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Annual Review of Environment and Resources

Governance and Conservation Effectiveness in Protected Areas and Indigenous and Locally Managed Areas

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Abstract

Increased conservation action to protect more habitat and species is fueling a vigorous debate about the relative effectiveness of different sorts of protected areas. Here we review the literature that compares the effectiveness of protected areas managed by states and areas managed by Indigenous peoples and/or local communities. We argue that these can be hard comparisons to make. Robust comparative case studies are rare, and the epistemic communities producing them are fractured by language, discipline, and geography. Furthermore the distinction between these different forms of protection on the ground can be blurred. We also have to be careful about the value of this sort of comparison as the consequences of different forms of conservation for people and nonhuman nature are messy and diverse. Measures of effectiveness, moreover, focus on specific dimensions of conservation performance, which can omit other important dimensions. With these caveats, we report on findings observed by multiple study groups focusing on different regions and issues whose reports have been compiled into this article. There is a tendency in the data for community-based or co-managed governance arrangements to produce beneficial outcomes for people and nature. These arrangements are often accompanied by struggles between rural groups and powerful states. Findings are highly context specific and global generalizations have limited value.

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Contents

1. INTRODUCTION 562
2. METHODS 564
3. EPISTEMOLOGICAL COMPLEXITY 565
4. CHALLENGES OF CATEGORIES AND DATA 566
   4.1. Challenges in Separating Different Forms of Governance 566
   4.2. Challenging Shifts Toward Participatory Conservation 566
   4.3. The Diverse Measures of Change 568
   4.4. Lack of Available Data 568
5. CONSEQUENCES OF DIFFERENT GOVERNANCE FORMS 569
   5.1. Nonhuman Nature and State Protection 569
   5.2. Social Consequences of State Protection 571
   5.3. Economic Implications of State Protection 572
   5.4. Community-Based Protection and Nonhuman Nature 572
   5.5. Unexpected Social Consequences of Community-Based Conservation 573

6. QUALITATIVE ANALYSES OF CONSERVATION CONTEXTS 574
6.1. Conservation Racial Capitalism 574
6.2. Conservation and Extractive Regimes 575
6.3. Conflict and Governance Change 575
7. QUANTITATIVE COMPARISONS OF CONSERVATION GOVERNANCE 576
8. CONCLUSIONS 578

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1. INTRODUCTION

Reports on the health of biodiversity and nonhuman nature paint an increasingly grim picture. Ever more habitat is lost, and ever more species are threatened (1). International conservation lobbies are therefore calling, with some success, for more, and more effective, action to protect biodiversity through protected areas (2). These calls increasingly recognize both Indigenous and local communities' stewardship of biodiversity and promote more local sovereignty over socio-ecological territories (3).

For this article, we were asked to review the literature that compares the effectiveness of protected areas and areas managed by Indigenous peoples and/or local communities. In what follows, we attempt to do this by raising questions about the very nature of the enterprise. That is, we explore what effectiveness can mean in different contexts; how commensurable different measures can be, in theory and in practice; and how different epistemic communities produce knowledge about conservation and its outcomes.

In undertaking this review, we began with a suite of questions:

- What does effective conservation mean?
- For whom is it effective?
- How is effectiveness measured?
- In what wider political, economic, and social contexts must we understand conservation effectiveness?
- How does membership in different epistemic communities affect scholars' approaches to conservation effectiveness?

The questions above are all dimensions of conservation governance (3). Governance strongly influences who should decide what sorts of activities are allowed and how these decisions are reached and enforced (4). These decisions might be enshrined in national law and enforced by fines or armed guards. In some cases, elected councils oversee harvesting of wildlife or timber with locally organized patrols, or community elders work with outsiders to create plans for socio-natural viability that refuse the category of conservation (5). In other cases, activities are governed by markets and regulatory bodies governing those markets. Most studies of conservation effectiveness examine specific, particular forms of governance (e.g., community conservation, strictly protected forests, hunting reserves). These increasingly include what are now called Other Effective Area-based Conservation Measures (OECMs) (6, 7).

Few studies compare different forms of governance. Some global studies have compared the assembled evidence of separate reports. Oldekop et al. (8) reviewed 160 marine and terrestrial protected areas, coding the tendency of the changes reported to show, inter alia, that protected

areas tend to produce better social and conservation outcomes if they involve Indigenous people and local communities more. More recently, Dawson et al. (9) examined the well-being of Indigenous peoples and local communities and its links with conservation effectiveness. The 169 peer-reviewed papers that met their selection criteria showed that "conservation governance that provides greater control to IPLCs [Indigenous peoples and local communities] and supports local environmental stewardship is a primary pathway to effective biodiversity conservation" (9, p. 12). Our review differs from theirs in three ways: (*a*) Dawson et al. were focused primarily on human well-being, defined as health and prosperity, and our inclusion criteria considered a broader range of social outcomes as well as ecological ones. (*b*) Dawson et al. (as Oldekop et al.) relied on works found in the Web of Science, and this article uses more diverse sources. And finally, (*c*) they structured their comparison between externally and locally controlled interventions (following 10). We find more fuzziness in some of the forms of conservation intervention.

In this article, we distinguish between the consequences of different forms of conservation governance and the effectiveness of these forms. Consequences are diverse, messy, and complicated; they can describe all the impacts of a particular intervention. But effectiveness is concerned with how much or how well an outcome or outcomes respond to a particular intervention (i.e., a treatment)—these can be both intentional and unintentional. Measures of effectiveness, in their very nature, reduce the diversity of consequences to make crisp, precise comparisons. Thus, comparative studies of effectiveness will focus on particular variables (forest cover, indicator species, asset ownership, morbidity data) or particular groups of variables within given frameworks (11, 12); comparative studies of consequences will be more general. Measures of specific outcomes, even when human well-being is centered, cannot capture other aspects that are not included or accounted for in the study. This often means that broader multivariant and longer-term social, economic, spiritual, and cultural changes that the people living in, and adjacent to, protected areas identify as constitutive of their day-to-day lives with conservation are not covered. It is equally hard to capture the full diversity of ecological outcomes.

Protected areas are a spatial category in which an array of objectives, claims, relations, laws, and ontologies can coexist. For example, protected areas can function as state territory, Indigenous homeland, resource frontier, real estate, or apparent wilderness, often simultaneously. Protected areas are therefore sites of intense contestation and claim making, as states seek to govern and assert authority, as Indigenous peoples express their sovereignty or customary claims, as long-term migrants exert their rights to areas they have used for generations, and as elite interests seek to extract resources. In Latin America, for example, protected areas are increasingly enrolled in territorial struggles against extractive industries, such as oil production in the Amazon (13) or mining in the Andean highlands (14). Conservation interventions here can provide welcome resources to peoples fighting for land and territory (15). But, plainly, measuring effectiveness in such circumstances is complicated (16). Considering these broader aspects of conservation's work makes comparative assessments of the outcomes of different governance regimes harder because these politics, histories, and consequences are highly specific. Contrasting effectiveness between different Indigenous conservation strategies will entail comparing uniquely place-based practices. Such strong grounding in place means that although we might be able to compare some of the outcomes of Indigenous management practices, gleaning common causal, or transferrable, mechanisms will be harder.

Below we attempt to explore the effectiveness of, and the consequences of, different forms of conservation governance. We argue that reviewing these aspects of conservation governance is a challenging and risky enterprise. It is challenging because actual comparisons of the effectiveness

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of different forms of governance are few; the outcomes they compare are limited; the data are restricted in terms of availability and coverage; and the hermeneutics—what is acknowledged and interpreted as effective—are varied. Reviewing this literature forces us to engage with work produced by radically different epistemic communities. It is risky for multiple reasons. Assessing the effects and effectiveness of governance from the peer-reviewed published literature occludes the diverse practices that sit outside of this literature. In particular, the diversity of relations that Indigenous peoples and local communities have with their surroundings is harder to capture in a review exercise like this. It is also risky because it aggregates across, and hence may suppress, difference between governance forms, geographies, and communities by the very terms it uses (e.g., governance, effectiveness, IPLC, OECM). Hopefully, pointing out some of the challenges of this exercise, as well as the diversity of conclusions the authors reached, will itself be an important contribution to debate across disciplines about how best to understand the significant challenges of protecting and supporting global biodiversity health.

Supplemental Material >

We present our findings in eight sections. In Section 2, we present the methods we used in this review. This section is supplemented by a longer, methodologically focused **Supplemental Appendix**. In Section 3, we discuss the epistemological complexity that comes to the fore in an enterprise like this. In Section 4, we discuss the challenges of categorizing different forms of conservation governance and collecting comparable data on them. Section 5 examines the different consequences of different governance forms, and Section 6 explores important broader contexts in which those consequences must be read. Section 7 presents the work of quantitative comparisons. Finally, we end with some conclusions.

2. METHODS

To put some boundaries around the challenges of reviewing the literature to compare the effectiveness of, and consequences of, protected areas and Indigenous and/or locally managed areas, we have focused on comparisons between state-managed protected areas and community-based forms of natural resource management. The first category includes anything that is managed by the state (or comanaged) as a protected area. The second includes anything managed by local residents or individual owners, which may or may not be recognized by states or conservation organizations.

To cope with the geographical and topical diversity, we formed different teams who combine the disciplinary approaches, language skills, and geographical expertise to assemble the knowledge required to produce this review (see the **Supplemental Appendix**). Our teams were formed primarily around different world regions as well as focuses on important issues (climate change, privately protected areas, quantitative comparative approaches). These groupings reflect our perceptions of strategically effective ways to subdivide this topic, as well as our understanding of the academic networks working there. Other leads and academic networks might produce different groupings. One point to note at the outset is that our groupings have not tended to cover marine protected areas.

Although all teams were given the same task and briefing, we deliberately did not ask each team to use the same methods. Rather, we encouraged each to develop their own methods to make sense of the literature, data, and dynamics within the areas with which they are familiar. The methods each used are described in the **Supplemental Appendix**, as is the full list of all the references used to produce this article, only 166 of which can be shown here. To produce this joint article, the two corresponding authors (P.W. and D.B.) then drew out the common themes that emerged from these different studies and combined these into the first draft, which was then shared iteratively with our coauthors for comments.

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3. EPISTEMOLOGICAL COMPLEXITY

Exploring the outcomes of different governance regimes is hard given the complexities of measuring conservation effectiveness and the difficulties with the data available to explore it, and because different epistemic communities undertake the research. By epistemic community, we mean groups of people in sustained networks who share lived experiences, scholarship, practice, and writing, or some combination of these things, as well as mutually intelligible methods, theories, beliefs, expertise, and positions (17, 18). Across the reports of the different writing teams, we have noted a tendency for natural scientists and economists to produce works that consider the performance of state protection ecologically (and in some cases also socially) and social scientists to explore its social and economic consequences (and often its shortcomings). For some disciplinary practices, specific and limited lines of inquiry that produce numerous, quantitatively parsed data points are symbols of rigor and quality. This forms an epistemic community that prioritizes measurement, discrete outcomes, and specificity of results when determining effectiveness. For others, rigor and quality are achieved through the depth rather than the breadth with which one engages with data. The epistemic communities that cluster around this perspective consider questions of conservation effectiveness and governance across longer histories and wider social, cultural, political, and technical spaces. The first community prefers statistically significant results with clear, scalable recommendations. The second community writes contextualized studies that show how large-scale structures and processes affect different sites in different ways. In other words, comparisons are possible, but their form, meaning, and value will vary significantly between epistemic communities and communities of practice.

The assessment of conservation governance by scientific communities reflects the measures different epistemic communities consider important. In their review of African national parks, Muhumuza & Balkwill (19, p. 14) note that some conservationists still perceive "genuine nature" to be devoid of humans. From such perspectives, effective conservation in these areas therefore hinges on the effectiveness of former residents' displacement. In contrast, social scholars of conservation working in the Caribbean and Southern Africa, for example, insist that we begin any analysis with the violence of racial capitalism, i.e., capitalism's tendency to racialize groups of people in production systems, which intensified through slavery and colonialism in the Americas (20). The resulting racial structures have driven the histories and geographies of protected areas—as well as transformed ecologies of the regions as a whole (see Section 6 below). Scholars working in Europe, in contrast, may feel no need to begin with histories deeper than statutory governance structures enacted before states moved into the European Union.

Thus, the social failings of protected areas presented in particular case studies may reflect the tendencies of the epistemic groups working on them, just as the ecological successes of protected areas reflect the tendencies of the epistemic collectives collecting ecological data within them. This does not mean that the successes are not real, or the problems trivial. But it does make it harder to produce more holistic socio-ecological assessments.

A further challenge is more logistical: Knowledge about the implications of protected area and natural resource governance is fractured by geography, language, and discipline. Relevant studies are written in numerous languages; they include peer-reviewed and un-peer-reviewed works from academics of many disciplines, consultants, and community knowledge holders. In conducting a review of this sort, there is no single literature to parse. Many aspects of Indigenous relations with their territories and nonhuman life are not known in any literatures. Indeed, the epistemic communities of Indigenous peoples are often silenced or obscured by the literature and reviews like the one we are undertaking (21). A review in this journal works best on a systematically produced and ordered literature. Where that is absent, other methods are required to discern what different communities know about the phenomena in question.

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4. CHALLENGES OF CATEGORIES AND DATA

Aside from epistemological differences, there are also challenges in the phenomena we are trying to understand. In the first instance, the different forms, or categories, of governance can be hard to distinguish. In the second, they are shifting. There is a widespread shift to more participatory forms of conservation, but these are often stymied or partial. And then the diversity of measures of change, and the lack of data, make this complexity harder to parse.

4.1. Challenges in Separating Different Forms of Governance

Many of the writing teams observed the difficulty of isolating the impact of different forms of governance on conservation outcomes because they covered overlapping territories. Work on privately protected areas emphasizes that there are fuzzy boundaries between their definition and other governance types, and with OECMs. For example, in some state-owned protected areas, all decision-making authority has been devolved to nongovernmental organizations (NGOs), making it difficult to differentiate clearly between state and civil society governance (22). In Papua New Guinea, where up to 90% of land is under Indigenous tenure, all conservation interventions in protected areas are a combination of state- and Indigenous-based governance (23). In Latin America and Southern Africa, there can be a strong overlap between state, private, and community conservation governance. States often administer and manage protected areas alongside Indigenous nations, rural communities, individual landholders, private foundations, and corporations.

Protected area coverage data can be problematic because of lack of standardization in classification (24). In other instances, changes to protected area systems make evaluation harder. In some regions, despite being generally more effective than control sites, the protected area system still experienced a certain level of habitat degradation and loss (25) and sometimes experienced downgrading, downsizing, and degazettement due to infrastructure development and economic activities (26). Although changing protected area boundaries to exclude degraded areas may improve effective allocation of conservation resources, impact evaluation without accounting for such boundary changes may lead to overestimation of protected area effectiveness (27).

4.2. Challenging Shifts Toward Participatory Conservation

Across the literature, we have seen a general, if incomplete, shift to more inclusive and participatory governance of conservation areas. Southern African countries have moved markedly to more inclusive community-based natural resource management (28). In Iran, community-managed conservation measures have been revived and established with calls for further incorporation of the traditional natural resource management approaches and participatory governance regimes in conservation, whereas community involvement in the decision making in protected areas has remained relatively poor (29). In China, varied modes of community participation in conservation have existed and are actively being considered in the planning of its new national park system (30). In Papua New Guinea, customary landowners require collective input from the government as well as local conservation scientists who have international scientific training to revive and strengthen management (23, 31). In West Africa, many governments have taken measures to include local communities in biodiversity protection and conservation. Côte d'Ivoire, Gambia, Guinea, Liberia, and Sierra Leone have put in place policies and programs for community-based conservation. Some of the community forests serve as buffer zones around government-protected areas and are being integrated into plans to create biodiversity corridors to connect isolated

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protected areas in West Africa (32). Comanagement in Argentine Patagonia has coincided with the emergence of Indigenous territorial claims and a general resurgence of Indigenous identities (33).

However, a further difficulty facing attempts to distinguish the consequences of more participatory conservation from less participatory governance regimes is that moves from the latter to the former can be incomplete and stymied. This is a common complaint of research into community-based forestry, where work on devolved governance in Central African forests highlights numerous forms of elite capture and devolution to institutions that are not democratically accountable (34, 35). Ghana practices decentralized forestry governance through the community resource management area model (36). However, critics observe that this promotes state conservation priorities because local communities lack discretionary powers over natural resources (37). Similar dynamics have been observed in Southeast Asia (38). For example, Conservation Forest Management Units in Indonesia, which were implemented to decentralize conservation and enable local income generation (39), are instead a form of government territorial claim (40).

In the Caucasus and Himalayas, there is an observable shift in the protected area management approaches from strict protection without the involvement of local people to multiple-use landscapes (41–43). However, conflicts over natural resource management between environmental institutions and local people continue to challenge protected areas (43). In India, policies attempting to shift control of natural resources from the Forest Department to the local people are resisted by the government staff affected by it [e.g., Joint Forest Management in India, Forest Rights Act 2006 (44)]. In Europe, Pietrzyk-Kaszyńska et al. (45) and Yakusheva (46) highlight that in Poland and Slovakia consultation processes have not been applied effectively, resulting in low levels of trust between different stakeholders, with Natura 2000 designations sometimes seen as unnecessary layers of protection.

In the United States, models of Indigenous land stewardship outside of Native Nation lands commonly rely on "comanagement," but these arrangements frequently fail to remove structural barriers to full and inclusive participation by Indigenous communities, reproducing colonial forms of resource control (47). In addition, Native Nations and communities are increasingly using private conservation action to reclaim access to homelands (48). But the efficacy of these approaches is limited by reliance on voluntary collaboration with colonial governments rather than expanded territorial sovereignty for Native Nations (49). NGO-owned lands are increasingly prevalent, with the rise of land trusts across the United States and conservation easements that alter the property rights regimes on private lands to limit development rights in perpetuity (50). But often, these conservation actors lack community accountability due to their institutional structure as private organizations. They extend and entrench exclusion-based property rights regimes and suffer from the same resource limitations that governmental institutions face, eroding effectiveness (51).

In the Caribbean, community engagement can often lack inclusivity, and what precisely is meant by "community" is often unclear (52). Local residents can be superficially co-opted into consultations to legitimize otherwise exploitative projects (53). When engagement extends beyond consultation, into education initiatives such as capacity assessments and capacity building, there remains a lack of understanding of the complex skills, networks, resources, and structures from which they draw (54). In Southern Africa, Zambia's Game Management Areas are closely tied to the tourism industry, where private-sector stakeholders and NGOs have authority and decision-making power (55). In Southeast Asia, where government or NGOs instigate community management, contrived participation is a key problem (56). Interventions such as payments for environmental services can become powerful domains for subject making in which community participation or agency is highly curtailed (57).

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4.3. The Diverse Measures of Change

The diversity of ways in which conservation effectiveness has been measured, as well as the difficulty of demonstrating the impact of particular forms of governance, is well illustrated across the literature. Various metrics and methods have been applied recently to evaluate the impact of protected areas in China. Impact evaluation with a quasi-experimental design often used remote-sensing-based metrics, such as deforestation or net primary productivity (25). Scholars use wide-ranging principles to evaluate protected areas in Latin America. In the literature, the most common criteria are "ecological." Within this category, tracking the impacts of conservation measures on specific species populations has the widest geographic domain from the Galápagos Islands (30) to the Patagonian coast (31). Most studies in Brazil focus on the dynamic of vegetation and deforestation rates, with great attention given to the Atlantic Forest, Cerrado, and Amazon biomes (32). The second most common group of principles are "social and political." The level of informed, transparent, and democratic decision making in protected-area creation and management is a primary criterion (33, 58). In Amazonia, many analysts evaluate conservation initiatives according to their ability to help clarify and strengthen local peoples' tenure and control of their lands (59). The third group of concepts used to evaluate conservation in Latin America are "economic." These can include tourism and regional development (60) or ensuring local peoples' income and resilient subsistence.

4.4. Lack of Available Data

A common theme across groups was that there is a basic lack of data in the published literature. This complicates the analysis of certain types of interventions over others and country- or region-wide generalizations (61). Agrawal & Chhatre (62) show that governance of community forests is one key factor determining the outcomes in terms of forest structure. The study does not, however, explain or evaluate the state of biodiversity or its conservation within these varying forest structures. A large amount of research explores the governance of forests in the Himalayas, focusing more on outcomes related to equity, justice, and fairness rather than on biodiversity outcomes (63). Oldekop and colleagues' (64) study of social and ecological outcomes across thousands of hectares of Nepalese forests provides a welcome, robust exception. In the United States and Canada, Indigenous and other locally managed lands include a diverse set of institutional arrangements, from Native Nation lands, where communities govern and steward their own territories as sovereigns, to local open-space districts, nonprofit land trusts, and even private landowners with conservation easements that serve both ecological and social goals (65). Yet, there is no systematic or self-evaluative research on conservation effectiveness across these varied arrangements. Data on the social and environmental effectiveness of privately protected areas are universally poor. In Southeast Asia, the lack of baseline data, surveys, and inventories stymies rigorous measurement of protected area effectiveness (66). In China, most assessments focus on forest ecosystems, whereas analyses of the effectiveness of conservation areas in non-forest habitats are lacking (67). In Latin America, due to the difficulty of obtaining comprehensive and consistent data, the effectiveness of protected areas is usually assessed more indirectly, such as by measuring human threats (68). One study of effectiveness indicators and fire in protected areas in the Amazon basin finds no clear relationship between the two (69). In places where there have been country-wide attempts to track some aspect of effectiveness, country-wide generalizations can be made. For example, the demand for conservation to provide direct social service benefits to Indigenous communities to be assessed as effective can be widely generalized across Papua New Guinea, whereas the social and ecological effectiveness of comanagement regimes can be generalized across Australia (23, 70).

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One basic problem is the lack of Before-After-Control-Impact designs to evaluate the effectiveness of such environmental governance with a long history, because records before intervention do not exist or can be hard to find. To deal with this, a growing literature rigorously compares conservation outcomes from different forms of conservation governance based on matching sites at various scales. We review this work below. But, as we argue, these welcome contributions have a restricted ecological range and thus, equally importantly, serve to highlight how many more such studies are required.

5. CONSEQUENCES OF DIFFERENT GOVERNANCE FORMS

The studies reviewed show that different governance forms have differing effects on the health and social well-being of and economic consequences for nonhuman nature and people living in and adjacent to conservation areas. In what follows, we first group our findings around both state protection and community-based protection in terms of effects on nonhuman nature and human lives. Next, we demonstrate the different kinds of findings presented by different epistemic communities. These sections are based on contexts in which it was possible to distinguish between these forms of governance.

5.1. Nonhuman Nature and State Protection

Many studies, across varying geographies, show that formal protected areas are achieving desirable results, according to their own criteria, with respect to conserving species, habitat, and valued nonhuman nature. For example, Thomas & Gillingham (71) discuss the performance of protected areas for biodiversity, specifically considering the fact that protected areas are static whereas species move around, and are predicted to do so increasingly as climate changes. They conclude that protected areas help slow climate-related species decline by minimizing threats posed by other environmental drivers and that networks of protected areas will be more resilient, especially at lower latitudes. In their evaluation of the ecological integrity of six national parks, including two in South Africa, Timko & Innes (72, p. 686) conclude that "national parks and protected areas are among our best current options for maintaining and enhancing biodiversity." There is similar success in Southeast Asia, where studies show less deforestation compared with counterfactual scenarios from 2000 to 2018 (73). Additionally, Feng et al. (25) assessed 227 protected areas and found that 53% of them effectively reduced deforestation in China.

European protected areas had substantially more positive than negative ecological outcomes (which included no difference in outcomes from controls) (74). When considering only highly reliable studies using complete semi-experimental designs, (marine) protected areas still had greater positive effects. Legally stringent reserves showed overwhelmingly positive performance compared to multiple-use protected areas, whose outcomes were moderately negative (including purely negative outcomes or similar outcomes to control areas) overall (**Figure 1**). Protected areas in the marine realm showed the best ecological outcomes. Terrestrial protected areas had largely positive outcomes, whereas freshwater protected areas showed mixed results overall (**Figure 2**).

Other studies show persistent benefits across dynamic interactions between nonhuman nature and humans over time. In some instances, in China, for example, the effectiveness of protected areas varied over time, which might be associated with the implementation of other non-area-based conservation policies, such as the national logging ban (75). In the western Caucasus, the state-protected areas appeared to be effective against forest clearings between 1985 and 2010 (76), though this threat appears to be rare in the Caucasus, in part due to the rugged and inaccessible landscape. A recent study on the current state of human encroachment into protected areas in five Eastern African countries (Kenya, Tanzania, Burundi, Uganda, and Rwanda) concluded that

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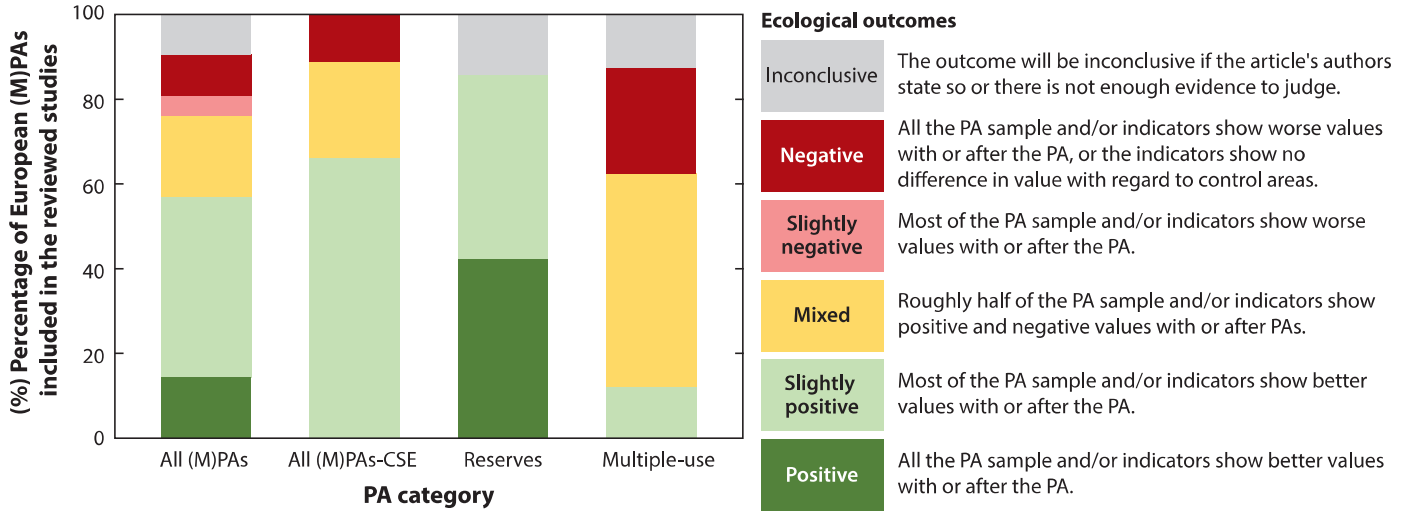

Figure 1

Ecological outcomes of European protected areas on land and at sea: All (M)PAs [1,220,578 (M)PAs from 21 studies]. All (M)PAs-CSE: all PAs from studies using CSEs [1,220,537 (M)PAs from 9 studies]. Reserves [8 (M)PAs from 7 studies]. Multiple-use [32 (M)PAs from 8 studies]. Abbreviations: CSE, complete, semi-experimental research design; (M)PA, (marine) or terrestrial protected area; PA, protected area.

despite rapid human population growth per year and related expected agricultural expansion and settlements in the coming decades, the degree to which habitat within protected areas (as of 2015) has been converted for human use is encouragingly low (6.8%) (77).

There are also numerous cases of protected areas failing in their declared goals. Findings in Indonesia suggest that protected area management focusing only on biodiversity is less effective at stopping deforestation (78). In Azerbaijan, monitoring forest cover in Samur-Yalama National Park (established in 2012) between 1984 and 2019 showed that despite the recent upgrade in formal protection, forest degradation continues rapidly, attributed to the land-use conflict between

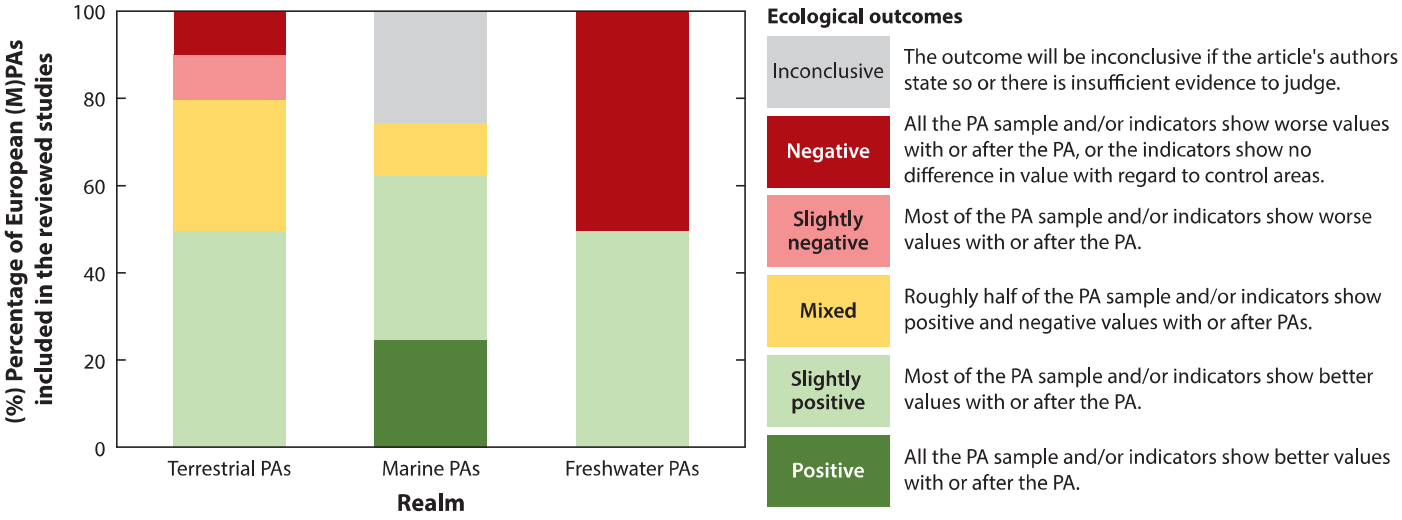

Figure 2

Ecological outcomes of European (M)PAs by realm. Terrestrial PAs (1,220,540 PAs from 10 studies). Marine PAs (36 protected areas from 8 studies). Freshwater PAs (13 PAs from 2 studies: 1 PA with negative ecological outcomes in one study, plus dozens of PAs included in the Spanish Natura 2000 Network with slightly positive outcomes overall in the second study). Abbreviations: (M)PA, (marine) or terrestrial protected area; PA, protected area.

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conservation, agriculture, and tourism sectors, as well as firewood collection (79). In Papua New Guinea, protected areas are exposed to instances of mining exploration, commercial plantations, logging, and road construction due to lax environmental regulations (23). Overall, the Caribbean literature describes significant failures of protected areas. Ill-designed protected areas, which are too small or incorrectly located effectively to support or protect intended biodiversity; lack of data-driven planning and goals; and ineffective management structures and weak governance—largely due to lack of resources—are all factors that contribute to the ineffectiveness of protected areas in the Caribbean (80, 81). In Nigeria, Oyeleke (82) compares the management effectiveness of Kainji Lake and Gashaka Gumti national parks. Grazing, hunting, logging, and illegal settlements within the park were persistent problems that the rangers encountered in both parks. In Southeast Asia, habitat may be protected, but not the animals who live in it. Hunting is by far the biggest threat to vertebrates in the region: Extinction looms unless locally effective strategies can be devised (83).

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5.2. Social Consequences of State Protection

Protected areas can be both detrimental and beneficial to their residents and neighbors. Different insights into the social impacts of protected areas may reflect the different methods involved. When examining the relationship between conservation and poverty, Brockington & Wilkie (84) reported two sorts of research that employed quite different methods. Some studies used mixed methods to explore individual protected areas (85), and others used large-scale, spatially explicit data to study the effects of protected areas on poverty (86). The latter can control for causes of poverty (isolation, lack of infrastructure) that are not due to the conservation policy studied. These have tended to show that the conservation intervention has resulted in better well-being among the local communities than we would otherwise expect. The advantage of the large-scale studies is precisely their size and scope, and their ability to determine the causal influence of many possible factors. Their disadvantage is that they cannot capture all of the diverse set of impacts of conservation interventions and how these are distributed, which the individual studies can capture. This aspect is crucial for understanding that the fortunes and misfortunes of conservation can be distributed unfairly (87).

In Europe, significant benefits have been recorded on the general level of well-being of local communities living near protected areas, including food security (88), spiritual values (89), and cultural heritage and identity and recreation (90). Negative impacts include conflicts and lack of consensus, restrictions on human activities, increased bureaucratic procedures, and a general sense that the protected area makes the lives of locals more difficult (45); a decrease in the level of trust in other stakeholders and increased rural depopulation (91); and negative impacts due to tourism development (92). In the Caribbean, there are also instances of tourist companies acting as watchmen in no-take zones (93)—though this can be fraught with problems and racial tensions that have led to environmental injustices (94). In the coastal and marine regions of South and West Europe, studies emphasize the conflicts that have emerged due to the designation of marine protected areas and coastal zone protection (90), with people often feeling marginalized (90) and issues with the unequal distribution of these impacts (88). In Southern Africa, state-protected areas have been critiqued for the violence they have perpetrated under the banner of the war on poaching in Mozambique, Zimbabwe, and South Africa, and for instigating job losses when agricultural farms are transformed into conservation areas (95, 96). Similarly, in Southeast Asia, protected areas are places where state power is enacted and extended, and this can lead to Indigenous and local community dispossession, for example, in Cambodia's new protected area system since 2016 (97).

5.3. Economic Implications of State Protection

The social consequences of protected areas also must be understood in terms of their economic and social innovations. One of the key areas where this is assessed is the tourism sector. In Europe, these innovations are often important (98). With lack of resources being a commonly cited factor for weak governance and poor management of protected areas in the Caribbean, many analyses sought to ascertain whether tourist-related income could bridge the funding gap. Attempts have been made to estimate divers' willingness to pay to visit coral reefs as a potential funding mechanism (99).

In Tanzania, protected areas contribute significantly to the economic sector. Wildlife-based tourism, for example, contributes approximately 17.2% of the national gross domestic product. Further, the ruling party has set an ambitious target of reaching 5 million tourists by 2025, from the current 1.5 million tourists, and a net revenue of US$6 million by 2025, from the current US$2.5 million. However, tourism remains heavily dependent on international tourists to generate revenue for development projects and fund conservation operations (100). Conservation in Patagonia is tied discursively and institutionally to tourism and rural development, but contributions to local livelihoods are limited, with the main profit reaped by larger operators (101). Meanwhile, restrictions on land use, in particular livestock, cultivation, and firewood, limit traditional means of subsistence (102).

In Southeast Asia, elite nature tourism is the other emerging domain of green profit making. Here, protected areas are seen to house a spectacular form of nature that is available for elite consumption. Now, with an emerging regional elite in Southeast Asia, we observe new nature enclosures for private consumption, priced for wealthy tourists alone. Indonesia provides an example of this. The Ministry of Environment and Forestry has rezoned the Komodo National Park to include a "utilization zone" for elite tourism, and the local government of East Nusa Tenggara Province announced plans in 2019 to move the Indigenous Ata Modo off the islands to pave the way for exclusive tourism development (103).

There are also larger questions about the longer-term effects of tourism and conservation governance. Büscher et al. (104) argue that the conservation sector in South Africa is inherently unsustainable due to dependency on fossil fuels, including international tourists flying to and from South Africa. Furthermore, they suggest that the racialized and gendered labor relations in conservation make it inherently unsuitable. Koot et al. (105) echo this, suggesting that private conservation in South Africa is unsustainable because it is premised on various forms of enclosures, including land, and particular ideologies that reproduce apartheid-like segregation as well as abhorrent treatment of conservation workers (106).

5.4. Community-Based Protection and Nonhuman Nature

The potential of community-based protection was prominent in many study groups. For example, several decades of study on the impacts of fire regimes in Arnhem Land, Australia, have shown the relative effectiveness of Indigenous governance regimes as compared to comanagement in conserving plant biodiversity and ecosystem health (107, 108). In North America, Indigenous-led land stewardship is an effective means of protecting biodiversity and improving cultural resilience and community well-being (109, 110). Various studies demonstrate the effectiveness of community-based approaches in reducing the threats of retaliatory killing of carnivores (111).

The Caribbean literature contains some examples of successes in protected area comanagement, such as the removal of invasive lionfish by fishermen, who supplement their diet and income with such catch (93). Various conserved areas are also under community governance or management in China, such as the sacred mountains and lakes in the mountains of

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southwestern China (112) and fengshui forests in the southern provinces (113). Declining religious beliefs and traditional practices are threatening some of these sites because these practices promote system health (114). There are also mini-reserves, which refer to small natural areas designated by administration below the county level outside the state-led protected area system (115).

In Europe, protected areas that have adapted a comanagement governance framework may have a more positive performance compared to protected areas whose management is not shared. This evidence comes mainly from Western and Northern European countries (116). In Central Africa, Cameroon is acknowledged as a leader in adopting community-based conservation in the form of community forestry; however, a lack of accountability, equity, and sustainable funding has hampered progress (117). In Southern Africa, Namibia is argued to have established one of the most innovative conservation management programs through its communal area conservancies (118). Communities are given ownership of huntable game species and decision-making rights for commercial tourism activities. As a result, communities within these communal areas are utilizing and managing their wildlife through various forms of tourism because they have incorporated wildlife conservation into their daily livelihood strategies. But this singularly positive view is contested. Other observers note that marginalized conservancy members can receive few benefits while still paying the considerable costs of living with large wildlife (119).

Other studies highlight the difficulty of separating state and other forms of protection when it comes to assessing the conservation work of rural communities. In the tropical savannas of northern Australia, Woinarski et al. (120) studied the effectiveness of protected areas, Indigenous lands, and other tenure types for protecting small mammals and biodiversity more generally (121). These studies show that all areas comanaged by the state and Indigenous communities have more effective outcomes.

5.5. Unexpected Social Consequences of Community-Based Conservation

Community-based conservation can still depend on excluding people from place and space, as well as excluding residents from benefit streams. The success of community-based conservation, as with common-property management generally, in part depends on defining who is and is not in the community. In Zambia, Godfrey (55) argues that interventions in game management areas homogenized the needs and understanding of communities in the Luangwa Valley (for example), and residents have not been able to optimize the benefits of living with wildlife, such as tourism, because they were advised to adopt small-scale farming methods as an alternative livelihood. In Southern Africa, community-based natural resource management can suffer from low levels of participation and community empowerment, unequal benefit sharing, and conflicts (122). This has further disenfranchised communities that were previously dispossessed of their land and resources from being allowed to categorize their wild spaces according to the values they find in them (55). In Tanzania, wildlife management areas, a promised alternative to the fortress conservation model, have been criticized for failing to deliver social benefits as well as benefits for wildlife under a decentralized governance regime (123–125).

We note mixed experiences in Southeast Asia: Some local and Indigenous communities residing in and around protected areas are exerting their customary claims, while also experiencing dispossession and violence (126). Protected areas tend to be overlaid onto circumstances where ethnic minority and Indigenous people have weak tenure or only informal customary rights. Ongoing struggles show how states are reluctant to formalize these rights or to acknowledge the presence of Indigenous people, whereas Indigenous populations see conservation as part of state efforts to appropriate resources for elite interests, especially in Myanmar (127) and Cambodia

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(128). In Vietnam, community forestry has had mixed results, due to weak or unclear community rights and poor forest quality—although community-driven acacia plantations have thrived (129).

6. QUALITATIVE ANALYSES OF CONSERVATION CONTEXTS

Several of our groups were committed to including literatures that provide history and broader context for various conservation governance regimes in their reviews. These broader contexts refer to issues that affect all sorts of government and civil society initiatives beyond just conservation affairs. However, even if not specific to conservation, they are vital for understanding conservation policies and interventions and often are the root cause of many conservation failures. Three key themes emerged in this literature: racial capitalism, extraction, and conflict. These themes all intersect with the broader circumstances rooted in imperial expansion and both historic and ongoing colonialisms.

6.1. Conservation Racial Capitalism

One theme, especially in the Caribbean and Southern Africa, is the way in which conservation's presence, history, and consequences are interwoven with the imposition of and struggles with racial capitalism. There is scant explicit mention of this in the scientific conservation literature; however, particularly in the Caribbean, its effects can be seen across page after page. The Caribbean, as the site of rupture and the linchpin of transatlantic slavery, has for centuries had its landscape and vegetation confiscated and categorized into either productive and governable crownlands or depleted, ungovernable, or inaccessible backlands (130). This impacts the distribution and composition of protected areas in the Caribbean today. One geography, defined by conquest, produced landscapes of rampant deforestation, exploitation, monoculture, and plantation establishment, which displaced native flora and fauna and exterminated local residents with cash crops and the spilled blood of enslaved Africans (131). The other geography, defined by inaccessibility, produced and maintained highly biodiverse areas of forest land in high-altitude karstic and volcanic formations (characteristic of much of the Caribbean) that became refuges for tribal, Indigenous, maroon, and biological communities alike. Caribbean geographies lie not just "in the shadow of the plantation" (132, p. 735) but along geopolitical faultlines, also generated by (in)accessibility. These include the guerrilla groups that coexist among traditional communities and rare species in protected areas and national parks (133).

Racial capitalism is conjoined historically and in the present with colonialism and ongoing dispossessions. Historically, conservation in Patagonia has been entangled with the settler-colonial efforts of Chile and Argentina toward the South (134). In Southern Africa, the geography and history of state-protected areas are bound up in the establishment of racist states, which sought to exclude black African ownership and governance of rural lands (135). As these countries have won independence, conservation policies have become much more inclusive. Yet, the legacies of violence and appropriation still loom large (136). In Burkina Faso, the protectionist and repressive management policies adopted during the colonial era and pursued subsequently were confronted with the hostility of rural populations who saw them as a form of confiscation of their forest resources (137).

Racial capitalism in North America follows logics of elimination tied to settler colonialism, to create conditions whereby Indigenous nations whose lands represent 4.2% of the land area of the United States and 6.3% of Canada, with ancestral territories spanning the vast majority of lands in each country, are often excluded from national data sets widely used in studies of conservation effectiveness in protected areas. The paucity of observed Indigenous-managed protected areas indicates not their absence but settler colonialism's erasures (138).

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6.2. Conservation and Extractive Regimes

Conservation is not just a means of conserving nature; it can in some cases also generate profit and rent for ruling groups. It can be a manifestation, and source, of privilege. The protection–extraction nexus in Cambodia is particularly vivid—like a green grab with an ulterior motive focused on land and timber (139). This has enriched elites and provides illicit financial flows to the ruling party.

And sometimes there is no nexus; extraction proceeds despite conservation measures, or conservation is one of the devices by which local residents fight despoilation. In Peru and Colombia, both of which have witnessed large-scale illicit economies and armed conflicts for years, protected areas can play an important role in sustaining or altering illegal activities (59). In Indonesia, rent-seeking practices in the governance of forestland licensing have cleared the path for continued development of large-scale monoculture plantations (oil palm and acacia), logging, and mining inside Indonesia's protected areas (140). For example, more than 1 million hectares of oil palm permits, owned by 724 different companies, are situated on primary forests (forest area protected by moratorium policy) and in priority peatland restoration locations (141). In Papua New Guinea, extractive industries such as foreign-owned logging companies that provide "short-lived" economic benefits to tribal forest communities put up stiff competition for conservation (142).

6.3. Conflict and Governance Change

One reason why evaluating the consequences of different forms of governance is so hard is that shifts from different forms of governance—the erasure of traditional controls and the imposition of state protection, or the cultivation and promotion of participatory measures in the face of state-directed top-down impositions—are often riven with conflict. In addition, it is often hard to know how and to what extent more inclusive measures have actually been implemented on the ground.

For example, there is a tension in South American conservation between more inclusive conservation, focusing on Indigenous and local groups in area management, and its exclusive use by powerful actors who may reproduce, reinforce, and even reintroduce fortress-style conservation. Along the Pacific coast of Patagonia, local communities have wrestled to maintain access to marine resources in a context of increased pressure from industrial harvesting of molluscs and Chile's emergence in the top ranks of salmon farming worldwide (143). This has created alliances between efforts to protect coastal environments by fisher communities and environmentalists. The emergence of the so-called TURFs (Territorial Use Rights for Fisheries) in Chile has created a framework for local management regimes that combines conservation efforts with community-based resource management. A review reporting on 53 ecological and environmental studies suggests that conservation outcomes are largely positive (but see 144) but unequitable (33). The TURFs have created a context in which fisher communities increasingly control their marine resources. Some report, however, that fishermen feel excluded from decision-making processes (58).

In East Africa, studies on community-based conservation reveal that the highly complex sociopolitical realities and histories of these areas in Kenya, as well as foreign influence in the ecotourism and development realms, have resulted in few communities actually owning and managing conservation operations. There are many approaches to community-based conservation, ranging from conservation enterprise (i.e., tourism), payment for ecosystem services, wildlife corridors, community-owned conservancies, and wildlife sanctuaries to revenue sharing from protected areas or national parks (145). In Indonesia, community forest management units struggle with complex and constantly evolving policies while trying to manage extremely challenging social conflicts and political situations on the ground (146).

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Beyond governmental agendas, community governance of natural resources can refer to Indigenous assertions of territory and sovereignty, as seen in Indonesia and the Philippines (126). Myanmar is a powerful example: Indigenous communities see traditional lands not just as economic resources but also as part of cultural identity and claims for political sovereignty (147). Some of these communities have sought alternative protected areas outside of the state, creating Indigenous and community conserved areas (ICCAs) within Indigenous lands governed by local communities. However, since the February 2021 military coup, the ICCAs have become tied to Myanmar's current political unrest, with refugees from the coup seeking refuge in ICCAs and the Tatmadaw bombing them (148).

7. QUANTITATIVE COMPARISONS OF CONSERVATION GOVERNANCE

The diversity above does not make quantitative comparison impossible. Indeed, if anything it makes it more important, because it is precisely to cope with such diversity that quantitative methods have been honed and refined. Rather, the previous discussion explains the caution and caveats that accompany the most robust quantitative research.

The state of the art with respect to quantified comparisons of the outcomes of different forms of governance demonstrates well the challenges of determining what forms of conservation governance pertain in different areas—as well as encouraging more such research. A range of quantitative approaches exist to compare different types of conservation interventions. Among them, the use of methods that compare a treatment to a counterfactual (what would have happened absent an intervention) has increasingly been promoted in the conservation science literature as being more robust compared to more traditional approaches, which does not account for the effect of the intervention's location in shaping outcomes (149, 150). Available counterfactual methods can be divided into experimental and quasi-experimental approaches. Quasi-experimental approaches imitate experiments by establishing a counterfactual control group that is similar to the treatment being studied on known contextual factors for which there are data. Methodological advances have helped to increase the quasi-experimental methods on offer and improve causal interference to better attribute impacts to conservation interventions (151). Several quasi-experimental approaches are used (all explained in **Table 1**), including matching (152), difference-in-differences (153), regression discontinuity (154), instrumental variables (155), and synthetic controls (156), with matching in particular becoming increasingly popular.

For the purposes of this review, the study group examined the sources of three review papers (8, 157, 158), the studies that met the criteria of the review protocol (159), and the citations of one of the studies (59). Of these studies, 34 compared conservation areas under different governance types, of which 12 assessed impacts through a counterfactual method with a sample size of at least two areas per governance category. All the 12 studies, using a counterfactual method, identified in this review assessed the impacts of conservation areas on the ecological outcome of tree cover loss. This means that they assessed whether the conservation areas have resulted in avoided deforestation that would have happened absent the conservation intervention. Three of the studies also assessed forest degradation (73–75), and one study assessed forest regrowth alongside tree cover loss (76). In addition, three studies assessed some social outcomes (77–79).

Most of the studies [8 out of 12 (75–78, 80–83)] were conducted in the Neotropics (cf. 70). Only one study was conducted in Asia [Cambodia (160)] and one in Africa [Cameroon (161)]. The remaining two studies were pan-tropical or global in scope (162, 163). The protected areas in the 12 studies were compared to one or several other governance categories: 7 studies compared the protected areas to Indigenous lands or territories, 6 studies included protected areas or forests

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Table 1 Pros and cons of commonly used nonexperimental, quantitative impact evaluation approaches to conservation

Method	When used	Pros	Cons
Matching[a]	Baseline information on confounding factors (those affecting both selection of treatment and outcomes) available for both treatment and control units	Relatively few data requirements; lends itself to integration with other approaches when used as a data preprocessing step	Assumes balance in observable covariates reflects balance in unobserved covariates (i.e., there are no unobserved confounders)
Before-After-Control-Impact (difference-in-differences)	Data before and after treatment implementation can be collected from replicated treatment and control units	Controls for time invariant variables and variables that change over time but affect both treatment and control groups equally	Assumes a parallel trend in outcome between treatment and controls (confounding factors are those affecting treatment assignment and changes in outcome over time)
Regression discontinuity	Selection of the intervention follows a sharp assignment rule (e.g., participants above a certain threshold are selected for treatment)	Strong causal inference	Outcomes calculated only for units close to the cutoff (i.e., data from only a small subgroup of units are used)
Instrumental variables	Treatment assignment correlated with error term (endogeneity); a third variable (the instrument) correlated with treatment but uncorrelated with the error term can be used instead of the treatment	Helps overcome endogeneity	Suitable instruments can be hard to find
Synthetic control	Intervention has occurred in only a single unit of observation; information from a potential pool of controls can be synthesized to generate a single artificial counterfactual	Can be conducted when large numbers of treatment units are not available	Credibility relies on a good prior to implementation fit for outcome of interest between treated unit and synthetic control

[a]Matching can be used to identify control units for comparison with treatment units as a method for impact evaluation but is often used to improve the rigor of other approaches. For example, matching can be used to select control units for difference-in-differences analyses. Table reproduced from Reference 166.

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managed by communities or civil society, and some included specific categories such as logging concessions.

In terms of differences in reported effectiveness of the conservation areas under different governance regimes, no one governance category was consistently better at reducing tree cover loss. Five studies found that both protected areas and alternative governance forms reduced deforestation compared to a counterfactual control but found no significant difference between protected areas and the alternative governance forms. Four studies found that protected areas performed better than the alternative governance types, whereas three found that the alternative governance form performed better than traditional protected areas. Only one of these comparisons (164) also compared socioeconomic outcomes, with results showing that community forests performed better than protected areas. Some studies reported factors that influenced which governance category was reported to be more effective, such as the level of deforestation pressure.

Furthermore, the studies that have been conducted often do not clarify what land-use restrictions and governance arrangements are in place in the unprotected landscapes that are taken as

counterfactual controls. As a result, it is assumed implicitly that these unprotected landscapes are devoid of land-use restrictions and governance, even when this is not the case (165). There is therefore a need to disentangle the governance arrangements and land-use restrictions in place in these "unprotected" areas. The few studies that have done so have concluded that these arrangements matter when assessing conservation impacts of conservation areas (59).

8. CONCLUSIONS

We were invited to compare the conservation effectiveness of protected areas and areas managed by Indigenous peoples and/or local communities. We understood this to be an invitation to think about literatures on the effects and results of different conservation governance regimes. In undertaking this review, we sought to be capacious in our inclusion criteria with regard to the notion of "effectiveness," with an understanding that different constituencies and epistemic communities have different ideas about what effective conservation means. We also sought to identify and review works that specifically compare these different governance types in their analyses. Finally, we sought to bring together interdisciplinary regional specialist groups so that we could gain broad global coverage and give more equal coverage of the forms of effectiveness highlighted. With more than 15% of the planet already falling under some form of state-protected regime, and new international policy targets calling for the protection of 30% of land and oceans by 2030, we believe that understanding what kinds of governance work for what kinds of conservation outcomes is a key part of moving conservation forward in ways that deliver both social and ecological outcomes, are ethical, and respect multiple approaches to stewardship to create conditions where nonhuman nature can be sustained.

Broadly, our review shows that there is a global lack of comparative data. It shows that within the data that do exist, a wide diversity of effectiveness is measured. It shows that overlapping governance structures make measuring the effectiveness of one form versus another challenging. There have been shifts in some sites in all geographies from protected area governance structures to more community-based governance structures, and these shifts hamper assessment (11). In other words, if we want to explore the consequences of conservation governance on the particular aspects of specific socio-ecological systems, then the data are messy, hard to compare, and few.

Despite these difficulties, the evidence suggests that community-based or comanaged governance arrangements can produce strong outcomes for people and nonhuman nature. But that can be difficult to discern given the struggles to devolve effective power to these communities and the difficulty of separating local power from government direction. But which regimes will work best in which socio-ecological circumstances is hard to determine and will be highly context specific.

A clearer finding is that the enterprise of measurement is often tied to the need to demonstrate externally designed metrics of success. These metrics of success, as evidenced in the forms of things measured for effectiveness in the studies we have reviewed, are rarely designed by the people-on-the-ground in conservation areas. Metrics of success exist because some things (e.g., forest cover, per-capita income) are relatively easy to measure and become proxies for effectiveness. Our analysis shows that effectiveness can be assessed only if conjoined with the questions of where, for whom, for what, and when. Some aspects of effectiveness are best understood in situ, and comparing across sites both is hard and needs to be adequately qualified. For some of us, this raises questions about the usefulness and ethics of measuring effectiveness across sites, scales, and geographies at all. It also raises the questions of who is defining effectiveness and for what ends, what forms of governance are not and cannot be captured by the scientific literature, and what power dynamics are at play in the multiple forms of effectiveness. Indeed, most of our authors reported knowledge of evidence of effectiveness, or lack thereof, that sits outside of the published scientific literature. This means that the enterprise is partial and incomplete in nature.

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We also found that most of the papers reviewed focus on either ecological effectiveness or social impacts, and most of the literature in scientific journals focuses on ecological, and not social, measures. Forest cover is taken as a proxy for the health of nonhuman creatures, but almost no data reflect the complex assemblages of people, forests, and creatures. This means that we cannot, based on the literature reviewed, draw a generalizable conclusion about the relative effectiveness of either form of governance on terrestrial animal populations. At the same time, the vast majority of the social science literature on conservation governance focuses on the social effects of protected areas and other forms of conservation management and rarely assesses ecological outcomes. This difference in focus, "effectiveness" versus "effects of," is important and points us to a major problem with both review and assessment exercises like ours and conservation planning more broadly. Simply put, there is a failure to conduct studies that measure both social and ecological effectiveness while simultaneously contextualizing the broader political-economic and social-spiritual transformations that result from conservation interventions.

This finding is an artifact of a broader set of problems with contemporary, and historic, conservation planning and raises the question of what is invisible in, and sometimes occluded by, the literature on effectiveness. Several of our geography-based review groups pointed to the lack of attention to historic processes and events that set the possibilities for contemporary conservation in all of its governance forms. Other groups showed that governance is not only diverse but also dynamic and can change repeatedly over time. Historically, many protected areas and some community-based conservation areas have been conceptualized and brought into being by actors removed from day-to-day social life with the plants, animals, and systems determined to be in need of conservation. Local ecosystems were cast as degraded or in danger of degradation, with little attention to the global processes and national and international structures that created the conditions for places to be in need of conservation and for communities to be living on the margins of these structures with, in many instances, degraded options for sociocultural livelihoods. Projects were then conceptualized to conserve sites in terms of ecological outcomes, with little attention to potential social outcomes and how they might replicate previous histories of Indigenous and local dispossession. Today, some of these sites of protection still sit within governance structures where states manage socio-ecological life for ecological outcomes; others have seen transitions to more comanaged governance structures, where the goals of ecological and social effectiveness are conjoined in governance plans and practices. Working out which is more effective for whom requires careful grounded studies that will enable comparisons across the appropriate scales.

The divisions of the data and the diversity of epistemic communities studying them are mirrored by the multifaceted conclusions we have drawn. Some see the enterprise that we have undertaken, which requires a deliberate narrowing and erasure of the divergent interpretations of effectiveness such that it cannot capture what effectiveness means to many actors involved, as inherently problematic. Other authors, while acknowledging the complexities of aggregations of this type, still welcome and pursue comparative work because it is necessary to understand effectiveness across diverse geographies and governance types. Some see the separation of social and ecological outcomes that we see in the literature as a broad example of how scientific methods of assessment fail to capture how most Indigenous and many local communities understand socio-ecological life. Others see this separation as the only adequate way to understand human impacts on nonhuman nature. Some of us now see the very idea of governance as a term that assumes a hierarchical relationship between humans and nonhumans. Others see the term as crucial for understanding what forms of relations should be funded, supported, enhanced, and strategically deployed if we are to move into a future with strong sites of ecological diversity.

Writing with, and across, such diverse views and interpretations has been as interesting and stimulating as it has been challenging and difficult. There are aspects of the text above on which

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we do not all entirely agree. But all the authors have been willing to be named as such. This reflects a collective willingness to be part of a diversity of views, perspectives, and academic traditions that seeks to understand these things we call conservation. And this has made the writing process enjoyable. That such diverse authors, from such different backgrounds and places, can broadly agree on the text above is testimony to the fact that despite these differences, a productive and enlightening conversation is possible.

SUMMARY POINTS

1. The consequences of conservation policies are messy and diverse. Measures of effectiveness can omit many complexities that attend to protected areas and community-based conservation.
2. The knowledges produced about protected areas and community conservation are created by different epistemic groups. They are not always commensurable.
3. Community-based conservation can be hard to distinguish, on the ground, from protected areas. Measures to promote community-based conservation are often contested and stymied.
4. Different research groups across many parts of the world, and using diverse methods, found a tendency for community-based conservation measures to be effective for people and nonhuman nature.
5. In particular regions of the world, area-based conservation measures are bound up in the oppressive histories and geographies of racial capitalism. In other regions, such conservation is a means by which marginalized groups strive for dignity, respect, and autonomy.
6. Robust quantitative comparisons are few and mostly conducted on (tropical) forests with no single category of protection proving better at reducing tree loss.

FUTURE ISSUES

1. Given how context specific the politics and outcomes of area-based conservation can be, at what scales can useful, context-sensitive generalizations be made as to the relative efficacy of different forms of conservation activity?
2. Can robust quantitative measures of efficacy be extended beyond forests, and at what scales can these be meaningfully applied?
3. What mixtures of agonistic and collaborative engagements can enable epistemic divides to be overcome in conservation research?
4. In what contexts are rural communities successfully able to empower their own governance of resources with welcome social and conservation outcomes, and what can we learn from these positive outliers?

DISCLOSURE STATEMENT

T.E. is Chairman of the Board of The Caribbean Coastal Area Management Foundation, an NGO that managed the Portland Bight Protected Area in Jamaica. The other authors are not aware of

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any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review. In the case of European Union funding, views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Council Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

AUTHOR CONTRIBUTIONS

This was a team effort with frequent rounds of writing, editing, reviewing, revision, comment, negotiation, disagreement, checking, and wrangling. It is difficult to set limits as to who did what when. Invitations to engage included no intention to make precise attributions of author roles at a later stage. P.W. and D.B. coordinated our collective efforts and are the corresponding authors; their emails are included in their institutional affiliations.

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Annual Review of Environment and Resources

Volume 48, 2023

Contents

I. Integrative Themes and Emerging Concerns

30×30 for Climate: The History and Future of Climate Change–Integrated Conservation Strategies
L. Hannah and G.F. Midgley 1

Exploring Alternative Futures in the Anthropocene
Steven Cork, Carla Alexandra, Jorge G. Alvarez-Romero, Elena M. Bennett, Marta Berbés-Blázquez, Erin Bohensky, Barbara Bok, Robert Costanza, Shizuka Hashimoto, Rosemary Hill, Sohail Inayatullah, Kasper Kok, Jan J. Kuiper, Magnus Moglia, Laura Pereira, Garry Peterson, Rebecca Weeks, and Carina Wyborn 25

Plastics and the Environment
I.E. Napper and R.C. Thompson 55

Toward Zero-Carbon Urban Transitions with Health, Climate Resilience, and Equity Co-Benefits: Assessing Nexus Linkages
Anu Ramaswami, Bhartendu Pandey, Qingchun Li, Kirti Das, and Ajay Nagpure 81

II. Earth's Life Support Systems

Harmful Cyanobacterial Blooms: Biological Traits, Mechanisms, Risks, and Control Strategies
Lirong Song, Yunlu Jia, Boqiang Qin, Renhui Li, Wayne W. Carmichael, Nanqin Gan, Hai Xu, Kun Shan, and Assaf Sukenik 123

Pushing the Frontiers of Biodiversity Research: Unveiling the Global Diversity, Distribution, and Conservation of Fungi
Tuula Niskanen, Robert Lücking, Anders Dahlberg, Ester Gaya, Laura M. Suz, Vladimir Mikryukov, Kare Liimatainen, Irina Druzhinina, James R.S. Westrip, Gregory M. Mueller, Kelmer Martins-Cunha, Paul Kirk, Leho Tedersoo, and Alexandre Antonelli 149

Soils as Carbon Stores and Sinks: Expectations, Patterns, Processes, and Prospects of Transitions
Meine van Noordwijk, Ermias Aynekulu, Renske Hijbeek, Eleanor Milne, Budiman Minasny, and Danny Dwi Saputra 177

Annu. Rev. Environ. Resour. 2023.48:559-588. Downloaded from www.annualreviews.org
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Understanding Fire Regimes for a Better Anthropocene
Luke T. Kelly, Michael-Shawn Fletcher, Imma Oliveras Menor, Adam F.A. Pellegrini, Ella S. Plumanns-Pouton, Pere Pons, Grant J. Williamson, and David M.J.S. Bowman 207

III. Human Use of the Environment and Resources

Deforestation-Free Commodity Supply Chains: Myth or Reality?
Eric F. Lambin and Paul R. Furumo 237

Great Green Walls: Hype, Myth, and Science
Matthew D. Turner, Diana K. Davis, Emily T. Yeh, Pierre Hiernaux, Emma R. Loizeaux, Emily M. Fornof, Anika M. Rice, and Aaron K. Suiter 263

Mapping Industrial Influences on Earth's Ecology
James E.M. Watson, Erle C. Ellis, Rajeev Pillay, Brooke A. Williams, and Oscar Venter 289

Mitigation of Concurrent Flood and Drought Risks Through Land Modifications: Potential and Perspectives of Land Users
Lenka Slavíková and Anita Milman 319

Surveying the Evidence on Sustainable Intensification Strategies for Smallholder Agricultural Systems
Meha Jain, Christopher B. Barrett, Divya Solomon, and Kate Ghezzi-Kopel 347

Brine: Genesis and Sustainable Resource Recovery Worldwide
Chenglin Liu, Tim K. Lowenstein, Anjian Wang, Chunmiao Zheng, and Jianguo Yu 371

Groundwater Quality and Public Health
Xianjun Xie, Jianbo Shi, Kunfu Pi, Yamin Deng, Bing Yan, Lei Tong, Linlin Yao, Yiran Dong, Junxia Li, Liyuan Ma, Chunmiao Zheng, and Guibin Jiang 395

The Global Technical, Economic, and Feasible Potential of Renewable Electricity
Nils Angliviel de La Beaumelle, Kornelis Blok, Jacques A. de Chalendar, Leon Clarke, Andrea N. Hahmann, Jonathan Huster, Gregory F. Nemet, Dhruv Suri, Thomas B. Wild, and Inês M.L. Azevedo 419

The State of the World's Arable Land
Lennart Olsson, Francesca Cotrufo, Timothy Crews, Janet Franklin, Alison King, Alisher Mirzabaev, Murray Scown, Anna Tengberg, Sebastian Villarino, and Yafei Wang 451

Annu. Rev. Environ. Resour. 2023.48:559-588. Downloaded from www.annualreviews.org
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Annu. Rev. Environ. Resour. 2023.48:559-588. Downloaded from www.annualreviews.org
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IV. Management and Governance of Resources and Environment

Environmental Decision-Making in Times of Polarization
Madeline Judge, Yoshihisa Kashima, Linda Steg, and Thomas Dietz 477

Implications of Green Technologies for Environmental Justice
Parth Vaishnav 505

The Commons
Arun Agrawal, James Erbaugh, and Nabin Pradhan 531

Governance and Conservation Effectiveness in Protected Areas and Indigenous and Locally Managed Areas
Yin Zhang, Paige West, Lerato Thakholi, Kulbhushansingh Suryawanshi, Miriam Supuma, Dakota Straub, Samantha S. Sithole, Roshan Sharma, Judith Schleicher, Ben Ruli, David Rodríguez-Rodríguez, Mattias Borg Rasmussen, Victoria C. Ramenzoni, Siyu Qin, Deborah Delgado Pugley, Rachel Palfrey, Johan Oldekop, Emmanuel O. Nuesiri, Van Hai Thi Nguyen, Nouhou Ndam, Catherine Mungai, Sarah Milne, Mathew Bukhi Mabele, Sadie Lucitante, Hugo Lucitante, Jonathan Liljeblad, Wilhelm Andrew Kiwango, Alfred Kik, Nikoleta Jones, Melissa Johnson, Christopher Jarrett, Rachel Sapery James, George Holmes, Lydia N. Gibson, Arash Ghoddousi, Jonas Geldmann, Maria Fernanda Gebara, Thera Edwards, Wolfram H. Dressler, Leo R. Douglas, Panayiotis G. Dimitrakopoulos, Veronica Davidov, Eveline M.F.W. Compaoré-Sawadogo, Yolanda Ariadne Collins, Michael Cepek, Paul Berne Burow, Dan Brockington, Michael Philippe Bessike Balinga, Beau J. Austin, Rini Astuti, Christine Ampumuza, and Frank Kwaku Agyei 559

Sustainability Careers
Christopher G. Boone, Erin Bromaghim, and Anne R. Kapuscinski 589

Three Decades of Climate Mitigation Policy: What Has It Delivered?
Janna Hoppe, Ben Hinder, Ryan Rafaty, Anthony Patt, and Michael Grubb 615

Overheating of Cities: Magnitude, Characteristics, Impact, Mitigation and Adaptation, and Future Challenges
Jie Feng, Kai Gao, H. Khan, G. Ulpiani, K. Vasilakopoulou, G. Young Yun, and M. Santamouris 651

Risks to Coastal Critical Infrastructure from Climate Change
Indrajit Pal, Anil Kumar, and Anirban Mukhopadhyay 681

US Legal and Regulatory Framework for Nuclear Waste from Present and Future Reactors and Their Fuel Cycles
Sulgiye Park and Rodney C. Ewing 713

V. Methods and Indicators

Metrics for Decision-Making in Energy Justice
Erin Baker, Sanya Carley, Sergio Castellanos, Destenie Nock, Joe F. Bozeman III, David Konisky, Chukwuka G. Monyei, Monisha Shah, and Benjamin Sovacool 737

Modeling Low Energy Demand Futures for Buildings: Current State and Research Needs
Alessio Mastrucci, Leila Niamir, Benigna Boza-Kiss, Nuno Bento, Dominik Wiedenhofer, Jan Streeck, Shonali Pachauri, Charlie Wilson, Souran Chatterjee, Felix Creutzig, Srihari Dukkipati, Wei Feng, Arnulf Grubler, Joni Jupesta, Poornima Kumar, Giacomo Marangoni, Yamina Saheb, Yoshiyuki Shimoda, Bianka Shoai-Tehrani, Yohei Yamaguchi, and Bas van Ruijven 761

Advances in Qualitative Methods in Environmental Research
Holly Caggiano and Elke U. Weber 793

Attribution of Extreme Events to Climate Change
Friederike E.L. Otto 813

Indexes

Cumulative Index of Contributing Authors, Volumes 39–48 829

Cumulative Index of Article Titles, Volumes 39–48 838

Errata

An online log of corrections to *Annual Review of Environment and Resources* articles may be found at http://www.annualreviews.org/errata/environ

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