; visits to horticultural plots to describe agricultural practices; semi-structured interviews with villagers to describe their concerns


LEGEND
District capital
Community population center
River
Titled Indigenous community
Ampiyacu-Apayacu regional conservation area
Maijuna-Kichwa regional conservation area
Yaguas National Park
Lapsed forestry concession
Suspended forestry concession
Active forestry concession
0
5
10
20 km



MAP 12.1. Conservation areas in the Putumayo Corridor, Northern Peruvian Amazon.
Map created by Jose Luis Jibaja-Aspajo.

and their vision for the future; and participant observation during hunting and fishing expeditions.

Implications and Lessons. Despite these successes, this process had limitations. In establishing all of these protected areas, some community members expressed concerns about whether protected areas might restrict their access to land and resources that they had been using. Some community members were even circumspect about foreclosing opportunities for income from logging and mining. While the lengthy community meetings generally surfaced a strong desire to maintain Indigenous languages, cultures, and stewardship practices, the promise of prosperity through extractive development was alluring to some (Reyes et al. 2016).

In contrast, elsewhere in Peru there are Indigenous nations who strongly oppose these kinds of protected areas, on the grounds that they legitimize an illegitimate colonial state. The Wampis Nation, for example, has called for new legal designations that offer more direct management rights to Indigenous Amazonians, and cede less power to the national government. These concerns have echoes elsewhere in the world. The Land Back movement in North America and elsewhere calls strongly for full decolonization of Indigenous lands, and for a return of full sovereignty to Indigenous peoples (Merino 2020). In West Kalimantan, Indonesia, Dayak communities have also rejected monetary benefits from protected areas for similar reasons (Myers and Muhajir 2015).

In this larger context, this case study provides important lessons for researchers with respect to the CARE principles described in table 12.2. First, organizations from the United States and the urban centers of Peru elected to work on this project at the invitation of local Indigenous organizations. The research was designed from the outset to secure ecological and economic *collective benefits* for communities. Second, Indigenous people collected data themselves, and information was returned to communities in a variety of media, and with key messages translated into local languages, to make them more accessible. Indigenous federations had more *authority to control data and knowledge* because of these arrangements. Third, communities held outside researchers accountable and made sure that they were *responsible* for communicating their methods and goals clearly at every stage of the process. Finally, Indigenous organizations set the agenda from the outset, meaning that researchers largely recognized that they had an *ethical* obligation to prioritize community interests.

Dam Removal in the Klamath Basin

Background. Built between 1908 and 1964, the Klamath River Hydroelectric Project consists of a series of four hydroelectric dams (Norgaard 2019). These dams have had severe impacts on salmon fisheries in the Klamath Basin, as the dams do not have fish passages and salmon cannot access over 150 miles of spawning and rearing habitat (Norgaard 2019). Salmon are central to culture, sustenance,

and identity of Indigenous people in the area. The three major tribes along the Klamath—the Yurok, Hoopa, and Karuk—all depended on fish for sustenance, and the fish provided a source of wealth and well-being. In fact, the Klamath was once the third most abundant salmon-producing river in the lower 48 states (Gosnell and Kelly 2010). In 2001, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service issued biological opinions that required higher water levels for endangered sucker fish in the upper basin and higher in-stream flow levels for the coho salmon. This caused a curtailment of water for irrigators, which led to losses between $37.5 and $54 million in gross crop revenues (Gosnell and Kelly 2010). In response to activism against these regulations, and a National Research Council report criticizing the science behind the 2001 biological opinions, the Bureau of Reclamation released a new management plan that provided a long-term irrigation water allotment. The fall of 2002 brought about a fish kill involving 33,000 adult salmon (Gosnell and Kelly 2010).

This fish kill was devastating given the importance of salmon for Klamath Basin tribes. For example, Karuk tribal members were once able to harvest 450 pounds per person per year (Reed and Norgaard 2010). Now salmon consumption has dropped to less than 5 pounds of salmon per person per year (Norgaard 2019). This event and a decline of other traditional food and fiber plants via fire suppression (Lake and Long 2014) have led to a drastic change in diet for Karuk tribal members, which comes with significant health and cultural implications, given salmon's centrality to Karuk identity and health. Activist and traditional dip net fisherman Ron Reed knew this, and when PacifiCorp filed to renew their dam license in 2004, he made every effort to voice his concerns (Norgaard 2019).

Approach and Participants. One of those efforts included a collaborative report with Dr. Kari Norgaard. The project consisted of surveys and interviews of Karuk tribal members about their health and their fish consumption. Interview and survey questions were informed by and developed in collaboration with Karuk tribal members. The research found that loss of access to traditional food was increasing diabetes rates for Karuk people to nearly four times the national average. The dramatic decline in eel and salmon populations, which provide essential nutrients important for the prevention of diabetes, happened within the lifetime of most Karuk adults alive at the time of the report (Norgaard 2004). These essential proteins once made up half the Karuk diet, and while diabetes was nearly unheard of prior to 1950, it became more common by the 1970s (Norgaard 2019). This report was groundbreaking in that it was the first time that a tribe had named diabetes as an impact of a dam in a federal process (Norgaard 2019). In 2008, an agreement was reached to remove the four dams along the Klamath in 2020, though that was delayed and is now slated for 2023 (Bacher 2021). Through tribal leadership, direct action, collaboration, and research partnerships that demonstrated the negative impacts of dams, tribes were able to change the political dynamics of dams. Tribes and advocates

continue to advocate for the dams to come down without further delay (www.californiasalmon.org).

Implications and Lessons. With respect to the CARE principles, research documenting the impact of salmon loss on Karuk health and culture helped make the tribe's case for the *collective benefit* of dam removal. Tribal members retained *authority to control the data* gathered by co-conducting the community survey, documenting their own situation in multiple media, and retaining copyright over their academic research partner's resulting book. The tribe ensured that the research practiced *responsibility* to their interests and *ethics* by executing a contract with Norgaard to do the work, and through tribal review of and participation in the research.

The Karuk Tribe continues to be a leader in making the connections between health and the environment. The Karuk Department of Natural Resources has been a strong advocate for food and cultural sovereignty through tribal stewardship of forest, wildlife, and watersheds. Research coming from Karuk country benefits from careful scrutiny by community members via a process called "Practicing Pikyav," meaning "to fix it." Created in collaboration with researchers at University of California, Berkeley, this process was an effort to begin to fix the long history of harm done by researchers. The document outlines expectations and requirements for researchers that have created a strong body of research based in, led by, and relevant to the community. Requirements include a review by the Karuk Resources Advisory Board, an established team of local mentors, and use of community-based research, as well as a list of required research principles that protect Indigenous intellectual property, confidentiality, and self-determination. These protections ensure that tribal members can continue to leverage research for their decision making. Having a formal process also supports researchers who now have guidelines for how to engage the Karuk Tribe, as well as a touch point for guidance and support. The document can be used as a model or conversation starter in other collaborations that might not have a formalized process, helping to set clear expectations, boundaries, and goals for researchers and tribes.

Land Governance in the Great Bear Rainforest

Background. In the Great Bear Rainforest in British Columbia, Indigenous communities worked with nonprofits and independent researchers from universities, including the University of Victoria, to secure legal protection and resources for the forests that these communities traditionally stewarded. In 1997, the Supreme Court of Canada ruled that First Nations hold the rights to vast swathes of land and resources in British Columbia (Esbjorn-Hargens and Zimmerman 2009). First Nations worked with the local government, with large environmental nonprofits, including Greenpeace, the Sierra Club, World Wildlife Fund, Nature United,

and the Nature Conservancy, and with independent scientists to campaign for restrictions on logging and a higher share of profits from any logging that does happen on Indigenous land. The Indigenous-led groups leveraged the support of the Nature Conservancy and Nature United to access funding for Indigenous-led conservation projects and investments in local businesses. More importantly, Indigenous groups demanded a right to co-manage their land, with the new agreement ensuring Indigenous rights in the context of the newly protected Great Bear Rainforest (Gaworecki 2016).

Approach and Participants. An Indigenous-led organization known as Coastal First Nations was established as a Great Bear initiative. Prior to mass organizing around Great Bear conservation, Indigenous tribes operated independently of one another due to the physical distance and cultural differences amongst them. However, the collaboration around Great Bear conservation inspired an alliance of the Wuikinuxv Nation, Heiltsuk, Kitasoo/Xai'xais, Nuxalk Nation, Gitga'at, Metlakatla, Old Massett, Skidegate, and Council of the Haida Nation (Low and Shaw 2011). Collectively, these nations held much more power than before. Nonprofits and independent researchers carried out ecological surveys to catalog ecosystem functions and traditional uses of the land in order to advocate for its protection under the leadership of the Coastal First Nations (Low and Shaw 2011).

The Coastal First Nations were crucial in the legal negotiations that led to the development of the Conservation Investments and Incentives Initiative. This initiative established financial support for the First Nations in their creation of a conservation-based coastal economy. This $120 million investment signaled an important shift in the definition of conservation (Low and Shaw 2011). For large environmental groups and researchers focused on environmental protection, conservation had been limited to the preservation of the natural environment. First Nations in Great Bear challenged this definition of conservation, expanding it to include the well-being of the Indigenous communities who lived in the rainforest (Low and Shaw 2011). Therefore, the fund allowed First Nations to manage and invest in sustainable business initiatives directly led by Indigenous groups to support the communities in the rainforest.

Indigenous communities in Great Bear also established a new category of protected areas called conservancies, which allowed Indigenous groups to insert themselves into the governing practices of these lands, whereas they had been excluded from governance of other land designations. The new designation enabled Indigenous groups to establish the management plan for conservancies, and empowered First Nations in each specific conservancy to serve as co-developers (Low and Shaw 2011).

Implications and Lessons. With respect to the CARE principles, environmental groups that had fought for the conservation of Great Bear Rainforest since the

1990s shifted to emphasize First Nations' demands for economic support and other material *collective benefits*, which ensured that community interests were at the center of environmental advocacy. By creating a coalition, the Coastal First Nations gained more *authority to control* information and how it was used—namely, by directing science towards their campaign objectives. Through direct actions and coordinated social movements, First Nations held nonprofits accountable to their principles, and outside researchers took *responsibility* for publishing information that advanced the campaign. Nonprofits recognized their *ethical* obligation to center the interests of First Nations. Over the course of the 1990s and 2000s they began to recognize this obligation by using their research to advocate not only for the protection of the ecosystem, but for the Coastal First Nations' vision of the future.

CONCLUSION

Fundamentally, Indigenous knowledge comes from people with ancestral connections to the places where they live. Researchers from non-Indigenous institutions—such as universities, government agencies, NGOs, and foundations that do not have these personal connections to the places where they work—must make Indigenous data and knowledge sovereignty a core priority. Conservation science continues to be dominated by organizations and researchers from non-Indigenous communities in the Global North. At the same time, Indigenous organizers and researchers have made impressive steps to reorient conservation science towards Indigenous policy demands, and to decolonize conservation.

Future CER that aims to be comprehensive must recognize how diverse Indigenous peoples relate differently to land, and consider all communities who live in and depend on these ecosystems, not just those with collective land rights or those postcolonial states officially recognize as Indigenous (Cossío et al. 2014). Indigenous communities are diverse in how they relate to states, nature, and other communities. In addition, in many landscapes where Indigenous people live, people who are not legally considered Indigenous and/or who do not self-identify as Indigenous often live as smallholder producers. These people are often refugees or migrants from elsewhere, and in many cases they have ecological knowledge that they use to care for and value tropical forests too. These peoples are also important actors in these ecosystems, frequently sharing histories of colonization and marginalization with legally and self-identified Indigenous people, and yet often ignored in international conservation discussions.

The principles outlined in this chapter provide a road map for researchers to support movements to decolonize conservation among Indigenous peoples and their neighbors and allies. The case studies provide insights into the complexities of carrying out conservation research in solidarity with communities who are most impacted by conservation policy. While these cases offer examples of what

individual researchers and teams have done to support Indigenous movements, many institutional changes need to be made to improve relationships with Indigenous communities and to increase structural support for CER (see chapter 5). Researchers engaging in this type of work must not forget to continue opening spaces for others to join. By creating opportunities for students and trainees, and holding their institutions accountable to ethical and reciprocal relationships with Indigenous groups, professional researchers can continue to make this work possible for themselves and others.