

Advances in privately protected areas

Edited by

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Advances in privately protected areas

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Editorial: Advances in privately protected areas

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KEYWORDS

conservation covenants, conservancies, OECMs, privately protected areas, private land conservation, protected areas

Editorial on the Research Topic

Advances in privately protected areas

Background

As the world faces a biodiversity crisis, the protection of important natural areas and areas that are priorities for ecological restoration is becoming increasingly important. Under Target 3 the Convention on Biological Diversity's Kunming-Montreal Global Biodiversity Framework parties have agreed to the protection of at least 30% of terrestrial, freshwater and marine ecosystems by 2030 (CBD, 2022) (the 30x30 target). Privately protected areas (PPAs) are often under-recognised, despite their significant contributions to biodiversity conservation (Stolton et al., 2014; Bingham et al., 2017; Mitchell et al., 2018a). These areas, which meet the IUCN definition of a protected area (Dudley, 2008) and are under private governance, have a diverse range of ownership, governance and protection models and involve a wide range of people and organisations (Figure 1). This includes governance by individuals and groups of individuals; non-governmental organisations; corporations; for-profit owners such as ecotourism companies; research entities such as universities and field stations; or religious entities. As a result, they experience a set of challenges and opportunities that are often distinct from those faced by government protected areas (Mitchell et al., 2018a; Fitzsimons et al., 2024a).

Despite the proven importance of PPAs in increasing the extent, representativeness and connectivity of protected area networks in many regions (e.g. Archibald et al., 2020; Kareiva et al., 2021; Palfrey et al., 2022), these mechanisms have received less research attention than other forms of protected areas. The goal of this Research Topic is to increase the knowledge of aspects of PPA networks or programs at regional or national scales to ensure more effective establishment, management, financing and protection. This is important not only for existing networks and programs but to inform future growth in these networks.

This Research Topic sought to advance our understanding of PPAs at a system-wide scale. Key topics called for included:

- 1) Ecological contribution of PPAs to representation of ecosystem types or species in protected area networks, connectivity and corridors, climate refugia, and provision of ecosystem services;



FIGURE 1

Privately protected areas under a variety of governance types: (A) a conservation covenant in Tasmania, Australia, (B) a private wildlife sanctuary purchased with Australian Government and philanthropic funding, Queensland, Australia, (C) a private land preserve Oregon, USA (photos James Fitzsimons), (D) Pednavounder in Cornwall, England is owned by the UK non-profit the National Trust (photo: Equilibrium Research).

- 2) Legal and governance arrangements;
- 3) Key factors encouraging or inhibiting PPA establishment;
- 4) Landholder perceptions; and
- 5) Interactions with other protected area categories and with 'other effective area-based conservation measures' (OECMs).

Inventory on location and growth in privately protected area estates still essential

A number of papers focused on PPA inventory. At a global level [Lewis et al.](#) focused on the contribution of PPAs to the 30x30 target and builds on past inventories of PPAs in the World Database on Protected Areas and their contribution to global targets ([Bingham et al., 2017, 2021](#)). Many countries recognise the importance of PPAs to Target 3 (e.g. [Fitzsimons et al., 2023](#)). [Lewis et al.](#) rightly highlight that other elements of Target 3 (e.g. location, effectiveness) are equally as important as the 30% coverage aspect of this target and explore aspects of coverage, connectivity and ecological representation. They also explore how privately governed OECMs contribute to Target 3 in countries where they have been identified, and show how privately protected and conserved areas play a

significant role in some countries' efforts to meet Target 3 (a theme also picked up by [Kopsieker and Disselhoff](#)). Finally, acknowledging that PPAs are under-reported, they call for scaling up efforts for their recognition and documentation.

Building on past discussions and inventories of PPAs in Kenya (e.g. [Carter et al., 2008](#); [Olivier, 2014](#)), [Bashir and Wanyonyi](#) provide an updated discussion on the progress and challenges of wildlife conservancy establishment in that country. As of 2023, there were 230 wildlife conservancies in Kenya totalling 9.04 million ha and comprising 16% of Kenya's total land mass. To contribute to the global target of protecting 30% of lands, freshwaters and oceans by 2030, the Kenyan Government considers the expansion of the number and area of wildlife conservancies as an important mechanism to contribute to these targets. The authors also explore some of the definitional and delineation challenges that remain in classifying PPAs and OECMs (see also [Mitchell et al., 2018b](#); [Fitzsimons et al., 2024b](#)).

[Kopsieker and Disselhoff](#) examine the potential of PPAs and OECMs to contribute to the aspirations of meeting the 30x30 target in the European Union, and in Germany in particular. They identify legal hurdles for the designation and recognition of PPAs in Germany but estimate that close to one million hectares of land could be classified instead as OECMs and outline potentially qualifying sites.

Also in Europe, [Halevy et al.](#) explore the potential for the extractive industry to contribute to the EU Green Deal's biodiversity objectives. They argue that well-managed quarries can

serve as vital habitats for endangered species, particularly near Natura 2000 sites. The paper introduces conservation easements as a financial incentive for quarry operators to invest in ecological restoration. These legal agreements limit specific land uses, making conservation a more financially predictable business venture. They provide a set of 12 selection criteria to help identify optimal quarry sites for such easements. These criteria consider various factors, from location and size to ecosystem services and stakeholder's attitudes. By aligning economic incentives with conservation goals, the paper offers a pragmatic blueprint to incorporate the extractive industry into Europe's biodiversity strategy.

Bezaury-Creel builds on his previous research on PPAs in Mexico (i.e. **Bezaury-Creel, 2014**). **Bezaury-Creel** reports that 546 land parcels within 27 states held valid certificates as PPAs or 'territories and areas conserved by Indigenous Peoples and local communities' (ICCAs), for a total of 718,526 ha as at mid-2023. PPAs in Mexico include 175,006 ha of private lands plus 9,860 ha of public property, which collectively represent a 44% increase from their 2012 coverage of 128,369 ha, while community lands or ICCAs comprise 486,082 ha in mid-2023.

Elton and Fitzsimons build on other Australian inventories and ecological characteristics of PPA networks at national and subnational levels (e.g. **Fitzsimons and Wescott, 2001**; **Fitzsimons, 2015**) and explore the PPA network (namely conservation covenants) in the state of New South Wales (NSW). They review changes in policy and practice for private land conservation in the state that has led to a marked acceleration in the establishment of PPAs since 2017. The historical average rate at which PPAs were being established in NSW under various schemes prior to the changes in 2017 was about 50 agreements and 12,000 ha per annum. New legislation, the establishment of the Biodiversity Conservation Trust, and increased NSW Government funding in 2017 saw the acceleration of the rate of establishment of PPAs to more than 100 agreements and 45,000 ha per annum, with many more PPAs now being established in higher priority bioregions. **Elton and Fitzsimons** suggest key changes that have strengthened the framework for establishing and managing PPAs in NSW include a guide for strategic investment; institutional arrangements that foster effective governance, trust and transparency; substantive NSW Government funding; an accumulating endowment fund model; in-perpetuity payments; and faster and more targeted delivery mechanisms.

Exploring policy and research options

Brugler also explores the legal and governance arrangements that are best placed to enable the continued growth of PPAs in Australia. Focusing on the state of Victoria, it was found that the conservation covenant regime has the legal foundations to enable adaptive governance and that conservation covenants are expected to continue to be important in maintaining and establishing new PPAs, with opportunities for covenants to similarly deliver ecosystem restoration and climate adaptation objectives. However, ongoing adequate public investment in the covenant regime and the ability to attract new landowners in high priority landscapes without better financial incentives are identified as key challenges.

Richardson et al. explored the potential and policy shifts needed to enable covenants in Australia to expand their value beyond Target 3. While covenants have typically focused on the protection of existing natural values (as opposed to restoration of degraded lands), **Richardson et al.** identify pathways for enabling conservation covenants to play an expanded role in the context of ecosystem restoration and climate adaptation. Restoration is a major need in Australia (e.g. **Armitage et al., 2021**) and covenants could play an important role in protecting this investment in the long-term.

Finally, **Fitzsimons and Mitchell** investigate research priorities for PPAs based on surveys of members of the IUCN World Commission on Protected Areas Specialist Group on Privately Protected Areas and Nature Stewardship. The paper complements the research by **Dudley et al. (2018)** who explored research priorities for protected areas more broadly and builds on that of **Palfrey et al. (2021)** who synthesised topics discussed in published research on PPAs to date. **Fitzsimons and Mitchell** found responses were higher on enabling factors and mechanisms specific to PPAs and somewhat fewer on ecological and social outcomes. They suggest results can be used to guide future research efforts that will be most meaningful to improve PPA take up, effectiveness and longevity, noting there is a need for researchers, practitioners, landowners and managers, and policymakers to collectively set the research agenda.

Concluding remarks

This Research Topic on Advances in Privately Protected Areas presents important new information on the growth and future potential of PPAs. This is critical in helping advance efforts to protect 30% of the Earth's lands, freshwaters and oceans by 2030. We hope that this Research Topic will stimulate further research into PPAs, their contribution towards national and global biodiversity targets and means of increasing uptake and sustained managed of biodiversity in the long term.

Author contributions

JF: Writing – original draft, Writing – review & editing. SS: Writing – original draft, Writing – review & editing. MR: Writing – original draft, Writing – review & editing.

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Framework features enabling faster establishment and better management of privately protected areas in New South Wales, Australia

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In response to the Convention on Biological Diversity's Kunming-Montreal Global Biodiversity Framework, Australia has committed to protecting 30 per cent of lands and oceans for nature conservation by 2030. Privately protected areas are vital to meeting this target and establishing an ecologically representative and well-connected National Reserve System on land in Australia. As a federated nation, most public and privately protected areas (especially conservation covenants) are established under state or territory (i.e. subnational) legislation, as opposed to national legislation. This paper conducts a review of changes in policy and practice for private land conservation in the state of New South Wales (NSW) that has led to a marked acceleration in the establishment of privately protected areas since 2017. The historical average rate at which privately protected areas were being established in NSW under various schemes prior to the changes in 2017 was about 50 agreements and 12,000 hectares per annum. The new *Biodiversity Conservation Act 2016*, the Biodiversity Conservation Trust of NSW (BCT), and increased NSW Government funding commenced in August 2017. Since then, the rate of establishment of privately protected areas has accelerated to more than 100 agreements and 45,000 hectares per annum. Not only has the rate of establishment more than tripled (by area) but many more privately protected areas are being established in higher priority bioregions, and the BCT is now able to provide better financial and technical support to privately protected areas, leading to better conservation outcomes overall. Key changes that have strengthened the framework for establishing and managing privately protected areas in NSW include a guide for strategic investment; institutional arrangements that foster effective governance, trust and transparency; substantive NSW Government funding; an accumulating endowment fund model; in-perpetuity payments; and faster and more targeted delivery mechanisms. The paper highlights features that could be adopted in other jurisdictions in Australia to support the vital role that privately protected areas must play in achieving commitments to nature conservation.

KEYWORDS

privately protected areas, global biodiversity framework, national reserve system, nature conservation, private land conservation, conservation covenants, biodiversity offsets

1 Introduction

1.1 Global context for protected areas

Protected areas are considered one of the most reliable forms of nature conservation and protected area networks often form a key part of conservation strategies (Watson et al., 2014; Maxwell et al., 2020). Australia, as a signatory to the Convention on Biological Diversity, has for almost three decades been expanding its protected area estate. Australia signed on to the Convention on Biological Diversity's Kunming-Montreal Global Biodiversity Framework (GBF) in December 2022 (CBD, 2022). The GBF significantly increased the ambition for nature conservation at a global level, in recognition of the dire state of biodiversity.

One of the headline targets of the GBF is Target 3 (the '30x30' target): *'Ensure and enable that by 2030 at least 30 per cent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, ...'*. Protected areas are critical to the success of many targets and goals in the GBF.

The Australian Government through its Nature Positive Plan (DCCEEW, 2022a) and in collaboration with subnational state and territory governments (Environment Ministers Meeting, 2022), committed to a domestic target to *'protect and conserve 30 per cent of land and 30 per cent of oceans by 2030'* prior to signing the GBF.

1.2 Australian context for privately protected areas

Australia's National Reserve System (NRS) is a network of public, Indigenous and privately protected areas over land and inland waters (the National Representative System of Marine Protected Areas occurs in marine environments) (DCCEEW, 2021a). Its focus is to secure long-term protection for samples of Australia's diverse ecosystems and the plants and animals they support. It is recognised that the NRS cannot be built solely on public lands and there is a significant role for Indigenous groups, local communities, private landholders, and non-government organisations to play in establishing and managing protected areas to ensure the success of the NRS. The Australian Government has played an important role in growing the private land trust sector in Australia over the past 20 years (land trusts being non-government organisations owning and managing land for conservation). Specifically, the provision of up to two-thirds of the purchase price for strategic land acquisitions through the National Reserve System Program has seen land owned by this sector grow from thousands of hectares in the mid-1990s to millions of hectares today (Fitzsimons, 2015; Fitzsimons, 2018).

The NRS is underpinned by a scientific framework that has a clear objective *'to develop a comprehensive, adequate and*

representative system of protected areas,' commonly referred to as a 'CAR' reserve system (JANIS, 1997; NRMCC, 2005; NRMCC, 2009; DCCEEW, 2021b; DCCEEW, 2022b).

The extent of protected areas in Australia is mostly recorded in the Collaborative Australian Protected Area Database (CAPAD) (DCCEEW, 2023c). The 2022 CAPAD data reports 13,903 protected areas covering 169.9 million hectares or 22.10 per cent of the Australian landmass. Some 9.94 per cent of the Australian continent is in public protected areas, 10.94 per cent covered by Indigenous protected areas (IPAs) and 1.23 per cent as privately protected areas (PPAs). Therefore, in 2022, PPAs contribute at least 5.6 per cent to the total of protected areas in Australia. However, not all PPAs are reported as part of CAPAD (Fitzsimons, 2015; Clements et al., 2018).

It is important however that the data be examined at bioregional or subregional scales to understand the extent to which protected areas are ecologically representative (see analysis below).

1.3 The nature of PPAs in Australia

1.3.1 Conservation covenanting programs

One main way in which PPAs are established in Australia is via conservation covenanting programs administered by departments or statutory authorities of subnational governments. Conservation covenants, usually via their associated private land conservation agreements, typically include restrictive components (e.g. preventing development on the land) and sometimes positive components (e.g. obliging the landholder to conduct certain conservation management activities). Although there is no Australian Government control over conservation covenants, State covenanting programs can be approved by the federal environment minister under the *Income Tax Assessment Act 1997* for the purpose of access to tax concessions for eligible landholders (DCCEEW, 2023b).

CAPAD 2022 data reports 6,148 PPAs established via conservation covenants, covering 5.96 million hectares or 0.78 per cent of Australia (DCCEEW, 2023c) (although covenants have been historically under-reported in this database; Fitzsimons, 2015).

1.3.2 Private nature reserves

The second main way in which PPAs are established in Australia is as Private Nature Reserves (Fitzsimons, 2015). CAPAD 2022 data reports 92 Private Nature Reserves covering 3.5 million hectares or 0.45 per cent of Australia (DCCEEW, 2023c), however a 2013 estimate puts the land held by land trusts closer to 4.6 million hectares (Fitzsimons, 2015; Bingham et al., 2017).

These private nature reserves are recognised by the Australian Government as PPAs because their acquisition has been facilitated with funds from the Australian Government's NRS Program and a 99 year contract stating they are part of the NRS (Fitzsimons, 2006; Fitzsimons, 2015); and/or because *'they are managed by established environmental ... NGOs'* that are *'deemed to be protected through other effective means'* based on the organisation's purpose/mission,

policies and that their activities are consistent with the in-perpetuity conservation of private land.' (Georgina Usher, DCCEEW pers. comm, 2023).

1.4 The importance of PPAs

PPAs, alongside IPAs and public protected areas, are vital to the success of the GBF (Bingham et al., 2021). The IUCN recognises that PPAs offer great opportunities for expanding the conservation estate to protect and manage areas of important biodiversity that lie beyond the boundaries of public protected areas (Mitchell et al., 2018a).

PPAs play a vital role in contributing to ecological representativeness, connectivity and ecosystem services, particularly in those bioregions and landscapes in Australia that are dominated by agricultural land uses, where there has been significant land clearing and fragmentation of remnant native vegetation, and where the bulk of the land is privately owned or managed (Fitzsimons and Wescott, 2001; Pasquini et al., 2011; Fitzsimons et al., 2013; Fitzsimons, 2015; Archibald et al., 2020).

PPAs that are appropriately supported with access to grants or annual payments, and access to technical support, can also bring important social and economic benefits to regional areas (Selinske et al., 2022). Funded PPAs can support rural and regional landholders with diversified sources of income for the environmental stewardship of parts of their properties, with flow-on economic benefits in their regional communities.

Palfrey et al. (2020) examined 412 articles in the global literature about the environmental and social outcomes of PPAs. They found the environmental outcomes of PPAs were mostly positive (89%), but social outcomes of PPAs were reported less (12% of all studies), and these outcomes were more mixed (65% positive). In Australia, various aspects of PPAs have been examined at the national level (e.g. Fitzsimons and Carr, 2014; Fitzsimons, 2015; Hardy et al., 2017; Ivanova and Cook, 2020) and within some states (e.g. Victoria; Fitzsimons and Wescott, 2001; Fitzsimons, 2006) but NSW has not been examined in detail.

The purpose of this paper is to document innovations that have strengthened the framework for establishing and supporting PPAs in New South Wales, with a particular focus on conservation covenants. We assess the key features of the new NSW framework and how these have accelerated the establishment of PPAs and provide increased financial and technical support to landholders managing PPAs. We also provide recommendations to further strengthen the NSW framework; the adoption of elements of the NSW approach by other sub-national governments; and the need to accelerate the establishment of PPAs nationally.

2 Assessment of the new NSW framework for PPAs

2.1 NSW operating context

Of Australia's 89 bioregions, 19 occur wholly or partly in NSW. In NSW, four bioregions exceed 30 per cent protected, one exceeds 17 per

cent protected, while seven are less than 17 per cent protected, and another seven are less than 5 per cent protected. There are 14 bioregions representing more than 88% of NSW which have less than 17 per cent of the land included in protected areas (DCCEEW, 2023c).

Many of these under-protected bioregions occur in the NSW wheat-sheep belt and other regions where agriculture is the dominant land use (see Figure 1), where there has been significant land clearing, and where the bulk of the land is privately owned or managed. Over 75 per cent of NSW is used for agriculture: 47 per cent for grazing native vegetation (mainly in the western division); 15 per cent and 13 per cent for modified pastures and cropping, respectively, mainly in the central division wheat-sheep belt and the Monaro; and 0.12 per cent for horticulture (ABARES, 2022). Some 249 of 571 NSW (Mitchell) Landscapes (Mitchell, 2002; NSW Government, 2023) have been cleared by more than 50 per cent, of which 161 have been cleared by more than 70 per cent (DPE, 2022).

The NSW Biodiversity Outlook Report found that several NSW bioregions are close to a point of accelerating biodiversity loss. It explored ecological carrying capacity, defined as a measure of effective habitat after accounting for the time-delayed extinction loss of sensitive species following clearing (NSW Department of Planning, Industry and Environment, 2020) (Figure 2).

Given this context, PPAs must play a far greater role in building the NRS in NSW and contributing to the GBF's Target 3, particularly in the landscapes dominated by private ownership, agriculture, over-clearing, and loss of ecological carrying capacity.

2.2 NSW reforms

The NSW Government conducted a large-scope land management and biodiversity conservation reform process from 2013 that culminated in the *Biodiversity Conservation Act 2016* (the Act) and amendments to the *Local Land Services Act 2013*.

The reforms introduced stronger and more contemporary legislative provisions for the protection and management of biodiversity in NSW, including the offences, penalties and licensing regime for protecting native plants and animals; supporting recovery of threatened species and ecological communities; and for private land conservation.

Prior to 2017, the framework for private land conservation in NSW was administered by the then environment department and complemented by a former statutory authority: the NSW Nature Conservation Trust. However, there had been very limited funding in prior years and PPAs were being established at a relatively low rate (see analysis below).

The reforms included a commitment to funding of AU\$240 million over the first five years and AU\$70 million per annum ongoing (escalated with inflation) for a new private land conservation program to be administered by a new Biodiversity Conservation Trust (BCT). The BCT is a not-for-profit statutory authority governed by a semi-independent board. The reforms and the BCT commenced in August 2017. This aspect of the reforms is examined in detail in this paper.

While we see merit in these aspects, two key challenges have arisen from the broader reforms. Amendments to the *Local Land Services Act*

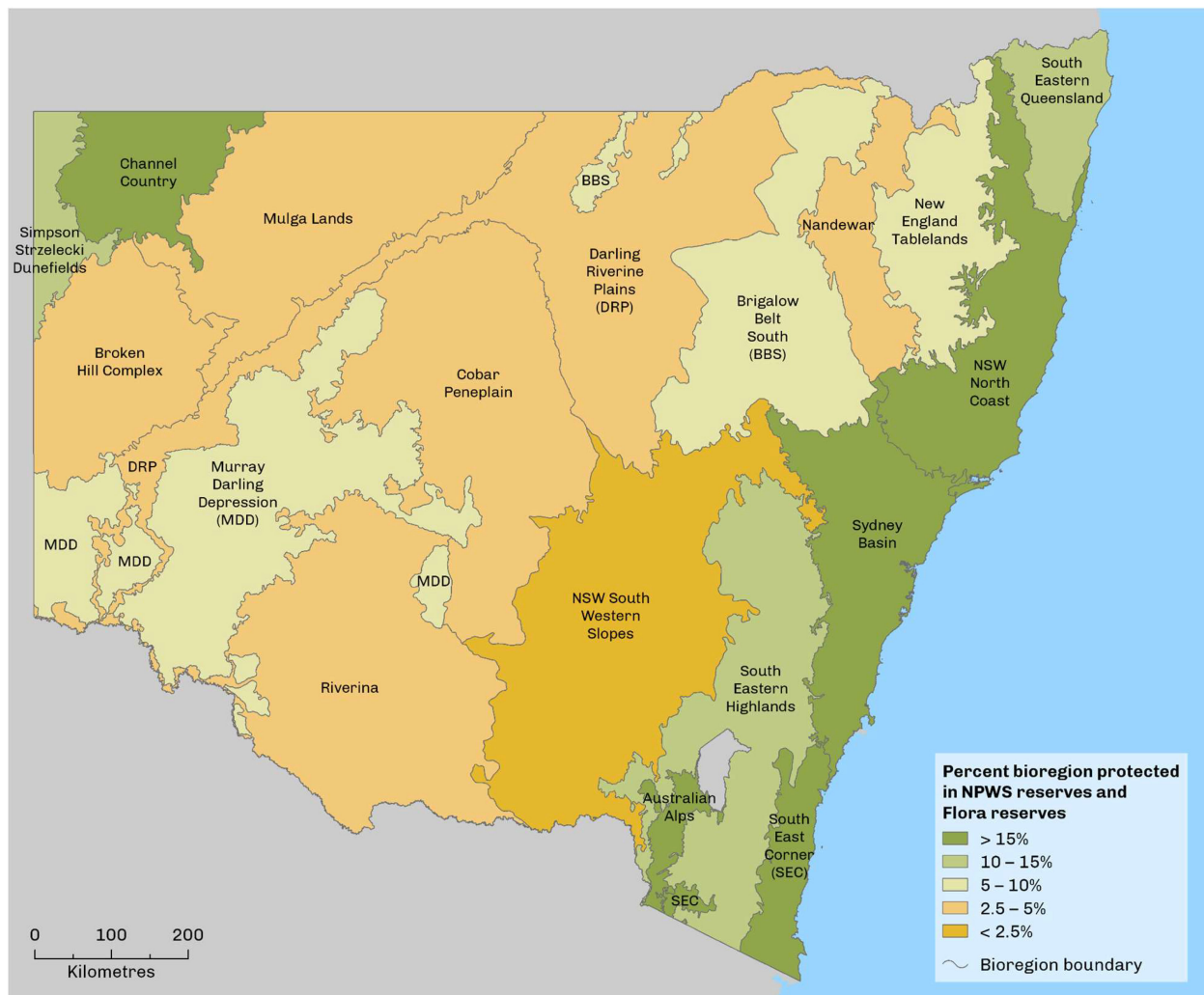


FIGURE 1
The percentage of bioregions in New South Wales included in protected areas (NSW EPA, 2021).

2013 allowed greater scope for clearing of native vegetation for agricultural development or expansion without the normal offset obligations imposed on other forms of land development. This has resulted in higher rates of clearing of native vegetation in NSW since 2017 (DPE, 2022; DPE, 2023). The reforms also introduced the NSW Biodiversity Offset Scheme, which has many positive design features, but the implementation of which has been subject to some critical scrutiny through both a NSW Auditor General's performance audit (NSW Audit Office, 2022) and a NSW parliamentary inquiry into the integrity of the scheme (NSW Parliament, 2022).

2.3 Innovative features in the new NSW framework for private land conservation

2.3.1 A contemporary legal and institutional framework

Through the 2017 biodiversity conservation reforms (Parts 5, 6 and 10 of the Act), NSW established a robust and contemporary

legal and institutional framework to support the establishment and management of private land conservation agreements (some of which count as PPAs).

The Act establishes strong governance arrangements for the BCT as the sole government entity for private land conservation in NSW. A key feature of the BCT's strategic approach is a diversity of programs, delivery mechanisms and private land conservation agreements.

The Act preserved, rationalised, and strengthened the legislative basis for three types of statutory private land conservation agreements and their associated covenanting mechanisms. The three types of private land conservation agreements are: wildlife refuge agreements (which can be revoked) and conservation agreements (which can be for a set term or in-perpetuity) established under the NSW Government's private land conservation program; and in-perpetuity biodiversity stewardship agreements established under the NSW Biodiversity Offsets Scheme. Those conservation agreements that are in-perpetuity and biodiversity stewardship agreements meet the definition of

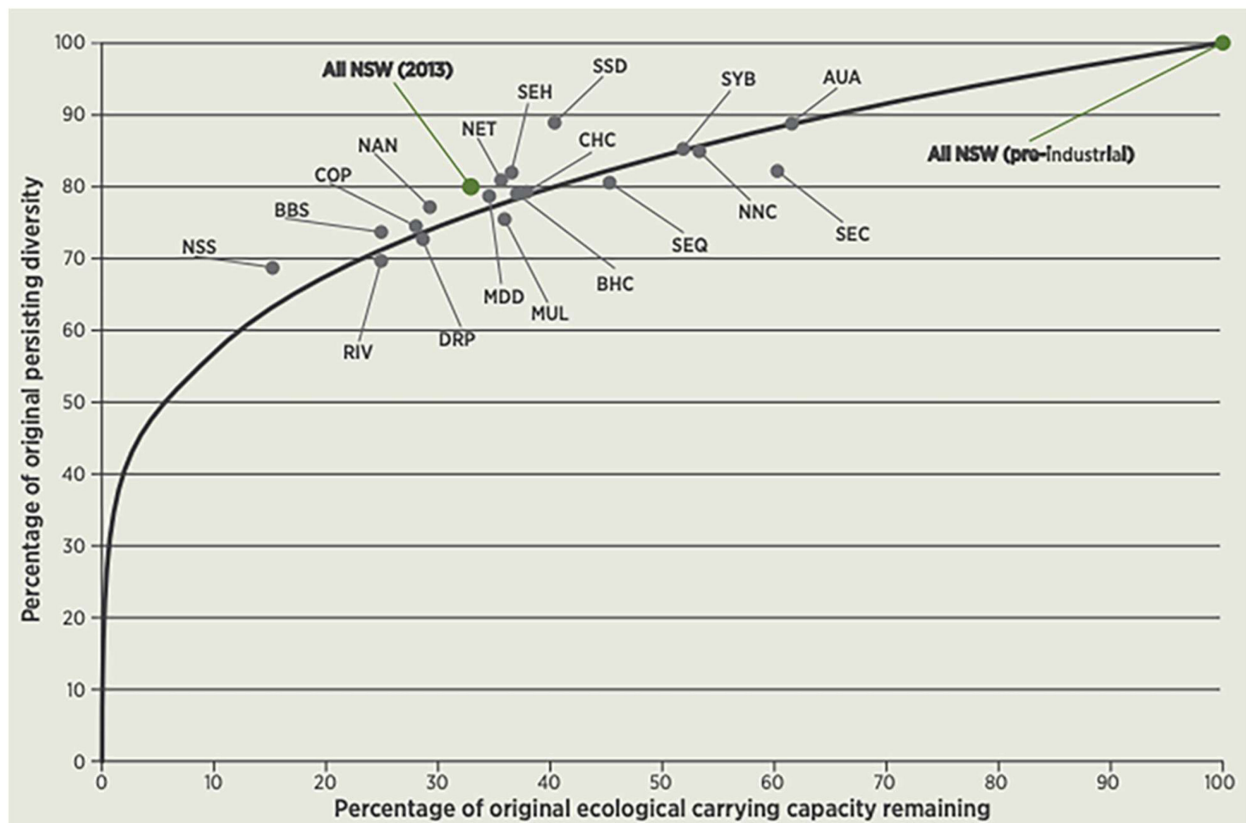


FIGURE 2

Declining ecological carrying capacity in NSW bioregions. Graph represents percentage of persisting diversity of vascular plant ecosystems for each bioregion, plotted against percentage of ecological carrying capacity remaining. The line shows the theoretical relationship between effective habitat and persisting diversity. Bioregion codes NSS, NSW South Western Slopes; BBS, Brigalow Belt South; COP, Cobar Peneplain; NAN, Nandewar; NET, New England Tablelands; SEH, South East Highlands; SSD, Simpson-Strzelecki Dunefields; CHC, Channel Country; SYB, Sydney Basin; AUA, Australian Alps; RIV, Riverina; DRP, Darling Riverine Plains; MDD, Murray-Darling Depression; MUL, Mulga Lands; BHC, Broken Hill Complex; SEQ, South East Queensland; NNC, NSW North Coast; SEC, South East Corner. Source: NSW Department of Planning, Industry and Environment, 2020.

PPAs. Set-term conservation agreements and wildlife refuge agreements do not.

The BCT retained, strengthened, and extended existing programs and delivery mechanisms previously operating in NSW (revolving fund, grants and voluntary applications for wildlife refuges or conservation agreements); and added new programs and mechanisms (fixed price offers, conservation tenders, co-investment partnerships).

Under the BCT's Conservation Management Program, under which the BCT enters agreements with annual payments in priority investment areas, the delivery mechanisms are: (1) fixed price offers; (2) conservation tenders; (3) co-investment partnerships; and (4) a revolving fund (BCT, 2023l).

Under the BCT's Conservation Partners Program, under which the BCT enters partnership conservation agreements with access to grants, the delivery mechanisms are: (1) landholder applications for conservation agreements; (2) landholder applications for wildlife refuge agreements; (3) conservation partners grants; and (4) the revolving fund (BCT, 2023k).

The BCT has developed further mechanisms under the Biodiversity Offsets Scheme, including the management of biodiversity stewardship agreements.

This diversity of programs, delivery mechanisms and agreements operate to provide alternative pathways to private land conservation for landholders with diverse interests, and to maximise the scope to advance private land conservation and PPAs in NSW by targeting a range of nature conservation objectives through tailored mechanisms.

2.3.2 Strategic investment

An important enhancement to the NSW framework is provision in the Act for the Minister to make a Biodiversity Conservation Investment Strategy. The strategy must include a map of identified priority investment areas (Figure 3) and principles that guide investment in those priority investment areas. The purpose of the science-based strategy is to guide the government and the BCT in prioritising investment in biodiversity conservation.

2.3.3 Fostering trust and transparency

The provisions establishing the BCT and the BCT Board are important in establishing transparency and trust with prospective and participating landholders.

In establishing a government-sponsored entity to deliver public-private partnerships in private land conservation, the

government, including as an enabling and funding partner, has a legitimate interest in being able to control the entity. That said, transparency and a degree of independent and sound governance are vital to enable trust to exist between the government-controlled private land conservation entity and private landholders.

Recognising the need to strike a balance, the Act provides for BCT to be subject to the control and direction of the Minister *and* provides that the BCT must publish any directions made by the Minister. This transparency requirement appropriately positions the BCT Board as a semi-independent body to govern the BCT and its relationships with participating landholders.

The Act states BCT must conduct its activities in accordance with a business plan approved by the Minister *and* requires the business plan to be published. The BCT is also required to prepare an annual report (e.g. BCT, 2022b), including the BCT's financial statements, which must be tabled in Parliament and published.

BCT manages and controls three funds, which have prescribed functions, and to act as trustee of money or other property vested in the BCT, including the monies held, managed and invested to support term or in-perpetuity annual payments to agreement holders. These provisions impose a strong duty of care on the BCT to exercise rigorous and prudential funds and investment management. These provisions were designed to give confidence to prospective and participating landholders that the government and the BCT will honour agreed payment arrangements.

2.3.4 Substantive NSW government funding for BCT operations

The lack of suitable and adequate funding arrangements has been a key factor inhibiting the role of PPAs in contributing to the NRS. In NSW prior to 2017, funding was generally modest, sporadic and short term.

In NSW, the BCT manages over 2,270 private land conservation agreements (as at 31 March 2023) and is seeking to enter a further 400 during its current four-year business plan.

The BCT currently spends about \$25 million per annum to operate and support private land conservation in NSW. Of this \$25 million, about \$7 million is expended on management and governance of the BCT (i.e. overheads) and the balance is expended on program delivery and landholder support, including program design, program delivery to procure new agreements (e.g. the conduct of conservation tenders to bring new landholders in to private land conservation), funds and investment management, grants for agreements not including annual payments, ecological monitoring, and vitally, education (BCT, 2023j) and participating landholder support programs.

The amount to be expended on operations can be expected to grow over time as more landholders participate in private land conservation, but this would be incremental as significant economies of scale can be anticipated. This can be supported also by making provisions from the investment budget (see below) for ongoing functions like landholder support. If, for example, the pace of investment was to double or triple (which may be required to achieve a CAR NRS and nature-positive outcomes by 2050), the operational budget of the BCT may only need to increase to about \$30 to \$35 million per annum.

2.3.5 Substantive NSW government funding for investment in PPAs

Landholders entering private land conservation agreements face three main costs: the opportunity cost of foregone alternative uses of the land, transactions costs in establishing an agreement (e.g. application fees, environmental assessment, legal advice, taxation advice), and ongoing conservation management costs (with higher

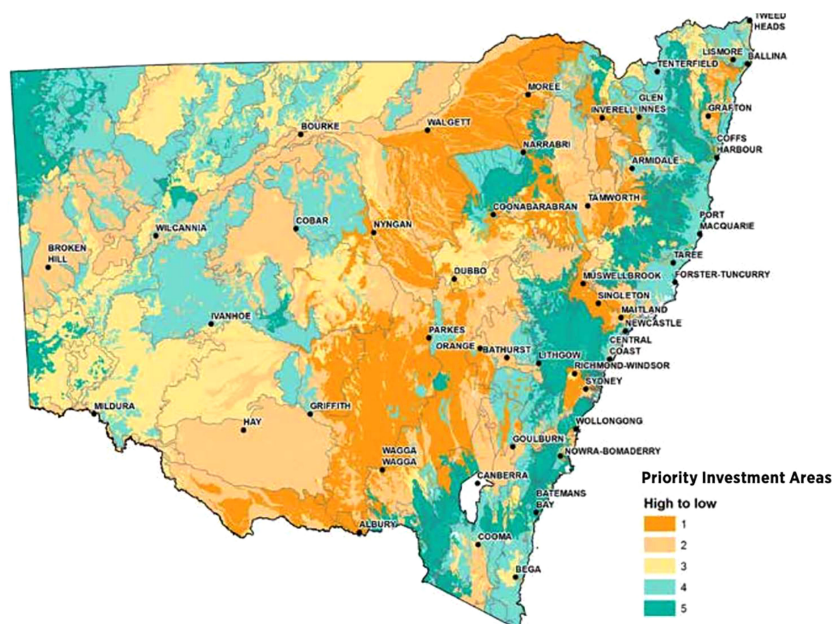


FIGURE 3
NSW priority biodiversity conservation investment areas. Source: NSW Office of Environment and Heritage, 2018.

expenditures usually occurring in the earlier establishment years and sporadically thereafter as a result of *force majeure* events). In addition, some altruistic landholders may accept significant or some net losses to participate in private land conservation while others may expect to make some level of profit from engaging in private land conservation.

PPAs established under State-administered schemes are effectively public–private partnerships. The landholder manages the land for the long-term conservation of nature while the covenant issued by the State is the legal means that establishes the clearly defined geographical space that is dedicated permanently (or long-term) for this purpose. One complexity that arises in such public–private partnerships is funding arrangements for PPA establishment and ongoing conservation management.

By comparison, the management and funding of public protected areas such as national parks is conceptually simpler. In these cases, the government owns, controls and manages the land pursuant to an Act of the State, and is responsible for funding capital and recurrent expenditure requirements. While conceptually simpler, in practice quality conservation outcomes in public protected areas are dependent on the will of governments of the day to invest adequately in effective conservation management.

To be successful in achieving intended conservation outcomes, a PPA, as a permanent or long-term government–landholder partnership, must be supported by an adequate permanent or long-term funding arrangement negotiated between the government and the landholder, ideally with both parties contributing proportionate to the benefits they derive.

While some benefits of a PPA may flow to the individual landholder (e.g. through ecosystem services) many and usually most benefits (e.g. protection of threatened species and conservation of biodiversity at landscape and bioregional scales) flow to surrounding landscapes and the broader community (Archibald et al., 2021). Therefore, the government partner should make an appropriate and sustainable financial contribution to fund these positive externalities. The extent to which the government partner may fully or partially contribute to the overall costs of a PPA will depend on many factors, including the government partner's objectives and method of procurement, and the motivations and interests of the participating landholder (and any third-party co-investors).

Long-term funding arrangements are therefore critical to supporting both participation in PPAs and to maintaining long-term, good-quality conservation outcomes.

The NSW Government has recognised this; that governments, alongside the private and non-government sectors, must contribute to building the PPA estate in Australia. From August 2017, the NSW Government committed funding for private land conservation of \$70 million per annum (escalated with inflation), including the \$25 million for BCT operations as set out above, and \$45 million per annum for investment in new funded conservation agreements. This is an impressive start but whether it is sufficient is explored later in this paper.

2.3.6 Payment certainty through an accumulating endowment fund

To encourage participation, landholders must feel that they can trust the government and its private land conservation entity to

honour the private land conservation agreement and any associated funding arrangements. NSW is one jurisdiction at least where some scepticism about private land conservation programs had arisen in prior decades due to longer-term funding promises being abandoned.

A key innovation in the new NSW framework was the establishment of a new Biodiversity Conservation Fund under the Act.

Once a private land conservation agreement has been prepared via one of the BCT's delivery mechanisms, it specifies the annual payments the landholder will receive for the term of the agreement, including for in-perpetuity agreements. The approach allows for variable payment amounts over the first 15 years and a fixed amount thereafter. It codifies how payments will be indexed each year due to realised inflation. The BCT can include annual funding provisions to support the BCT's ongoing functions such as agreement management, landholder support and ecological monitoring. The BCT then determines a present value of these future payments and provisions using a discount rate.

The discount rate is set by the BCT Board annually having regard to its financial risk appetite; advice from the NSW Treasury Corporation (TCorp) on long-term investment return and volatility forecasts, and inflation assumptions; BCT and TCorp fund management fees; modelling from actuaries on the forecast probability of future fund adequacy; and advice from actuaries on an appropriate investment market risk adequacy margin.

The BCT uses the Biodiversity Conservation Fund to hold, up-front, the assets (i.e. full present value of future payments) required to support the inflation-indexed annual payments for the term or in-perpetuity life of each new funded conservation agreement it enters.

The BCT Board aims to maintain the fund at present level of asset adequacy of 120 per cent relative to the present value of all future conservation agreements payments and BCT provisions, to mitigate the risk of market downturns.

The funds set aside for each agreement in the Biodiversity Conservation Fund are invested via TCorp in inflation-hedged investments. The principal amounts and proceeds of investment are used to make the annual payments. For term agreements, the principal amount is drawn down over the life of the agreement, whereas for in-perpetuity agreements, the aim is to retain the principal amount (managing fluctuation from year to year due to market volatility).

From the Biodiversity Conservation Fund, the BCT makes annual term or in-perpetuity payments for conservation agreements established in priority investment areas (BCT, 2023a). As at 31 March 2023, the BCT was “investing more than \$239.9 million to support these agreements. ... Landholders with funded agreements are typically being paid between \$5 and \$432 per hectare, per annum to manage these conservation areas.” (BCT, 2023d). In the 12 months to 31 March 2023, the BCT made payments worth \$10.3 million to the 165 holders of funded conservation agreements (BCT, 2023d).

The Biodiversity Conservation Fund is in effect an accumulating endowment fund and provides substantial certainty for the participating landholders that the term or ongoing annual

payments will be honoured. It also mitigates against any risk that already participating landholders would become disadvantaged if a future NSW Government opted to cease investing in new private land conservation agreements.

2.3.7 New, faster and targeted delivery mechanisms – fixed price offers and conservation tenders

PPAs in Australia have been established historically by landholders voluntarily applying to enter private land conservation agreements (with associated covenants) with governments (Fitzsimons and Carr, 2014). This has sometimes been supported by incentives to support establishment and/or short-term grants for conservation management. This has been effective in some jurisdictions over time but the levels of landholder participation, pace of establishment of PPAs, and the quality of conservation outcomes have been hampered by an absence of or insufficient funding for establishment costs and/or ongoing conservation management costs.

Voluntary mechanisms have largely relied on altruistic landholders willing to bear the bulk of or all costs of establishing and managing a PPA. This reliance on altruism has skewed establishment of PPAs into only some bioregions or subregions where it is attractive to landholders to manage a conservation property as a lifestyle option. In NSW for example, voluntary private land conservation agreements are concentrated in coastal and hinterland regions (BCT, 2023d), similar to some other jurisdictions (Fitzsimons and Wescott, 2001; Fitzsimons, 2015).

The quantum and ongoing commitment of NSW Government funding enabled the BCT to go beyond traditional delivery mechanisms like the revolving fund and unsolicited and unfunded voluntary agreements, and to accelerate the establishment of conservation agreements in priority investment areas. To achieve this, the BCT designed two primary delivery mechanisms aimed at achieving private land conservation agreements (mainly PPAs) at a greater pace and scale, and in priority investment areas: fixed price offers and conservation tenders.

The BCT offers a standing fixed price per hectare per year for the conservation of biodiversity in certain priority investment areas (BCT, 2023g). These areas contain threatened ecological communities, habitat for threatened species and/or important wetlands. They are under-represented in the NRS. Landholders can express interest at any time and the BCT assesses applications annually.

The BCT typically conducts three conservation tenders each year in targeted priority investment areas for specified conservation values.

The main difference between the two mechanisms is that one involves a fixed annual payment offered by the BCT, whereas in conservation tenders bidders set their own schedule of proposed annual payments. Both are competitive processes aimed at eliciting value-for-money conservation agreements. In both mechanisms, the BCT funds and conducts biodiversity value assessments and assists landholders to participate through a supported, two-stage process.

In both mechanisms, after receiving expressions of interest in the first stage, the BCT checks eligibility and shortlists the best prospects for on-site assessments. During site assessments, the BCT

works with the landholder to identify conservation values, and a suitable conservation area, and drafts a conservation agreement and associated conservation management plan. At this stage, the BCT also assesses the site using its peer-reviewed Assessment Metric to determine a Biodiversity Value Score (BCT, 2022a).

Once a set of conservation agreements have been prepared for a conservation tender, the BCT invites the landholders to price their agreement, by specifying the annual payments they wish to receive, and to submit the draft agreement and payment schedule as a tender bid (similar to other tender-based approaches in Australia: Rolfe et al., 2017; Whitten, 2017). In the case of fixed price offer rounds, the BCT invites the landholder to apply to enter the draft agreement based on the BCT relevant fixed price offer.

In both mechanisms, the BCT establishes independent panels to assess value for money in accordance with a tender evaluation plan. A key determinant for ranking successful bids and applications is value for money determined by calculating a Biodiversity Value Index, where the Biodiversity Value Score is the numerator, and the present value of the proposed payments and provisions is the denominator. Other assessment criteria are also applied to ensure the BCT is only selecting good, value-for-money conservation agreements.

The BCT has to date conducted six rounds of fixed price offers and 17 conservation tenders (BCT, 2023d). Figure 4 shows funded conservation agreements, established via fixed price offers and conservation tenders under the BCT's Conservation Management Program, have been effective in the establishment of more PPAs in the priority investment areas of NSW, i.e. in priority investment areas 1, 2 and 3 shown in Figure 3 (BCT, personal communication, 25 July 2023).

2.3.8 New delivery mechanisms – co-investment partnerships

In June 2022, the BCT launched a co-investment partnerships prospectus inviting the corporate and philanthropic sectors, and the Australian Government, to co-invest with the BCT in private land conservation and biodiverse carbon projects (BCT, 2022c). The prospectus lists five co-investment partnership pathways: (1) biodiversity plus carbon projects; (2) supporting Aboriginal landholders; (3) real property, real conservation; (4) large-scale conservation properties; and (5) protecting endangered species and ecosystems. The objective of these new delivery mechanisms is to leverage third-party investment in PPAs, in addition to BCT and landholder investment, by highlighting and enabling access to the BCT's high-integrity mechanisms for investing in nature conservation and biodiverse carbon projects.

Two tangible outcomes have arisen to date. Firstly, the BCT has entered its first co-investment partnership for a large-scale conservation and cultural heritage site arising from its first co-investment partnership with an Indigenous landholder (the Nari Nari Tribal Council), and an NGO (The Nature Conservancy Australia). This single agreement entails a very large PPA at Gayini (55,220 ha) in a high priority bioregion, with Nari Nari Tribal Council to receive annual funding of about \$1 million per annum (BCT, 2023h).

Secondly, the BCT is currently conducting its first biodiversity plus carbon conservation tender (BCT, 2023i). Telstra (a national

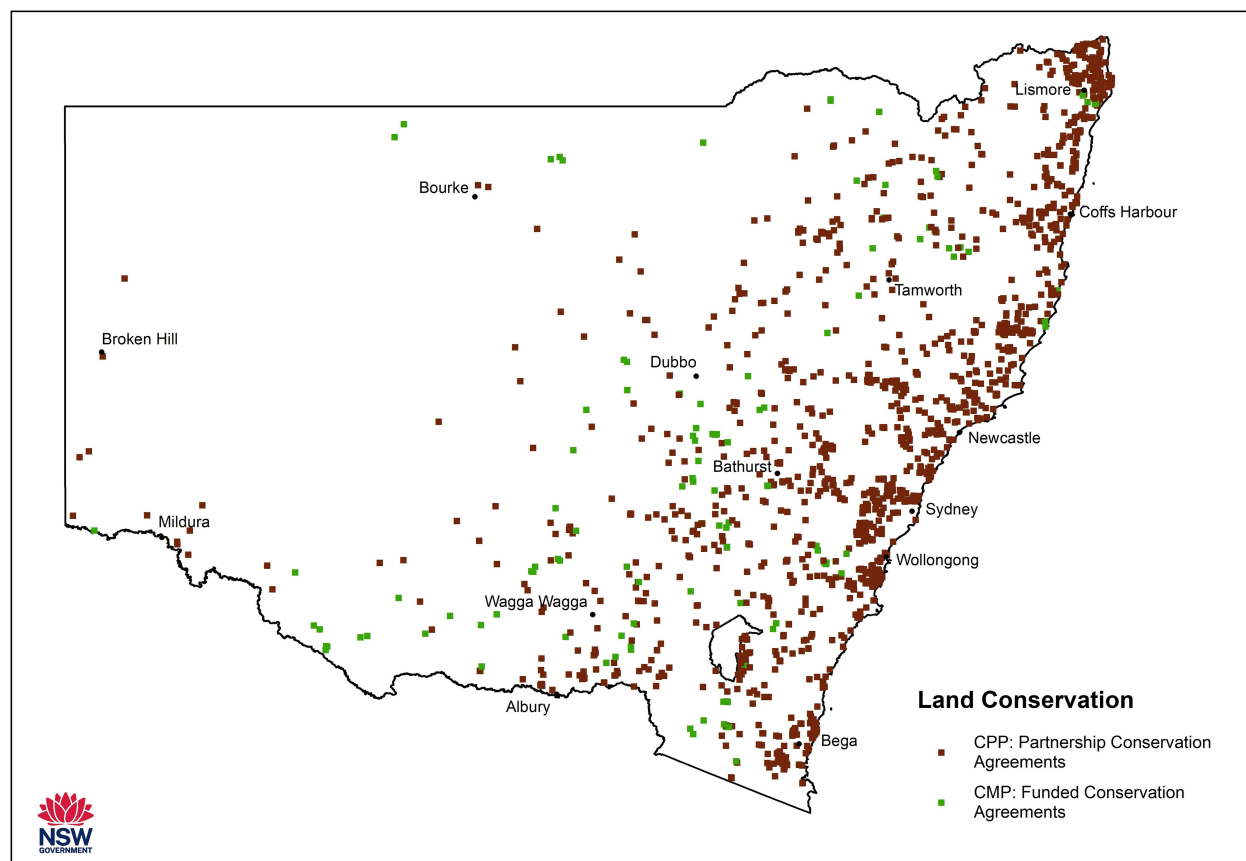


FIGURE 4

Conservation agreements resulting from the NSW Biodiversity Conservation Trust's Conservation Partners Program (CPP) and Conservation Management Program (CMP) as at 31 March 2023. Source: NSW Biodiversity Conservation Trust.

telecommunications company) has entered into a co-investment partnership with the BCT to support this new type of tender. Telstra may offer long-term contracts to successful landholders to purchase Australian Carbon Credit Units generated over the life of the carbon project; and the BCT will make payments for the long-term biodiversity values that arise from the biodiverse carbon project, to be located within the conservation covenant. There is enormous potential for the BCT to further accelerate the establishment of PPAs by leveraging more corporate investment in nature conservation or in biodiverse carbon projects.

Currently, the BCT is in effect purchasing the protection of all or most of the biodiversity values that arise from conservation agreements that receive annual payments and some of the values from those landholders that receive grants.

The BCT is exploring development of a tradable biodiversity unit for conservation agreements that could be used to support corporate investment in biodiversity projects alongside carbon projects (BCT, 2023m).

2.3.9 Strengthened delivery mechanism – revolving fund

Some organisations use 'revolving funds' to buy land, place it under permanent protection, and on-sell it to landholders willing to manage the land for conservation under a conservation covenant. In

the past, the former NSW Nature Conservation Trust managed a revolving fund.

Revolving funds can be highly effective by being opportunistic in the real estate market and securing properties with high conservation values (Hardy et al, 2018a; Hardy et al, 2018b; Hardy et al, 2018c). However, they can only establish PPAs at considerable capital or transactional cost. Historically, these significant costs and the opportunistic nature of these mechanisms means they have only established PPAs slowly. For example, the NSW BCT has only 'revolved' 11 properties in five years, albeit that most have very high conservation values, and some are of significant scale.

The BCT has retained this mechanism but reoriented it to focus predominantly in priority investment areas, with resulting conservation agreements supported via fixed-price-offer annual, in-perpetuity payments. Payments improve resale value, enabling the revolving fund to operate more cost effectively.

2.3.10 Strengthened delivery mechanism – conservation partners grants

Prior to the BCT, some modest grants were available from time to time via the NSW Environmental Trust and earlier departments. Early on, the BCT identified the need to provide better technical and financial support to existing agreement holders to ensure they can

achieve good conservation outcomes in their conservation areas. BCT offers grants of up to \$15,000 per annum for up to three years for agreements that do not include annual payments, known as 'partnership conservation agreements' (BCT, 2023b). These include agreements established prior to the creation of the BCT, the bulk of which do not include ongoing annual payments, and new agreements established outside priority investment areas, which also do not include annual payments.

The establishment of the BCT and this grants mechanism in particular reinvigorated landholder interest in participating in partnership conservation agreements. Early in its life, the BCT was overwhelmed by hundreds of new applications for partnership conservation agreements, and at 31 March 2023, the BCT had entered 236 new partnership conservation agreements and still had 232 applications under assessment (BCT, 2023d).

To 31 March 2023, the BCT has approved grants worth \$7.11 million over 105,600 hectares of both new and previously established partnership conservation agreements (BCT, 2023d).

2.3.11 Enabling adaptive management

During program design and landholder consultation, in designing long-term or in-perpetuity conservation agreements, the BCT identified a concern that the landholders could become locked-in with an inflexible conservation management and payments regime. The conservation management needs for a conservation area may evolve over time if the threats to conservation values change.

Recognising this, the BCT includes a provision in each agreement for reviews at five-yearly intervals. This allows the conservation management plan to be updated if required. The BCT adopted a policy that, if a suitable business case can be made at the time of a review, it may also consider an increase in the future annual payments to address additional conservation management needs, subject to the BCT having sufficient uncommitted investment budget available at the time of the review to support the present value of proposed increases in future payments.

2.3.12 Technical support and networks

The IUCN guidelines for PPAs (Mitchell et al., 2018a) note the importance of recognition, technical support, and private land conservation networks as powerful incentives for PPAs. All private land conservation entities operating in Australia recognise the importance of technical support for participating landholders. Because it has sufficient operational funding, the BCT has been able to put in place a well-funded and comprehensive Landholder Support Program (BCT, 2023c).

The BCT relies on its base funding to provide this technical support to the stock of agreement holders it inherited, and now sets aside funds for each new agreement so that this capacity grows over time proportional to the growth in agreements.

Anecdotal evidence and feedback to the BCT via landholder surveys have indicated that technical support, education, and networking are vital to the satisfaction of almost all landholders participating in private land conservation.

2.4 Progress under the new NSW framework

The innovations and enhancements to the NSW private land conservation framework have been very successful in accelerating the establishment of private land conservation agreements and PPAs in priority investment areas in NSW.

As at 31 March 2023, the BCT reports 1,496 PPAs (in-perpetuity conservation agreements and biodiversity stewardship agreements) over 475,666 hectares (BCT, 2023d; BCT, 2023e). Figure 5 shows the growth in the numbers and hectares of PPAs in NSW since 1990 (BCT, unpublished data, 25 July 2023).

Excluding the early years from 1990 to 1998, the historical average rate at which PPAs were being established in NSW from 1999 to 2017 was around 50 agreements and 12,000 hectares per annum. The new *Biodiversity Conservation Act 2016*, the BCT, and increased NSW Government funding commenced in August 2017. From 2018 to 2023, the rate of establishment of PPAs has accelerated to more than 100 agreements and 45,000 hectares per annum. Not only has the rate of establishment tripled (by area), but many more PPAs are now being established in much higher priority bioregions, meaning more valuable conservation outcomes. The BCT is also now able to provide more comprehensive financial and technical support to all past and new participating landholders, leading to more informed landholders and potentially better overall conservation outcomes across the entire private land conservation estate.

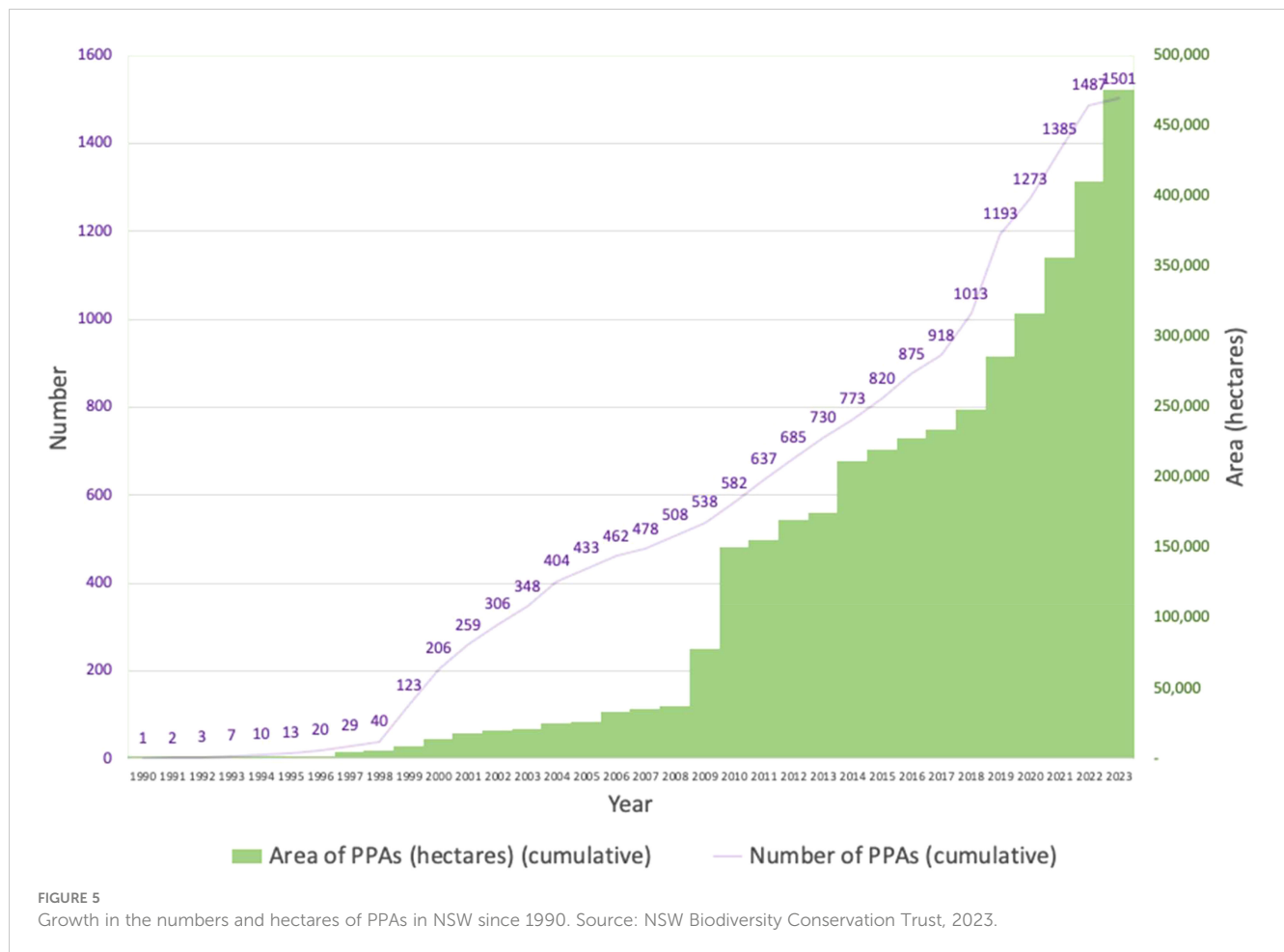
While numbers and hectares of PPAs are important quantitative measures of outcomes, the return on investment in PPAs should also be measured qualitatively. Under its Ecological Monitoring Module, the BCT recently published its first biodiversity outcomes report, providing a baseline assessment of the condition of the private land conservation estate in NSW (BCT, 2021; BCT, 2023n).

In NSW, term conservation agreements or wildlife refuge agreements, which are revocable, while not meeting the IUCN definition of a protected area, are also important forms of private land conservation. The BCT manages 774 such agreements across more than 1.79 million hectares, which do not count as part of the NRS, but some longer-term agreements may qualify as potential OECMs based on future assessments. The BCT has incentives and programs in place to encourage these agreement holders to upgrade to permanent agreements. In total, as at 31 March 2023, the BCT is managing 2,270 private land conservation agreements with landholders over 2.263 million hectares, representing around 2.8 per cent of NSW (BCT, 2023f).

3 Discussion

3.1 Addressing native vegetation clearing

We suspect that, with the increased rates of native vegetation clearing in NSW since 2018 (DPE, 2023; Henry et al., 2023), the loss of biodiversity values is likely to be outstripping gains in



biodiversity values in several bioregions of NSW, even after accounting for the positive effects of the enhanced NSW framework for PPA and the ongoing establishment of national parks in NSW. The current rates of land clearing in NSW and in some other Australian jurisdictions may be inconsistent with the GBF and Australian and NSW government ambitions for nature positive (Henry et al., 2023).

3.2 Possible refinements to the NSW framework

While the NSW framework has resulted in a significant increase in the rate of establishment and increase in priority values protected by PPA and has many elements that are seen as a model in Australia, we have identified some measures that could strengthen it further.

3.2.1 Aligning the BCIS and BCT programs with the GBF

An important element of the NSW framework is the Biodiversity Conservation Investment Strategy. The *Biodiversity Conservation Act 2016* provides for this strategy to be reviewed

every five years. There is an opportunity for the strategy and BCT programs to be brought into stronger alignment with the goals and targets of the new GBF.

The current strategy places emphasis on sampling of unrepresented and under-represented landscapes and on socio-economic benefits for landholders and regional communities. While these are important, the strategy's objectives could be broadened to align with the wider suite of objectives of the GBF, such as restoration of degraded ecosystems, nature-based solutions to climate change, sustainable agriculture, ecosystem services, and benefit sharing for traditional owners.

For example, current settings in the strategy, BCT eligibility requirements, and the BCT assessment metric may unintentionally undervalue investment in long-term restoration of well-functioning ecosystems in landscapes which are over-cleared and with at-risk ecological carrying capacity.

3.2.2 A separate fund and risk management framework

The BCT's Biodiversity Conservation Fund holds the assets required to support the annual payments under funded conservation agreements but is also used for all the BCT's other revenues and expenditures for its private land conservation and

biodiversity offset scheme functions. Holding agreement assets and the BCT's other purpose revenues in one fund creates complexity and potentially undermines transparency.

For technical accounting reasons, the present value of future conservation agreement payments cannot be treated as a liability against the agreement assets. This creates an undesirable accounting revenue–expenditure mismatch and uncertainty or confusion about why the BCT is apparently accumulating net assets over time.

By comparison, assets held for funded, in-perpetuity Biodiversity Stewardship Agreements are held in a separate Biodiversity Stewardship Payments Fund that does not form part of the BCT's balance sheet. Legislative provisions quarantine assets held in the Biodiversity Stewardship Payments Fund for Biodiversity Stewardship Agreements and associated costs; and establish risk management arrangements.

It would simplify BCT accounting and reporting, and increase transparency and certainty for participating landholders, if the Act established a separate fund for the assets held for funded conservation agreements, and an associated risk allocation and management framework.

3.2.3 Limiting the use of term agreements

The BCT offers only in-perpetuity agreements through all but one of its delivery mechanisms. The BCT offers the option of term conservation agreements, with a minimum term of 15 years, through its conservation tenders. This approach was adopted to encourage greater participation by those landholders anxious about the implications of permanent agreements. However, term agreements do not count as PPAs.

To date, the BCT investment in funded conservation agreements disaggregates into 71 per cent in-perpetuity agreements and 29 per cent term agreements (BCT, 2023d). The BCT could consider further restricting access to term agreements. Options include only making term agreements available under the fixed price offer mechanism rather than through conservation tenders, and/or setting a tighter cap on the total proportion of the BCT's investment that can flow to term agreements.

3.2.4 Better strategic coordination with public protected areas

NSW currently has a Biodiversity Conservation Investment Strategy 2018 to guide the BCT's investment in PPAs and a National Parks Establishment Plan 2008 (DECC, 2008) to guide the establishment of public protected areas. Better outcomes may be achieved if NSW developed an integrated and science-based strategic investment plan for the establishment of all types of protected areas and OCEMs across the State, in line with IUCN guidelines (Mitchell et al., 2018a).

3.3 Voluntary markets and their intersection with PPAs

A voluntary environmental market is where an individual or company purchases environmental values (often called 'credits')

without being legally obliged to do so. Voluntary markets are becoming common in addressing climate change, where companies seek to buy carbon credits to offset or compensate for the emissions from their business activities, motivated by many factors including the Taskforce on Climate-related Financial Disclosures (TCFD, 2023) and investor/shareholder expectations.

There is now also growing demand for voluntary investment in nature conservation or biodiverse carbon projects. Demand is being driven by both philanthropy and by the concept of Environmental, Social and Corporate Governance (ESG) being adopted by many corporations. Demand will be further motivated by the work of the Taskforce on Nature-related Financial Disclosures (TNFD, 2023) and Target 15 in the GBF that requires policy action on corporate disclosure of impacts on biodiversity (CBD, 2022).

The BCT is exploring development of a voluntary market for the values created by conservation agreements (BCT, 2023m). The Australian Government is aiming to establish a 'Nature Repair Market', where 'a single tradable certificate will be issued for each project, which can be sold to buyers under commercial contracts' and that 'certificates will provide standardised information to enable the market to confidently compare and value projects' (DCCEEW, 2023d).

A key challenge for all Australian governments and all private land conservation entities operating in Australia will be to ensure that PPAs are properly recognised and valued in emerging voluntary markets for nature conservation. We contend that voluntary markets for biodiversity values should be designed, everything else being equal, to place greater market value on PPAs, as permanent private land conservation agreements with covenants on title, relative to the market value attributed to set-term private land conservation agreements, OCEMs or other forms of short-term or less secure investment in nature conservation projects.

Care is also needed to ensure that voluntary and compliance markets are not inappropriately conflated. Compliance markets for biodiversity credits like the NSW Biodiversity Offset Scheme have different priorities. They prioritise like-for-like offsets typically nearer to the relevant development, which sometimes may and sometimes may not arise where the highest priorities for investment in nature conservation and restoration are located. They drive offsets to be located nearer to development, typically in areas of higher land value. As compliance markets, they also face higher up-front assessment and ongoing compliance costs. These three factors mean that on average credits secured under compliance markets will cost more per equivalent unit of biodiversity value than credits secured in voluntary markets. As at 31 March 2023, the BCT was managing and investing \$6,278 in assets in the Biodiversity Stewardship Payments Fund for the average hectare of all biodiversity stewardship agreements (in the compliance market) compared to managing and investing \$778 for the average hectare of all funded conservation agreements in the Biodiversity Conservation Fund. While these figures should be interpreted with caution as they do not account for varying biodiversity value, they demonstrate that biodiversity stewardship agreements are on average far more expensive than conservation agreements.

3.4 Sub-national level legislative, policy, and institutional frameworks

The new framework supporting the establishment and better management of PPAs in NSW includes several innovative features and has proven effective. We see merit in sub-national governments in Australia establishing new or stronger frameworks to better support the role that PPAs must play in achieving Australia's commitments under the GBF.

We believe that the BCT model of a dedicated, board-governed, and properly-funded statutory trust established explicitly to deliver all aspects of private land conservation programs, and to provide ongoing technical and financial support to the growing estate of privately managed protected areas, provides a range of benefits and efficiencies compared to programs operating from within government departments. As per previous discussion on similar models (e.g. Whelan, 1997), this model seems more likely to be effective in establishing trust and eliciting the participation of private landholders in PPAs.

Other key features of the NSW framework that we commend to State and Territory governments include the NSW legislation (as it relates to operation of the BCT), the Biodiversity Conservation Investment Strategy, the BCT's diversity of programs and delivery mechanisms, and the role the Biodiversity Conservation Fund plays as an accumulating endowment fund.

3.5 State and Territory government funding for viable private land conservation entities

A vital element is funding. There is only merit in proceeding with stronger legislative, policy and institutional arrangements with adequate funding. To support the establishment and effective ongoing management of PPAs at a suitable pace and in an efficient and cost-effective manner, State and Territory governments must provide foundational funding to enable an efficiently functioning private land conservation entity to facilitate establishment and ongoing management of private land conservation agreements and PPAs with thousands of landholders. Based on the NSW experience at \$25 million per annum, we estimate this would require from around \$20 million per annum in Victoria to possibly as much as \$40 million per annum in Queensland.

3.6 Australian and State and Territory government investment in PPAs

It is also vital that governments, alongside the private and non-government sectors, contribute to investing in the PPA estate in Australia. While private sector participation in compliance (offset) regimes and voluntary markets will play an important role, as will philanthropic investment, these alone will be insufficient in many bioregions; and governments must play their part to both redress past market and government failure that has led to over-cleared

landscapes and threatened species, and to fund, at least in part, the positive externalities arising from PPAs.

Improved frameworks and sub-national government spending on viable private land conservation entities, along with national and sub-national government investment in PPAs, are also vital to establish a critical mass of activity and proof of concept to induce greater corporate and philanthropic investment in PPAs.

The amount of investment required, and the relative proportions that governments, corporations, NGOs and others should contribute to the overall mission—to meet the GBF's 30 per cent by 2030 target, to build a CAR NRS and achieve the nature-positive concept of full recovery by 2050—is complex to determine and beyond the scope of this paper. Quantifying the quantum, pace, sources, and nature of investment needed to achieve the 30x30 target in Australia is a pressing research need. That said, the current absence of detailed answers to these questions should not be used as a pretext to delay government action and initial investment. To give some sense of scale, we estimate the level of investment needed from Australian governments collectively will be in the order of hundreds of millions of dollars per annum for the next three decades, considerably more than is being invested currently.

To maximise good outcomes, the Australian Government could direct investment in PPAs in an optimal mix through both NGOs to support more private nature reserves and through State and Territory conservation covenanting programs.

While it could be strengthened in its next edition, the Biodiversity Conservation Investment Strategy in NSW appears effective in guiding investment in PPAs to where it is needed most. We see merit in the sub-national governments making equivalent investment strategies, and the Australian Government making a national level biodiversity conservation investment strategy that is consistent with and complements sub-national level strategies.

3.7 National policies and targets for protected areas and OECMs

Further work is required to establish the policy framework and targets for implementation of the GBF in Australia.

Figure 6 shows the rate at which protected areas have been established in Australia from 2000 to 2022. This includes the addition of 18 million hectares between 2020 and 2022, with 96 per cent of this figure contributed from large new IPAs. The Australian Government is currently supporting the establishment of a further 14 IPAs expected to protect another 21 million hectares (DCCEEW, 2023d). While critical for protecting some of Australia's largest and most intact landscapes, the majority of these IPAs are likely to be created in only some bioregions in some jurisdictions. There has been a significant decline in the underlying rate of establishment of protected areas in most bioregions from 2014 to 2022 (Taylor, 2021).

This macro-level data also disguises the rate at which protected areas may be being established in an ecologically representative and well-connected manner at bioregional scales. It is important that the data be examined at bioregional scales (Woodley et al., 2012; or perhaps subregional scales in some cases) to understand the extent

to which protected areas and OECMs together will be sufficient to achieve the full intent of Target 3 of the GBF which requires these areas to be ‘ecologically representative’ and ‘well-connected’ and inclusive of ‘areas of particular importance for biodiversity and ecosystem functions and services.’ An ecologically representative network of protected areas and OECMs will be necessary to achieve the nature-positive concept of full recovery by 2050 (Nature Positive, 2023) and to materially reduce extinction risk of the more than 1,700 species and ecological communities known to be threatened and at risk of extinction (DCCEEW, 2021c).

Policy on other effective area-based conservation measures (OECMs) in Australia is in its formative stages (DCCEEW, 2023a) and no OECMs have yet been defined (although see Mitchell et al., 2018b). The Australian Government’s consultation paper on principles for OECMs states that meeting the 30 per cent target for land ‘requires an additional 60 million hectares to be protected or conserved’ as either protected areas or OECMs. While stating this, the paper is silent on the relative contribution that should be made by protected areas and OECMs or the scale(s) at which the target (or sub-targets) should be measured. Depending on the role that protected areas may need to play within each bioregion, this figure of 60 million hectares may be understated.

Figure 6 projects the rate at which protected areas (and perhaps some OECMs) would need to be established to achieve the GBF’s Target 3 of 30 per cent by 2030. Figure 6 presents different pathways based on five alternative example targets for the role of protected areas in bioregions. This is illustrative only as it uses an average target for all bioregions, whereas in reality there may need to be different targets for protected areas in different bioregions.

Using these examples, Figure 6 shows that the overall additional area to be protected would range from a minimum of 61 million hectares, if it was decided that protected areas should make up 15 to 20 per cent of each bioregion; 78.4 million hectares, if it was decided that protected areas should make up 25 per cent of each bioregion; and 102.8 million hectares, if it was decided that protected areas should make up 30 per cent of each bioregion.

The Australian Land Conservation Alliance (2020) has called for the role of PPAs to increase to 5 per cent of privately managed lands by 2030, which would require at least an additional 13.6 million hectares of PPAs. The authors consider this a realistic estimate of the role that PPAs will need to play to ensure progress towards a comprehensive, adequate and representative NRS by 2030 in those bioregions dominated by agricultural land uses.

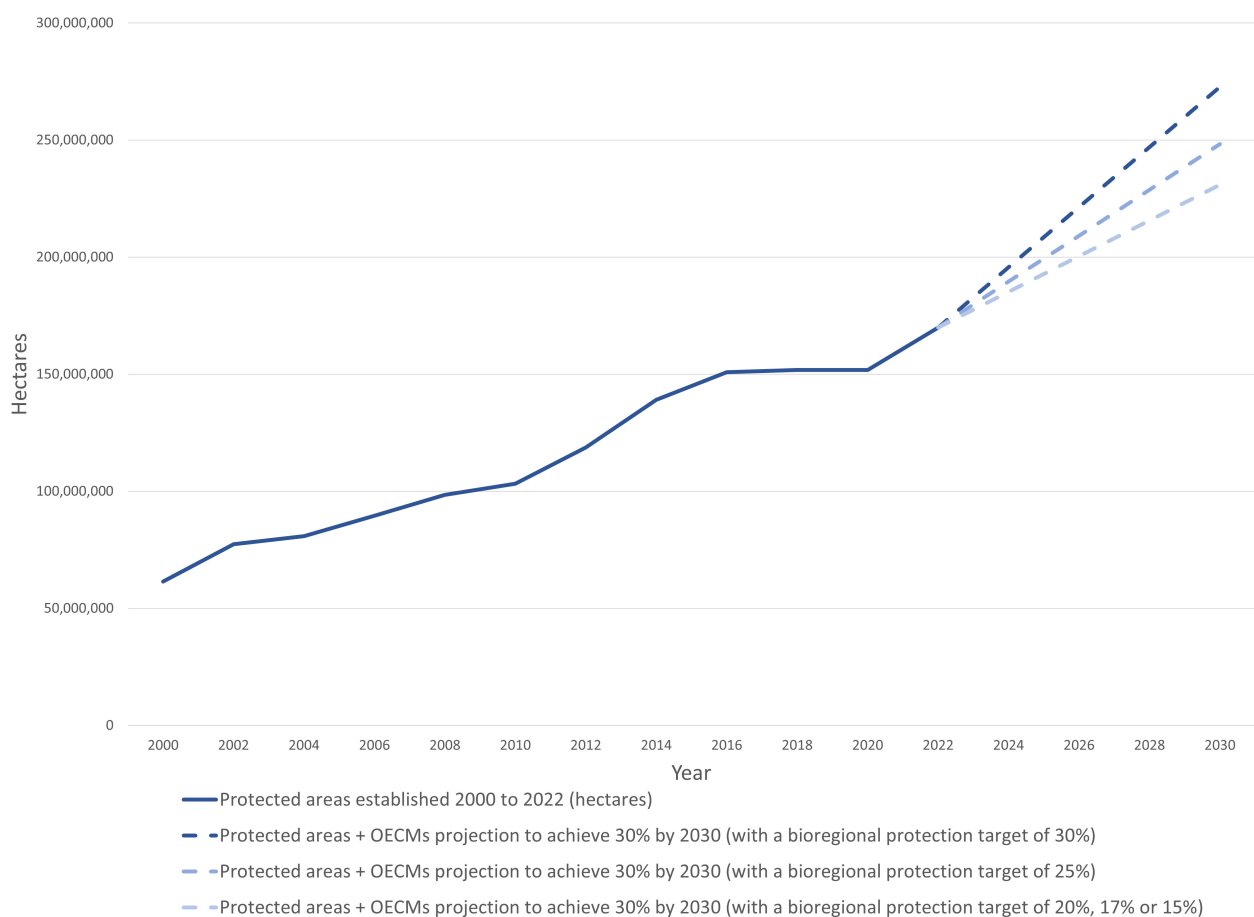


FIGURE 6

Establishment of protected areas in Australia (actual from 2000 to 2022 (solid line); and alternative possible projections to achieve 30 per cent by 2030 in protected areas and OECMs using five different bioregional reservation targets (dashed lines)). Source DCCEEW CAPAD 2022 data, 2023; and analysis by authors.

Conservation covenants were first established in Victoria in 1978 and in NSW in 1990. It has taken about four decades to establish 9.4 million hectares of PPAs nationally. An additional 13.6 million hectares may only be realistically achieved sometime after 2030. For example, to establish 13.6 million hectares of PPAs by 2040 would require the historical pace to more than triple from 250,000 hectares per annum to about 800,000 hectares per annum.

Even in NSW, where the rate has reached 45,000 hectares per annum under its new framework, investment by governments and the private sector in NSW would need to more than triple again to achieve about 150,000 hectares per annum to contribute to this suggested national goal.

4 Recommendations

We make the following actionable recommendations to support the vital role that PPAs must play to achieve Australia's 30x30 protection commitments and to achieve the nature-positive concept of full recovery and the broader goals of the GBF by 2050.

- (1) Australian governments should significantly reduce the rate of native vegetation clearing, to be consistent with Target 1 of the GBF.
- (2) The NSW Government should further strengthen its framework for PPAs by considering the four ideas suggested in this paper: (a) aligning the BCIS and BCT programs with the broader goals and targets of GBF; (b) a separate fund and risk management framework for the assets held for funded conservation agreements; (c) prioritising in-perpetuity agreements and limiting the use of term agreements; and (d) better strategic coordination with public protected area establishment processes.
- (3) Governments and private land conservation entities operating in Australia should ensure that PPAs are properly recognised and valued in emerging voluntary markets for nature conservation (relative to OECMs and any other forms of investment in nature conservation that do not qualify as PPAs).
- (4) Sub-national governments in Australia should establish new or stronger legislative, policy, institutional and financial frameworks to accelerate the establishment of PPAs, and to better support the ongoing management of PPAs in their jurisdictions, consistent with the effective features highlighted in this paper.
- (5) Sub-national governments in Australia should fund effective and efficient private land conservation entities in their jurisdictions to support existing PPAs and to accelerate the establishment of new PPAs.
- (6) Sub-national governments and the Australian Government (along with private sector actors) should invest sufficiently in PPAs (alongside investment in establishment and management of public protected areas and IPAs), to achieve Target 3 of the GBF by 2030, and the nature-positive concept of full recovery and an ecologically representative National Reserve System by 2050. Further research and

analysis are required to quantify the level of investment required but this should not be used as a pretext for delay. This investment should be guided by a national biodiversity conservation investment strategy that is consistent with and complements sub-national level investment strategies for increasing the rate of establishment of protected areas.

Author's note

PE was Executive Director Policy with the NSW Office of Environment and Heritage from October 2012 to August 2017 involved in the NSW biodiversity conservation reforms; and was CEO of the BCT from August 2017 to August 2022 involved in the delivery of private land conservation programs in NSW. PE and JF have previously served on the Board of the Australian Land Conservation Alliance, the peak body for the private land conservation sector in Australia.

Author contributions

PE: Writing – original draft, Writing – review & editing. JF: Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Conservation easements – project selection criteria for quarries in Europe

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The paper highlights the potential for the extractive industry to advance the EU Green Deal's biodiversity objectives. It argues that well-managed quarries can serve as vital habitats for endangered species, particularly near Natura 2000 sites. The paper introduces conservation easements as a financial incentive for quarry operators to invest in ecological restoration. These legal agreements limit specific land uses, making conservation a more financially predictable business venture. In the US, tax benefits have made conservation easements popular tools for private land conservation; however, their application in Europe remains nascent. The paper also provides a comprehensive set of 12 selection criteria to help identify optimal quarry sites for such easements. These criteria consider various factors, from location and size to ecosystem services and stakeholder. By aligning economic incentives with conservation goals, the paper offers a pragmatic blueprint to incorporate the extractive industry into Europe's biodiversity strategy. Conservation easements could be pivotal in creating a symbiotic relationship between commercial interests and ecological preservation, expanding the scope of partnerships to other stakeholders like water companies or insurance firms.

1 Introduction

Private sector support is essential to achieve the EU Green Deal's biodiversity goals, given that a significant portion of Natura 2000 and potential restoration sites are privately owned ([European Commission](#), no date).

The extractive industry is a prime example of how private business impacts biodiversity policy implementation.

Historically, European land has often been altered or degraded by agriculture, forestry, and other land uses. While resource extraction can lead to further destruction, well-managed former quarries and reclamation sites can provide vital habitats for endangered species, including those adjacent to Natura 2000 sites. This presents an opportunity to rehabilitate habitats that have suffered significant loss ([European Commission](#), 2019).

New, enhanced reporting requirements will intensify public scrutiny of private firms' biodiversity impact, demanding inventive and proactive approaches to harmonise resource extraction with nature preservation. Conversely, voluntary efforts to maximise long-term biodiversity value in quarries could spawn new business models by leveraging current and future fiscal incentives linked to nature restoration and promoting biodiversity-friendly land use.

It's relevant to explore how the extractive industry can proactively surpass legal norms for net biodiversity gains. A dual case—both communicative and financial—is essential to persuade firms to invest in conservation voluntarily. Often, companies seek public recognition, align such efforts with their ESG goals, and justify them through public and private financing options.

Conservation easements could help make nature conservation a more appealing investment for mineral extractive companies by bridging existing gaps.

- A conservation easement restricts specific land use rights via a voluntary legal agreement, transferring these restrictions to an easement holder, often a public agency or land trust.
- These limitations become part of the property title and are thus running with the land.

Unlike Europe, conservation easements are a widely recognised conservation mechanism in many parts of the world, like the USA, Australia, and South Africa. In the US, they've become a favoured means for landowners and interest groups to permanently preserve conservation values on private lands. While not all agreements are designed to be perpetual, they typically prioritize long-term protection. This aspect would complement more conventionally employed conservation tools, like stewardship agreements, in Europe well (Johnson, 2014).

Tied to financial incentives, conservation easements are attractive to landowners while providing conservation organisations with a flexible, enduring tool: a usually perpetual agreement connected to the land, not the owner. Their adaptability for site-specific land use stipulations and allocation of rights and responsibilities makes them widely popular among the contracting parties.

Although the legal framework for their use is present in most EU member states, conservation easements have only recently gained traction in Europe (Racinska and Vahtrus, 2018; Račinska et al., 2021).

Wilker et al. (2016) argue that the mining industry typically underinvests in high-quality restoration since it doesn't directly benefit from this. Restoration budgets are kept low as future benefits are more complex to estimate than costs. In the long term, conservation easements could offer more financial predictability by accumulating data on valuations for "given-up" quarry rights. These easements safeguard biodiversity while permitting private ownership and economic activities (Kiesecker et al., 2007).

To protect a property against nature-harming land use, a conservation easement can limit the right of the landowner to

exercise them. This can include mineral rights and potentially reopening the quarry (Adams and Moon, 2013).

Maintaining ownership of a repurposed quarry as a natural area can serve multiple goals for quarry owners. It can offset the company's environmental impacts elsewhere ("insetting"), enhance its eco-friendly reputation, and foster positive community relations. Additionally, retaining ownership allows for potential property value appreciation and the monetisation of site-specific features or services. Conservation easements enable landowners to undertake green energy, carbon, or biodiversity credit-linked conservation projects.

Given their requirements for additionality and permanent protection, conservation easements are especially suited for initiatives involving carbon and biodiversity credits (Chiang et al., 2020). These easements can also solidify agreements with other stakeholders interested in the ecosystem services from a restored site. For example, insurance firms might invest in a quarry that serves as flood protection for a neighbouring city.

To assess the viability of conservation easements in quarries, we suggest choosing test sites with the most significant potential for conservation success.

This paper proposes selection criteria to accelerate the adoption of conservation easements throughout Europe. It guides quarry operators who may lack the expertise to identify optimal sites for such initiatives.

2 Selection criteria

The Land Trust Alliance, the US land trusts' umbrella organisation, offers guidance for its members through its *Land Trust Standards and Practices*, with Standard 8 focusing on best practices for project evaluation and selection. Standard 8 emphasises the need for criteria aligning with conservation goals, providing a framework for assessing potential sites. Conservation goals targeting key species and habitats based on robust ecological practices serve as the basis for site identification. These land protection criteria enable a transparent system for prioritising potential locations (Little Traverse Conservancy, 2004).

We reviewed nine sets of selection criteria from US Land Trusts including those in "The Conservation Easement Handbook" by Byers and Marchetti Ponte (2005) and more recent examples provided by the Land Trust Alliance from the Marin Agricultural Land Trust and the North Florida Trust as well as their guide to creating selection criteria for conservation easements.

In conclusion, we suggest 12 criteria for evaluating if a quarry in Europe is a suitable candidate for a conservation easement. We elaborate on these criteria in the sections that follow, in no order.

2.1 Location

A site should be considered favourable if it's proximate to or part of a protected area network, such as Natura 2000 or a regional network like the Flemish Ecological Network. A quarry under a

conservation easement can enhance the cohesion of these conservation networks, broaden their scope, act as a buffer for adjacent protected zones, or support species migration. In these instances, the site's size may be less relevant.

When choosing a quarry site for a conservation easement, surrounding land uses are pivotal. The scarcity of nearby natural areas boosts the conservation's value for biodiversity and the local community. Sites that can link or buffer existing natural vegetation fragments are particularly valuable. They can expand rare habitat patches, offer complementary habitats for local species, or serve ecological functions—like trapping nutrients from adjacent farmlands to protect valuable wetlands. A site's clear, identifiable landscape enhances its suitability for a conservation easement.

2.2 Size

Cost-benefit is a function of size. A conservation easement must cover a sufficient area to ensure monitoring and enforcement costs don't outweigh the conservation benefits. Transaction and monitoring efforts are nearly the same for small and modestly sized plots of land. However, context factors—like the ecological quality of the area or its location, especially in densely populated regions like the Netherlands—can significantly affect the importance of size in the cost-benefit equation.

2.3 Habitat

The habitat selection at a quarry site should align with overarching conservation goals, whether regional, national, European, or global. For a site to be considered favourable, habitats existing there should be of Annex 1 of the Habitats Directive or otherwise deemed valuable – e.g., biodiversity-rich, important for species or relevant for a conservation target – seen as valuable by local stakeholders, on a regional or national level like those of a Red List or protected by law. Quarries often house unique features—cliffs, caves, ponds, screes—that offer valuable habitats for diverse species like bats, birds, reptiles, and amphibians. These settings can be ecologically distinctive and uncommon in surrounding landscapes.

2.4 Species

A site's potential for achieving or maintaining good conservation status for a particular key species should be a key factor. Specifically, the presence of classified as endangered or threatened species would make a site a high-priority candidate for a conservation easement. Like habitat types, regional, national, European, or global conservation targets, such as those outlined by the IUCN Red List or Birds and Habitats directives, can guide species prioritisation.

For quarries, the presence of endangered species, whether flora or fauna, may be a compelling reason for choosing nature-based after-use and can significantly impact ongoing management

practices. Evaluations should be case-specific, determining which species are most relevant and could offer solid arguments for long-term protection.

2.5 Archaeological/Geological value

Quarries can contain fossils and be valuable historical or geological archives. Quarrying itself Quarries may house valuable historical or geological features, such as fossils, with tourist, educational, or scientific significance. The mining industry itself may have historical importance in a given region. In such cases, a conservation easement could be a suitable mechanism to protect the site's archaeological and geological assets.

2.6 Ecosystem services

Quarries can offer unique ecosystem services beyond the typical benefits of healthy ecosystems, such as carbon sequestration. For instance, quarry ponds or wetlands may serve as water retention areas or flood barriers. These benefits can be enabled by linking the quarry to nearby rivers or floodplains. Ecosystem services that align with conservation goals could make a site a strong candidate for a conservation easement.

2.7 Threats

Threats such as invasive species or pollution should not significantly displace native flora, fauna, or habitat or disrupt ecosystem functioning. Site disqualification depends on the threat's severity, manageability, rate of change, trend (declining, stable, increasing) and the degree to which it changes (slow versus rapid).

2.8 Environmental damage

Conservation easements prioritise a site's current and future conservation potential over its past conditions. While past resource extraction and landscape modifications are generally less relevant, lasting negative impacts such as soil contamination or groundwater disruption can still disqualify a site for consideration.

2.9 Time

Extraction creates new habitats through disturbance. The time factor evaluates both the habitat's age and its future prospects. Optimal habitats should have matured to their ecological climax, aligning with conservation goals. Since habitats are dynamic, their future value can shift based on restoration and management plans. A site's suitability should be assessed through its restoration potential over a specific timeframe, grounded in a well-formulated restoration and management hypothesis.

2.10 Stakeholders

Given the voluntary nature of conservation easements, key stakeholders who can influence its implementation must be supportive. Relevant parties include quarry operators, authorities, site managers, local communities, and potential easement holders, typically NGOs.

2.11 Public Access

Sites that offer public access to living nature are deemed favourable. This can be facilitated through the construction of trails, observation hides, viewpoints, or other recreational amenities.

2.12 Cost

Easement holders and landowners should consider the financial implications of establishing and maintaining a conservation easement. This includes initial setup costs and ongoing stewardship and monitoring expenses, such as changing management costs over time, especially for dynamic habitats that may require more intensive care in the long term. For example, maintaining transient pioneer habitats often necessitates active management, potentially escalating costs, unless natural hydrological conditions or large herbivores are reintroduced.

3 Discussion

It should be emphasised that these criteria are interrelated, influencing each other and should be evaluated collectively. Their relative criteria significance may vary from one site to another. Quarry operators are encouraged to customise their criteria list in collaboration with relevant local interest groups to address the unique aspects of each site.

Considering selection criteria from US Land Trusts, we found that the requirements outlined by the Little Traverse Conservancy, as featured in *The Conservation Easement Handbook* by Byers and Marchetti Ponte (2005), align closely with our proposed list. This resource proved invaluable in shaping our criteria for the European context.

In our review of various land trust selection criteria lists, specific criteria consistently appeared. These include 1) location, 2) size, 3) habitat, 4) species, 10) stakeholders, 11) public access, and 12) cost.

Criteria that emerged from our discussions, notably 5) Archaeological/Geological Value, 6) Ecosystem Services, 7) Threats, 8) Environmental Damage, and 9) Time, are especially relevant for quarry conservation.

It should be highlighted that financial compensation for quarry easements is hard to gauge and competes with alternative after-uses. Currently, European landowners may find conservation easements less financially rewarding than other after-uses. Nonetheless, alternative revenue streams like carbon offsetting could make conservation easements financially viable for quarry owners. The

perceived value of nature in the future may also change. Moreover, intangible benefits like an enhanced brand image could indirectly boost a quarry owner's revenue, making a cost-benefit analysis compared to other after-uses essential for informed decision-making.

Additionally, the landscape of conservation easements as a private land conservation tool is quite fragmented across Europe (Racinska and Vahtrus, 2018). While theoretically applicable in most nations, the tool is underutilised. For instance, legal barriers hamper its use in countries like Slovenia. In contrast, others, like Portugal, lack a formal legal framework. Which makes the establishments of easements more difficult as these countries follow a civil law legal system (Johnson, 2014).

Conversely, some European nations have analogous systems in place. Finland's METSO programme and Belgium's nature management plans serve similar purposes. The French "real environmental obligations" (ORE) and Scottish and English conservation covenants mirror the US model more closely.

Given this uneven legal terrain, piloting conservation easements in European countries with more developed frameworks makes sense. Doing so would provide a testbed for refining and adapting the model for broader European implementation. It could help upscale the use of conservation easements in Europe and incentivize the extractive industry to go above and beyond legal requirements in quarry restoration.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Coverage and beyond: how can private governance support key elements of the Global Biodiversity Framework's Target 3?

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A vast cross-societal effort will be needed to achieve the ambition of protecting and conserving 30% of the earth's lands and oceans by 2030, as called for in Target 3 of the Kunming-Montreal Global Biodiversity Framework. While focus is often given to the 30% coverage aspect of this target, other elements – on the location and effectiveness of protected and conserved areas – are equally important. As the implementation of Target 3 progresses, it is increasingly acknowledged that non-profit organisations, for-profit organisations, and individual landowners play a key role by choosing to manage their lands and waters to deliver conservation outcomes. However, privately protected and conserved areas lack recognition by many governments charged with reporting progress on the target. For countries and territories where these areas have been reported, we use the World Database on Protected Areas to explore their contribution towards elements of Target 3, particularly coverage, connectivity and ecological representation. In addition, we explore how privately governed 'other effective area-based conservation measures' contribute to Target 3 in countries and territories where they have been identified. Our results demonstrate that privately protected and conserved areas play a significant role in some countries' efforts to meet Target 3. Since these areas are known to be under-reported, we stress the need for scaled up efforts for their recognition and documentation. This is vital not only for Target 3 tracking and implementation, but to ensure private actors receive appropriate recognition and support for their role in tackling the biodiversity and climate crises.

KEYWORDS

conservation planning, kunming-montreal global biodiversity framework, private governance, privately protected areas, target 3, world database on other effective area-based conservation measures, world database on protected areas

1 Introduction

The unprecedented rate of global biodiversity loss (IPBES, 2019) and intensifying impacts of climate change (IPCC, 2021) are intertwined crises that require urgent international action (United Nations, 2021). With extinction rates now estimated to be thousands of times higher than background rates, scientists suggest we are undergoing a sixth mass extinction event (Barnosky et al., 2011). In addition, global mean temperatures, including ocean temperatures, continue to be the hottest on record (WMO, 2022). The interdependence of these crises is increasingly being recognised (Pörtner et al., 2021), with experts agreeing that successful solutions will need to address both crises simultaneously (IPBES, 2019; Pörtner et al., 2021; Smith and Young, 2022). Protected and conserved areas (PCAs) have long been considered the cornerstones of biodiversity conservation (IPBES, 2019), but their potential to protect vulnerable ecosystems, store carbon, and promote future carbon sequestration (Duncanson et al., 2023) make them one of the most effective solutions for tackling both biodiversity loss and mitigating climate change impacts (Smith and Young, 2022; Pörtner et al., 2021). Governments and other stakeholders have expanded the global coverage of PCAs in recent years, but the contributions of these areas to halting biodiversity loss also depends on their location and effectiveness. To date, improvements in coverage have not been matched by improvements in ecological representation, connectivity, coverage of important areas, or efforts to monitor effectiveness (UNEP-WCMC and IUCN, 2021b).

At the fifteenth Conference of the Parties (COP15) of the Convention on Biological Diversity (CBD), Parties to the Convention acknowledged the important role that PCAs will continue to play in tackling the biodiversity crisis. Specifically, Parties to the CBD committed to achieving Target 3 of the Kunming-Montreal Global Biodiversity Framework, which set out an ambitious goal to effectively conserve 30% of terrestrial and inland waters and coastal and marine areas through protected areas (PAs) and other effective area-based conservation measures (OECMs)¹, recognising Indigenous and traditional territories, by 2030 (CBD, 2022). The target promotes the effective management and equitable governance of existing and new sites and ambitions also include improving the system of PCAs with respect to connectivity, ecological representation, and coverage of areas of importance for biodiversity and ecosystem services. All these elements will need to be addressed by the global community to achieve the ambition of Target 3 and to ensure the most successful outcomes for biodiversity and climate change mitigation.

Monitoring progress towards Target 3 and broader conservation goals requires a comprehensive understanding of the world's existing PCAs. Currently, this understanding is limited as reported data is often skewed towards state-led approaches. In recent decades, non-state actors have received increasing attention

for their contributions to achieving such targets (Bingham et al., 2017), however, the areas they conserve remain largely undocumented with little data (Borrini-Feyerabend et al., 2013). Privately protected areas (PPAs) and privately governed OECMs are defined as any site that meets the IUCN definition of a protected area (Dudley, 2008), or the CBD definition of an OECM (CBD, 2018), and is under the governance of a private actor. These private governance actors can include individual landowners, non-governmental organisations, research organisations, religious entities, and for-profit organisations, including corporations (Mitchell et al., 2018). PPAs and privately governed OECMs are a potential avenue through which non-state actors can contribute to Target 3 and diversify area-based conservation approaches, complementing state-led approaches (Bingham et al., 2021). With vast areas of the world in the hands of private landowners, the collective contributions of private actors to the implementation of Target 3 may prove substantial – particularly where their lands and waters fall in under-represented ecosystems, intersect with important habitats or ecosystem services, or provide landscape- or seascape-level conservation by connecting other PCAs.

The World Database on Protected Areas (WDPA) and World Database on Other Effective Area-Based Conservation Measures (WD-OECM) provide the headline indicator (CBD, 2023) of progress towards Target 3. They are the most complete global databases on PCAs (Milam et al., 2016; UNEP-WCMC, 2019), yet sites under private governance comprise just 6.55% of reported PAs and 2.44% of reported OECMs. This is thought to be a significant under-estimation of the actual conservation efforts being carried out by private actors worldwide. The primary reasons for this are thought to be a lack of recognition by governments and/or a lack of data at the national level (Bingham et al., 2017). In the case of OECMs, there is limited data across all governance types because the concept is new, meaning many governments have not yet recognised or reported data on OECMs. To date, studies focused on the contribution of PPAs to global coverage targets, ecological representation, and the connectivity of PCA networks have been restricted to specific ecoregions (Plischoff & Fuentes-Castillo, 2011), groups of nations (Palfrey et al., 2022), individual countries (Fitzsimons and Wescott, 2001; Laurindo et al., 2017; Shanee et al., 2017; Clements et al., 2018; Nolte, 2018), or to explicit groups of species (Clements et al., 2018; Archibald et al., 2020). There therefore remains a critical lack of global scale analyses assessing the contribution of PCAs under private governance to biodiversity conservation efforts, particularly their potential role in helping to achieve Target 3.

To fill this gap, we analyse the contribution of internationally reported PPAs to achieving Target 3, examining their contribution to coverage, connectivity, ecological representation and coverage of areas important for biodiversity, comparing the results to PAs under other governance types. First, we focus on simple coverage metrics of PPAs before examining the intersection between PPAs and ecoregions (including priority ecoregions) and Key Biodiversity Areas (KBAs), finally investigating how PPAs contribute to connectivity. We then explore how privately governed OECMs could complement the impact of PPAs (and other PCAs) in achieving Target 3, assessing the additional benefits provided by

¹ Protected areas and other effective area-based conservation measures (OECMs) are collectively referred to as protected and conserved areas, or PCAs, within this paper.

these areas in countries and territories where they have been identified.

2 Methodology

2.1 Data preparation

The April 2023 versions of the WDPA and WD-OECM were used in these analyses (UNEP-WCMC & IUCN, 2023). We removed all sites reported as “Proposed” or “Not Reported” in the status field (STATUS). For spatial analyses and calculations of average size, we also removed all PAs designated as “UNESCO-MAB Biosphere Reserve” in the English designation field (DESIG_ENG), as these include buffer and transition zones, which are usually not considered PAs (UNEP-WCMC & IUCN, 2021a). Data on the core zones of UNESCO-MAB Biosphere Reserves – which meet the definition of a protected area – are retained as these are usually recorded as separate polygons representing nationally designated protected areas. A different approach is taken for UNESCO-MAB Biosphere Reserves reported to the WD-OECM. These are retained for analyses because they have been specifically identified as meeting the OECM definition by the data provider. We selected data on PPAs and privately governed OECMs from the broader dataset by filtering the datasets by governance type (GOV_TYPE), selecting data with the governance type ‘Individual landowners’, ‘For-profit organisations’ or ‘Non-profit organisations’. For comparison, a dataset on PAs and a dataset on OECMs under all other governance types (including ‘Not Reported’) were also produced. In summary, four datasets were produced; PPAs, privately governed OECMs, PAs not under private governance and OECMs not under private governance.

All privately governed PAs and OECMs reported to date were in polygon format. However, some sites under other forms of governance were reported as point data. For these, we buffered each point to equal the value of its reported area (REP_AREA) and in this process removed any point data with no reported area. We used the dissolve tool to prevent the double counting of areas where polygons overlapped. In some cases, PAs and OECMs consist of multiple spatial zones with differing descriptive data. For these instances we selected the descriptive data of the largest zone to be used in count statistics, except in the case of the area field (GIS_AREA), where the data was instead summed across the different zones. For national level count statistics, PAs and OECMs were assigned to countries and territories based on the ISO3 field of the WDPA or WD-OECM.

Analyses were carried out in ArcGIS Pro (v3.1.2) using Python 3. All data were transformed to the projected coordinate system Mollweide (world) for analyses. For spatial analyses at the national level, we intersected the four datasets with a basemap combining Exclusive Economic Zones (VLIZ, 2014) and terrestrial country boundaries (World Vector Shoreline, 3rd edition, National Geospatial-Intelligence Agency). A simplified version of this layer has been published in Nature Scientific Data journal (Brooks et al.,

2016). PAs and OECMs were assigned to countries and territories based on the ISO3 codes of this basemap.

2.2 Data analysis

We calculated the coverage of PPAs and privately governed OECMs at both the global and national level using the standard methods of the Protected Planet Initiative (UNEP-WCMC and IUCN, 2021a). For coverage calculations and other spatial analyses, areas of overlap between privately governed PCAs and PCAs under non-private governance were considered as under non-private governance. This ensured that we only measured where privately governed PCAs provide exclusive, additional coverage outside of other forms of governance.

We also calculated the change in worldwide PPA coverage over time. This was carried out by collating information on the years that PPAs were reported as proposed, inscribed, adopted, designated, or established (STATUS_YR) and then calculating the cumulative coverage of PPAs across ten-year intervals from the first designated PPA in the 1870s up to the present day; for ~27% of all PPAs no STATUS_YR data was available, so these were excluded from the analysis.

We assessed the contribution of PPAs and privately governed OECMs to the protection of terrestrial ecoregions (Olson et al., 2001), marine ecoregions and pelagic provinces (Spalding et al., 2007; Spalding et al., 2012), as well as priority terrestrial and marine ecoregions (Olson and Dinerstein, 2002) and Key Biodiversity Areas (KBAs) (BirdLife International, 2023). This involved intersecting each of these datasets with our four prepared datasets. The area of intersection was calculated to give the percentage protection of each ecoregion, KBA or system of KBAs. These analyses were carried out at both at the global and national level.

The contribution of PPAs to terrestrial connectivity was calculated using the Protected Connected (ProtConn) indicator, defined as the percentage of an area that is covered by protected and connected lands (Saura et al., 2017; Saura et al., 2018), by calculating ProtConn with and without PAs under private governance. ProtConn indicators were calculated for countries and territories and for terrestrial ecoregions (Olson et al., 2001). OECMs were not included.

2.3 Data gaps

This paper is based on limited data. Given that data for only 39 countries and territories was available in the Protected Planet databases, our results highlight a worrying data gap that means we can provide only a limited insight into the actual conservation efforts of private actors. Currently, international reporting on area-based conservation is dominated by PAs under state governance, comprising around ~84% of all sites in the WDPA (UNEP-WCMC & IUCN, 2023). PPAs are the second most commonly reported governance type, yet only 18,580 PPAs have been reported

internationally, comprising just 6.55% of all sites. The vast majority of reported coverage from PPAs occurs in just three countries: Australia, South Africa, and the USA, where robust PA reporting procedures and established frameworks for recognising non-state governance are in place (Bingham et al., 2017). It is also important to note that data on governance type has not been reported to the WDPA and WD-OECM for all PCAs. In this analysis, 6.55% of records did not have any governance type reported (GOV TYPE = 'Not Reported'). Only PCAs with a reported private governance type were included in this analysis, meaning that other privately governed PCAs are likely to have been omitted. Notable examples are New Zealand and Brazil, where thousands of known PPAs are missing accurate data on their governance type. This issue also extends to most protected areas in Europe, where there is no option to submit data on governance type to the European Environment Agency's database of nationally designated areas, which feeds into the WDPA. As a result, large PPA networks such as Finland's cannot readily be identified in the WDPA. This highlights the need for both scaled up reporting on privately governed PCAs and improved reporting on governance types. Opportunities to address these issues are discussed in Bingham et al., 2021.

3 Results

3.1 Privately protected areas

3.1.1 Coverage

As of April 2023, there were 18,580 PAs reported to the WDPA under private governance, covering approximately 167,670 km² of terrestrial and inland waters and 723 km² of the marine realm. Whilst these sites comprise approximately 6.55% of all protected area records reported to the WDPA, they cover only 0.78% of protected terrestrial and inland waters and 0.002% of the protected marine realm. The average size of PPAs reported to the WDPA was relatively small, at 10.26 km², compared to the average size of PAs under other forms of governance, which is 219 km². Nonetheless, the coverage of PPAs has increased rapidly since around 1950, after a period of slow growth following the designation of the first reported PPA in 1876 (Figure 1)². While this suggests a general increase in the rate of designation of PPAs over time, the shape of the curve could change substantially with improved reporting of both older and newer PPAs (see 'data gaps').

PPAs have been reported in 39 countries and territories. The majority of PPAs were located in the United States of America (USA) (11,877 PPAs), Canada (1,863 PPAs) and Australia (1,530 PPAs). The USA alone reported 63.9% of all PPAs and these three countries combined reported 82% of all PPAs in the WDPA (see Bingham et al., 2021). In four countries and territories, PPAs make up over 50% of all reported PAs. These were: Colombia (68.6%), The Kingdom of

Eswatini (61.5%), Bermuda (57.1%), and South Africa (55.4%). In a further 7 countries and territories, PPAs made up over 25% of the reported PA network (Table 1). While for many countries and territories, large numbers of PPAs do not equate to large contributions to geographic coverage, in three countries and territories, PPAs contribute over 25% of the coverage of the PA network. These are The Kingdom of Eswatini (25.0%), Nepal (32.1%) and Aruba (98.1%).

3.1.2 Ecoregions

PPAs provided some level of protection for 235 (28.5%) terrestrial ecoregions worldwide, compared to 801 (97%) with coverage from PAs under other forms of governance. The Montane fynbos and renosterveld ecoregion of South Africa had the greatest coverage by PPAs at 13%. Four terrestrial ecoregions had at least 5% coverage by PPAs and 37 had coverage of at least 1%, but for most (96%) terrestrial ecoregions, the coverage provided by PPAs was less than 1%. In three cases, ecoregions were better represented in PPAs than other protected area types: Chimalapas montane forests and Oaxacan montane forests in Mexico and Highveld grasslands in South Africa. For eight terrestrial ecoregions, the addition of PPAs to PAs of other governance types pushed levels of coverage to exceed 30% of the ecoregion area.

In the marine realm, 41 (15.2%) marine ecoregions had some coverage by PPAs, whereas 257 (95.5%) marine ecoregions and pelagic provinces worldwide have coverage by PAs under other forms of governance. The spatial extent of protection of marine ecoregions by PPAs is minimal, with no ecoregions having greater than 1% coverage. Only two marine ecoregions had greater than 100 km² within PPAs, specifically Delagoa eastern coast, Africa and Western and Northern Madagascar.

When only the section of each ecoregion falling within national borders was considered, there were 54 terrestrial ecoregions across 18 countries and territories where PPAs provided greater than 1% coverage, and six terrestrial ecoregions across five countries and territories where PPAs provided greater than 30% coverage. PPAs provided greater coverage than other forms of PA for 15 terrestrial ecoregions across 10 countries and territories and brought coverage levels above 30% for 12 terrestrial ecoregions across seven countries and territories. Nepal had three ecoregions with greater than 30% coverage exclusively by PPAs, two of which had greater protection by PPAs than by PAs under other forms of governance: Eastern Himalayan alpine shrub and meadows (53% PPA coverage; 4,493 km²), Eastern Himalayan subalpine conifer forests (36% PPA coverage; 1,822 km²), and Rock and ice (30% PPA coverage; 1,950 km²). In general, PPAs provided minimal protection to marine ecoregions and pelagic provinces at the national level, with no greater than 1% protection provided. The highest level of protection provided by PPAs was the portion of the Delagoa marine ecoregion within Mozambique's national waters, with 0.82% coverage.

3.1.3 Priority ecoregions

The analysis of global priority ecoregions showed that 52 (36.4%) terrestrial and 17 (41.5%) marine priority ecoregions had at least some coverage by PPAs. Broadly, priority terrestrial ecoregions were

² The year of designation is not known for ~27% of all PPAs in the WDPA, generating uncertainty around the change in coverage over time. These PPAs are excluded from Figure 1, meaning the present-day coverage in Figure 1 is lower than the total coverage reported in this paper (167,670 km² of terrestrial and inland waters and 723 km² of the marine realm).

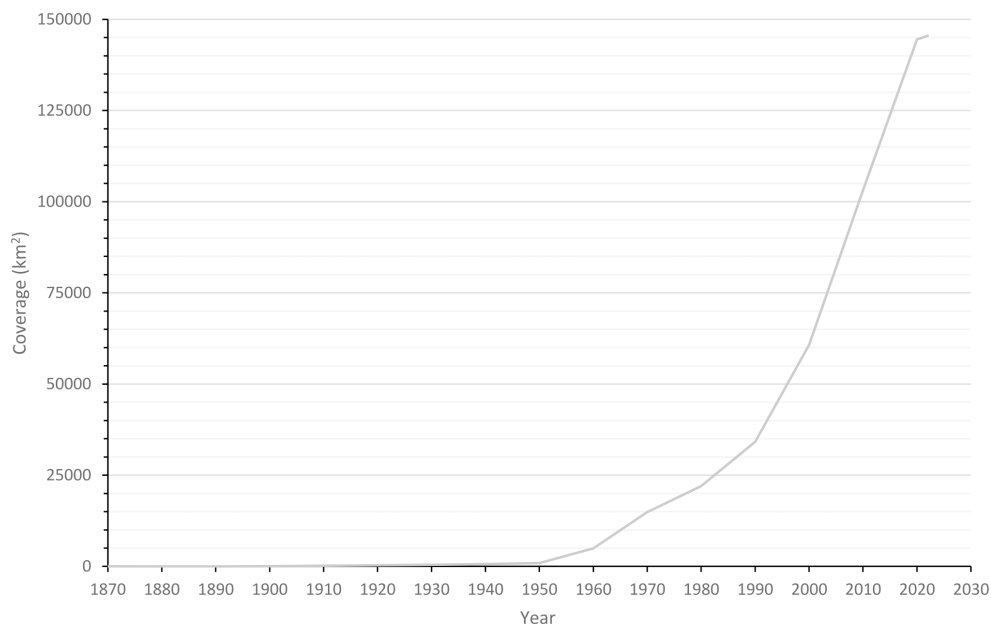


FIGURE 1
Change in global privately protected area coverage reported to the WDPA over time.

poorly captured in PPAs; however, for 17 of these ecoregions, over 1,000 km² was captured within PPAs. The largest area covered (in km²) by PPAs in a terrestrial priority ecoregion is the in the Northern Australia and Trans-Fly Savannas ecoregion, with around 37,037 km² coverage. In addition, there were eight terrestrial priority ecoregions that had greater than 1% coverage by PPAs. The greatest percentage coverage occurred in the Fynbos ecoregion in South Africa, which had 8% (6,393 km²) coverage by PPAs. PPAs provided some coverage to 17 priority marine ecoregions, but this was very minimal (less than 0.1% in all cases). The greatest area covered (in km²) of a priority marine ecoregion was in the East African Marine ecoregion, with coverage of 211 km².

3.1.4 Key biodiversity areas

PPAs provided some coverage to 554 or 13.8% of all recognised KBAs across 35 countries and territories (Figure 2). PPAs provided greater than 1% KBA coverage in nine countries and territories, with the greatest percentage coverage found in Aruba, with 77.6% (34 km²) KBA coverage. 94% of the largest reported PPA in the world, Annapurna (7,491 km²), overlapped with KBAs. In both Aruba and the Cayman Islands, PPAs provided greater total coverage of KBAs than PAs under other forms of governance. PPAs provided greater than 30% protection to 44 KBAs worldwide, and in 53 KBAs the addition of PPAs in addition to other forms of governance has resulted in greater than 30% protection. For 153 KBAs, the coverage provided by PPAs was greater than that provided by PAs under other governance types (within the borders of the countries and territories assessed).

3.1.5 Connectivity

PPAs increase the percentage of land that is both protected and connected in 60 countries and territories. In six of these countries

and territories, PPAs increased the area that is protected and connected by greater than one percentage point. The most substantial increase in connectivity attributed to PPAs was in Bonaire, Sint Eustatius and Saba where the proportion of protected and connected land increased by 23.2 percentage points, and in Aruba, where PPAs provided all 19.2% of protected and connected land. The Cayman Islands were another case where a substantial increase in connectivity was attributable to PPAs, more than doubling the area of protected and connected land from 2.15% to 5.45%. In Nepal, the area of protected and connected land almost doubled with the inclusion of PPAs, increasing from 5.85% to 10.87%.

PPAs increased the percentage of land that is both protected and connected across 261 terrestrial ecoregions. This increase was greater than one percentage point for 16 terrestrial ecoregions and greater than five percentage points for four terrestrial ecoregions. The largest increase attributable to PPAs was recorded for Montane fynbos and renosterveld in South Africa and for Cape York Peninsula tropical savanna in Australia, with 13.14 and 12.09 percentage point increases in the area protected and connected respectively. The largest proportional increases in ProtConn were found in Oaxacan montane forests in Mexico, where connectivity of the protected area network was over 31 times greater due to PPAs. For three further ecoregions, the proportion of land that is both protected and connected more than doubled as a result of PPAs.

3.2 Privately governed OECMs

As of April 2023, there were 20 privately governed OECMs from four countries reported to the WD-OECM (Table 2). In total, these OECMs covered 86,018 km² (85,434 km² of terrestrial and

TABLE 1 The contribution of PPAs to the national protected area networks of the 11 countries or territories where the proportion of PPAs exceeds 25% of the total number of PAs. The total number of PAs, PPAs, PA and PPA coverage, and the percentage of protected areas under private governance both as a proportion of all sites within the country or territory and the area of the national protected area system made up of PPAs reported in the WDPA are detailed.

Country or territory	No. of PAs	No. of PPAs	Proportion of PPAs in PA network (%)	Total area of PAs (km ²)	Total area of PPAs (km ²)	Proportion of PA network area consisting of PPAs (%)
Colombia	1330	912	68.57	312700.72	1837.73	0.59
Eswatini, the Kingdom of	13	8	61.53	738.21	184.72	25.02
Bermuda	28	16	57.14	1.76	0.26	14.55
South Africa	1667	924	55.42	352780.48	23584.64	6.69
Guatemala	352	151	42.89	23069.34	3250.47	14.09
Bonaire, Sint Eustatius and Saba	14	5	35.71	25203.52	75.36	0.30
Peru	277	95	34.29	359148.63	343.25	0.10
Aruba	3	1	33.33	35.86	35.18	98.10
Mexico	1185	380	32.06	994918.57	4987.35	0.50
United States of America	42824	11877	27.73	2872009.19	24519.53	0.85
Cayman Islands	58	16	27.58	124.03	12.30	9.92

inland waters and 584 km² of the marine realm). Privately governed OECMs comprised 2.44% of all reported OECMs (3.04% of terrestrial and 0.52% of marine). Of the total area covered by OECMs globally, privately-governed OECMs contributed 5.37% to terrestrial and inland waters and 0.16% to marine coverage. Non-profit organisations governed around 55% (11 OECMs) of all privately governed OECMs, amounting to over 99% of the total area covered by privately-governed OECMs. This is due in large part to the reporting by South Africa of UNESCO Man and Biosphere Reserves buffer and transition zones, which cover large areas reported as OECMs governed by non-profit organisations. Individual landowners across Canada, Colombia, and The Kingdom of Eswatini govern 45% (9 OECMs) of privately governed OECMs, but these provide coverage of just 90.16 km², or 0.1% of total privately governed OECM coverage. No privately governed OECMs have yet been reported as under the governance of for-profit organisations. Of the 20 privately governed OECMs, 12 intersected with a priority terrestrial ecoregion, with 10 having at least 50% of their area within a priority terrestrial ecoregion, including six OECMs fully within priority ecoregions. Furthermore, 14 OECMs under private governance intersected with KBAs, with seven having over 50% of their area in a KBA and three of these being fully within a KBA.

4 Discussion

This study demonstrates that both PPAs and privately governed OECMs already play an important role in protecting biodiversity in some countries and territories around the world. The contributions

of these areas – while modest in most cases – to the implementation of Target 3 go beyond coverage by extending protection to Key Biodiversity Areas and under-represented ecoregions, and by increasing the percentage of land that can be considered both protected and connected. For those countries and territories where data is available, our results reveal important insights into the scale of these current contributions, whilst more broadly highlighting the potential of PCAs under private governance for integration in future conservation strategies.

While the contributions of privately governed PCAs to Target 3 implementation may be small, they are important in the context of the limitations of the broader global system of PCAs. Systems of PCAs are known to provide important shelter for vulnerable species and habitats, however, there remain gaps in the ecological representativeness and connectedness of the current global PCA system (Maxwell et al., 2020). KBAs and priority ecoregions are currently not sufficiently protected at the global level (UNEP-WCMC and IUCN, 2021b), with 39% of KBAs having no coverage in PAs (IUCN, 2021). Furthermore, in 2021 only 47.4% of marine ecoregions had reached the 10% coverage target and just 44.5% of terrestrial ecoregions had reached the 17% coverage target (UNEP-WCMC and IUCN, 2021b). Whilst these results are based on limited data, with reported PPAs currently comprising less than 1% terrestrial and just 0.002% of marine PA coverage globally, they also provide some coverage to 36.4% of priority terrestrial ecoregions, 41.5% of priority marine ecoregions and 554 KBAs. In the case of some KBAs, PPAs are providing greater coverage than PAs under other forms of governance. Furthermore, our results show that PPAs increase the connectivity of 60 national PA networks and 261 terrestrial ecoregions.

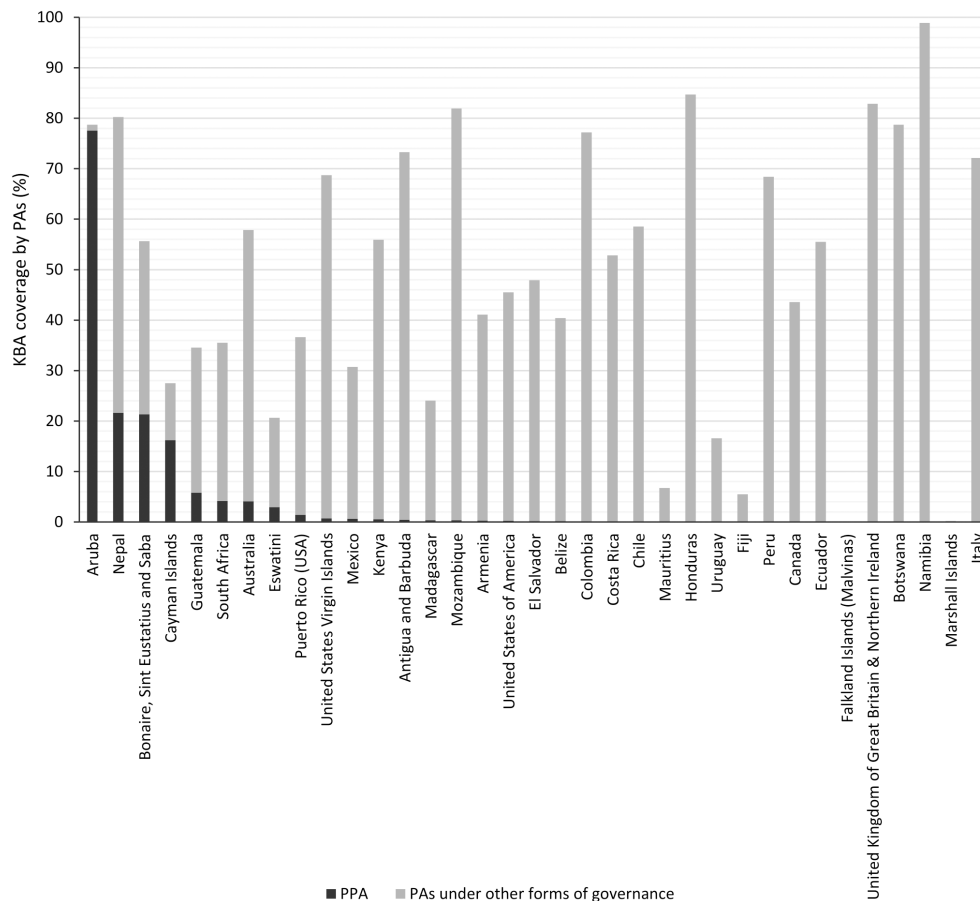


FIGURE 2

The total percentage coverage of KBAs by protected areas within each country or territory, split by coverage from privately protected areas (PPAs) (black) and protected areas under other governance types (grey).

Recognising and supporting OECMs provides a further opportunity to implement Target 3 and acknowledge the conservation efforts of a diverse set of governance actors. Privately governed OECMs are a relatively new concept but offer a new avenue to increase engagement of private actors. Although currently only a very small number of privately governed OECMs

have been reported, their relative contribution to terrestrial OECM coverage is large and when combined with PPAs this impact is even greater. Our results also show that these OECMs are already conserving key areas for biodiversity, including priority ecoregions and KBAs, suggesting that scaling up their recognition will be an important component of Target 3 implementation.

TABLE 2 Countries with privately-governed OECMs reported to the WD-OECM. The table details the number of sites for each country, their coverage, their coverage disaggregated by governance type, and the number of sites governed by different private actors. (IL, Individual landowners; NPOs, Non-profit organisations).

Country	No. of OECMs	No. of privately-gov-erned OECMs	Proportion of privately-governed OECMs in OECM network (%)	Total area of privately-governed OECMs (km ²)	OECMs governed by ILs	Coverage by ILs (km ²)	OECMs governed by NPOs	Coverage by NPOs (km ²)
South Africa	17	10	58.82	85,854.21	0	0	10	85,854.21
Canada	230	3	1.30	55.42	3	55.42	0	0
Eswatini, the Kingdom of	8	3	37.50	33.47	3	33.47	0	0
Colombia	55	4	7.27	1.46	3	1.42	1	0.03

While recognising existing PCAs is only one step towards achieving Target 3, it is a vital one. A clear baseline revealing where protection is already adequate, and where it is not, would bolster the efforts of governments and others to prioritise their efforts under the target. The potentially vast costs of implementing the GBF (CBD, 2020) and the shortfalls of past approaches (UNEP-WCMC and IUCN, 2021) make such prioritisation efforts essential. If patterns of PCA expansion efforts continue as they have over the last three decades, it is predicted that 75% of ecoregions worldwide will not reach 30% coverage (Chauvenet et al., 2020). Future efforts to expand the global PCA network must therefore prioritise areas based on their contributions to ecological representation and their biodiversity importance (IUCN, 2021; Antonelli, 2023). A comprehensive global map of privately governed PCAs would play an important role in enabling these prioritisations to take place.

A final, important point is that the validity of all results presented here depends upon the effectiveness of the PCAs in question. Even PCAs that are ideally located to conserve biodiversity will not do so unless they are well governed and managed. Efforts are underway to better monitor this crucial aspect of Target 3, and the data gathered will provide new opportunities to assess the relative effectiveness of different governance types. In the case of OECMs, it will also provide greater transparency regarding the basis on which individual OECMs are considered effective conservation measures, and may lead to changes in the currently reported data, for example if data providers choose to divide up very large OECMs into smaller parcels for which there is stronger evidence of effectiveness. Ultimately, a greater focus on effectiveness will provide opportunities to understand the enabling conditions behind the effectiveness of privately governed PCAs, address barriers to success, and optimise biodiversity benefits.

Data availability statement

The datasets analysed for this study are available from the following links. The WDPA and WD-OECM datasets are available at <https://www.protectedplanet.net>. KBA data can be requested from <https://www.keybiodiversityareas.org/kba-data/request>. The marine ecoregions and pelagic provinces dataset is available at <https://data.unep-wcmc.org/datasets/38>. The terrestrial

ecoregions dataset is available at <https://www.worldwildlife.org/publications/terrestrial-ecoregions-of-the-world>. The priority ecoregions dataset is available at <https://www.worldwildlife.org/publications/global-200>. A simplified version of the basemap used in this analysis has been published at Nature Scientific Data journal (Brooks et al., 2016) and is available here: <http://datadryad.org/resource/doi:10.5061/dryad.6gb90.2>.

Author contributions

AL: Writing – original draft, Writing – review & editing. BG: Formal Analysis, Methodology, Writing – review & editing. BW: Writing – review & editing. JS: Formal Analysis, Writing – review & editing. JL: Writing – review & editing. GDe: Writing – review & editing, Formal Analysis, Methodology. GDu: Formal Analysis, Methodology, Writing – review & editing. HB: Conceptualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

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Evaluating successes and challenges for effective governance of privately protected areas in Australia

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Australia has one of the world's largest privately protected area (PPA) estates and has been seen as a world leader in establishing PPAs, with significant growth since 2000. Despite the policy expectation that PPAs will continue to grow in Australia, there has been limited policy or academic consideration of the legal and governance arrangements that are best placed to enable this. This article uses adaptive governance as a conceptual framework for conducting doctrinal (to explore the legal rules) and socio-legal (to understand the implication and effects of the rules in practice) research to analyze the governance of conservation covenant regimes in Australia, with a particular focus on the State of Victoria. The article finds that Victoria's conservation covenant regime has the legal foundations to enable adaptive governance and that conservation covenants are expected to continue to be important in maintaining and establishing new PPAs, with opportunities for covenants to similarly deliver ecosystem restoration and climate adaptation objectives. Ongoing adequate public investment in the regime and the ability of the regime to attract new landowners in important landscapes without better financial incentives are identified as key challenges. The analyses and findings, while focused on the Australian context, are expected to have applicability to other jurisdictions that are focused on implementing the Kunming-Montreal Global Biodiversity Framework and policies related to protected areas, private land conservation, ecosystem restoration, and climate adaptation.

KEYWORDS

conservation covenants, privately protected areas, private land conservation, adaptive governance, ecosystem restoration, climate adaptation, conservation agreements

1 Introduction

Nature is declining globally at rates unprecedented in human history. The rate of species extinction is accelerating (IPBES, 2019) and there is an increasingly common linking of the environmental problem of climate change, to biodiversity loss (Pörtner et al., 2022). Australia is a country that has more biodiversity than most (Chapman, 2009), much

of which is endemic to Australia, but it also has the highest loss of mammal species anywhere in the world (Woinarski et al., 2015). Dispossession of Aboriginal and Torres Strait Islander peoples and the application of English property tenure in Australia marks a particularly profound ecological shift for the Australian environment. Since European colonisation began, Australia has lost at least 100 endemic species (Woinarski et al., 2019), including three species since 2009 (Woinarski et al., 2017). Almost 2,000 plant and animal species are threatened with extinction, with dozens of reptile, frog, butterfly, fish, and bird and mammal species set to be lost forever without a step change in resourcing and conservation effort (Woinarski et al., 2017, p. 5) (Murphy & Van Leeuwen, 2022).

The key threats to biodiversity in Australia include impacts from invasive species (weeds, rabbits, foxes, pigs, deer, etc.); habitat loss (due to agriculture, urban development, and overexploitation); inappropriate fire regimes; pollution from agriculture (which is particularly problematic for fish and freshwater systems) (Kearney et al., 2019) and - increasingly - climate change which is exacerbating many biodiversity threats (Steffen et al., 2009) (Dunlop et al., 2013).

Increasing protected areas, ecosystem restoration, and climate adaptation are widely accepted as essential conservation strategies and have been featured in the newly agreed Kunming-Montreal Global Biodiversity Framework. The focus of this article is, through the lens of adaptive governance, to evaluate the governance of Australia's privately protected areas (PPAs) focusing on conservation covenant regimes, with a detailed evaluation of the Victorian regime. Adaptive governance is used as a conceptual framework to develop recommendations for how best to achieve effective governance of conservation covenant regimes moving forward, particularly in light of emerging international policy initiatives that relate to protected areas, ecosystem restoration, and climate adaptation.

Essentially, under the Australian conservation covenant regime, a landowner agrees to a series of restrictions imposed by the registered conservation covenant which embeds a long-term - normally in-perpetuity - conservation objective for the land and restricts property rights that are otherwise available. Most PPAs in Australia are established via a voluntary conservation covenant by conservation-minded landowners who wish to protect their land from future land use that may harm environmental values. The number of landowners participating in conservation covenant regimes has grown significantly since 2000 (Australia has one of the largest PPA estates in the world) (Fitzsimons, 2015, p. 41), with Australia seen as a world leader in establishing PPAs (Bingham et al., 2017, p. 48) (Bingham et al., 2021). As a regulatory tool that has evolved from property law, a conservation covenant is comparable to a conservation easement in the United States (although the governance regimes operate very differently).

Conservation covenant regimes in Australia are state-based systems with administrative differences across state jurisdictions. However, generally, the regime is overseen by a dedicated agency either within a state government department (as in Queensland), by a charitable entity acting according to a legislative mandate (as in Victoria), or by a statutory body that is fully funded and controlled

by the state government (as in NSW). Under each state regime, the registerable property agreements are referred to differently and include, for example, conservation covenants, conservation agreements, and nature refuges. For simplicity, this article uses the term 'conservation covenant' to capture all registerable instruments under Australian property law that can create a PPA as defined by the IUCN and which are eligible for inclusion as part of the Australian protected area estate known as the National Reserve System (NRS).

Previous studies from Australia have looked at the governance frameworks for PPAs and whether they can deliver both biodiversity and ecosystem services (Archibald et al., 2021), and suggested a new type of 'rolling covenant' that could operate in a rolling geographic area to keep pace with sea-level rise as a tool for coastal land management under climate change (Bell-James et al., 2022). Further, the adaptability of conservation easements to climate change has been considered in the literature from the United States (Rissman et al., 2015). Overall, however, there has been limited policy or academic consideration of the legal and governance arrangements that may be necessary to continue to grow the PPA estate in Australia.

This article first establishes what aspect of governance for PPAs this article is interested in and explains why the conceptual framework of adaptive governance has been chosen to assess governance effectiveness for conservation covenant regimes in Australia. Next, the governance regime for conservation covenants in Australia - being the international, state, and local regulatory institutional landscape is summarized. Finally, how the various elements of the regime interact is explored, through a detailed review of the governance arrangements for Trust for Nature (Victoria). The discussion and conclusions consider what this means for the effectiveness of the governance framework in Victoria and how well-placed the regime is to simultaneously deliver protected area, ecosystem restoration and climate adaptation objectives. This article applies doctrinal research methods to review the state-based regulatory framework and socio-legal research to understand the implications and effects of the rules in practice. A document review of the Victorian template conservation covenant and management plan is undertaken to inform the analysis in Section 4 as well as publicly available information such as annual reports, strategic plans, media release etc.

The analysis indicates the Victorian conservation covenant regime is being used at a small scale to deliver a range of objectives in addition to conservation, such as ecosystem restoration, and as a tool to deliver environmental regulatory project approvals through biodiversity offsets. However, if conservation covenant regimes are to attract wider participation from more landowners and deliver restoration and climate adaptation objectives at a meaningful scale, conservation covenanting needs to become more financially viable for private landowners, and a change in governance policy settings is necessary to achieve this.

While focusing on the Australian context, and in particular the conservation covenanting regime in Victoria, the analysis in this article suggests a methodological framework to assess governance for PPAs which is expected to have applicability to other

jurisdictions that are focused on implementing the new Global Biodiversity Framework and policies related to private land conservation, ecosystem restoration, and climate adaptation.

2 Adaptive governance to guide a governance assessment for conservation covenant regimes in Australia

Governance is a very broad term and has been described by sociologist and social theorist Nikolas Rose as:

‘any strategy, tactic, process, procedure, or programme for controlling, regulating, shaping, mastering or exercising authority over others in a nation, organisation or locality’ (Rose, 1999).

Similarly, within environmental governance, and more specifically the field of protected area governance, governance has been defined as referring to issues of control being the structures, processes, and traditions that determine how power and responsibilities are exercised, how decisions are made, and how stakeholders have their say (Borrini-Feyerabend et al., 2013); (Graham et al., 2003; Worboys et al., 2015).

Academic scholarship, policy insights and guidance on governance – as opposed to management which is more about resourcing, development of plans, and implementation of actions – is relatively new for protected areas. This section of the article provides the conceptual framework for governance that is used for

this research, before applying those concepts to an analysis of the conservation covenant regimes in the State of Victoria in Australia.

To assess the governance of PPAs established via a conservation covenant, this article considers conservation covenants as a regime, being the totality of the governance arrangements for PPAs established via a conservation covenant (Young, 2012). The governance arrangements for conservation covenant regimes in Australia – for the purposes of this article – are summarised in Figure 1 and the analysis in the remaining sections of the article begins to consider how the various elements of the conservation covenant regime – both rules and institutional frameworks – interact together and what this means for adaptive governance and the ability of the regime to deliver protected area, ecosystem restoration and climate adaptation objectives. Importantly, a regime analysis demonstrates that conservation covenants – and indeed PPAs more generally – do not operate in a vacuum and are not expected to solve on their own, threats to biodiversity. By understanding how PPAs fit within an overarching regime, enables an analysis of how the different parts of the governance regime work together, where there are frictions, and importantly, assists in understanding opportunities and challenges to guide policy and legislative reform.

Conservation covenant regimes in Australia are one of many conservation initiatives on privately managed land that are influenced by new environmental governance (Lawson, 2019). New environmental governance is a conceptual framework that generally involves a collaboration between private, public, and nongovernment stakeholders who work together towards

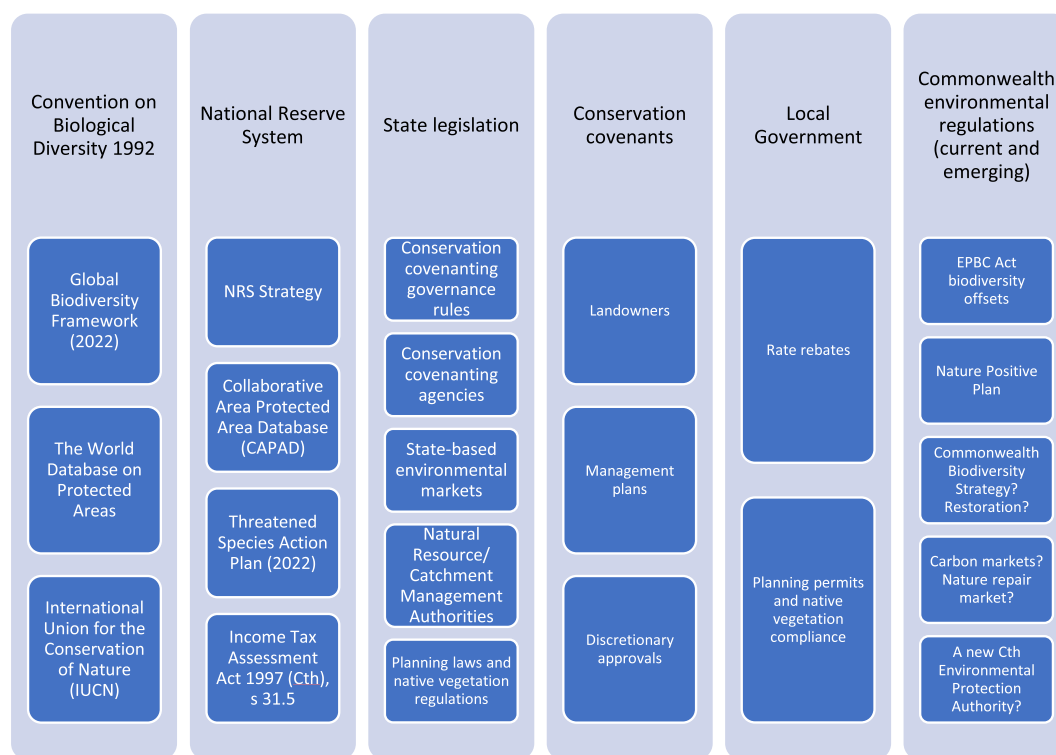


FIGURE 1

The governance framework of a conservation covenant regime in Australia.

commonly agreed goals based on the understanding that they will achieve more for the environment by working together, as opposed to acting individually (Holley et al., 2012). New environmental governance has also been argued to be able to cope better with the uncertainty and complexity of environmental problems than traditional regulation or market-based approaches (Holley et al., 2012, p. 5) (Chaffin et al., 2014, p. 22). Notwithstanding potential benefits, there has been criticism of new environmental governance approaches including that there can be gaps in accountability because of its adaptive and flexible approach (Biber, 2011, p. 81) and that it can be susceptible to abuse of power by management authorities (Doremus, 2007).

Conservation covenanting regimes are reflective of a new environmental governance model in their reliance on collaboration and voluntary participation from private landowners. However, conservation covenant regimes differentiate themselves from other conservation initiatives on privately managed land because they are underpinned by legislation that enables secure and permanent protection and restrictions on use rights over privately managed land. The enabling legislation empowers conservation covenanting bodies to – with the consent of the landowner – register a conservation covenant over a property's title, which satisfies the IUCN definition of a PPA and contributes to the Australian NRS.

Other new environmental governance examples of conservation initiatives on privately managed land from Australia – which include for example Land for Wildlife and planning agreements with local councils – generally do not meet the IUCN definition of a PPA (except for wildlife reserves managed by eNGOs, and in some cases a conservation covenant is also registered over such reserves).

In recent years there has been academic scholarship emerging on the principles of good governance for protected areas and this article and associated research is informed by Lockwood's articulation of seven principles of good governance and the associated outcomes related to each principle (Lockwood, 2010). Building on Lockwood's early governance focus for protected areas – which included resilience and flexibility as a core principle – adaptive governance theory has also become a popular conceptual framework for environmental governance scholarship (often from within the field of new environmental governance) where there is an overarching goal of achieving sustainable ecosystem functioning amidst the uncertainty of climate change and the current state of biodiversity loss. This is because adaptive governance is based on the concept of managing resilience (Garmestani & Benson, 2013) and social-ecological sustainability (Chaffin & Gunderson, 2016). Adaptive governance is described as 'flexible and responsive environmental governance' (The Australian Panel of Experts on Environmental Law, 2017) and as 'a range of interactions between actors, networks, organisations, and institutions emerging in pursuit of a desired state for social-ecological systems.' (Chaffin & Gunderson, 2016).

Arguably, PPAs need to be flexible and responsive to their dynamic context. This includes the dynamic properties of the environment, which are intensified with climate change such as more frequent and intense drought, fire, and floods as well as rising sea levels. The social values of landowners that commit to owning and managing a PPA, and expectations of the broader society in what PPAs should deliver also shift with time and may require a

change in higher or different environmental standards to be delivered by conservation covenant regimes. However, such flexibility needs to be balanced with caution about any change in standard that may be regressive, or which is intended to be a lower standard of environmental protection (The Australian Panel of Experts on Environmental Law, 2017). This is particularly important for conservation covenant regimes that establish secure, permanent, and in-perpetuity PPAs on private land. Similarly, there is also tension for legal frameworks in achieving flexibility because while legal systems adapt and change over time in response to the values of society, legal systems are also purposely structured to provide a stable framework. Legal frameworks can therefore serve to hinder adaptation (Cosens et al., 2017).

This article applies the legal guidelines for adaptive governance developed by Cosens et al. (Cosens et al., 2017) to try and navigate tensions between the perceived need for flexibility and their key differentiating factor, being their permanence and legal security. The guidelines have been tweaked slightly in the below analysis for heightened relevance to considerations of how law can facilitate adaptive governance for PPAs. Taking a similar approach to Cosens et al, in looking at the governance of conservation covenant regimes, this research focuses on laws that establish the structure, authority, and process for the governmental aspect of governance which includes how authority is distributed, the authority of agencies to act, and the processes that agencies are required to follow in acting. Based on this analysis, preliminary ideas are introduced for how the conservation covenant regime needs to evolve and adapt to ensure its ongoing effectiveness.

3 Current and emerging international and national settings for PPA governance in Australia

Table 1 sets out each Australian conservation covenanting regime and primary underpinning legislation that can create a PPA incorporated into the NRS. There has been steady growth of conservation covenanting practice in Australia since the 1970s (Hardy et al., 2017, 222) which predates the international legal frameworks and institutional biodiversity conservation focus that relate to private land conservation. For example, the signatories to the CBD only first formally recognised the contribution of PPAs as part of protected area management in 2014 (Conference of the parties to the Convention on Biological Diversity, 2014) which coincided with a seminal report published by the IUCN entitled 'The Future of Privately Protected Areas' (Stolton et al., 2014), and there are now IUCN guidelines for PPAs (Mitchell et al., 2018). As an increasing number of global and local environmental issues and challenges evolve, so does the regime within which conservation covenanting program sit. As demonstrated within Figure 1, there are now complex international and local interactions that influence conservation covenanting regimes in Australia.

Conservation easement practice was developing at a similar time in the United States, with the adoption of the *Uniform Conservation Easement Act* by the National Conference of

TABLE 1 Conservation covenant regimes that qualify as a PPA and are included in the NRS⁴.

Covenantee agency	Governance type	Name of Program	Legislation	No. of Covenants, % protected areas	Total area under covenant; % land
NSW Biodiversity Conservation Trust	A statutory body, subject to direction and control of the government	Conservation Agreement and Biodiversity Stewardship Agreement Programs	<i>Biodiversity Conservation Act 2016</i> (NSW)	1243 ⁴ 2.58% of NSW protected areas	210,492 ha 0.26% of NSW
Trust for Nature (Victoria)	A statutory body, not subject to direction and control of government, independent charity	Trust for Nature Covenant Program	<i>Victorian Conservation Trust Act 1972</i> (Vic)	1593 1.85% of VIC-protected areas	74,365 ha 0.33% of VIC
Department of Environment and Science (Qld)	Government department	The Nature Refuges Program	<i>Nature Conservation Act 1992</i> (Qld)	561 28.65% of QLD-protected areas	4,375,857 ha 2.53% of QLD
Department of Environment and Water (SA)	Government department	South Australian Heritage Agreement Scheme	<i>Native Vegetation Act 1991</i> (SA)	1,583 3.42% of SA protected areas	1,015,726 ha 1.03% of SA
Department of Primary Industries, Parks, Water and Environment (Tas)	Government department	Tasmanian Protected Areas on Private Land Program	<i>Nature Conservation Act (2002)</i> (Tas)	848 3.50% of Tas-protected areas	101,199 ha 1.48% of Tas
The National Trust for Australia (WA)	Incorporated Association, independent charity	The National Trust for Australia (WA) Covenant Program	<i>The National Trust of Australia (WA) Act 1964</i> (WA)	172 0.02% of WA protected areas	16,167 ha 0.1% of WA
Parks and Wildlife Commission of the Northern Territory	A statutory body, subject to direction and control of the government	Conservation covenants	<i>Territory Parks and Wildlife Conservation Act 1976</i> (NT)	4 0.42 of NT protected areas	140,551 ha 0.10% of NT

Commissioners on Uniform State Laws in 1981, and modelled legislation was rapidly adopted by states (Johnson, 2014, p. 4). Converse to Australian practice, conservation easements are privately or self-regulated (through for example a land trust accreditation program) and the significant tax benefits available for a 'gift' of a conservation easement to a qualified organisation have undoubtedly grown private land conservation across the United States. Further, while the United States is a member of the IUCN, it is not a party to the CBD and so alongside domestic legislative differences, the United States operates under a different international regime and does not formally recognise a national protected area system (Clements et al., 2018, p. 5). Despite this, the Land Trust Alliance – which represents 950 member land trusts – reports that over 8 million hectares is protected under a conservation easement (Land Trust Alliance, 2020) and the United States has the most PPAs nationally (Clements et al., 2018, p.5).

Returning to the Australian context, the Commonwealth government while not directly involved in the state-based covenanting regimes, approves programs under the *Income Tax Assessment Act 1997* (Cth) that – in theory – provides income tax incentives for landowners with conservation covenants in Australia. However, unlike the income tax incentive that exists in the United States for conservation easements, eligibility of this Australian incentive

is very limited and there is little take-up (Shearing, 2006; Smith et al., 2016). The limited tax incentives available in Australia, in comparison to the United States, have long been assumed to be the reason that conservation covenanting practice in Australia has not had the broad participation as is evident in the United States (Smith et al., 2016).

The Commonwealth government also operates the Collaborative Area Protected Area Database (CAPAD) and collects data from state and territory governments and protected areas managers, which is publicly available. This data is used to report progress in meeting protected area targets under the CBD. In turn, CAPAD reports into the World Database on Protected Areas, a joint project between UN Environment Program and the IUCN. Table 1 demonstrates the conservation covenant regimes that have the legislative power to register and are responsible for ongoing stewardship of conservation covenants that create PPAs that are formally considered as part of Australia's NRS (Department of Agriculture Water and the Environment, 2022).

In summary, PPAs have a long history of being part of the protected area estate in Australia and are particularly important to achieving an effective and representative protected area estate (Bingham et al., 2017). However, despite being a world leader in establishing PPAs, less than 2% of privately managed land in Australia is within a PPA, and PPAs make up less than a 6% proportion of the NRS (Department of Climate Change, 2023b). It follows that biodiversity on privately managed land is at particular risk in Australia and between 70 and 90% of inadequately protected biodiversity distributed predominantly on private land and 88% of inadequately protected threatened ecological communities also occurring largely on private land (Ivanova & Cook, 2020, pp. 8-9).

⁴ Note: These figures include NCT Agreements, Biodiversity Stewardship Agreements, Conservation Agreements, and Registered Property Agreements (as reported in CAPAD 2022).

Further, given the voluntary nature and lack of financial incentives available for conservation covenanting regimes to date, gaps in the representation of the NRS appear particularly in productive landscapes on privately managed land in NSW and Victoria (State of NSW and Office of Environment and Heritage, 2018, pp. 10-11) (Victorian Government, 2017, p. 48). In Queensland, mining poses particular challenges to conservation covenanting because where there is a mining interest over private land – noting that mining is the primary industry in Queensland – the mining interest must consent to the covenant. Further, even where conservation covenants are achieved, they cannot legally exclude mining from privately owned land and this has presented challenges for conservation covenant regimes in both Queensland and NSW (Nelson, 2021) (Ken Henry et al., 2023, p. 20). There therefore continues to be a significant need to further grow PPAs in Australia and adapt the regimes in which they operate.

This need fits within Australia's commitment to implement the newly agreed Global Biodiversity Framework protected area target (Target 3) to increase protected areas, to 30% of land, freshwater, and oceans by 2030 (commonly referred to as the 30 x 30 protected area target) (Department of Climate Change, 2022). Meeting this target in Australia will require a significant upscaling of the NRS which currently 22% of Australia's landmass, with additional coverage on private land being essential to achieving an effective and representative NRS.

The Global Biodiversity Framework also includes a restoration target – which aims for 30% of degraded ecosystems to be under effective restoration by 2030 (Target 2) – and a climate adaptation target to minimize the impact of climate change on biodiversity and increase resilience through climate adaptation (Target 8). Also related to these targets are that this current decade is recognised by the UN General Assembly as the 'Decade on Ecosystem Restoration' (United Nations General Assembly, 2019) and the climate adaptation target under the Paris Agreement which aims to significantly strengthen climate adaptation efforts (Article 7). These international targets are likely to influence the overarching regime in which conservation covenants operate.

The following paragraphs provide a more in-depth summary of the laws that establish the structure, authority, and process for the governmental aspect of governance for the Victorian conservation covenanting regime. After providing an overarching summary, this information is then assessed through the lens of adaptive governance, which inform the conclusions of the article.

4 Trust for Nature (Victoria)

4.1 Summary of governance

The Victorian conservation covenanting regime is primarily governed under the *Victorian Conservation Trust Act 1972* (Vic) (the Act) and Trust for Nature (Victoria) (the Trust) is established under the Act.

Victoria has the highest number of registered conservation covenants than any other State jurisdiction – over 1567 – and this grows by around 40 new voluntarily registered conservation

covenants every year (Trust for Nature (Victoria), 2022a). However, the total land protected by conservation covenants is relatively small for Australia, covering a total of 74,365 hectares which is only 1.85% of Victoria's protected areas and only 0.33% of Victoria (Department of Climate Change, 2023a). This is reflective of the smaller private freehold land parcels across the State of Victoria (especially in comparison to other states such as Queensland which has much larger pastoral leasehold land).

The Trust is granted broad powers under s3(2) of the Act that include 'all things that are necessary or convenient to be done' in connection to carrying out the overarching conservation objectives. These powers include without limitation, the power to demise, sell, transfer, convey and otherwise-dispose of real property. This means that the Act governing the Trust is an enabling framework that empowers the Trust to adapt and incorporate contemporary approaches to First Nations rights and interests and conservation which are aligned with contemporary science, the CBD, IUCN best practice and the NRS (Trust for Nature (Victoria), 2021a), despite these matters not being specifically included in the Act.

Section 3A establishes the process for the Trust to enter conservation covenants with landowners and register them against a property's title. The relevant government Minister must approve all conservation covenants and covenants can only be released or altered with approval from the Minister and by agreement between the Trust and the landowner. The registration of a covenant is therefore very secure and there are very few known cases where a conservation covenant has been released in Victoria (Hardy et al., 2017).

The Trust runs a stewardship program that monitors compliance, assesses the environmental condition of the covenanted land, and provides ongoing land management support for participants with the conservation covenant regime. The Trust's conservation work is guided by its Statewide Conservation Plan (Trust for Nature (Victoria), 2021a) and landowners can directly approach the Trust if they would like to voluntarily participate in the conservation covenant regime. Acceptance into the regime will depend on the Trust's strategic priorities which are limited by the internal funding capacity to administer the program (Trust for Nature (Victoria), 2022b).

In general, under the Victorian conservation covenanting regime, landowners have not received ongoing funding or financial incentives. Some landowners may receive a one-off payment to enter the conservation covenant and/or the Trust seeks to negotiate project-based funding that can incentivize and support landholders' conservation efforts, including for fencing, weeding, and revegetation works. However, such one-off payments or project-based funding is generally not equivalent to the ongoing financial contribution of landholders actively managing and improving their conservation assets (Selinske et al., 2022). The Victorian Government has recently introduced a land tax exemption for conservation covenants, which will sit alongside a longstanding exemption in place for primary producers (Trust for Nature (Victoria), 2023). This will come into force on 1 January 2024 and will remove what was otherwise a perverse incentive when taking land out of primary production to meet a conservation covenant objective. For council rates, some local Councils in

Victoria will offer full or partial council rate rebates for landowners with conservation covenants, and this is at the discretion of each local Council and varies across the state.

A small sub-set of landowners with covenants have 'offset conservation covenants' as part of the native vegetation and biodiversity offset markets regulated by the Victorian and Commonwealth governments. A landowner with an offset conservation covenant receives yearly payments for 10 years for the management of the offset site which is protected in-perpetuity by the covenant (Trust for Nature (Victoria)). In comparison to the around 40 voluntary conservation covenants registered each year by the Trust (approximately an increase of 2,500 hectares of PPAs per annum), there are only around 7 offset conservation covenants registered each year.¹ While not a significant component of the Trust's covenanting practice, in terms of establishing a tested model for restoration and climate adaptation, offset conservation covenants incorporate more active land management obligations in accordance with the biodiversity offset objectives and for which there are often significant yearly payments payable to landowners to fund offset management activities (up to a ten-year period). This model is returned to in the conclusions of this paper.

Conservation covenants are also a part of the Victorian government's new restoration program known as BushBank (Victorian Government, 2022). Under BushBank, landowners will be eligible for restoration and protection costs, and in some cases, additional financial incentives (Cassinia Environmental & Victoria State Government, 2023). The program is in its early stages and is due to commence in 2024. The level of funding available for landowners is therefore not yet clear with \$30 million of public money expected to be leveraged with private carbon and restoration investment and its goal is to achieve 20,000 hectares of restoration of privately owned degraded lands.

Section 3(2) of the Trust's Act also enables the Trust to buy and sell land. In exercising these powers, the Trust operates a revolving fund that acquires private land for the purposes of conservation. The Trust then on-sells the land with a condition of sale that the new owner must enter a conservation covenant.

Further to requiring the Minister's approval for a conservation covenant, the government is also responsible for appointing the Board of Trustees under section 4 of the Trust's establishing Act. The Board is responsible for appointing the CEO and setting its own strategic priorities (Trust for Nature (Victoria), 2021b). The Trust's conservation work is guided by its Statewide Conservation Plan (Trust for Nature (Victoria), 2021a) and its work is funded through a combination of government (approximately 50%), philanthropic funding (approximately 30%), provision of services (approximately 15%), and investments (Australian Charities and Not-for-profits Commission, 2023).

The Trust publishes an annual report every year in the form required by the Victorian Department of Treasury and Finance under the *Financial Management Act 1994* (Vic) which requires a high standard of accountability for all statutory bodies. The Trust is

known as a public sector entity within the Victorian public sector and public entities are intended to operate at 'arm's length' from Ministers (Victorian Public Sector Commission, 2023). Further, the Trust's financial statements are audited by the Victorian Auditor-General's Office (VAGO) which is the body responsible for auditing the public sector in Victoria (Trust for Nature (Victoria), 2022a).

Because the Trust is also a registered charity with the Australian Charities and Not-for-Profit Commission (ACNC), it must comply with the governance framework of registered charities as set out by the ACNC and the Trust also produces an annual report to the ACNC.

The key governance elements of the Victorian conservation covenant regime outlined above, are analysed through the lens of adaptive governance (Cosens et al., 2017) in Table 2 and in more detail below.

4.2 Applying an adaptive governance framework to Trust for Nature (Victoria)

The first key aspect of adaptive governance for legal systems requires regulatory and management system design that facilitates polycentricity, integration and persistence (Cosens et al., 2017). Simply put, polycentricity calls for multiple centres for authority. Essentially adaptive governance promotes the keeping of authority for decision making as close to the local scale as possible, while still operating within a larger governance framework that can build trust and knowledge and facilitate the flow of information and consistency of implementation (key elements of subsidiarity and nesting; (Clarvis et al., 2014; Cosens et al., 2017, pp. 6-7; Ostrom et al., 1961)).

The Trust has the legislative powers to administer its conservation covenant program, and employs regional staff to foster trusted local relationships with landowners and local environment managers. There are also several government agencies and partners at different levels of government that the Trust relies on to deliver their programs. Management and decision-making functioning, therefore, occurs at multiple scales and importantly for private land conservation, fosters strong local relationships with regional staff that live and work in local communities. Further, different agencies can intervene at the appropriate level. For example, if a landowner breached a conservation covenant and the Trust failed to enforce the covenant terms, a local Council offering a rate rebate may be inclined to revoke any rate rebate and thus intervene using their local powers available. If strategic and substantial issues and complaints about the Trust were raised at the state and Commonwealth levels and/or with philanthropic funders, there could be funding implications for the Trust which relies on these bodies for funding. Reputation and legitimacy are therefore likely to be a key concern for the Trust. The Minister is also responsible for approving conservation covenants and the Victorian Government is responsible for appointing the Trust's Board, providing the state government with a significant degree of oversight and influence.

Importantly for the Trust, in 2017, the Victorian Government committed to achieving an additional 200,000 hectares of new PPAs

¹ Based on a 5-year average from 2017 -2022 as reported in Trust for Nature (Victoria) Annual Reports.

TABLE 2 Summary of application of Cosens et al. Guidelines to the Trust.

Framework component	Applying the guidelines for assessment to the Trust
Structure	
Polycentricity	<i>Polycentricity is achieved in the conservation covenant regime through embedded local staff Ministerial and government oversight, and government agencies and partners at different levels, which have some powers and authority to intervene (i.e. local council) and other which are more a centre of influence (i.e. the IUCN).</i>
Integration	<i>The Trust has partnerships with various resource management across relevant sectors to reduce unintended consequences. Mining sector is however missing which poses a threat to PPAs in Australia.</i>
Persistence	<i>The Trust is a 50-year-old well-trusted conservation organisation that is delivering existing and emerging conservation initiatives.</i>
Capacity	
Adaptive	<i>The Trust's establishing Act successfully provides the Trust with the authority to adapt as necessary. Resourcing may be problematic.</i>
Participatory	<i>Although not included as a legal requirement within the Act, the Trust has a significant work stream committed to enabling self-determination for First Nations people. The Trust's covenanting processes also appear to facilitate participation from landowners. Further investigation from participants is needed to test assumptions here.</i>
Process	
Legitimacy	<i>The Trust has detailed annual reporting processes and is held accountable by government processes and the ACNC which is relevant to its transparency, accountability, and legitimacy. It is also stable (see further above). While not legally mandated, its Statewide Conservation Plan is an example of a science-based approach to decision-making. Further empirical investigation is needed to test assumptions.</i>
Procedural justice	<i>In addition to the transparency and accountability described above, the Trust is subject to several Victorian government-specific procedural justice frameworks including freedom of information requests and whistleblower protections.</i>
Problem-solving approach	<i>The Statewide Conservation Plan indicates a high level of sophistication to use science and the wide variety of partnerships referred to earlier enables the development of interest-based collaborative processes. Further, the arms-length/independence from the government is expected to assist in beneficial solutions.</i>
Reflection and learning	<i>Stewardship program offers a space for monitoring, feedback and consideration of new information. Amendments are made to the Management Plan that accompanies the covenant accordingly. Further evidence needed to understand whether this is sufficient/adequate to ensure response to change is not rote.</i>
Balance stability and flexibility	<i>The conservation covenant is stable and contains restrictions. However, there is also flexibility built into its terms, which is further supported by a management plan. Ultimately, the capacity to undertake sophisticated management techniques will depend on the capacity and resources of the landowner. There is a risk that this is scarce for many landowners.</i>
Dispute resolution	<i>The conservation covenant contains dispute resolution procedures.</i>

by 2037 in their biodiversity strategy (Victorian Government, 2017, p. 20). This state government policy commitment firmly places the Trust's work at the centre of the State's priorities. Alongside the creation of new PPAs, is a commitment from the state government to achieve 200,000 hectares of revegetation in priority areas for connectivity. The BushBank program is contributing to both these targets.

As referred to above, conservation covenants registered by the Trust are also included in the NRS and meet IUCN protected area criteria (most are IUCN Category II). The IUCN classification and reporting on it to CAPAD and the World Database on Protected Areas provides an international reference and standard to localised property specific protection. This brings an individual privately owned property into a larger network of national and international network of protection. Notwithstanding challenges (Clements et al., 2018), the regime interactions arguably allow for landscape-scale planning and establish trust and consistency in the standard of protection achieved by conservation covenant regimes.

The IUCN, NRS and state governance interactions mean the Trust is influenced by complex horizontal relationships which arguably achieves a degree of polycentricity which is supported through effective nesting of decisions and outcomes through subsidiarity. That is, the legal framework supports decisions to be made locally - allowing for innovation - while the NRS guidelines (which are informed by the IUCN criteria) ground and support local action.

It is also important to note that there are other less-utilised forms on-title conservation agreements that landowners could participate in, in Victoria (for example regulated by government Departments or local Councils), however these other forms of on-title agreements do not proactively recruit new landowners and tend to operate outside of the PPA and NRS governance frameworks (Fitzsimons, 2015; Brugler, 2020).

The Trust's high number of partnerships - which cross over resource sectors - is reflective of the Trust achieving integration across sectors that influence its work. In addition to the horizontal relationships already mentioned, key partners across sectors include for example, catchment management authorities, water authorities, First Nations groups, various state and federal government departments, and a variety of corporate partners including those in sectors relating to finance, forestry and agriculture (Trust for Nature (Victoria), 2022a). Notably missing is the mining sector, although unlike other states, issues of mining conflicting with the conservation covenant regime in Victoria have not been documented.

In relation to persistence, the Trust has been in existence for over 50 years and is understood to be Australia's oldest conservation covenanting organisation. Further, the modest but consistent increases in the yearly number of conservation covenants have - to date - ensured that conservation covenants remain relevant to emerging environmental initiatives, including for example the national and state biodiversity offsets market and the new restoration program in Victoria, BushBank. These factors potentially reduce response time to surprise.

The second key aspect of adaptive governance relates to the resources and authority of a regime to respond to change, this

encompasses participatory capacity and authority (Cosens et al., 2017). Despite not being specified in its governing legislation, the Trust appears to be prioritising self-determination with First Nations people through co-designing land management courses for First Nations people, working on Country with First Nations groups, and significantly, is pursuing land hand-backs to First Nations organisations of land that it owns and manages for conservation purposes.

Participation in the context of PPAs is also about the way in which a conservation covenant regime fosters and enables landowner participation, for those enrolled in the scheme. To maintain legitimacy, cooperation, and buy-in from landowners it is important for the Trust to continue to work in a consultative manner with landowners regarding the implementation of the conservation covenant, and for landowners to be granted rights within conservation covenants to have the power to negotiate and have a say on what is included in management plans and environmental strategies for the land. These rights are not embedded in the Act, however, the Trust's covenanting processes facilitate participation through its covenant terms, stewardship program and the flexibility offered in Management Plans. For example, the Trust's covenant deed, contains a definitive set of restrictions – including, for example, removing vegetation, use of livestock, introduction of non-indigenous fauna or domestic animals, removal of soil and minerals, use of fertilizer etc. however, discretion is provided to the Trust to allow a landowner to undertake certain activities otherwise prohibited by the covenant. Discretionary approvals are granted subject to conditions imposed by the Trust and can be revoked at any time should it become apparent to the Trust that the activity is adversely affecting the covenant objectives. This builds-in flexibility to the conservation covenant for evolving environmental management techniques and is more likely to meet landowner needs. To ensure that discretionary approvals do not undermine covenant objectives, the Trust needs to ensure it adopts a science-based approach to decisions with reference to ecological data. In terms of having the ability to encourage a larger number of landowners to participate in the regime, while covenanting has been attractive to a small number of conservation minded landowners, it would require a significant upscaling of investment into the organisation and its processes to be able to process more covenants in addition to being able to offer as financial incentives for landowners to make covenanting attractive to financially motivated landowners (see for example the level of investment in NSW's Biodiversity Conservation Trust, Elton & Fitzsimons, 2023).

The current participation of largely 'lifestyle' and increasingly absentee landowners to conservation covenants, is also potentially a barrier to achieving greater participation from landowners that rely on land for income. Further, concerns from current participants in Victoria about their resources and expertise in meeting conservation covenant objectives raise doubts about the ability of 'lifestyle' landowners to implement effective adaptive management (Bond et al., 2018) (Groce and Cook, 2022) (Selinske et al., 2019).

Finally, in relation to legitimacy and good governance, the Trust's regime is particularly transparent due to its multiple reporting obligations and well as being subject to several

Victorian government-specific procedural justice frameworks including freedom of information requests, conflicts of interests and declaration of gifts, and public interest disclosures regimes (which essentially protect whistleblowers). Further, the procedural elements outlined in the Act (for covenant approval and registration etc.) provides an avenue for administrative law judicial review if they are not followed. These aspects establish a high degree of legitimacy, accountability, and procedural justice which is necessary to identify unintended consequences, check corruption, and avoid uneven application of the burden of adaptation.

5 Discussion and conclusions: where to next

The goal of this article has been to consider the international and national governance settings that influence conservation covenants in Australia, in order to evaluate the governance of Australia's conservation covenant regimes which are the primary legal tool that establish PPAs in Australia. Adaptive governance – and in particular the framework evaluating the role of law in environmental governance developed by Cosens et al. – is promoted as a conceptual framework to guide conservation covenant regimes to achieve effective governance through flexibility and being responsive to their dynamic contexts, while not sacrificing the permanence and security that is one of the key strengths of conservation covenants (in comparison to other environmental initiatives on privately managed land for example).

The above analysis of the conservation covenant regime in Victoria indicates that many of the legal foundations for an adaptive governance framework exist and that the Trust balances the stability and security of the permanently registered conservation covenant regime with flexibility that is needed for environmental and social change. Additional re-assurance in the legislative framework and/or the covenant deed that the Trust is making decisions based on best available evidence and science may help to re-assure stakeholders regarding its internal decision making processes where discretionary approvals are being granted to landowners.

The complex web of horizontal relationships in PPA governance demonstrates that the Trust has evolved to embed its local work within state, national and international targets for protected areas; it is now influenced by the Victorian Biodiversity Strategy, the Commonwealth NRS strategy as well as IUCN guidance and frameworks established under CBD. This has elevated the importance, trust, and consistency of implementation of the Trust's local work to a landscape level that is part of a global effort to achieve the 30 by 30 protected area target.

The key challenge that has been identified for the Victorian conservation covenant regime to continue to grow and evolve, relates to inadequate public financial investment for the conservation covenant administrative regime. This includes both adequately resourcing the covenanting body to enable it to strategically build relationships and recruit new landowners, while also providing effective stewardship to current landowners. This raises the question of whether the regime has adequate capacity to respond to change and has the resources to apply best practice

science and interest-based collaborative processes. The second key challenge that has been identified relates to providing sufficient financial incentives to landowners that are needed to effectively recruit landowners who can implement adaptive management on the ground. By comparison, New South Wales (NSW) has significantly increased its public investment in private land conservation and has moved towards a more market-based approach for conservation covenants. In NSW, since 2017, the NSW Biodiversity Conservation Trust has invested close to \$250 million of public money to establish/expected to establish 308,116 hectares (430 properties) of new conservation areas through conservation agreements (Henry et al., 2023, p. 19).² This is significantly vaster than what Victoria has delivered over its 50 year history and is a good benchmark for the scale of public investment that is required in each State jurisdiction. It should be noted that while the scale of funding and private land protected in NSW demonstrates recent successes for private land conservation in NSW (PPAs and otherwise), the overarching governance framework in which conservation covenants sit within in NSW, and in particular the very different standard for native vegetation clearing rules on agricultural land and the biodiversity offsetting scheme, has been the subject of significant criticism due to loss of habitat on unprotected private land overall, which has occurred since the new markets-based regulatory scheme was introduced in NSW 2016 (Henry et al., 2023, p. 4).

In looking forward to ideas for how to grow and evolve conservation covenanting regimes in Australia, the preliminary findings in this article demonstrate that the Victorian conservation covenant regime has a solid governance foundation to achieve effective governance of PPAs to continue achieve protected area targets. The legal governance foundations have demonstrated their capacity to support the national and state biodiversity offsets markets, which indicates that conservation covenant regimes are similarly well-placed to support the delivery of complementary objectives relating to climate adaptation and ecosystem restoration and be incorporated into these new policy initiatives, as is currently occurring in Victoria under the BushBank scheme.

Further, being part of ecosystem restoration and climate adaptation potentially opens new revenue streams for private land conservation (i.e. under Bushbank or a proposed Commonwealth Nature Repair Market) to cover the high costs of restoration activities. Such an approach would likely bolster conservation covenanting programs, increase the establishment of PPAs and at the same time, achieve security of investments and permanent protection for ecosystem restoration and adaptation projects. For conservation covenant regimes in Australia, this presents an opportunity for growth and evolution. A particular challenge in Australia will be to find financing that is not dependent on offset payments, which are regulatory payments for harm caused to threatened species and ecosystems. Continuing to rely on biodiversity offset payments will likely

undermine the overarching objectives of the CBD (to maintain and restore ecosystems and stop extinctions).

Finally, while there is likely to be a need for a range of policy and legislative instruments (both new and established) to assist in reversing the trajectory of biodiversity decline in a changing climate in Australia, based on these findings from Victoria, it is expected that conservation covenants will continue to have an important role to play in maintaining existing and establishing new PPAs. The findings in this article suggest that conservation covenant regimes have good governance frameworks to achieve effective governance and can continue to be used to achieve protected area targets in Australia, as well as – with the right policy levers – having the capacity to evolve and adapt to complement and support new regulatory initiatives such as ecosystem restoration and climate adaptation.

Given the voluntary nature of participation with conservation covenants, getting the right policy levers and incentives to encourage participation from landowners who agree to forgo property rights and commit to active land management to achieve restoration and climate adaptation objectives in degraded landscapes, is likely to be the biggest challenge.

Data availability statement

Publicly available datasets were analysed in this study. This data can be found here: <https://www.dccew.gov.au/environment/land/nrs/science/capad/2000>.

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² Note that these are understood to be a mix of fixed-term and in-perpetuity agreements (so not all will meet the definition of a PPA and be included in the NRS).

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The contribution of private land conservation to 30x30 in Germany

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In line with Target 3 of the Kunming-Montreal Global Biodiversity Framework, the European Union (EU) aims to protect 30% of its land and sea by 2030 (known as 30x30). Germany has been a vocal supporter of this goal in the international arena but has yet to achieve sufficient protected area coverage domestically. We estimate that Germany needs to report an additional 4.65 million hectares of protected land to achieve 30x30. This article examines the potential of privately protected areas (PPAs) and other effective area-based conservation measures (OECMs) to contribute to this goal. We explore the German Federal Nature Conservation Act and identify the legal hurdles for the designation and recognition of PPAs. Furthermore, we argue that OECMs have the potential to contribute significantly to 30x30 in Germany. We estimate that close to one million hectares of land could be classified as OECMs and outline potentially qualifying sites. In conclusion, we discuss the prerequisites for upscaling private land conservation in Germany, focusing on required conditions for establishing OECMs and incentivising conservation easements and long-term conservation leases through national funding programmes.

KEYWORDS

privately protected areas, other effective area-based conservation measures, Germany, EU, conservation easements

1 Introduction

Protected areas can be an effective solution to address global biodiversity loss and mitigate climate change impacts (Lewis et al., 2023). However, worldwide protected area networks their current form have been insufficient to halt the loss of biodiversity (Secretariat of the Convention on Biological Diversity, 2020), partly due to a lack of ecological representation, connectivity and management effectiveness (Lewis et al., 2023). Therefore, the expansion and improved management of protected areas are key policy goals in nature conservation at the global and EU level (EC/European Commission, 2020; CBD/Convention on Biological Diversity, 2022). There is less clarity about how and where protected areas should be supplemented and upgraded (Kullberg et al., 2019; O'Connor

et al., 2021; Ranius et al., 2022). Opposition of landowners and land users against restrictions associated with protected area designation and management (Allendorf, 2022), particularly in the context of Natura 2000 (Blicharska et al., 2016), has shifted the focus to socio-economic aspects of protected area expansion (Yang et al., 2020; Jones et al., 2022). In this light, voluntary forms of area-based conservation appear as a politically attractive alternative to public protected area designation.

The importance of private land conservation for global and EU biodiversity targets is increasingly recognized politically and scientifically (e.g. Disselhoff, 2015; Kamal et al., 2015; Capano et al., 2019; Shumba et al., 2020), especially to fill gaps in public protected areas networks (e.g. Bargelt et al., 2020; Ivanova and Cook, 2020). Worldwide, public protected areas are, on average, disproportionately found at higher elevations, on steeper terrain, and on land of low economic value (Venter et al., 2018). As a result, important species and habitats are underrepresented in protected area networks, particularly in regions with high intensity of land use or high levels of private land ownership (Venter et al., 2018). Meanwhile, privately protected areas (PPAs) are twice as likely to be found in human-dominated landscapes as compared to public protected areas (Palfrey et al., 2022). Similarly, other area-based effective conservation measures (OECMs) can provide long-term biodiversity conservation benefits for hundreds of key biodiversity areas located outside protected areas (Donald et al., 2019). OECMs may also be more socially acceptable than public protected areas when conservation is not the sole or primary land use objective (Dudley et al., 2018), which can lead to improved connectivity of protected areas, for example in coastal and rural settings (Maxwell et al., 2020) and can offer a similar level of protection for vertebrates comparable to existing protected areas (Schuster et al., 2019). Despite mounting evidence that PPAs and OECMs are already helping to fill gaps in public protected area networks, data on PPA and OECM coverage remains incomplete, with only around 40 states reporting PPAs or OECMs to the World Database on Protected Areas (Bingham et al., 2021).

2 Policy and legal framework

Adopted in 2020, the EU Biodiversity Strategy aims to protect at least 30% of the EU's land and sea by 2030 (EC/European Commission, 2020). The same goal (30x30) was included as Target 3 in the Kunming-Montreal Global Biodiversity Framework (CBD/Convention on Biological Diversity, 2022). As a founding member of the "High Ambition Coalition for Nature and People", Germany has been a vocal supporter of 30x30 in international negotiations.

For the implementation of 30x30 in EU Member States, the European Commission (EC) has designed a "pledge and review" process, expecting EU member states to submit pledges of existing or planned protected areas contributing to 30x30. The EC has published guidance on the criteria used to review these pledges (EC/European Commission, 2022). This guidance indicates that private land conservation can contribute to protected area targets if the

land in question meets the same quality-related criteria as publicly protected areas.

EU member states were expected to submit the first pledges for their protected area targets to the EC in 2023. Germany was among the few countries to submit an (incomplete) pledge, which consisted of protected areas covering 17% of its land base. Although Germany has announced the submission of additional protected area pledges in the following months, it is improbable that these will amount to 30% of Germany's land base. In fact, we expect that Germany will face a sizeable gap between its ambition and the reality regarding protected areas. If the German government wants to honour its political commitments, it must come up with roughly 4.65 million hectares of additionally protected land (13% of Germany's land base). An undertaking of this magnitude will require looking beyond traditional protected area designation. In this light, private land conservation merits further scrutiny by German authorities.

3 Privately protected areas in Germany

In Germany there is a constitutional separation of powers between the federal government and the federal states i.e. Länder. The Federal Nature Conservation Act ("Bundesnaturschutzgesetz", BNatSchG) provides the framework for nature conservation in Germany, which is enacted through the individual state legislation (through the Länder Naturschutzgesetze). There is no national agreement among the federal state governments regarding how to enact the BNatSchG because political parties in the states represent different interests. The federal states are ultimately responsible for the designation of protected areas and for funding incentives to promote biodiversity management.

Currently, the German nature conservation law does not provide for management of protected areas by non-state entities - unlike other EU member states like Portugal, Belgium and Slovenia (Disselhoff, 2015). Section 22 of the Federal Nature Conservation Act stipulates that parts of nature and landscapes can be protected "by declaration" and that protected areas must be "registered and marked". It refers to German state law for the form and procedure of protected area "declaration" (i.e. designation). Most nature conservation acts of the German federal states foresee some public decree, law or statute as the standard legal procedure for protected area designation. A declaration by non-state entities is not mentioned in any of the laws. This makes it clear that the designation for protected areas is considered solely a sovereign competence. German law does not provide for the registration, public recognition or marking of land under private governance dedicated to conservation. On the contrary, most state nature conservation laws stipulate that a protected area designation may only be used for sites that have been protected by competent public authorities. Accordingly, there are high obstacles to extending the definition of protected areas under German law to areas under private governance. In particular, delegating the enforcement authority to third parties would require a clear legal framework that regulates the powers and duties of those entrusted with performing sovereign tasks. Such a construct is conceivable in principle and known from other areas of German law but is non-

existent in German nature conservation law. The complex administrative processes and lack of existing procedures in place to designate PPAs makes it extremely difficult for private land owners to get recognition for their sites unless they are well versed in German Law and well organised with established contacts to local government authorities. Nevertheless, due to the existing diversity of protected area management categories in German Law (i.e. Naturschutzgebiet (Nature Reserve), Nationalpark (National Park), Biosphärenreservat (Biosphere Reserve), Landschaftsschutzgebiet (Landscape Conservation Area), Nationale Naturmonumente (National Natural Monument), Naturpark (Nature Park), Natura 2000), the additional complexity of the individual federal state legislation, and the lack of formal recognition of private governance in this regard, it is more likely that areas potentially qualifying as PPAs would be designated and reported to the WDPA using one of the existing management categories rather than establishing a 'new' PPA category within the legal framework.

The instruments to formally/legally designate PPAs are therefore relatively superfluous in German nature conservation law as detailed above. However, as discussed by Bingham et al. (2017), there are other alternatives for recognising PPAs in Germany, for example by focussing on encouraging the reporting of potentially qualifying sites. Even if these have not been recognised according to German law, non-government sources can report sites to the WDPA, and these can be verified by WCPA and experts. This process can in turn encourage government recognition in the future. In comparison, there is more of a niche for the designation of OECMs as these are potential sites that would not qualify under an existing protected area management category according to the current legislative framework, however have the potential to add significant value to the connectivity and representativity of the German protected area network.

4 Other effective area-based conservation measures in Germany

The 14th Conference of the Parties to the Convention on Biological Diversity defined OECMs as “a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the *in-situ* conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values” (CBD/Convention on Biological Diversity, 2018). The IUCN distinguishes between OECMs that have conservation as a primary objective (primary conservation), those where conservation is a secondary objective (secondary conservation), and those where conservation is not a primary management objective but *in situ* conservation of species and habitats is achieved as a by-product of management activities (incidental conservation; IUCN/International Union for Conservation of

Nature, 2019). OECMs with a primary conservation objective qualify as protected areas but are not formally designated as such. Thus, although they are obvious candidates for new protected area designations, the responsible governance authority (including landowners, indigenous peoples and local communities) may not wish to officially report these sites as protected areas.

There are quite a few sites in Germany that meet the above definition of OECMs. Following the IUCN's distinction of OECMs according to their objectives, the following categories of sites merit further investigation.

4.1 Primary conservation: areas owned or managed by foundations and associations

Many sites in Germany that are permanently dedicated to nature conservation are located outside existing protected areas. This concerns primarily properties owned by foundations and associations with nature conservation as their statutory objective. The most famous example, the National Natural Heritage (“Nationales Naturerbe”, NNE), consists of more than 180,000 ha in former Federal ownership that has been donated to various charitable recipients and dedicated to nature conservation in perpetuity. Ackermann et al. (2021) conclude that about half of the NNE areas > 300 ha still need to be protected as nature reserves and that many more have only been partially protected. Although these sites are prime candidates for protected area designation, many German nature conservation authorities currently do not have the capacity to designate new protected areas, even if the landowner agrees to the designation. Although non-state entities (in this case foundations and associations) could self-report these sites as PPAs to the WDPA, this would not guarantee their legal recognition. Alternatively, these sites could qualify as privately governed OECMs, existing outside the protected area management categories in German Law.

Other properties owned by nature conservation foundations and associations can also be considered OECMs. Dozens of German associations and foundations each own thousands of hectares of such land (Scherfose, 2017). Unpublished data suggests that these institutions combined own more than 250,000 ha in Germany. There is no data on what percentage of this land is located within protected areas, but it can be assumed that at least some of it is not legally protected.

Besides land ownership, German nature conservation associations or foundations use other means to gain permanent access to properties of conservation interest, e.g. through leases (Pachtverträge), land swaps (Tauschvertrag), licensing agreements (Lizenzvertrag), and conservation easements (Dienstbarkeit). These sites could potentially qualify as OECMs (depending on a case-by-case evaluation). While contracts and agreements may be of limited duration or terminable, conservation easements have the advantage of placing perpetual restrictions on a property irrespective of the ownership. Although there is no legal obstacle to using easements for conservation purposes under German law (Račinska and

Vahtrus, 2018), the instrument is not yet widely used in Germany (Račinska et al., 2021).

4.2 Secondary conservation: privately owned land with conservation-friendly land uses

More than half of Germany's land is used for agriculture, while forests comprise another 31% (Federal Statistics Office Germany, 2022). Samples of the ownership structure of agricultural land in Germany suggest that around 80% of the land is owned by natural persons (Tietz et al., 2021). In forests, the proportion is around 48% (BMEL/Bundesministerium für Ernährung und Landwirtschaft, 2014). Many private landowners do not use their properties themselves but lease them to third parties. Such absentee landowners may want to restrict the use of their property to activities compatible with the conservation of its natural values. The Nature and Biodiversity Conservation Union ("Naturschutzbund", NABU), the largest conservation NGO in Germany, has developed information material and provides advisory services to landowners on including conservation stipulations in agricultural lease contracts. Since the terms of agricultural leases are freely negotiable under German law, and contracts can last up to 30 years, respective properties used in line with conservation purposes in the long term could be classified as OECMs if a third-party monitors compliance. However, there are ongoing discussions to clarify the definition of 'long-term conservation' and whether 30 years is sufficient. For forest land on the other hand, conservation easements (Disselhoff, 2013) seem to be the more appropriate tool because of the longer management periods required for the preservation and development of conservation values in forest ecosystems. If forested properties in private ownership are (partially) dedicated to nature conservation for a meaningful period, they could also be classified as OECMs.

As environmental awareness is positively correlated with income and education (Franzen and Vogl, 2013), we suggest that, on average, members and supporters of conservation NGOs are more likely to own land than non-members. Hence, a large pool of wealthy, educated people in Germany may be inclined to dedicate part of their real estate to conservation purposes. Today, NABU has over 900,000 members, i.e. more than 1% of the German population and other conservation NGOs, like WWF, Greenpeace, and Friends of the Earth also have hundreds of thousands of members or supporters. This demonstrates the potential of German nature conservation NGOs as beneficiaries of conservation leases, stewardship agreements or conservation easements - a relevant new field of activity. In principle, all instruments that ensure the permanent dedication of a piece of land to nature conservation with sufficient legal certainty and transparency can be suitable to qualify a site as OECM, regardless of whether ownership and land use are in one hand. If only 1% of privately-owned land in Germany was dedicated to nature conservation, this could theoretically result in around 300,000 ha of agricultural OECMs and around 170,000 ha of forest OECMs. However, a large number of small OECMs may lead to a significant monitoring challenge, alongside the difficulty of ensuring high conservation quality and effective governance at the site level.

The same logic applies to the Catholic and the Evangelical churches, which own about 820,000 ha of land in Germany (Frerk, 2001). There have been several initiatives to include nature conservation considerations in the lease contracts of church parishes (Bund Naturschutz in Bayern, 2010; Rothauwe et al., 2019). In 2023, the German Church Congress adopted (almost unanimously) a resolution titled "Preserving creation - leasing church land for the common good". If the church parishes, in line with this resolution, dedicated some of their land to nature conservation in the long term, the German churches could contribute considerably to 30x30.

4.3 Incidental conservation: land in public ownership with lasting conservation benefits

Lastly, there are substantial areas in public ownership outside protected areas where management is incidentally beneficial for nature. Military sites are particularly relevant in this context: Germany has about 680,000 ha of current and former military training areas. Approximately 60% of the active training areas are designated as Natura 2000 sites (Naturstiftung David, 2012), and some of the remainder are dedicated to nature conservation. The German Institute for Federal Real Estate ("Bundesanstalt für Immobilienaufgaben", BImA), together with other authorities, implements nature conservation measures (often in the context of offsetting projects) on federally owned forest land (300,000 ha), railway properties (34,000 km in length), inland waterways (7,300 km), and other properties (BMUB/Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit, 2016). Similar properties managed in compliance with nature conservation purposes are owned by the Federal states and municipalities. Recognizing these sites as OECMs, if site-level evaluations identify high conservation value and connectivity, could also contribute to 30x30, but an in-depth analysis of their suitability goes beyond the scope of this paper.

5 Conclusions

While private land conservation cannot and should not replace public protected area networks, it can complement them. Although PPAs are unlikely to receive legal recognition in Germany due to various hurdles, they could make an important contribution to Germany's 30x30 pledge and could be recorded in the WDPA by non-government entities. Nevertheless, their introduction as a protected area management category in German nature conservation law (both at the national and federal state level) would have to be preceded by an in-depth consideration of the preconditions that private landowners would have to fulfil to qualify for a transfer of powers in the context of the current German legal framework protected area governance and management. In contrast, OECMs have the potential to contribute to 30x30 in Germany in the near future. Together, foundations, nature conservation associations, conservation-minded private landowners, and the church own more than 1,000,000 ha of land, a sizeable share of which could qualify as

OECMs. A prerequisite would be that the responsible authorities agree on uniform criteria and procedures for how OECMs could be recognized, registered, monitored, and reported. While the organizational and structural necessities for OECMs in Germany cannot be discussed in detail here, their establishment would require additional capacity in public agencies. Testing the approach based on pilot sites would be a conceivable next step.

Meanwhile, the properties owned by foundations and conservation associations already represent “de facto OECMs”, and their contribution to nature conservation needs to be better recognized and supported. Networking of relevant organizations should be encouraged so that they can learn from one another. Finally, funding instruments must be developed or adapted to incentivize private landowners to engage in the voluntary nature protection of their properties. The new Federal Action Plan for Nature-based Solutions for Climate and Biodiversity (Aktionsprogramm Natürlicher Klimaschutz, ANK) will hopefully offer opportunities to expand private land conservation in Germany through funding instruments tailored to different target groups (e.g. by incentivizing long-term conservation leases and the use of conservation easements).

Data availability statement

The original contributions presented in the study are included in the article/supplementary material. Further inquiries can be directed to the corresponding author.

Author contributions

LK: Conceptualization, Project administration, Visualization, Writing – original draft, Writing – review & editing. TD: Conceptualization, Supervision, Writing – original draft, Writing – review & editing.

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Conservation covenants for ecosystem restoration: adapting an old instrument to a new global conservation challenge?

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Conservation covenants are an important legal tool for enabling private land conservation, whose significance to policymakers has recently grown in light of new global commitments to expand areas of land and water protected and restored. Covenants' traditional focus on conservation of existing natural values rather than restoration of degraded land or active management of environments impacted by climate change pose significant challenges to the flexibility and efficacy of this legal instrument. In Australia, recent national legal reforms to incentivise private land conservation, notably the new *Nature Repair Act 2023*, will need to consider how it can align with conservation covenanted lands that are regulated by different laws with different criteria and goals. Here we identify some pathways for enabling conservation covenants to play an expanded role in the context of ecosystem restoration and climate adaptation.

KEYWORDS

climate change, conservation covenants, restoration/rehabilitation, private land conservation, protected areas, privately protected areas, climate adaptation and mitigation

1 Introduction

Can conservation covenants strengthen efforts to restore degraded and damaged land in a changing climate? Having endorsed ambitious new global targets for biodiversity conservation and restoration, governments around the world are seeking suitable governance mechanisms to help those who privately manage land to implement such targets (Bingham et al., 2021). As areas with degraded and damaged ecosystems needing restoration are often privately owned and managed, such as farmlands, it is generally not politically feasible nor necessarily the best use of publicly available conservation money for

governments to bankroll the purchase of such areas to put them into public reserves. We need other approaches. The covenant is a legal instrument whereby private landholders voluntarily agree to restrict in perpetuity (i.e. permanently) how their estate is used (Hardy et al., 2017). In recent decades, covenants in many countries have been repurposed to protect natural values (e.g. Rodgers and Grinlinton, 2020). Yet, the capacity of covenants to encourage active restoration of ecosystems — as opposed to passive conservation of healthy ecosystems — is unclear. In addition, climate change will necessitate adaptive and sometimes novel forms of conservation management on covenants in the future (McDonald and Styles, 2014; McCormack, 2018a). Here we consider the potential of conservation covenants, focusing on Australia's experience because of its wealth of relevant practice and because it has pending a major, national legal reform that may influence its approach. Our analysis furnishes insights of international relevance, given the significant numbers of these instruments that have been adopted in Australia as compared to other countries around the world (Bingham et al., 2021).

The global governance framework for biodiversity conservation and restoration is changing rapidly. Landmark initiatives include the Kunming-Montreal Global Biodiversity Framework (GBF) which has a global target of ensuring at least 30% of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under restoration by 2030 (Target 2), and to protect at least 30% of its terrestrial and inland water areas and marine and coastal areas by 2030 (Target 3) (amongst others) (Convention on Biological Diversity Secretariat, 2022), the United Nations Decade on Ecosystem Restoration, 2021–2030 that commits countries to 'mainstream ecosystem restoration into policies and plans' for 350 million hectares worldwide (United Nations General Assembly, 2019, clause 3(b)), plus various international pledges to enhance climate adaptation such as 'Race to Resilience' by 2030 (United Nations, 2021). Commitment to these initiatives requires that governments partner with private actors including landholders. For example, the United Nations seeks a 'diverse array of stakeholders to be involved', including 'farmer groups' (United Nations Decade on Ecosystem Restoration, 2021). Yet, these initiatives, as is common with international instruments, do not include specific guidance on how to implement the goals nationally or locally.

Traditionally, few governments have adequate laws to facilitate restoration goals (Richardson, 2016), owing partly to a long-standing bias in environmental law to focus on (short-term) future adversities rather than legacies of past mistakes (Richardson, 2017; Telesetsky et al., 2017; McCormack, 2018b). Several correcting legal reforms are in the pipeline, however. In November 2023 the Council of the European Union reached a provision political agreement on a regulation to restore at least 20% of the European Union's land and sea areas by 2030, and all ecosystems in need of restoration by 2050 (Council of the European Union, 2023), and in December 2023 the Australian parliament adopted a *Nature Repair Act 2023* (Australian Parliament, 2023). The success of such initiatives, in Australia and in other legal jurisdictions, will hinge partly on cooperation

from private landholders who manage a large percentage of ecosystems needing restoration.

2 Challenges for ecosystem restoration governance in Australia

Recent, authoritative analyses of Australian national environmental law identify deficiencies for biodiversity management and restoration on privately held property (Australian Panel of Experts on Environmental Law, 2017). A review in 2020 of Australia's lodestar statute, the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), bluntly concluded: it 'does not facilitate the maintenance or restoration of the environment. ... The scale of the restoration challenge is beyond the ability of governments alone to solve' (Samuel, 2020; see Akhtar-Khavari and Richardson, 2020 for comments). Likewise, the nation's *State of the Environment 2021* report stressed: 'Australia's strategies and investment in biodiversity conservation do not match the scale of the challenge, and ... species continue to decline' (Cresswell et al., 2021, p. 14). Past and ongoing biodiversity declines have been primarily due to: invasive species; habitat loss (e.g. agriculture, urbanization); inappropriate fire management regimes; and, increasingly, climate change. The protected area estate, collectively known as the National Reserve System (NRS), lacks adequate representation of all ecosystem types (Taylor, 2020; Fitzsimons et al., 2023). Furthermore, Australia's *Threatened Species Strategy 2022–2032* calls for restoring areas to create climate change refugia (Australian Government, 2022b).

Specialist legal mechanisms for restoration projects in Australia, as in other countries, are only well-developed for discrete contexts such as remediating 'brownfield' industrial sites and former mines (Akhtar-Khavari and Richardson, 2019). By contrast, landscape-scale restoration has often relied on philanthropic and community-led initiatives, alongside government aid and carbon markets money, such as the Gondwana Link project in Western Australia (Bradby, 2013). These voluntary initiatives primarily depend on laws of the Australian states and territories to underpin conservation investment and secure long-term outcomes, such as covenants negotiated between the covenanting agencies and landholders. The transaction costs to broker customized solutions on a property-by-property basis can be high (Richardson and Davidson, 2021) and the federal government mainly assists indirectly such as via bespoke financial grants and the regulated carbon market which can aid restoration by revegetation and soil management. The Australian government also operates an income tax incentive program for conservation covenants under the *Income Tax Assessment Act 1997*, however, its applicability is limited (Smith et al., 2016).

Alongside the *Nature Repair Act 2023*, the Australian Government released a *Nature Positive Plan* in December 2022 (Australian Government, 2022a). The Act and the Plan both contribute to a new national framework for biodiversity restoration. The *Nature Repair Act 2023* will create a system to

certify and register biodiversity conservation and restoration projects using officially approved methods, with verification of environmental outcomes. A market in the resulting certificates will ensue, enabling traders to help meet their legal obligations or voluntarily assumed commitments for ‘nature positive’ targets. The proposal’s design has some parallels to *Australia’s Carbon Credits (Carbon Farming) Act 2011*.

Earlier iterations of the *Nature Repair Act 2023* faced considerable criticism, such as from the *National Environmental Law Association (2023)*. Concerns included that the biodiversity certificates could be used as ‘offsets’ for new environmentally impacting developments rather than furnishing net nature gains (references to ‘offsets’ were removed before the passage of the legislation through Parliament; *Greber, 2023*), and the lack of integration of the nature repair market with state government-level initiatives. The Act does not explicitly deal with covenants but, in theory, they would be able to be accommodated given the law’s provisions in sections 34 and 89-90 about the type of property-owning interests eligible to participate in a project generating a biodiversity certificate. Yet, as a federal law, the *Nature Repair Act 2023* does not alter the regulation of conservation covenants, which are primarily governed by the laws of Australian states and territories.

3 Conservation covenants

Australia has a relatively high uptake of conservation covenants globally, second only to the United States (US) where they are usually termed ‘conservation easements’ (*Bingham et al., 2021*). Covenants are widely used in many countries to promote nature conservation and restoration on private land. In the US their use took off from the mid-1990s under the aegis of some 1,280 private land trusts that as of 2024 conserve approximately 25 million hectares – an area of protected land that exceeds that in all US national parks (*Land Trust Alliance, 2024*). The law has been crucial to private protected areas in the US via tax concessions and state conservation easement-enabling legislation (*McLaughlin, 2013*). In England, where covenants originated, there was surprisingly no bespoke legislation for enabling conservation covenants until 2021 when the *Environment Act 2021* (Part 7) was enacted, a reform adopted following recommendations from the *Law Commission (2014)* to develop a better legal framework for private nature conservation. A distinctive feature of the English approach is the requirement for certain development projects to generate a ‘biodiversity net gain’, which can be achieved offsite by collaborating with landholders who create a conservation covenant on their property (*Ronish and Hilburn, 2022*). England’s reforms were influenced by New Zealand’s long history of conservation covenants since the 1970s under several specialist laws that experts have described as ‘very successful’ in enhancing public, recreational access to covenanted land whilst protecting biodiversity (*Rodgers and Grinlinton, 2020*). The *International Land Conservation Network (2024)* documents many other countries, including in non-common law jurisdictions, using covenants or other institutional tools for facilitating private land conservation.

Covenants were used in Australia to protect natural values as early as the 1920s (*Richardson, 2023*), but the ‘restrictive covenant’, as this non-statutory, traditional form is known, only allows negative obligations (e.g. not to remove trees) and the benefit of the covenant must accrue to a neighbouring property (*Richardson, 2023*). From the 1970s the Australian states introduced legislation, such as the *Victorian Conservation Trust Act 1972* (Vic), that removed some of these restrictions. *Table 1* details typical components of modern covenant legislation. Today a conservation covenant is used as a voluntary statutory legal tool that a landowner can choose to enter with an authorised body. Generally, landowners are motivated to ensure that the nature and habitat on their land will remain, no matter who the future owners or managers are. That is, it is intended to provide in-perpetuity (or long-term for leasehold properties) protection for nature on privately owned land so that any new owner of that land is bound by the terms of the conservation covenant.

The advantages of such covenants include assisting altruistic landowners in managing their properties’ environmental values and providing legal security for protected values that endure regardless of changes in property ownership (*England, 2015*). Empirical research suggests covenants in Australia have improved covenants’ environmental behaviour (*Groce and Cook, 2022*), because they typically rely on *voluntary* participation from landowners. However, covenants can be differentiated from other conservation initiatives on private property such as government land use planning and restrictions on native vegetation clearing. Covenants can work in tandem with these and other initiatives, such as being sites for threatened species recovery activities and biodiversity or carbon offsets. *Figure 1* illustrates how covenants

TABLE 1 Examples and components of modern conservation covenant provisions in legislation.

Component	Examples
Terminology	‘Land’, ‘native vegetation’, ‘natural values’, and ‘owner’
Location of subject land	Property address, site boundaries, and any areas excluded from the covenant
Relationship of covenant to other laws	Building regulations, municipal land use plans, threatened species laws, and land title legislation
Negative land use obligations	Prohibits or limits clearing vegetation, grazing livestock, lighting fires, disturbing soil, introducing foreign materials, and using agricultural chemicals
Positive land use obligations	Controlling weeds & pests, maintaining livestock-exclusion fences, and applying prescribed fire management practices
Responsibilities of government	Providing financial and/or technical assistance to landholders
Compliance control	Access to the property for site inspections by the covenant agency, issuance of notices, authority of government to enter and complete works to protect natural values, and penalties for non-compliance
Dispute resolution	Availability of mediation or arbitration mechanisms to settle disputes
Alteration of covenants	Procedure for landholder to request a change to the terms of the covenant

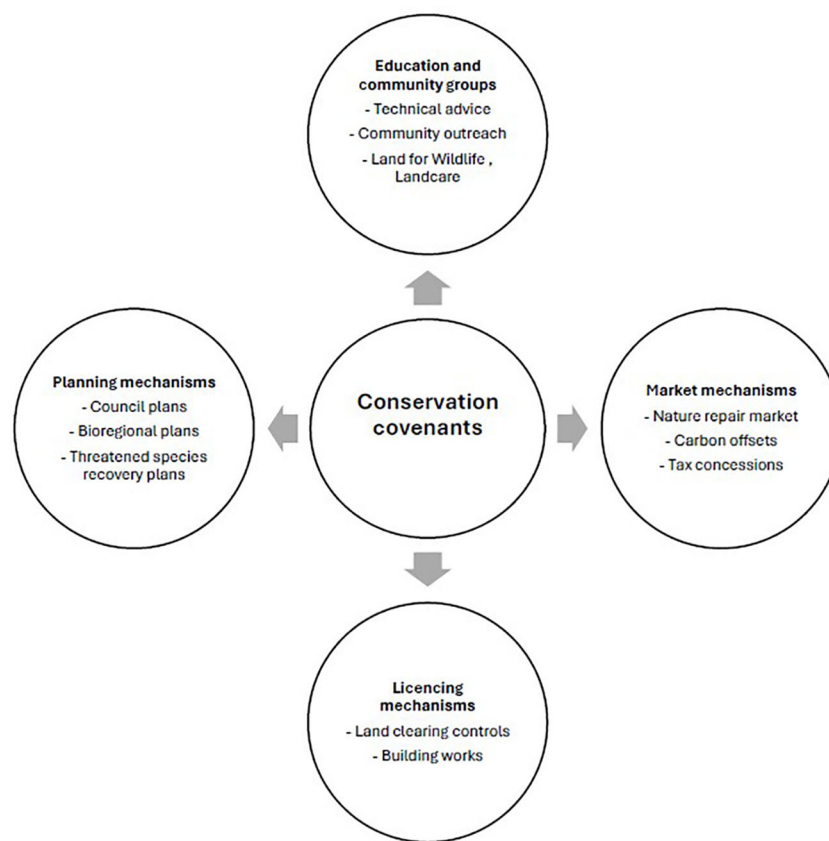


FIGURE 1
Covenants' wider governance context for conserving/restoring biodiversity on private land.

may interact with the broader governance landscape for private nature conservation in Australia.

For Australia to grow its NRS (currently covering 22% of the continent) to meet the 30% protection target by 2030, the Australian government has proposed to add 61 million hectares of new protected areas to the NRS (Australian Government, 2022b). Conservation covenants have so far been applied to nearly 6 million hectares (Australian Government, 2022c), as detailed in Table 2. Recognised in the NRS as a type of 'privately protected area', which also includes private nature reserves, covenants can secure important wildlife habitat, connect fragmented ecosystems and create buffer areas around national parks (Fitzsimons and Wescott, 2001; Fitzsimons, 2015). However, for Australia to meet its international commitments and domestic policy obligations for establishing a comprehensive, adequate, and representative protected area system, it is likely that restored (or 'under restoration') ecosystems will need to be included. Furthermore, existing healthy ecosystems are likely to increasingly require active stewardship to enable their adaptation to climate change, plus creation of entirely new biodiversity habitat for climate refugia (McCormack, 2019). The urgency of climate adaptation was demonstrated by the massive bushfires and then floods in eastern Australia over 2019–2022 that devastated vast areas including national parks and covenanted land (United Nations Environment Programme, 2022).

Notwithstanding the overwhelming positive literature on conservation covenants in Australia (Selinske et al., 2019; Gooden and Sas-Rolfes, 2020), potential challenges have also been identified for expanding their use (e.g. limited financial resources for covenanting agencies to meet demand for new covenants (Fitzsimons et al., 2023) and monitor compliance and/or ecological outcomes on existing covenants (Fitzsimons and Carr, 2014). Covenants have traditionally served to conserve *existing* natural values such as intact native vegetation, and they usually apply only to areas of relatively high conservation value rather than degraded land needing restoration (Fitzsimons and Wescott, 2001; Fitzsimons and Carr, 2014) (see Figure 2). A key challenge is making covenants sufficiently flexible to meet the ambitious international and national goals for ecosystem restoration and climate adaptation. Covenant agencies typically rely heavily on one-size-fits-all legal templates rather than bespoke arrangements that might better accommodate the needs of different landholders or different ecosystems (Archibald et al., 2021). Furthermore, the efficacy of covenants is impacted by the wider governance challenges of private land conservation, including limited financial incentives for landholders to undertake nature-positive measures: given the choice, most landholders will accept financial incentives for set-term agreements over in-perpetuity covenants if both agreement types are offered (Productivity Commission, 2001;

TABLE 2 Conservation covenant regimes recorded as part of Australia's National Reserve System in 2022; data from Collaborative Australian Protected Areas Database 2022 (Australian Government, 2022d).

Covenanting body in Australian states and territories	Governing legislation	Area under covenant; and percent of state's total land covenanted
NSW Biodiversity Trust (New South Wales)	<i>Biodiversity Conservation Act 2016</i>	210,492 ha 0.26%
Trust for Nature (Victoria)	<i>Victorian Conservation Trust Act 1972</i>	74,365 ha 0.33%
Department of Environment, Science and Innovation (Queensland)	<i>Nature Conservation Act 1992</i>	4,375,857 ha 2.53%
Department for Environment and Water (South Australia)	<i>Native Vegetation Act 1991</i>	1,015,726 ha 1.03%
Department of Natural Resources and Environment (Tasmania)	<i>Nature Conservation Act (2002)</i>	101,199 ha 1.48%
National Trust of Australia (Western Australia)	<i>The National Trust of Australia (WA) Act 1964*</i>	16,167 ha 0.10%
Parks and Wildlife Commission of the Northern Territory (Northern Territory)	<i>Territory Parks and Wildlife Conservation Act 1976</i>	140,551 ha 0.10%

*Note, these figures do not include Western Australia's Nature Conservation Covenant Program overseen by the Department of Biodiversity, Conservation and Attractions because these are not reported into CAPAD.

Fitzsimons and Cooke, 2021). Opposition by agriculturalists to environmental restrictions has already led to government retreat, in the states of New South Wales and Queensland, from controls on landholders' clearance of native vegetation (Heagney and Kovac, 2021).

One of the biggest challenges in addressing potential risks and resolving whether covenants are sufficiently flexible to support restoration and climate adaptation is the inconsistency in practice across Australian jurisdictions, both in public funding and administration of the conservation covenant itself, as well as their broader governance regime. Illustratively, while relaxing controls on clearing of native vegetation on agricultural land, NSW has invested some AUD\$250 million of public money since 2017 to establish 308,116 hectares on 430 private properties of new conservation areas through conservation agreements that include annual payments to landowners (Henry et al., 2023). While this is the most well-funded and active conservation covenant program in Australia (Elton and Fitzsimons 2023), since it was introduced the annual rate of clearing of woody vegetation in NSW increased by a third, with over 379,000 hectares cleared, 83% for agriculture (Henry et al., 2023). Conversely, in Victoria, there are tighter controls on land clearing but limited financial incentives to



FIGURE 2
Map from Tasmania's publicly available Land Information System, illustrating how covenants in an area of southern Tasmania (highlighted in green overlay) are concentrated in forested and relatively intact ecosystems but largely absent from agricultural and settled areas where ecosystem restoration is most needed.

expand covenanted areas apart from the new BushBank scheme (Victorian Department of Energy, Environment and Climate Action, 2023). By further comparison, in Tasmania, the state government is currently unwilling to expand its covenants program (Hiscutt, 2022).

4 The Nature Repair Act 2023 and conservation covenants

The *Nature Repair Act 2023* may help overcome some of the foregoing limitations. Its focus on creating an *economic* incentive for biodiversity restoration and conservation, through the ability to earn tradeable biodiversity certificates, could help counteract the economic disincentives some Australian landholders face to put a covenant on their land or otherwise to implement nature-positive measures (although how this will work in practice is still unclear) (The Nature Conservancy Australia, 2023). This shift to market-based approaches dovetails with some Australian state-based initiatives, such as Victoria's new BushBank program (Brugler, 2023), however unlike BushBank, the *Nature Repair Act 2023* will not require that all participating lands have a covenant. As a landholder could still create biodiversity credits for the national market regardless — the *Nature Repair Act 2023* option might appeal to landowners unwilling to encumber their property's title permanently with a covenant obligation or to use its provisions for very long-term agreements.

Conversely, a voluntary, market-based approach presents several challenges. The economic benefits of generating biodiversity credits may be insufficient to motivate, for example,

an agriculturalist, to change land use practices when more lucrative, development or carbon opportunities exist, especially if the price point for biodiversity certificates is inadequate. Secondly, whilst the *Nature Repair Act 2023* will create a national-level institution to ensure the integrity of the new market, it is currently unclear how it would create, or provide for cooperation with, sub-national institutions that can work closely with landholders, such as those furnishing technical assistance. Conservation covenant agencies can provide such assistance (Elton and Fitzsimons, 2023). Relatedly, covenants helpfully foster an ongoing relationship between the landholder and the covenant-supervising agency, which can nurture landholders' sense of kinship with like-minded conservationists and boost peer monitoring of compliance with covenants (Selinske et al., 2019). A national market in biodiversity credits, operating remotely from day-to-day land managers, is unlikely to generate these social and governance benefits. Some other features of the *Nature Repair Act 2023* might also detract from its ability to stimulate ecosystem restoration regardless of the covenant context. Notably, the Act will allow the governing Minister to exclude a biodiversity project that 'will have a material adverse impact' on specified items that include 'land access for agricultural production' and 'employment'. These exclusions could potentially exclude environmentally degraded land associated with agriculture that could benefit from restoration and, even if these areas are not excluded, risks creating uncertainty for agricultural landholders about their eligibility to participate in the market.

5 Reforming covenants to facilitate ecosystem restoration

Covenants are not a specialist tool designed for restoration, just as they were not initially designed to create privately protected areas. They have however demonstrated their value in achieving long-term conservation on private land (Hardy et al., 2017) and we suggest six propositions which, if considered, could help to improve covenants' effectiveness in achieving the multiple goals that relate to protected areas, ecosystem restoration, and climate adaptation. These issues reflect not only conclusions drawn from the emerging literature but the direct experience of several of this paper's authors in managing covenanted properties and/or working with covenant agencies in Australia (e.g. Fitzsimons and McDonald, 2021). Some legal scholars have debated more far-reaching reforms, which include revolutionising the institution of private property (Davies et al., 2021). Such ideas are not currently politically feasible to be implementable by 2030. Our focus is how an existing instrument, the covenant, might be reformed to help meet near-term goals.

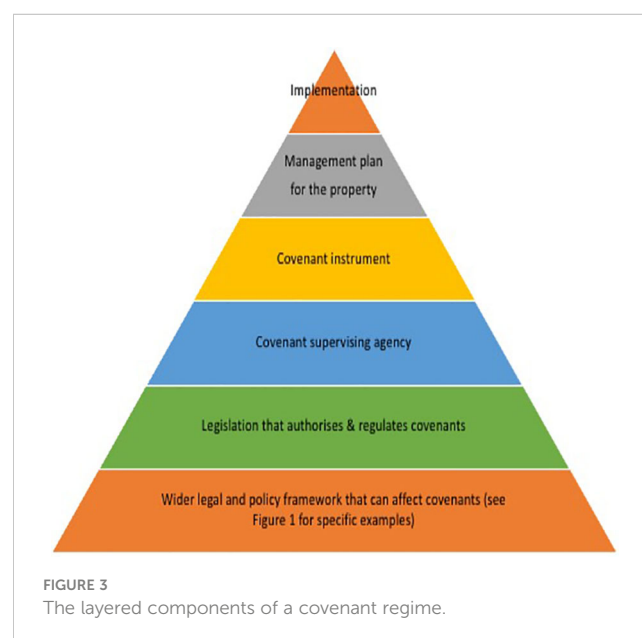
5.1 Think of covenants as situated within a dynamic governance 'regime'

A covenant should not be understood as a discrete, time-frozen tabulation of legal responsibilities for environmental management.

Instead, we propose conceptualising the covenant as a central part of a governance 'regime' in which the protective instrument is nested within a cluster of governance arrangements. The notion of 'regime' has been applied in relation to international environmental agreements (Young, 2012), but the concept can also be applied productively to local scales, helping decision-makers to focus on how a package of actors, instruments and policies can best function synergistically. A covenant's regime includes the covenant administering agency, its overarching legislation, and landholders' biodiversity management plans, as depicted in Figure 3. The regime influences the decisions of private landholders without being directly binding on them. The regime exists independent of actors but the concept allows us to better appreciate what might be the optimal combination of actors and tools for ecosystem restoration on private land. For instance, despite protected area objectives and criteria typically not being specifically referred to in covenant legislation, international guidance (Mitchell et al., 2018) and NRS policy have influenced conservation covenant regimes as they have been formally accepted as an important contributor to the NRS (Fitzsimons, 2015). Similarly, there is now an opportunity for national and international standards for ecosystem restoration and climate adaptation to drive conservation covenant practice and encourage covenanting agencies to meet such standards. Lawmakers also need to be more attentive to how covenants interact with other laws and programs within the regime that may affect private land conservation, including tax incentives, carbon offset markets and municipal land use plans, to ensure mutually supportive relationships (Gunningham and Grabosky, 1998).

5.2 Be attentive to different ecosystem types

Ecosystems of course differ in how easily they can be restored. Some wetlands can be passively restored once the obstacles to



reinstating hydrological conditions have been removed (e.g. removing levees on a floodplain) (WetlandCare Australia, 2023). Some terrestrial ecosystems require more active, ongoing interventions, as with restoration of native grasslands that have lost their seedbanks or been contaminated by agri-chemicals (Gibson-Roy, 2022). Further, reintroducing native wildlife to areas where they were extirpated can involve long-term management of invasive species such as, in southern mainland Australia, foxes, feral cats and rabbits along with numerous weeds (Stobo-Wilson et al., 2020). For restoration-focused covenants, restoration programs must be specifically designed according to ecosystem, financing available and the type of restoration activities that are therefore being promoted. Thus, lands and waters that are amenable to more passive forms of restoration, may be more easily undertaken using existing governance settings. However, areas requiring complex and ongoing support, active restoration are likely to need more tailored programs with sufficient resources, long lead-in times (to establish seed banks, etc.) and multiple parties to assist in facilitation. Following the example of Trust for Nature in Victoria, a revolving fund model (Hardy et al., 2018) could potentially be used to first buy heavily degraded land to enable its restoration by experts before being on-sold to the market with the covenant added.

Identifying any ‘flagship species’ in an area, namely highly appealing wildlife species that can serve as an ambassador or symbol for broader ecosystem values, may also be useful, incentivising conservation or restoration of different areas. For example, the presence of koalas – a well-recognised Australian flagship species – on a property has been suggested to make landholders and other stakeholders more likely to agree to protection measures (Schlagloth, et al., 2018). For areas lacking flagship species, however, it is important to focus on highlighting other potential benefits to landholders (Kusmanoff et al., 2016).

5.3 Be attentive to different landholder types

We need to make covenants more attractive to a wider array of landholders. Presently, conservation covenants in Australia, as in other countries, appeal mainly to landholders who are already conservation-minded and do not wish to make economic use of that section of their property (Groce and Cook, 2022). For corporate and agricultural land users that prioritise economic development of their land, the regime in which covenants sit need to better reward landowners for the public good they are providing (which includes foregoing development and future land use change rights). By restoring ecosystem services essential for agriculturally productive landscapes, covenants can also help integrate nature conservation into economic decision-making (Matzek et al., 2019; Fischer et al., 2021). Streamlining how the various emerging environmental markets interact is also going to be necessary so as not to penalise early movers. We recommend moving away from the preference for a one-size-fits-all legal template, to a more diverse offering of covenants that can be applied transparently on a case-by-case basis according to the ecological needs of the property and preference of the landowner,

while still ensuring that a standard of environmental protection is provided by the covenant that meets NRS protected area criteria (as guided by the international standard). Diverse offerings could also be relevant to First Nations landowners whose protocols of ‘caring for Country’ can assist ecosystem restoration, but where the covenant – and the regime itself – may need to be adapted to dual cultural and conservation agendas (Brugler and Richardson, 2023).

Set-term conservation agreements can be important tools for landholders unwilling to commit to conservation covenants. Although set-term agreements have been seen as a ‘stepping stone’ to conservation covenants, there is, so far, little evidence to suggest this occurs (Fitzsimons and Cooke, 2021) and greater attention to the social and financial influences for this are required. Where landholders otherwise oppose a covenant, rather than wholly foregoing their participation, we recommend a stepping-stone approach using intermediary tools. In the Tasmanian Midlands where ecosystem restoration projects are underway, 5-year or 10-year conservation contracts with financial aid have been offered to farmers that have been reluctant to enter longer-term agreements (Cowell et al., 2013; Gilfedder et al., 2021). The use of conservation contracts, which only bind the current landholder, can provide an interim tool to achieve 2030 restoration targets, however, clearer strategies are needed to ensure the outcomes from investment in restoration continue to be realised once the contract expires.

5.4 Expect more government leadership

Taking a regime perspective seeks to establish solutions for achieving optimal interactions within and across the regime. We suggest that conservation covenants can be used to help deliver internationally agreed restoration and climate adaptation, alongside protected area targets. But in doing so, the national government needs to provide greater support to covenant administrators across jurisdictions. Funding from the Australian government to covenant agencies and landholders to fulfil a larger mandate should come with associated obligations to achieve agreed environmental outcomes. While federal aid and associated funding conditions for covenanting bodies is not a novel proposition, there has been an increasing reluctance from the national government to contribute funding to state-based conservation covenanting programs, and certainly not at the levels required to effectively achieve protected area targets (Elton and Fitzsimons, 2023).

5.5 Build climate adaptation capacity into covenants

Whilst we need to retain the permanency of the covenant, as long-term legal security helps protect restoration work by landholders, we also need flexibility to change ongoing management to address new circumstances such as the impacts of climate change, both following stochastic events such as floods and fires, but also more gradual events such as vegetation changes and invasive species. Covenants also need to have sufficient flexibility

within their terms, to enable landowners to undertake climate-adapted restoration activities (which may be experimental, such as species relocations and hydrology restoration). The flexibility of covenants to allow for this appears to be mixed across jurisdictions. The well-established theoretical paradigm of adaptive environmental management has principles useful for guiding ecosystem restoration, including principles of responsiveness, iterative decision-making, and collaborative subsidiarity (involving decisions made at the lowest feasible governance scale) (Chaffin et al., 2014; Lubell and Morrison, 2021). Existing features of covenant governance provide opportunities to introduce adaptive forms of management. The current practice of renegotiating every 10 years a new management plan for a covenanted property provides an opening to adjust covenants to new circumstances, including to facilitate climate adaptation, although more frequent updating of management plans may be necessary in some situations such as after major bushfires. While covenant agencies' strategies are increasingly building climate change considerations into their practice (South Australia Native Vegetation Council, 2023), governing laws typically do not refer to climate change. Ultimately, without a sufficiently supportive statutory framework, the extent to which conservation covenant regimes can deliver restoration will be limited to pockets of innovation, rather than a broadscale institutional approach. More focus on climate adaptation will also require covenant regimes to build stronger ties to other actors and laws, such as emergency services (e.g. Halliday et al., 2012), to build capacity to manage the impacts of climate change, such as compounding and increasingly extreme events, in ways that are also ecologically sound.

6 Conclusion

Private landholders are expected by governments to play a greater role in biodiversity conservation and restoration to help meet international goals such as those set by the Kunming-Montreal Global Biodiversity Framework. Like some other countries such as England, Australia is modernising its environmental laws including new legislation to support a nature repair market to help it implement the new global goals by 2030. The covenant is an old instrument from the nineteenth century that in the 1970s began to be modernised by lawmakers to encourage private landholders to practice nature conservation. Today, a new generation of environmental challenges need to be addressed in which it is no longer sufficient to merely conserve nature; it must also sometimes be restored and made more resilient to climate change. We suggest that covenants can fill an important niche in

private land conservation but to help deliver the new agenda of climate-adapted restoration at scale, some adjustments are necessary. We furnish ideas of international relevance for modernising conservation covenants in Australia. Greater research that compares the experiences of different countries applying or reforming their laws and policies for conservation covenants will be helpful.

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Research priorities for privately protected areas

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The important role of private land conservation, and particularly privately protected areas (PPAs), in contributing towards global conservation is increasingly recognised. With an increase in the extent of PPAs, under a variety of different legal regimes and governance types, comes an increasing number of ecological, social, governance and legal research questions. Research into various aspects of PPAs has been growing. In compiling the IUCN's *Guidelines for Privately Protected Areas*, a range of research questions were posed. The IUCN World Commission on Protected Areas Specialist Group on Privately Protected Areas and Nature Stewardship subsequently sought to gain the views of researchers and practitioners involved in PPAs regarding what they considered to be priorities for research. Responses were higher on enabling factors and mechanisms specific to PPAs and somewhat fewer on ecological and social outcomes. These results can be used to guide future research efforts that will be most meaningful to improve PPA take up, effectiveness and longevity, noting there is a need for researchers, practitioners, landowners and managers, and policymakers to collectively set the research agenda.

KEYWORDS

privately protected areas, financial incentives, research, protected area establishment, success

1 Introduction

The signing of the Convention on Biological Diversity's Kunming-Montreal Global Biodiversity Framework in December 2022 raised the stakes for global area-based protection targets. Target 3 of the Framework saw countries commit to conserving 30% of terrestrial and inland water areas and marine and coastal areas in networks of 'protected areas and other effective area-based conservation measures (OECMs), recognizing indigenous and traditional territories, where applicable' (CBD, 2022).

The important role of private land conservation, and particularly privately protected areas (PPAs), in contributing towards global conservation is increasingly recognised (e.g. [Stolton et al., 2014](#); [Bingham et al., 2017](#); [Mitchell et al., 2018a](#); [Bingham et al., 2021](#)). PPAs have been shown to make important contributions at national or subnational levels for

elements such as ecosystem representation and connectivity (e.g., Fitzsimons and Wescott, 2001; Fitzsimons and Wescott, 2008a; Fitzsimons and Wescott, 2008b; Plischoff and Fuentes-Castillo, 2011; Clements et al., 2019; Archibald et al., 2020) and the initiatives of private actors (and those of indigenous peoples and local communities) are considered “central” to the implementation of the Global Biodiversity Framework (Maxwell et al., 2020).

With an increase in the extent of PPAs, under a variety of different legal regimes and governance types, comes an increasing number of ecological, social, governance and legal research questions. The interest in research in PPAs has been growing with an increasing (though still relatively small) number of papers and reports in the literature in recent years (Palfrey et al., 2021), including an increasing diversity of subjects and geographies. These range from inventories at global (e.g. Stolton et al., 2014; Bingham et al., 2017; Hardy et al., 2018; Bingham et al., 2021; Lewis et al., 2023), national (Fitzsimons, 2015; Pellin and Lima Ranieri, 2016; Shanee et al., 2020), and subnational (Elton and Fitzsimons, 2023) levels, ecological values (Archibald et al., 2020; Ivanova and Cook, 2020), issues of definition (Mitchell et al., 2018b), policy at national and global levels (Clements et al., 2018; Archibald et al., 2021; López de la Lama et al., 2023), motivations (Selinske et al., 2015; Gooden, 2019a; Gooden and Grenyer, 2019b; Selinske et al., 2019), incentives (Wright et al., 2018; Selinske et al., 2022), and monitoring (Fitzsimons and Carr, 2014) amongst others.

The review by Palfrey et al. (2021) on research published in the peer reviewed literature suggests “limited questions have been asked about PPAs” noting that “38% of articles (n = 155) investigated the location of PPAs or ownership characteristics, incentives, and motivations for PPA establishment”. Palfrey et al. (2021) suggested the research questions in already published studies “reflect an exploratory research agenda and demonstrate a trend of research heavily dominated by factors shaping PPA establishment and aims (inputs), rather than results (outputs)”.

The International Union for Conservation of Nature (IUCN) World Commission on Protected Areas developed Guidelines for Privately Protected Areas (Mitchell et al., 2018a) as part of its Best Practice Protected Areas Guidelines Series, in recognition of the growth and diversity of PPAs. The aim of these guidelines was to shape the application of IUCN policy and principles towards enhanced effectiveness and conservation outcomes for PPAs, focused on the managers and administrators of such areas. In compiling the guidelines, a range of research questions were posed in relation to PPAs. In order to help direct research that might be useful for advancing PPAs from a policy and practice perspective, the IUCN World Commission on Protected Areas Specialist Group on Privately Protected Areas and Nature Stewardship (PPA Specialist Group) sought to gain the views of researchers and practitioners with an interest in PPAs regarding what they considered to be priorities for research.

2 Methods

The following questions were sent to the ‘Privately Protected Areas and Nature Stewardship’ Google Groups listserver (a list that

contained 373 people at the time) via email on 4 April 2019 and was posted on ResearchGate (www.researchgate.net) on 5 April 2019 (see Supplementary File 1):

- What do you consider to be the priorities for a research agenda on PPAs?
- What is the capacity for conducting research on PPAs? (That is, what academic institutions are engaged or interested in topics related to PPAs)?
- What are your research interests? Where do you see yourself/ your institution in future research on PPAs?
- Why is research into PPAs attractive (or not attractive) to you?

It was noted in the request for feedback that all disciplines and perspectives from any geography or scale were welcome.

Respondents were encouraged to email responses to the sender directly (Brent Mitchell, then Chair of the PPA Specialist Group) as opposed to all on the listserver. This avoided respondents’ answers being influenced by other respondents, thus reducing bias. Respondents were informed that the results from the survey would be synthesised and made publicly available.

Between 5 April 2019 and 15 April 2019, we received 28 responses from researchers and practitioners in 16 countries (and all inhabitable continents, Table 1). The 28 respondents represent a response rate of 7.51% based on the mailing list of 373 recipients. The respondents were diverse – only 22% could be characterized as being researchers primarily. 28% were owners or managers of PPAs, and another 28% manage projects for national NGOs. The balance of

TABLE 1 Origin of respondents to survey on research priorities for privately protected areas.

Country	Respondents
South Africa	4
Brazil	3
UK	3
USA	3
Australia	2
Canada	2
Spain	2
Belgium	1
China	1
Chile	1
Colombia	1
Democratic Republic of Congo	1
India	1
Iran	1
Namibia	1
Paraguay	1

respondents work for international NGOs, national governments, and international donor organizations.

We focused on responses to the question “What do you consider to be the priorities for a research agenda on PPAs?”. An inductive thematic analysis (Braun and Clarke, 2006; Nowell et al., 2017) was undertaken by JF on responses, identifying various themes and focal areas for future research (Table 2). We grouped suggested research topic that were similar and categorised responses into common themes. Where a respondent suggested multiple research topics, each topic was recorded.

We sought to retain anonymity of respondents when coding the data, including by removing unnecessary detail that might link the responses to a particular individual or group.

3 Results

Respondents identified 25 different priority research topics for PPAs, which we classified into 10 different themes (Table 2). The highest responses were for better understanding of the factors that are successful and not successful as they related to financial incentives (13 respondents), policy and/or legal mechanisms (9)

and governance and/or institutional mechanisms (7) for PPAs. A better understanding of ecological outcomes was the second most suggested theme, including the contribution of PPAs to global, continental and regional conservation objectives (5), protection of threatened or restricted range species (3) and improved biodiversity outcomes at site level over time (3). Social research such as the contribution of PPAs to socio-economic development including positive and negative social aspects of PPAs (5) and motivations of landholders for the creation of PPAs (3) was the next most commonly listed priority for research. Six respondents identified aspects of the security of PPAs as important, particularly as part of intergenerational transfer of properties. Management (e.g. supporting and monitoring management plan implementation), economic issues (e.g. sustainable finance and economic impacts on property values) and the role of PPAs in surrounding landscapes and role of PPA networks were each considered research priorities for five respondents. Future opportunities and the role of tenure in future growth of PPAs in national protected area networks and changes over time (e.g. with climate change and landholders perceptions) were considered priorities by four respondents and further research on the definition of PPAs and priority for three.

TABLE 2 Broad themes and priority research topics for privately protected areas identified by respondents to survey.

Broad themes	Total	Priority research topics	Responses
Mechanisms	29	Financial incentives and terms that are successful and those that are not (and related context)	13
		Policy and/or legal mechanisms that are successful and those that are not (and related context)	9
		Governance and/or institutional mechanisms that are successful and those that are not (and related context)	7
Ecological outcomes	11	How are PPAs contributing to global, continental and regional conservation objectives (in terms of improving representation, connectivity, ecosystem services etc. of the protected area estate)?	5
		Have PPAs quantifiably contributed to the formal protection of threatened or restricted range species?	3
		Have PPA proclamations/agreements resulted in improved land management and biodiversity integrity (and has that changed over time)?	3
Social	9	How do PPAs contribute to socio-economic development (including positive and potential negative social aspects of PPAs, and landholder wellbeing)?	5
		What are the motives (generally) of people who create and manage PPAs?	3
		Indicators of the social dimensions of effective PPAs (e.g., landholder commitment, willingness-to-participate, willingness-to-collaborate)	1
Security	6	Intergenerational issues of transfer of properties (including stewardship)	5
		Reasons for PPA abandonment	1
Management	5	How to improve and support PPA management plans (including whether management plans are effectively enforced and how are landowners that default on management agreements addressed)?	3
		What the barriers to effective operation (generally)?	1
		What are the basic skills needed of a PPA manager?	1
Economic	5	Sustainable finance through the private sector (e.g. ecotourism)	2
		How best to balance sustainable use with conservation in PPAs (ecotourism, non-lumber forest products, bird watching, domestic animals vs. wildlife, cultivations vs. native climax vegetation, etc)?	2
		What impact has the establishment of PPAs had on property value?	1

(Continued)

TABLE 2 Continued

Broad themes	Total	Priority research topics	Responses
Role of surrounding landscape/uses/actors	5	Interrelationships, interactions, and even eventual conflicts between PPAs and public protected areas (or how do they operate as part of a boarder protected area network)	2
		Do other forms of conservation on private land act as a 'stepping stone' to PPA status and what are key drivers for this?	1
		What is the role of third-party non-government organisations in helping maintain community engagement in the PPA effort?	1
		Are PPA networks useful? Do they create added value, or just added work? Under what conditions does a network create added conservation value?	1
Future opportunities	4	Land tenure, and how much 'opportunity' a nation has for PPAs to contribute to a representative protected area network (and are some tenures more or less favourable?)	4
Change over time	4	How climate ready are policies/laws re PPAs?; using individual PPAs as a means to study climate change impacts over time; what are the perceptions of climate change by PPA owners and their confidence to manage as a result?	3
		How does capacity, satisfaction and perceptions of the PPA programs change over time to inform PPA program design?	1
Definition	3	Definition of PPA (including intersection between IUCN protected area management category guidelines and consistency of standards of definitions for PPAs between countries).	3

4 Discussion

Our findings highlight at least 25 different priority research topics for PPAs as identified by researchers and practitioners. The priorities were diverse and ranged from inventory (contribution of the current network of PPAs to global conservation efforts), forward looking (documenting change over time – ecologically and socially), focuses on site qualities and landholders/managers and definitions. The three highest responses were for better understanding of the factors that were successful (and not successful) as they related to 1) financial incentives, 2) policy and/or legal mechanisms and 3) governance and/or institutional mechanisms. This suggests a desire for a deeper, system-level and comparative approach to understanding how to grow and maintain successful PPA programs. Many respondents identified more than one of these, highlighting the potentially inter-related nature of these issues and the need for a multi-disciplinary approach to explore them.

Dudley et al. (2018) generated 100 research priorities for protected areas more broadly, based on responses from 50 protected area specialists (researchers and practitioners) who were asked to generate two priorities per person. The responses were grouped under four categories – management, governance, ecological and social (including political and economic) issues. Each response was listed by Dudley et al. (2018) because “While recurrent themes were identified ... none of the responses received were direct repetitions, although this is partly a matter of wording or perspective in some cases”. This is interesting, and in contrast to our results where there was repetition, particularly in the most popular responses, though we did not limit responses to two priorities per person. Dudley et al. (2018) suggested responses to their broader protected area survey ranged from “very broad to quite specific issues” which was generally consistent with responses to our PPA survey, although responses we received were less geography-specific. “Environmental change” and “protected area effectiveness” were considered two highly mentioned themes by

Dudley et al. (2018) but were only mentioned in a small number of responses to our survey. Dudley et al. (2018) suggested that some high-profile issues such as Protected Area Downsizing, Degrading and Degazettement (PADDD) “featured very little” and “Interestingly there was little focus on the intersection of social and governance aspects of protected areas”. In contrast, our responses identified ‘security’ as the fourth most mentioned broad theme and ‘governance’ as the third most listed research priority.

These findings on the future research needs of privately protected areas as identified by researchers and practitioners themselves, complements the work of Palfrey et al. (2021) on the published research already undertaken on PPAs until late 2019. In addition to our findings, we concur with Palfrey et al. (2021) in “that future research should widen the geographical scope and diversify the types of PPAs studied”. However, acknowledging that significant variation in factors influencing uptake and/or establishment of PPAs can also vary significantly within countries (e.g. Australia: Fitzsimons and Wescott, 2001; Leverington, 2012; Fitzsimons, 2015; Selinske et al., 2019; Elton and Fitzsimons, 2023), broadening the geographic scope should also encompass inter-country differences, particularly between subnational governments.

It is likely that with a larger sample size, more research priorities would be identified. It is important to note, that our survey was undertaken prior to the COVID-19 pandemic, an event that did have numerous impacts on protected areas, including privately protected areas (Hockings et al., 2020; Waithaka et al., 2021). Thus, it could be that additional research priorities may arise if the questions were asked today, or the priorities of some may increase or decrease based on that major event. The passage and specifics of the Global Biodiversity Framework and its Target 3 ‘30x30’ mandate might also influence results if the survey were to be repeated.

There is a need for researchers, practitioners, landowners and managers, and policymakers to collectively set the research agenda to ensure that the research undertaken is most meaningful, and has the greatest chance of being useful and being used to improve PPA

take up, effectiveness and longevity. This should involve jointly setting research indicators that meet the multiple and often different needs of academics, policymakers and practitioners (Lavery et al., 2021). Study of the expansion of and outcomes from privately protected areas should be part of coming global stock-takes as the Global Biodiversity Framework is implemented.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for this study because the survey of members of the IUCN's Privately Protected Areas and Nature Stewardship listserver was not originally envisaged as a formally publishable research survey, rather a survey of members to inform a program of work for a specialist group of a large global conservation organisation, the IUCN. Nonetheless, respondents were informed that the results from the survey would be synthesised and made publicly available. The responses provided valuable information on research priorities which will be of interest to the academic community. By responding to the survey, the participants provided their written informed consent to participate in this study.

Author contributions

JF: Writing – original draft, Writing – review & editing. BM: Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fcsc.2024.1340887/full#supplementary-material>

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Privately protected areas in Mexico, a 2012–2023 update

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In 2002, the first privately protected area (PPA) was legally “certified” by the Mexican government. The last PPA country review used data from 2012, so a decadal update is considered to be timely. By June 2023, 546 land parcels within 27 states held valid certificates as PPAs or ICCAs, for a total of 718,526 ha. PPAs include 175,006 ha of private lands plus 9,860 ha of public property, which jointly represent a 44% increase from their 2012 coverage of 128,369 ha, while community lands or “territories and areas conserved by indigenous peoples and local communities” (ICCAs) now comprise 486,082 ha. No new uncertified PPA inventory has been developed to date, but their number and territorial coverage have increased. After more than 20 years of use of the certified “voluntary conservation use areas” (ADVCS) mechanism, this review gives us a clearer and more mature picture of the benefits and limitations of using this legal tool. For example, no 10-year—the initial minimum required by law—certificates remain. Meanwhile, the Kunming-Montreal Global Biodiversity Framework’s 30x30 target, with emphasis on effectively conserved and managed areas, has resulted in the development of an ADVCS assessment tool, while advances toward the establishment of a legal “easement in gross” mechanism, through contractual means, have been developed for one Mexican state, which will serve as a proof-of-concept precedent for other states. Overall, certification of ADVCS has proved to be a useful tool for conservation of biodiversity and environmental services, which certainly needs to evolve to become more effective and efficient, in order to be a more widely used tool and increase its contribution for achieving Target 3 of the Kunming-Montreal Global Biodiversity Framework for Mexico.

KEYWORDS

Mexico, voluntary conservation use areas -ADVCS, PPAs, ICCAs, decadal assessment, 30x30 target

Introduction

Mexico’s unique rural land tenure structure, a mixture of the country’s pre-Hispanic heritage, its 19th-century struggle to incorporate land into a market-based economy, and the results of the land redistribution process that was carried out as a consequence of the early 20th-century agrarian revolution, can be a determinant factor for establishing privately protected areas (PPAs) (for details, refer to [Bezaury-Creel, 2014](#)).

The last PPA country review for Mexico used data from 2012 (Bezaury-Creel, 2014); thus, a decadal update on the advances achieved in their evolution and consolidation is timely. In Mexico, “voluntary conservation use areas” (*áreas destinadas voluntariamente a la conservación* or ADVCs) are considered by law as a special kind of federal protected areas (PAs) that are established, administered, and managed by their owners (SEMARNAT - Secretaría de Medio Ambiente y Recursos Naturales, 1988) (Figure 1). ADVCs are certified by the Federal Government through the National Protected Areas Commission (Comisión Nacional de Áreas Naturales Protegidas or CONANP) for a specified time period—a minimum of 15 years and a maximum of 99 years; the first ADVC was certified in 2002. ADVCs include not only PPAs but also “territories and areas conserved by indigenous peoples and local communities” (ICCAs). ADVCs can be established outside of or within governmental protected areas, a situation that could be interpreted as shared governance.

Statistics on moving toward maturity

In Mexico, PPAs and ICCAs also exist outside this formal legal framework, as social conservation initiatives that are not certified by the Federal Government. Thus, four broad groups of PPAs and ICCAs currently coexist in Mexico (Table 1): on one side, officially recognized government-certified ADVCs and, on the other, independent non-certified private and community land conservation efforts. Since non-certified PPAs and ICCAs by their own nature correspond to independent and highly decentralized sets

of individual and community conservation initiatives, information on them will always include only an incomplete set of these properties. The last effort to map and quantify non-certified PPAs took place in 2012 (Bezaury-Creel et al., 2012), so this update will only analyze progress on certified PPAs. Nevertheless, the number and territorial coverage of non-certified PPAs and ICCAs have increased since then.

Since certification of ADVCs is by its own nature a voluntary process, they can also be later voluntarily “uncertified” by their owners, or by not renewing the certificate after the specified time period expires, thus losing their PA status and existing incentives. A total of 677 properties have been certified since the inception of this policy tool; 131 of them have been uncertified, and 546 or 81% (CONANP - Comisión Nacional de Áreas Naturales Protegidas, 2023b) still hold a valid certificate (Figure 2). This proves the effectiveness of the instrument since, for example, out of the 131 uncertified areas, 88 were ejido parceled lands corresponding to 5 ejidos (post-revolution properties, recognized or distributed to legally landless rural communities or groups and later on parceled) that were certified between 2005 and 2007 on the initially required 10-year period and which were not renewed, excluding only 1,457 ha. This situation was a direct result of an intensive top-down institutional approach for promoting new ADVCs that was carried out between 2005 and 2007, with an unforeseen reduced capacity to follow up after 10 years, especially in the case of multiple small ejido parcels whose owners had not obtained any tangible benefits from being certified. This highlights the importance of developing new incentives that will enhance permanence and commitment of their owners.

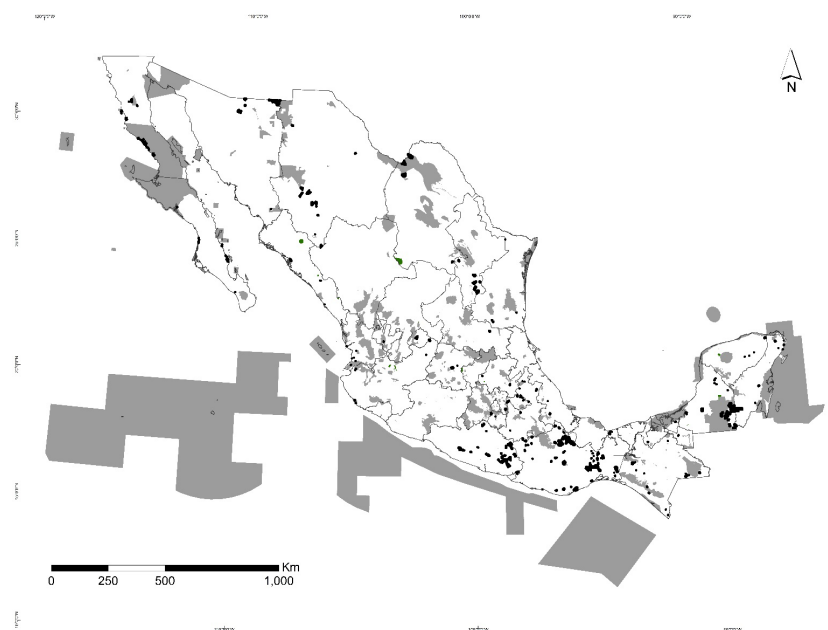


FIGURE 1

Government-protected area (CONANP - Comisión Nacional de Áreas Naturales Protegidas, 2023a) in gray and ADVCs (CONANP - Comisión Nacional de Áreas Naturales Protegidas, 2022a) including PPAs and ICCAs in black, coverage for Mexico in 2023. (For 2012, see Stolton et al., 2014.) Note: PPAs were drawn larger than their corresponding scale for clarity.

TABLE 1 Governance type and governmental recognition of private and community initiatives for land conservation in Mexico.

Governance types Governmental recognition	UICN C Private governance	UICN D Governance by indigenous peoples and local communities
ADVC (Voluntary conservation use areas) Certified by CONANP or subnational governments	Potential PPAs Privately protected areas	Potential ICCAs Territories and areas conserved by indigenous peoples and local communities
Non-certified private and community conserved lands	Potential PPAs	Potential ICCAs

ICCAs and PPAs are marked as potential since some of them may not qualify.

From the 546 currently certified ADVCS, 395 (72%) are classified as PPAs, which include six different types of land ownership that can be grouped within three broad categories:

- Community lands: ejido parceled lands (ejido and communal common use or un-parceled lands are considered ICCAs and thus not covered in this review).
- Private lands: private property lands, private company lands, and non-governmental organization (NGO)-owned lands.
- Other government lands: government-owned company lands and other certified federal, state, and municipal owned lands (different from federally, state, or municipally established PA properties).

Figures 2–5 illustrate data pertaining to certified PPAs for the different types of ownership categories (Figures 2–4 based on CONANP - Comisión Nacional de Áreas Naturales Protegidas, 2023b). Even after a significant reduction of their number derived from many of them being uncertified and the reclassification of the largest parcel to private property, by 2023, ejido parceled lands still represent the greatest number of certified PPAs but still contribute with a very low territorial coverage. A number of government-owned company lands, plus other federal, state, or municipal ADVCS, are also still basically not significant territorial contributors. NGO, private company, and private properties increasingly represent the greatest territorial coverage. The total average size of PPAs increased by 2023, due to the numerical reduction of ejido parceled lands, but the average size of NGO and private company properties decreased due to an increase of newly certified smaller properties.

Legal instruments and policy framework

In 2014, changes and additions were instrumented within the protected areas chapter of the Regulations to the General Law on Protection of the Environment (SEMARNAT - Secretaría de Medio Ambiente y Recursos Naturales, 2014). These provisions specify administrative and procedural aspects related to ADVCS, including changing the minimum certification period requirement from 10 years to 15 years. Two other issues are noteworthy, even though they have not yet been fully implemented. The first one is the definition of “levels of certification,” based upon distinct biodiversity/cultural values. By June 2022, 382 ADVCS had their certification level assigned as follows: basic, 27%; intermediate, 57%;

**Year of Certification as ADVC
of PPAs and ICCAs**
(Shows the year that the 131 ADVCS that have been
uncertified - 55,066 hectares - were certified)

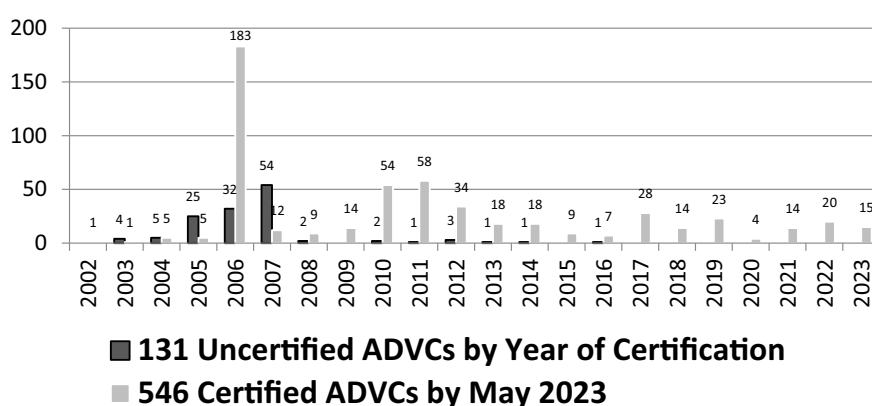


FIGURE 2
Date of initial certification of ADVCS.

Number of PPA Certified as ADVC per Ownership Type

Total 2012 = 407 certificates

Total 2023 = 395 certificates

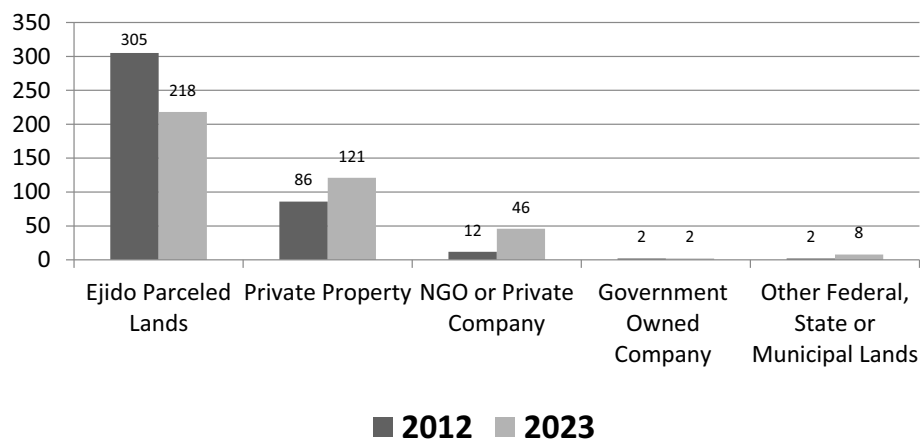


FIGURE 3
Ownership of certified PPAs.

and high priority, 16% (CONANP - Comisión Nacional de Áreas Naturales Protegidas, 2022b). These levels would define the ADVCs' preferential access to governmental economic instruments, but new incentives have not been established. The second one deals with the possibility of establishing a "sustainability seal" to products and services that conform to specifications, which would be established through an Official Mexican Norm.

At the subnational level, 22 of Mexico's 32 federated entities (31 states plus Mexico City) have included private and community protected areas in their local legislation, 2 of them only considering community protected areas (Ciudad de México and Colima). Only 9 of these have established ADVCs based upon their own legislation (Aguascalientes, Chiapas, Coahuila, Ciudad de México, Hidalgo, Puebla, Querétaro, Tabasco, and Veracruz), which represent a

Total PPA Certified as ADVC Coverage per Ownweship Type

Total 2012 = 128,369 hectares

Total 2023 = 187,294 hectares

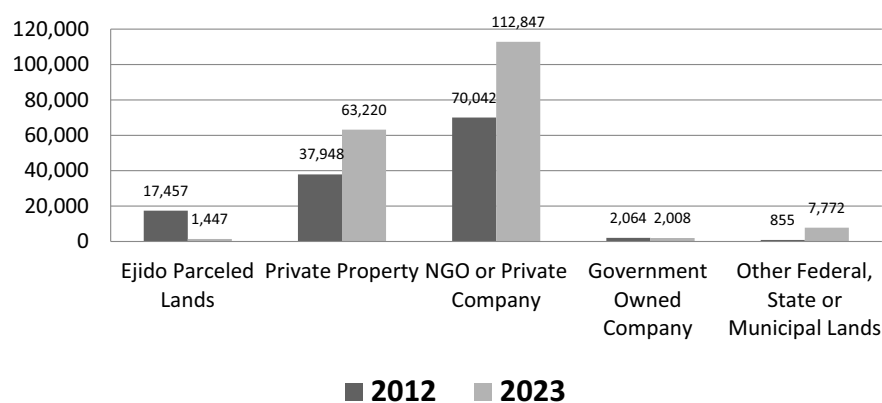


FIGURE 4
Territorial coverage of certified PPAs.

Average Size of PPA Certified as ADVC per Ownweship Type

Total Average 2012 = 315 hectares

Total Average 2023 = 479 hectares

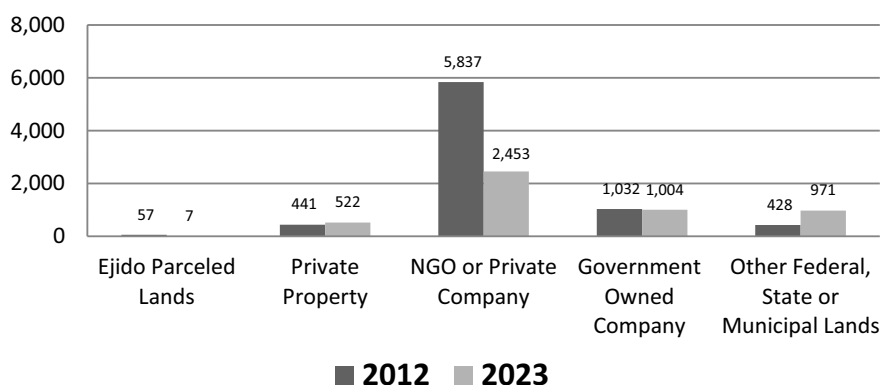


FIGURE 5
Average size of certified PPAs.

significant increase from the 2 states that had created them by 2013 (*in italics*). Nevertheless, there is still ample room for consolidating these subnational initiatives; 10 federated entities need to include PPAs in their legislation (8 private and community and 2 private), and many of them have only certified one property.

ADVCs were not relevant within the context of the “2007–2012 National Protected Areas Program” (CONANP - *Comisión Nacional de Áreas Naturales Protegidas*, 2007), save for one objective that called for stimulating the establishment of private,

ejido, and communal properties for conservation; all these were lumped together as alternative conservation modalities (certified areas, conservation easements, aquatic species refuge areas, critical habitats, and marine turtle protection facilities) with an overall modest goal of reaching together 80,000 ha of new protected territories by 2012. Nevertheless, during this period, ADVC territorial coverage was increased by over 238,000 ha.

Metrics for other conservation modalities were separated from the ones for ADVCs in the “2014–2018 National Protected Areas

Number of Years Included in the Certificate as ADVC for PPAs and ICCAs

(Shows the number of years of validity of the certificate for the 546 ADVCs certified by May 2023)

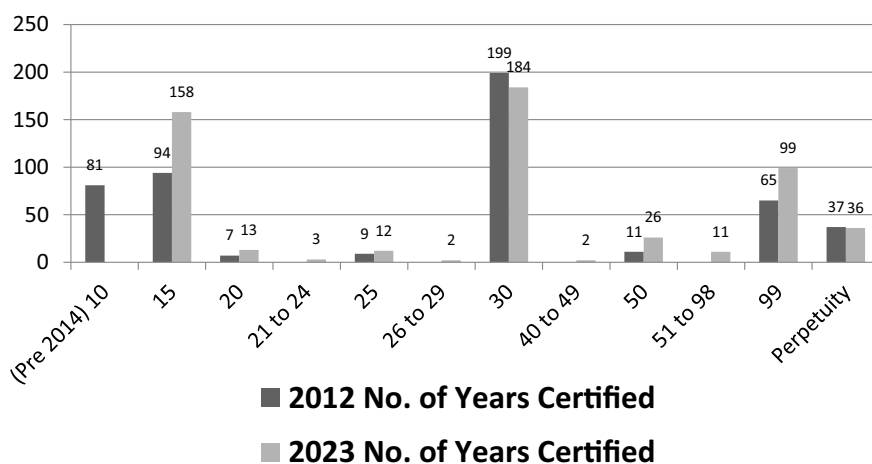


FIGURE 6
Number of years of certification for all ADVCs.

Program” (CONANP - Comisión Nacional de Áreas Naturales Protegidas, 2014) and were added to federal protected area metrics as a distinct component, within an integrated landscape management objective. A more aggressive goal of reaching a 412,000 ha total coverage for ADVs was set, thus increasing the previous surface covered by 174,000 ha or 73%. This goal was missed by 3%, reaching 399,500 ha, in part due to the phasing out of the original 10-year certification period initially permitted.

Even though in 2019 the Secretary for the Environment announced a goal of one million hectares of ADVs (PlanetaB, 2019), the “2020–2024 National Protected Areas Program” (CONANP - Comisión Nacional de Áreas Naturales Protegidas, 2020) only called for reaching a 10% minimum coverage of each ecoregion (INEGI, 2008) under governmental protected areas, ADVs, and other conservation measures. The program stated that through ADVs, progressive protection of underrepresented ecosystems within governmental protected areas would be sought; thus, in addition to their role in increasing the country’s protected territorial coverage, they will seek achieving greater representativeness of ecosystems under protection. The program also indicates a specific action to promote and incentivize the certification of ADVs.

A series of four “seminars” were successfully organized with legislators and CONANP, at the Federal House of Representatives in 2014, 2016, 2017, and 2019, in order to promote greater awareness of the importance and needs to legally and budgetarily strengthen ADVs. Unfortunately, significant budget cuts have not enabled CONANP to increase its capacity to do so.

Stewardship, reporting, and management effectiveness

Most ADVs in Mexico include limited natural resource use within their boundaries such as lumber and useful plant collection practices, others include management for sustainable cattle activities, and still others protect the large trees that form forest canopies and intermediate forest strata while growing coffee plants in the understory. Some focus on developing nature tourism activities or environmental education, and some are dedicated only to conservation or research purposes.

Although a formal exercise for assigning International Union for Conservation of Nature (IUCN) categories to privately protected areas has not been developed, most of Mexican PPAs are consistent within Category VI management objectives. A minimum number of ADVs are managed as Category Ia, but other properties or portions of them could actually be managed as such. Mexico’s only wilderness or Category Ib area, the “Tierra Silvestre Cañón del Diablo,” was established in 2009 as an ADV by CEMEX, a private cement company, covering 22,377 ha, within an existing much larger Category VI governmental protected area.

While it is widely recognized that PPAs can play an important function to enhance connectivity between governmental protected areas, a formal policy or specific programs to encourage such function have not been implemented.

There are currently only very basic reporting obligations required for ADVs by CONANP. A “management strategy,” which is equivalent to a basic management plan, is pre-agreed between the landowner(s) and CONANP before the certificate is issued. Standard certified landowner general obligations include.

- Maintaining the land’s conservation status while the certificate retains its validity.
- Abiding by the policies, guidelines, criteria, and actions outlined within the management strategy approved by CONANP.
- Informing CONANP of conservation projects implemented for land protection.
- Facilitating access to CONANP’s personnel so that technical supervision and monitoring of authorized conservation activities are taking place within authorized parameters.
- Providing legal and regulatory compliant public use facilities if public access is permitted.
- Posting the area’s boundaries.
- Conducting flora and fauna inventories in the property.
- Establishing an environmental education program for visitors.

Non-compliance with the terms of the management strategy or with the landowner’s general obligations is a cause for the parcel being uncertified. Currently, CONANP’s institutional capacity for verifying existing certified ICCAs and PPAs is still extremely limited. One solution to this problem, which would also help solve the lack of knowledge on existing uncertified ICCAs and PPAs and their conservation and management effectiveness, could be the establishment of a national and/or corresponding regional non-governmental conservation land practitioners and landowner networks, which could support CONANP by playing this role.

Incentives for the establishment and stewardship of ADVs

Because of their official status, currently only certified ADVs (PPAs and ICCAs) are eligible to receive the limited existing incentives provided by governmental programs. Since ADVs are considered to be protected areas by the Environmental Law, they are automatically subjected to its regulations (Article I, Section IV, SEMARNAT - Secretaría de Medio Ambiente y Recursos Naturales, 1988), situation which represents an important incentive to many landowners. Thus, through the certification process PPAs attain the same legal status as a federal protected area and in theory their owners can defend them against certain outside threats. Due to old stipulations still included in articles 116 to 124 of the Agrarian Law (SRA - Secretaría de la Reforma Agraria, 1992), one potential threat derives from the fact that conservation is still not recognized as a valid land use by it. In this case uncertified PPAs could be considered as non-productive

fallow lands and thus the owner be forced to subdivide and sell, in order to reach the maximum size allowed for agricultural lands, which is less than that used for forestry or cattle raising.

Construction of new public infrastructure designed to go across ADVCS, which could negatively affect their natural/cultural values, can be successfully challenged due to their Federal PA status. Uncertified PPAs and ICCAs with legally based enforceable contractual “rights” such as easements, usufructs etc., could in theory be legally defended from certain outside threats, although none of the above-mentioned situations have yet actually been judicially challenged. Since May 2023 mining and prospecting are not authorized within federal PAs (SE - Secretaría de Economía, 2023), situation that relieves ADVCS from these threats. Oil and gas extraction and related activities have not been yet excluded from PAs and thus still remain a threat to ADVCS. A disincentive for certifying temperate climate ADVCS, is ironically derived from their Federal PA status. Since all forestry activities within PAs require an environmental impact statement (EIS), ADVCS with temperate forests need to develop one if they want to use their forests for activities other than tourism, while no EIS is required outside PAs for these forests. Thus, at least four landowners have uncertified their land and some will not be inclined to certify them, in order to avoid the cost and time involved in the EIS procedure. This disincentive does not apply to tropical forests, since forestry activities within them always requires an EIS, whether or not they are within a PA.

Financial support for ADVCS

Traditionally and since 2011 the main financial incentive provided for the establishment of certified PPAs and ICCAs, was the general Mexican Payment for Environmental Services Program which is investing in conservation of forest cover at priority areas mainly for the enhancement of hydrological resources (SEMARNAT - Secretaría de Medio Ambiente y Recursos Naturales, 2010). The program is managed by Mexico’s National Forestry Commission (Comisión Nacional Forestal or CONAFOR), which provides financial compensations to owners of forest lands in order to maintain conditions that favor environmental services production. In this case a contractual relationship is formed between the forest owner and the government, the latter assuming the role of the buyer of the environmental service for a five-year period funding cycle. The program’s “operational rules” lay out specific guidelines for the allocation of funds, where the number of potential beneficiaries is always greater than available funding. Certified PPAs and ICCAs in this case receive extra points in the allocation process and thus are able to access the program, ahead of other non-certified solicitors with otherwise equal potential. Nevertheless the extra points for this window have been greatly reduced and are now merely marginal.

Federal support to ADVCS has been provided by CONANP, which aside from its ADVCS administrative responsibilities undertaken with its yearly operations budget, since 2023 can provide funding for projects within certified community, ejido common lands or ejido’s

parceled lands through the Conservation for Sustainable Development Program (SEMARNAT - Secretaría de Medio Ambiente y Recursos Naturales, 2022). Support from CONAFOR, aside from its general Payment for Environmental Services Program, has also focalized these payments on specific regions such as the Lacandon Forest Region in Chiapas, the Chinantla region of Oaxaca and the Maya Railway affected project area in the states of the Yucatan Peninsula, Tabasco and Chiapas. The National Commission for the Knowledge and Use of Biodiversity (CONABIO) through the Mesoamerican Biological Corridor Mexico (CBMM) project, supported until 2018, projects, meetings and publications to strengthen the role of ADVCS as important elements to enhance ecological connectivity (see for example Elizondo and López-Merlín, 2009). Although not specifically targeted to ADVCS, the National Institute for Indigenous Peoples PROBIPI program (INPI, 2022) supports protection of biodiversity in territories owned by indigenous and afro-mexican communities, which can fund projects within ejido’s parceled lands, including supporting direct conservation activities, climate change mitigation and nature tourism activities, amongst others.

External philanthropic support targeted to ADVCS, has mainly consisted of specific funding for certifying individual land parcels, initiating stewardship activities and developing sustainable productive activities within them, has provided strength to the mechanism. Grants and/or direct support for these activities have been provided amongst others by: The Nature Conservancy (TNC), Resources Legacy Fund (RLF), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Agence Française de Développement (AFD), the UNDP Small Grants Program, American Bird Conservancy (ABC) and World Wildlife Fund (WWF).

Since 2017 AFD, the Mexican government and other partners, have been engaged with the implementation of the “Bioconnect” Project (Agence Française de Développement - AFD 2022), which aims to support the development of a national policy on ecological connectivity. Amongst other components and environmental policy tools being explored by Bioconnect, AFD’s funding has supported ADVCS, as a territorial management tool that helps the creation of biological corridors between protected areas according to the principles of ecological connectivity. A 2021 evaluation of the project points out that through this support, the concept of connectivity, which is not enshrined in Mexican legal frameworks, has gained more prominence within the government’s agenda. The following Bioconnect interventions have a direct link into consolidating Mexicans efforts to strengthen both ADVCS coverage territorial growth and their management effectiveness, which directly support the implementation of the Kunming-Montreal Global Biodiversity Framework’s 30x30 target:

- Identifying incentives for owners of ADVCS for certification and stewardship.
- Developing a methodology and pilot project for voluntary evaluation of management effectiveness of ADVCS.
- Preparing and signing of a contract instituting a “real conservation right” on a property certified as ADVCS in the State of Sonora, pilot project.

The “Identifying incentives for owners of ADVCS for certification and stewardship” report (CIPAD - Centro de Investigación y Proyectos en Ambiente y Desarrollo, 2021) provides an interesting set of recommendations for strengthening and creating these incentives, but of greater value for this state-of review are the results of the first ever survey applied to owners on their perception of the value of certifying an ADVC. This limited survey includes both ICCAs (32% of the properties participating in the survey) and PPAs (68% of them). Information on certification motivation obtained from the 46 survey respondents, representing 56 ADVCS (15.4 % of the total in 03/2021), indicate that the owners of ADVCS received information about the process, mainly from CONANP (72% of cases), had an interest in conservation (91%) and had their own financial resources (65% for obtaining the certificate and 74% for land stewardship). Two secondary motivations for the certification are the legal protection of their property (63%) and the possibility of accessing public resources (50%). The incentives report also includes an estimate of the partial value of some ecosystem services provided by these ADVCS, based upon the vegetation type they protect, which represents US\$ 95 million annually.

On the disincentives side, the following potential problems were identified for obtaining certification of a property, the four most important being: direct investment on the process (30%); long processing time (22%); lack of information and interest on the certification process (19%); and, lack of institutional efforts to increase general knowledge on ADVCS (11%). Other disincentives include: insufficient compensation for the provision of public benefits for biodiversity conservation; insufficient institutional capacities to meet the demand for certification (i.e. currently only three FTE are specifically available for ADVCS, plus legal support to review each certificate in Mexico City and pre certification site visits support from regional offices within CONANP); limited influence over the process by owners requesting to certify their lands; and, CONANPs objectives or priorities that may sometimes conflict with those of the owners.

According to information provided by the owners, the cost of certifying an ADVC is on average US\$ 6,808 (at an annual average for 2021 of Mx\$ 20.27 per US\$ 1), while the yearly cost for stewardship is US\$ 44,401 on average (US\$ 110 per ha/year). Owners who have managed to receive additional funding to cover the costs of these activities have done so mainly through access to public resources and subsidies and, to a lesser extent through philanthropic donations. Only 13% of owners have managed to reinvest income obtained through activities carried out on the property (sale of products and/or provision of services). The majority (83%) of owners declared that they would renew the certificate once it expires, so it is assumed that the benefits they receive are valued, at least on par with the costs that they have incurred to participate in the program.

The “Developing a methodology and pilot project (ECOSUR, VoBo, 2022) for voluntary evaluation of management effectiveness of ADVCS” report, concluded that the adaptation of the “i-efectividad” platform used by CONANP, was not only viable, but will also facilitate systematization and data management within CONANP. I-efectividad covers five themes or components (context

and planning; administrative and financial; governance and participation; stewardship; and, benefits provided) to calculate an index of effectiveness, that can determine not only strengths but also opportunity areas for improvement. The self-evaluation tool was piloted on 20 ADVCS. It was designed in Google Forms and mainly but not exclusively accessed through a cellphone, which allows the user to answer 36 questions. The report concludes that a simple platform accessible to all ADVC owners/stewards can become a very powerful management effectiveness evaluation tool.

Real conservation rights are recently created instrument for private lands protection within the civil law framework, which were first established in Chile in 2016 and are somewhat an equivalent to easements in gross within common law. Real conservation rights consist of the faculty of owners of properties to sign contracts constituting said right, with the purpose of guaranteeing their conservation. In June 2022, the Congress of the State of Sonora approved a bill that reforms the Law of Ecological Equilibrium and Environmental Protection of the State of Sonora and other regulations (Congreso del Estado de Sonora, 2022), to incorporate real conservation rights and also create fiscal, financial and market economic instruments to encourage certification of properties as “Conservation Areas of state competence” or as federal ADVCS. This bill still pending approval by the State governor. The “Preparing and signing of a contract instituting a “real conservation right on a property certified as ADVC in the State of Sonora, pilot project.” is currently being coordinated by the Ecology and Sustainable Development Commission of the State of Sonora and executed by the Wildlands Network.

Private and community land conservation networks

Non-governmental private and community land conservation networks, alliances, or other organized citizen-based structures should play an increasingly important role to consolidate social land conservation initiatives. The creation of a nationwide entity or regional entities as appropriate to represent the interests of Mexico’s citizen-driven conservation initiatives could.

- Increase the number and territorial coverage of non-governmental conservation initiatives.
- Develop methodologies and tools for measuring conservation results and management effectiveness of social conservation land initiatives.
- Improve stewardship efficacy through sharing experiences and best practices on land stewardship among members and non-members.
- Ensure the permanence of conservation efforts by helping create the policies, laws, and regulations required to defend protected land over the long term.

The development of such networks in Mexico has proved to be a rocky road, much easier to discuss and plan than to implement. Since 1997, TNC collaborated with Pronatura A.C., for hiring and sending staff to a Land Trust Alliance Rally, and provided funding

and direction on tool research activities. In 2002, TNC, with support from The David and Lucile Packard Foundation, convened a round table toward the establishment of a national network of private and community practitioners, and by 2004, the establishment of a national network, the Red Mexicana de Organizaciones de Conservación de Tierras Privadas y Sociales (REDCOT), had been agreed upon, and a network coordinator was hired. By 2003, an NGO named Asociación de Reservas Naturales Privadas de México A.C. (ARENA) was created and supported by Pronatura, but it imploded due to the lack of a shared vision among its multiple members and insufficient funding. An informal ICCA practitioners' network named Red Nacional de Conservación Comunitaria (CONSERCOM) met infrequently, funded by CONABIO, the Global Diversity Foundation, The European Union's Fondo de Cooperación Internacional en Ciencia y Tecnología de la Unión Europea-México (FONCICYT), Spain's Agencia Española de Cooperación Internacional para el Desarrollo (AECID), and the University of Barcelona's Fundación Autònoma Solidària (FAS).

Regional initiatives for the Yucatan Peninsula and Northwest Mexico supported partially by TNC, previous to the establishment of a national network, were just not able to gather momentum. Perhaps the most successful examples of regional networks take place in Chiapas, where the Red de Áreas Naturales Protegidas Comunitarias y Servicios Ambientales (RED ANPCs), promoted by the Instituto para el Desarrollo Sustentable en Mesoamérica, A.C. (IDESMAC) since 2008, with support from the US Fish and Wildlife Service, includes only ICCAs and has been developing an innovative evaluation and certification protocol. The Red de Reservas Naturales Voluntarias de Chiapas (RENACH), which includes both PPAs and ICCAs, was established in 2011 as a network being promoted by Pronatura Sur A.C. A local organization working exclusively in the northern part of the State of Coahuila, just south of the Big Bend National Park in the US, named Conservadores de Ecosistemas del Puerto del Pino (CONECO), loosely coordinated since the end of the 1980s an important network of private conservation-minded ranchers in the Sierra del Burro and Maderas del Carmen.

A private and community reserve network for the Yucatan Peninsula was launched in 2015. The Red de Reservas Privadas y Sociales de la Península de Yucatán (RRPSPY), established by four regional and local NGOs, Amigos de Sian Ka'an A.C., Pronatura Península de Yucatán A.C., Kaxil Kiuic A.C., and Reserva Ecológica el Edén A.C., was funded through the Itzincab Alliance by the Méxicoredd+ Alliance [TNC/US Agency for International Development (USAID)], Fundación Claudia y Roberto Hernández, and Fundación Alfredo Harp Helú. A regional NGO, Terra Habitus A.C. (THAC), was established in 2020, with the goal of helping private landowners develop practical conservation finance tools to better manage their properties. Tools such as knowledge hubs and networks, regenerative ranching practices, and public-private partnerships are part of the approach. A very loose informal network of land conservation NGOs exists in northwestern Mexico that includes: Pronatura Noroeste A.C. (PNO), the Sociedad de Historia Natural Niparájá A.C. (Niparájá), Terra Peninsularis A.C. COSTASALVAJE (Wildcoast),

the Comité para la Conservación de Especies Silvestres, A.C. (Naturalia), and Cuenca Los Ojos (CLO).

Many of the abovementioned network initiatives have been put on hold after the initial creative impetus passed and external funding diminished or disappeared altogether. Nevertheless, some of them are still viable and could become the core of a potential national network. AFD's Bioconnect project went through a bidding process for creating a strategy to foster the development of private/community networks, but the project did not materialize due mainly to CONANP's lack of capacity to support its development.

Recommendations and discussion

Privately protected areas increase global protected area coverage and connectivity (Palfrey et al., 2022) and are important toward achieving Target 3 of the Convention on Biological Diversity's (CBD) Kunming-Montreal Global Biodiversity Framework. Thus, the enhancement of the role that ADVCs will play in the fulfillment of Mexico's commitments will require a creative approach to the following pending issues among others:

Institutional capacity

Increasing CONANP's capacity to coordinate all the different procedural components involved in ADVC certification, which include technical, legal, and physical verification of submissions; expedition of certificates; database management; monitoring and evaluation and uncification processes; and outreach, is of critical importance to consolidate this policy tool. A dedicated budget line item, not only for their Mexico City office but also for their nine regional offices, is urgently needed to consolidate private and community efforts and capacities to protect lands.

Incentives

Providing the widest range possible of financial, fiscal, and knowledge support incentives to landowners for certifying their lands not only will help increase the territorial coverage of ADVCs but will also enable them to provide better stewardship practices and evaluate by themselves their management effectiveness on their lands, which can only result in better-protected ADVCs. Implementation of already existing legal instruments, such as the sustainability seal and the use of certification levels, could create a basis for creating new incentives that could also help increase ADVCs' permanence.

Permanence

Not only will increasing the minimum certification period from 15 years to 25 years (Mitchell et al., 2018) result in a

decreased workload for CONANP but it will also serve as a filter that advances real commitment for long-term conservation from the landowners. Some potential incentives, especially those that could include substantial financial support from fiscal sources, could be used to increase their permanence through contractual obligations for returning such resources plus interests, in case of non-compliance of the negotiated terms or voluntary uncertification before the specified time period agreed upon expires.

After the original minimum 10-year period of commitment for certification was modified in 2014 to 15 years, no substantial changes in the number of years structure for certified areas were detected (Figure 6) and only a minor reduction of newly certified areas per year during 2015 and 2016 was observed (Figure 2), while social opposition to this measure was minimal. This situation underlines the feasibility of implementing a new 25-year minimum commitment period for future ADVCs.

Management effectiveness

Increasing monitoring and evaluation capacity within CONANP, together with a widespread use of voluntary evaluation of management effectiveness practices, will help Mexico achieve Target 3 of the Kunming-Montreal Global Biodiversity Framework, within a context of a highly decentralized set of private and community landholdings and owners' idiosyncrasies.

Networks

The creation of networks of private and community land conservation efforts that include both certified ADVCs and non-certified landholding will not only empower landowners' participation in the certification process but also promote a culture of social responsibility in protecting lands to preserve biodiversity and environmental services, which could increase the level of commitment from landowners.

Overall certification of ADVCs by the Mexican government has proved to be a useful tool for conservation of biodiversity and environmental services, which certainly needs to evolve to become

more effective and efficient, in order to be a more widely used tool and increase its contribution on achieving the 30x30 Kunming-Montreal Global Biodiversity target for Mexico.

Author contributions

JB-C: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Writing – review & editing.

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Conflict of interest

The authors declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Winning space for conservation: the growth of wildlife conservancies in Kenya

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Kenya's conservation areas consist of national parks and reserves, national forests, and private and community wildlife conservancies. The historically protected areas only account for 10% of Kenya's land mass (national parks, reserves, and protected forests). Conserving Kenya's biodiversity referred to as a "national heritage" is at the core of the country's conservation agenda. The success of Kenya's model of free-ranging wildlife is based on allowing as much unhindered movement and distribution of wildlife as possible. However, the human population increase, along with the expansion of agriculture into arid lands and the impacts of climate change, has affected the dynamics of pastoralism, where increased competition for natural resources has escalated in some areas. One of the identified measures to mitigate the current challenges is to increase the space for conservation and provide incentives for communities to conserve. The development and growth of the wildlife conservancy movement in Kenya have been a prominent response. As of 2023, there have been 230 wildlife conservancies in Kenya totaling 9.04 million ha and comprising 16% of Kenya's total land mass (with 195 being members of the Kenya Wildlife Conservancies Association). To contribute to the global target of protecting 30% of lands, freshwaters, and oceans by 2030, the Kenyan Government considers the expansion of the number and area of wildlife conservancies as an important mechanism to achieve these targets. Here, we discuss Kenya's wildlife conservancies from legal and policy perspectives, the factors that have enabled their growth, the challenges they face, and the opportunities ahead.

KEYWORDS

biodiversity conservation, conservancies, Kenya, privately protected areas, wildlife

Introduction

Kenya covers a land area of approximately 583,000 km² that supports a population of 55.1 million people as of January 2023 ([United Nations Population Fund, 2023](#)). Kenya has a diverse range of marine, freshwater, and terrestrial ecosystems, from the top of Mt. Kenya in central Kenya to Lake Turkana in the northwestern part of the country, to the savannas of the Maasai Mara ecosystem and east to the Somali grasslands and the Indian Ocean.

Kenya is a mosaic of government, private, and communally managed lands and supports some of the most intact conservation systems in the East African region. Buffering those areas are the rangelands, which play host to wildlife conservancies across contiguous and interconnected landscapes, wildlife corridors, and patches of biodiversity hotspots.

Kenya's rich wildlife resource plays critical ecological functions that are important for the interconnected web of life-supporting systems as well as tourism (Ministry of Tourism and Wildlife, 2022). Tourism plays a hugely significant role in Kenya's economy, contributing to approximately 25% of Kenya's gross domestic product (GDP). Wildlife tourism in Kenya's numerous national parks and reserves represents a substantial part of this, with approximately 70% of tourism revenue in Kenya coming from wildlife tourism (Korir et al., 2013).

Although the 2021 National Wildlife Census Report (Kenya Wildlife Service, 2021) recorded an increase in some of the more sought-after species, such as elephants, rhinos, lions, giraffe, Grévy's zebra, and hirola, there were relatively lower records of the plain game species. Evidence from the census illustrates that activities such as agriculture, human settlements, and infrastructure development have an impact on wildlife movements and loss of space for wildlife, and thus, has a socioeconomic impact.

Kenya's rural lands also support the agricultural sector, which provides the livelihood (employment, income, and food security needs) for more than 80% of Kenya's population. Population increases, along with the expansion of agriculture into arid lands and the impacts of climate change, have affected the dynamics of pastoralism. This includes increased competition for natural resources, which has escalated conflict in some areas. Human-wildlife conflict is high in Kenya because over 65% of Kenya's wildlife (large mammal populations) is found on private and communal lands outside protected areas (Western et al., 2009; Mukeka et al., 2019a). The success of Kenya's model of free-ranging wildlife is based on its ability to allow as much unhindered movement and distribution of wildlife as possible, and this has succeeded despite the growing human population and the need for improved livelihoods.

Kenya is also endowed with biologically rich marine ecosystems ranging from mangrove forests, coral reefs, seagrass beds, estuaries, sandy shores, sand dunes, and rocky shores. These ecosystems provide important goods and services, including serving as habitats for fish and other aquatic and terrestrial organisms, aiding in coastal erosion control, providing wood and non-wood forest resources, and providing food, water, and industrial resources to millions of people along the coast (Obura, 2001). Marine-protected areas (MPAs) in Kenya are managed by the government as per the *Wildlife Conservation and Management Act 2013*. The Act sets out restrictions on different uses, jurisdictions, and responsibilities of the managing authority (Kenya Wildlife Service). The Act also provides a basis for community participation, through Marine Conservancies. Community-managed MPAs in Kenya (also called locally managed marine areas, LMMAs) are characterized by local communities taking a lead in the conservation and sustainable use of marine resources, which are essential for the long-term social

and economic well-being of communities. Kenya has seen a rapid rise in the number of LMMAs since 2010 (Kawaka et al., 2017), with more than 24 marine conservancies established (KWCA, 2023).

The Kenya Constitution 2010 is the supreme law of the land where all other laws are derived from and provides for regulations governing land and environment. The Constitution states that all land in Kenya belongs to the people of Kenya collectively as a nation, as communities, and as individuals, and land is classified as public, community, or private land. It further provides for the principles of land policy and classification of land. It gives clarity on landholding by non-citizens, regulation of land use and property, establishment of the National Land Commission, and legislation on land.

The *Wildlife Conservation and Management Act 2013* provides for the establishment of national parks, national reserves, marine protected areas, conservancies, and sanctuaries. The Act defines a "wildlife conservancy" as "land set aside by an individual landowner, body corporate, group of owners or a community for purposes of wildlife conservation in accordance with the provisions of this Act". Under the Constitution, private land consists of the following categories:

- a. registered land held by any person under any freehold tenure;
- b. land held by any person under leasehold tenure; and
- c. any other land declared private land under an Act of Parliament.

The expansion of wildlife conservancies in Kenya has provided more space for wildlife movements, corridors, and breeding ground outside of government-protected areas. The need for their support to put strong governance structures and sustainable financing mechanisms in place for their survival is a priority for the Kenyan Government (KWCA, 2020). The Northern Rangelands Trust and the Maasai Mara Wildlife Conservancies Association are model regional associations supported by many NGOs and the government. Bilateral partners like USAID and the European Union and non-government organizations (NGOs) such as The Nature Conservancy (TNC), World Wildlife Fund (WWF), and African Wildlife Foundation (AWF) have supported the creation of wildlife conservancies as well as the establishment of an umbrella body—the Kenya Wildlife Conservancies Association—to shape the growth and governance of community-led conservation in Kenya. However, there is more work to be done toward empowering communities and putting in place governance structures for their management and financing in the long term.

In this paper, we explore the evolution of private and communal land conservation, the growth of wildlife conservancies and their current status, how they contribute to national and international policy, and the challenges and opportunities going forward.

Evolution of wildlife conservancies

The history of conservation in Kenya dates back to 1898 when a Game Ordinance was enacted to control hunting, and subsequently, in 1946 when the first National Park was established. Conservation

has moved from a focus on hunting to setting aside protected areas, to conservation of species, communities living around protected areas, ecosystems, and biodiversity in the 20th century.

The changing nature of conservation has been guided by environmental aspects and how the public has continued to view nature. Conservation spaces moved from being only recreational facilities to visit, view, and enjoy biodiversity to other benefits. More recently, these areas have been recognized as natural solutions to climate change. Conservation efforts for over 30 years have focused on anti-poaching efforts, resulting in increased numbers of wildlife (Ministry of Tourism and Wildlife, 2018). As wildlife numbers increased, they moved to community areas and human–wildlife conflict began to increase across the country. This introduced new perspectives into conservation, specifically how to enhance human wildlife co-existence and benefit sharing. Thus, the growth of wildlife conservancies is a result of evolution of conservation in Kenya.

In Kenya today, all protected areas not State-owned are almost invariably referred to as “Wildlife Conservancies” (Carter et al., 2008), many of which are considered privately protected areas. Starting the year 2000, through the support of The Nature Conservancy, WWF, and the Kenya Wildlife Service, there has been an acceleration of establishment of wildlife conservancies in Kenya, and in 2013, the Kenya Wildlife Conservancies Association (KWCA) was established—a landowner-led national membership organization representing community and private conservancies, with 13 regional wildlife associations.

Conservancies in Kenya are mainly classified into three categories (Table 1). “Community Conservancies” are formed on jointly owned community land. The community members come together and agree to set aside the land for conservation. These conservancies can include multiple objectives such as keeping livestock and allowing the area for wildlife movement. The communities then share benefits accrued jointly. Most community conservancies border the national parks like Marsabit, Amboseli, and Tsavo. “Group Conservancies” are formed through combined private land and community land, and by coming together, they increase the area for conservation. This type of conservancy tends to be managed more by professional wildlife and tourism operators. Most group conservancies are found around the Maasai Mara National Reserve and Amboseli National Park. “Private Conservancies” are formed on private land by private individuals or corporates for the purpose of conservation.

In Kenya, community and private conservancies are legally recognized via the *Wildlife Conservation and Management Act 2013*. Many are reported to the World Database on Protected Areas as privately protected areas (PPAs) and would typically comply with this definition (Olivier, 2014; Mitchell et al., 2018a). Some consider they may also qualify as “other effective area-based conservation measures” (OECMs). A review conducted by Waithaka (2017) in June 2017 to establish whether the conservancies would qualify as OECMs concluded that they all satisfied the criteria, except that some had no guarantee of sustained conservation outcome over the long term. Waithaka and Warigia Njoroge (2018) further found conservancies were established in areas identified as important for conserving Kenya’s biodiversity using a scientific approach based on biological, social, and economic considerations. Most conservancies in Kenya are either in wildlife corridors, dispersal areas, or are breeding grounds for wildlife and most buffer state-protected areas (Figure 1). However, these assessments were undertaken before global guidance on OECMs was adopted (CBD (Convention on Biological Diversity), 2018; IUCN-WCPA Task Force on OECMs, 2019). Noting that an area cannot be an OECM if it is already considered a protected area (IUCN-WCPA Task Force on OECMs, 2019), greater policy clarity and comparison to international guidance on definitions of privately protected areas and OECMs (e.g., Mitchell et al., 2018b) are needed.

As of 2023, there have been 230 wildlife conservancies in Kenya totaling 9.04 million ha and comprising 16% of Kenya’s total land mass (with 195 being members of KWCA through registration; Table 1) (Source KWCA Conservancy status report 2023; note that the area for each different conservancy type is not available at the time of writing). It is not mandatory that all conservancies must be members of KWCA.

Role of wildlife conservancies in contributing toward international and national conservation and protected area targets

Over the last 20 years, Kenya has made significant progress to reclaim space for nature through community and privately owned

TABLE 1 Different types of wildlife conservancy in Kenya and the number of those that are members of the Kenya Wildlife Conservancies Association (KWCA) (Note: Not all conservancies are members of KWCA).

Conservancies that are members of KWCA				
Type	No. of conservancies	Percentage of conservancies	Size (ha)	Percentage of size
Community conservancy	99	51%	8,927,751	92%
Private conservancy	54	28%	478,461	5%
Group conservancy	38	19%	252,599	3%
Co-managed	4	2%	68,578	1%
Total	195	100%	9,727,389	100%

Source: KWCA (2023).

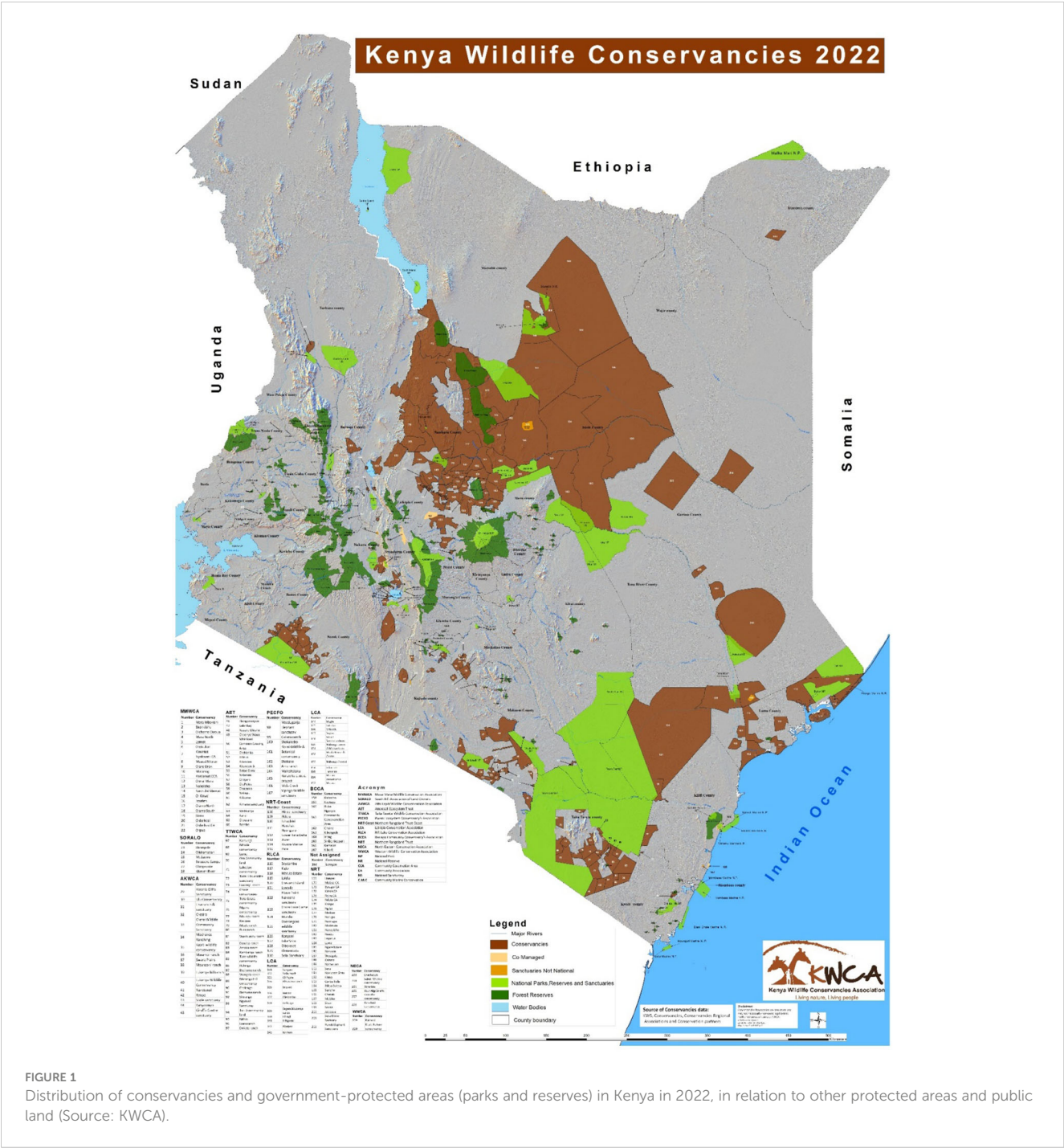


FIGURE 1 Distribution of conservancies and government-protected areas (parks and reserves) in Kenya in 2022, in relation to other protected areas and public land (Source: KWCA).

and managed wildlife conservancies increasing to 9.04 million ha. PPAs complement government-owned protected areas by providing additional habitat and refuge for wildlife, buffering government-protected areas where they adjoin and providing increased connectivity between protected areas (Figure 1). They enable adjacent communities to protected areas to identify and own conservation efforts while deriving benefits.

Communities that live on land right outside of the boundaries of the state-protected areas that were traditionally wildlife territories have been empowered through conservancies, to address livelihood problems and reduce human–wildlife conflict that has evaded long-

term solutions since 1895 when Kenya became a British colony. At independence on 12 December 1963, Kenya’s population was only 8.1 million but is now at 54.03 million. Due to the increase in population, land populated by abundant wildlife has been taken up by housing and infrastructure development. Population increase has increased the loss of biodiversity that has interfered with wildlife movement and their breeding grounds (Ogutu et al., 2016).

Kenya committed to the Convention on Biological Diversity’s Kunming-Montreal Global Biodiversity Framework in late 2022, including the global goal to conserve at least 30% of terrestrial and inland water areas and marine and coastal areas by 2030 (Target 3;

the “30 × 30 target”). In addition, the Kenyan Government has committed to protecting 30% of the country’s terrestrial and freshwater ecosystems by 2030 (Langat, 2022; Chebet, 2023). Currently, over 20% of Kenya’s land mass is under a conservation or protection framework: national parks and reserves (8%); forests (2%); and wildlife conservancies (11%) (KWCA, 2021). Private and communal rangelands span about 88% of Kenya and support 65%–70% of Kenya’s large wildlife (Ogutu et al., 2016), much of which migrates and occurs in or moves through wildlife conservancies (KWCA, 2016; Ojwang et al., 2017) (Figure 2). Wildlife conservancies have enabled the inclusion of landscapes in the conservation estate in a way that broadly aligned with the values and rights of indigenous people and local communities and their livelihoods. Thus, through investing in conservancies, the journey toward achieving the 30 × 30 requirements has been accelerated, and some of the social implications of meeting the target (e.g., Sandbrook et al., 2023) have been alleviated.

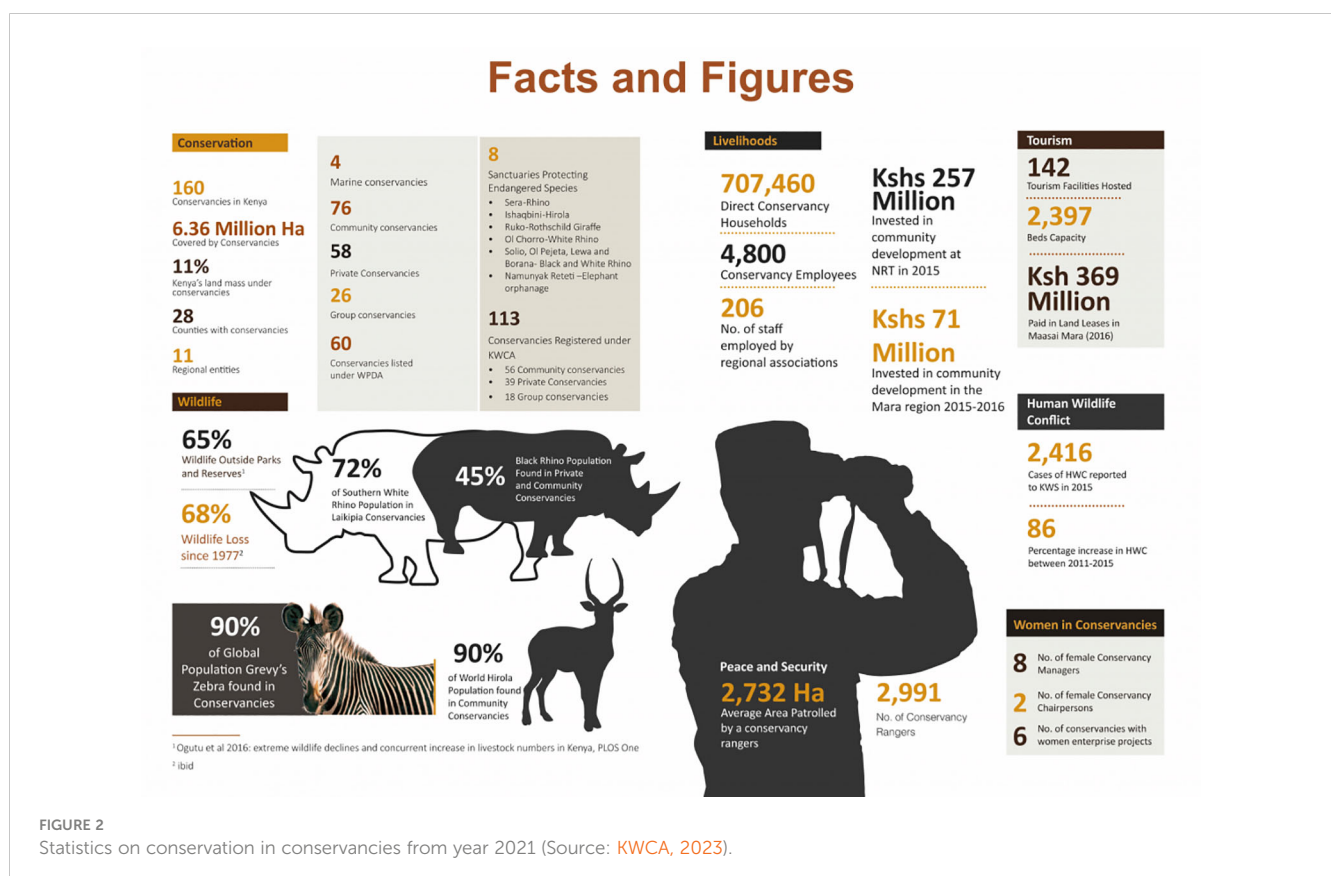
Various Kenyan Government strategies and policies specify the need to establish wildlife areas outside state-protected areas owned by communities and private people. The National Wildlife Strategy 2030 (Ministry of Tourism and Wildlife, 2018) outlines a vision for wildlife conservation as part of a strong environmental foundation for achieving Kenya’s sustainable development agenda as articulated by the Constitution of Kenya 2010, the Wildlife Policy 2020, the *Wildlife Conservation and Management Act 2013*, Vision 2030, and the Bottom-Up Economic Transformation Agenda (which seeks to improve manufacturing, improve food security, housing, and healthcare while also improving the economic

livelihood of the citizens). These goals align with, and support, international treaties and obligations, including the Convention on Biological Diversity and the Sustainable Development Goals.

Conservation and economic benefits from conservancies

Figure 2 illustrates some of the benefits that communities derive from taking up conservation as a sustainable land-use option. The conservancy movement has enabled Kenya to increase space for wildlife outside the state-protected areas. Some of the endangered species, including Kenya’s “big five”—elephant, lion, buffalo, leopard, and rhino—are found in and protected by communities that manage the conservancies. The Kenya Wildlife Service supported the first translocation of critically endangered black rhinos to Sera Rhino Sanctuary, a community conservancy in northern Kenya. Sera Rhino Sanctuary is East Africa’s first and only community-run black rhino sanctuary, established in 2015 with a founder population of 10 black rhinos, and it is now home to 21 black rhinos. Private and community conservancies are likely to become increasingly important for the survival of the black rhino, complimenting government efforts.

Conservation can provide livelihood incentives, which helps in the reversal of wildlife decline, thus ensuring continuity for future generations. Historically, these lands had a mixed use of livestock and wildlife. However, with increasing urbanization, creation of county governments and the increase in land prices, land is being



increasingly subdivided for sale. Loss of space and connectivity is threatening Kenya's wildlife heritage, its multi-billion-dollar tourism industry and the livelihoods for rural communities that are dependent on that industry. Wildlife conservancies can act to reduce this threat. Increasing development pressures and impacts of climate change are also challenging conservation efforts and human wellbeing. Conservancies are not only providing a public service by protecting and conserving majority of the wildlife in the country but also enhancing livelihoods (KWCA, 2023). Communities that take up wildlife conservation anticipate improved livelihoods from conservation of the existing natural resources on their land (Lesorogol and Lesorogol, 2024). Conservancies derive tourism conservation fees that are invested in social and economic ventures to benefit the conservancy members. Some of the benefits include direct employment; social projects like water, health, and educational facilities; and economic businesses like beadworks, livestock sales, carbon markets, and small-scale businesses.

Wildlife conservancies also serve to promote healthy ecosystems that support wildlife, livestock, and human needs (Figure 2). This includes retaining good quality and quantity of grass for livestock during all seasons around the year, improving the conditions of degraded areas, minimizing invasive species, ensuring adequate supply of water for wildlife, people, and livestock, and integrating indigenous knowledge specifically among the pastoralist's communities to cope with climate variability.

A benefit for northern Kenya conservancies under the membership of Northern Rangelands Trust (NRT) is "peace and security" (Pas et al., 2023). For many years, northern Kenya has been an area of insecurity, livestock thefts, and banditry attacks. The establishment of community conservancies has brought about peace and improved security for ethnic communities that have fought for years.

Legal and governance arrangements

Even though the term "wildlife conservancy" has been in use since the 1990s, the first legal definition of the term came in 2013 under the *Wildlife Conservation and Management Act 2013*: "land set aside by an individual landowner, body corporate, group of owners or a community for purposes of wildlife conservation in accordance with the provisions of this Act". Establishment of conservancies represents a voluntary decision by landowners to give priority to biodiversity conservation, and by extension, wildlife. The KWCA's guide *Establishing a Wildlife Conservancy in Kenya* (King et al., 2015) describes the conservancy establishment process until it is formally registered with KWCA and Kenya Wildlife Service. The conservancy concept is based on the premise that given the necessary support, incentives and policy framework, communities and landowners can be the stewards of wildlife conservation working together with county and national governments to protect and benefit from a healthy and productive environment. Since the first few conservancies began in the 1990s, the scope and institutional complexity have grown far beyond just wildlife conservation and

tourism to include peace and conflict resolution, land management, income generation, employment, community cohesion, and community-led development (King et al., 2015).

In 2023, Kenya prioritized halting and reversing loss of its biodiversity, wetlands, rivers, lakes, ecosystems, wildlife, forest cover, and general degradation of the environment (*Presidential Executive Order No. 2 of 2023*). To achieve this goal, a process of integrating the legal, policy, and institutional frameworks that guide the management of these critical resources have been put in place. The intent is to improve synergies and enhance integration of ministerial, state departments, and state agencies' mandates and roles. The Office of the President through its 2023 Executive Order gave a directive for a review of the whole of the natural resource management sector with particular focus on areas of critical biodiversity and the lands that host them. An integrated natural resources management policy will be developed, coordinated, and anchored within the executive office of the president. A coordinating secretariat has been established within the executive office of the president, and it is responsible for the coordination and management of all natural resources. With the planned enhanced coordination of the natural resources, the growth of the wildlife and natural resources conservation and management is expected to improve with more benefits to people and nature.

Environmental easements have also been applied on some conservancies in Kenya, such as Lewa and Loisaba (Nielsen et al., 2018). An environmental easement is an agreement between a landowner and an easement holder, which restricts certain uses of a property to achieve conservation purposes. An easement enables a landowner to retain ownership while simultaneously achieving a conservation outcome. Easements were adopted into the Kenyan law by the Kenya Colony Order in Council 1921, which approved the general application to Kenya of the English common law as it was in August 1897 (Gitahi, 2006). Easements are most known in Kenya as creating a right, such as a right of way or a water usage right. The use of easements for conservation purposes was historically provided for in the *Environmental Management and Co-ordination Act 1999* (Fitzgerald, 2014) but has been used to protect land to allow for wildlife movement (Kameri-Mbote, 2019).

Landholder perceptions

In Kenya today, community and private landowners receive minimal direct benefits from wildlife. Kenya compensates for human death, human injury, and property damage caused by wildlife (Mukeka et al., 2019b); however, the compensation is not adequate and therefore, public attitudes toward wildlife are negative, especially among landowners who practice small-scale farming and pastoralism. Franzel and Wambugu (2007) explored some of the issues arising from interactions between local landowners and wildlife in a prominent wildlife area in Laikipia, Kenya, with private landowners of three categories, small-scale, pastoralist, and large-scale. Policy and developmental issues found critical to discussions involving biodiversity conservation in Laikipia were wildlife utilization legislation, wildlife

proprietorship, human population stabilization, identification of core biodiversity areas, coordinated electric fencing, institutional development, biodiversity education, negotiations with landowners, and incorporation of incentives, wildlife damage compensation, ecotourism development and an enabling political environment (Franzel and Wambugu, 2007). More recently, Hoare et al. (2022) found the influence of conservation education on students of Maasai communities regarding knowledge about wildlife, and positive attitudes and an understanding of pro-environmental behaviors were evident, but that the filtration of knowledge and pro-environmental behaviors to the community level were positive but limited. In their study, culture and human–wildlife conflicts were the predominant factors influencing attitudes.

These findings have important implications for support required for existing and future wildlife conservancies. Further developing additional income streams beyond the traditional income sources from agriculture, such as tourism, philanthropic funding via Project Finance for Permanence, REDD+, carbon credits, and restoration payments will be essential to ensure well-funded and well-managed conservancies.

Challenges facing wildlife conservation and conservancies in Kenya

Despite the growth of community and private conservancies, numerous challenges to wildlife and their habitat in Kenyan landscapes remain. These include climate change, habitat degradation and loss, forest depletion, tourism market volatility, human–wildlife conflict, land fragmentation, conversion of wildlife habitat, encroachment of wildlife habitat, and the impact of rapid population growth on ecosystems brought on by population growth and changing land use habits of communities that co-exist with wildlife.

Some of the challenges experienced by conservancies include a lack of land tenure rights for community conservancies leading to fragmentation and subdivision of land, especially around the Amboseli ecosystem, fencing, and the individual land tenure rights that threaten change of land use in the Mara ecosystem. The requirements for land ownership have also raised concerns about equity for participation and funding (e.g., Bedelian et al., 2024; Ogutu, 2024). The slow implementation of the *Community Land Act 2016* also threatens the sustainable conservation of wildlife in areas outside of the state-protected system that has seen traditional conservation areas being converted to agriculture and infrastructure development.

Sustainable financing for conservation is also a big challenge. There is a lack of sufficient incentives and benefits derived from wildlife as a land-use option. Most of the community conservancies do not have funding for social projects, management plans, and economic investments (although see Jirmo, 2018; Malleret King and Dyer, 2018). In recognition of this, The Nature Conservancy has partnered with the Government of Kenya, conservation

stakeholders, private sector, and communities to develop a sustainable financing mechanism—Project Finance for Permanence (PFP)—that will see the establishment of a conservation trust fund for the long term. A PFP is a financial model that brings together governments, indigenous peoples, and local communities, funders, and other partners to secure long-term conservation, full and sustained funding, and community benefits (McCormick et al., 2012). Through this approach, protected places stay protected because they are collaboratively designed, locally led, nationally supported, sustainably funded, and highly accountable. Kenya is one of several countries where PFPs are being developed, under the auspices of Enduring Earth (<https://enduringearth.org/>), a collaboration of The Nature Conservancy, The Pew Charitable Trusts, World Wildlife Fund, and ZOMALAB.

Concluding comments

To ensure the sustainability of community and private conservancies in Kenya, a concerted effort by all stakeholders is required. Although the Kenyan Government is committed to conserve wildlife, which is a “national heritage”, more actions need to be done by the government, including pledging to long-term funding commitments to support conservancies. Kenya’s wildlife conservancies support conservation while increasing benefits to communities, which then improve both their social and economic livelihoods. Through placing communities at the center of wildlife conservation and improving conservation incentives, conservancies in Kenya are securing livelihoods resulting in the protection of Kenya’s iconic wildlife for future generations. Kenya has a strong community conservancy movement under the leadership of Kenya Wildlife Conservancies Association with 13 regional ecosystem conservancy associations. Maasai Mara Wildlife Conservancies Association and NRT are leading model associations for the rest to emulate. TNC, WWF, and AWF, among others, with USAID support have been instrumental in the conservancy growth and movement in Kenya within the mentioned regional associations’ conservation ecosystems. The emerging challenge for wildlife conservancies is how best to improve their governance and management systems while expanding the areas under their coverage.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material. Further inquiries can be directed to the corresponding author.

Author contributions

MB: Writing – original draft, Writing – review & editing. EW: Writing – original draft, Writing – review & editing.

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