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A review of successes, challenges, and lessons from Indigenous protected and conserved areas

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ABSTRACT

Indigenous Peoples' protected and conserved areas have gained global attention due to growing interest in protecting biodiversity during a time of Indigenous resurgence. We reviewed the academic literature to synthesize the motivations, successes, challenges, and lessons from protected and conserved areas led by Indigenous Peoples globally. We found and analyzed 58 papers, describing 86 specific initiatives involving at least 68 Indigenous Peoples across 25 countries. We found that Indigenous Peoples established protected and conserved areas independently and through local- and broad-scale partnerships. States that supported such efforts did so through formal legislation, agreements, and policies, and informally through local relationships and shared values. Indigenous Peoples' protected and conserved areas created socio-cultural, political, and ecological benefits such as improving Indigenous livelihoods, increasing governance and management capacities, and improving species populations and habitat protection. However, some challenges (e.g. restrictive legislations, burdensome partnerships, insufficient funding) limited benefits, and demanded additional capacities and resources for mitigation. We recommend that states and other external actors: create and improve policies, legislations, and resources for Indigenous Peoples' protected and conserved areas as defined by Indigenous Peoples; provide resources and facilitate Indigenous leadership to shape external mechanisms for protected area establishment and development; and create new internal mechanisms for Indigenous engagement and partnerships. Indigenous Peoples would benefit from building partnerships to support and manage their areas. Finally, we suggest that managers commit more resources to effectively monitor and manage these areas, including integrating management priorities with local and larger scale socio-cultural and environmental issues that affect these areas.

1. Introduction

Areas that are protected and conserved by Indigenous Peoples have gained global attention due to the urgency of protecting declining biodiversity during a time of Indigenous resurgence and recognition of Indigenous Rights. Through the adoption of United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP), 144 countries recognized Indigenous Peoples' Rights (see glossary) to self-determination, cultural identity, and free prior informed consent to uses that affect their traditional Territory (UN General Assembly, 2007). Considerations of Indigenous Rights and Title and Indigenous Peoples' role in protected and conserved area governance in state-recognized conservation initiatives is also growing. For example, International Union for Conservation of Nature (IUCN)'s protected area matrix includes protected areas with traditional uses and governance regimes involving Indigenous Peoples (see Beltrán, 2000; Borrini-Feyerabend et al., 2004, 2013; Dudley et al., 2008). Similarly, countries participating in the Convention of Biological Diversity (CBD) not only committed to creating new protected areas across ecosystems by 2020 (Aichi Target 11), but also to considering the needs of Indigenous Peoples in conservation and restoration (Target 14), and to respecting Indigenous institutions relevant to conservation and the 'effective participation' of Indigenous Peoples across all conservation activities (Target 18, CBD, 2010). As such, there is interest from states, Indigenous, and environmental conservation organizations in the establishment and increasing widespread recognition and support for territories and areas protected and conserved by Indigenous Peoples.

Indigenous forms of land and water protection and stewardship have existed since time immemorial. Yet only within the last few decades have they been acknowledged by states and global conservation efforts through formal labels, designations, and arrangements. We use the term Indigenous Protected and Conserved Areas (IPCAs), currently

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used in Canada, to refer to a suite of Indigenous-driven initiatives to protect, conserve, or steward areas where they exercise agency in territorial management (see glossary). In practice, there are many labels used by different agencies, initiatives, and regions to describe territories and areas protected by Indigenous Peoples, including: some Indigenous Community and Conserved Areas (ICCAs, https://www.iccaconsortium.org)[1], Indigenous Protected Areas (IPAs) in Australia (Department of the Environment and Energy, 2019), Tribal Parks in North America (e.g. Nexwagwez?an – Dasiqox Tribal Park; Dasiqox Tribal Park Initiative et al., 2019); areas with shared governance and management (e.g. Uluru-Kata Tjuta and Kakadu National Parks, Langton et al., 2005), and many other political designations and arrangements (Table 1). IPCAs may have state-recognized Indigenous tenure (e.g. some Australia IPAs, Smyth, 2015), or they may exist without state recognition and/or within state-recognized protected areas (e.g. beyuls in Nepal, Stevens, 2010; 2013). The multiple designations and arrangements highlight a wide range of areas that we consider to be IPCAs in our review, but may not be labelled explicitly as such other than in Canada. Indeed, some Indigenous Peoples prefer to use their own definitions, governance, and management structures for IPCAs (see Davies et al., 2013; ICE, 2018). The term IPCA is relatively new, even in Canada; we have elected to use it for consistency with growing national literature. For the purpose of this review, we consider any area as an IPCA when it meets all of the following criteria, which draw from the IUCN definition of ICCAs (Borrini-Feyerabend et al., 2013; ICCA Consortium, 2019) and from Canada's Indigenous Circle of Experts (ICE) report regarding IPCAs (ICE, 2018):

1) Indigenous Peoples have a strong spiritual and/or cultural connection to the area, be it terrestrial, aquatic, marine or otherwise, through past and current lived histories language, and other potential interactions;
2) Indigenous Peoples have asserted a leading role in decision-making (governance), establishment, and/or management that demonstrates their rights and responsibilities in the area. This includes arrangements with other organizations but in a way that governance and/or management occur with the consensus of Indigenous actors; and
3) Environmental protection and/or conservation occurs whether it is stated explicitly or an understood (implicit) goal.

The most comprehensive attempt to explore and document IPCAs to date was published by the CBD, which evaluated examples in 19 countries under the ICCA framework and suggested recommendations for state, civil society, and Indigenous actors to support and recognize these initiatives (Kothari et al., 2012). That report was developed through reviewing case studies in those countries, based on publications and reports that were readily available, and reviewed by experts within these countries and internationally. The report indicated a strong link between ICCAs' ecological conservation success, and for Indigenous-led initiatives, increased self-determination of Indigenous Peoples, while also highlighting several challenges.

There were some key limitations to the CBD report when it comes to focusing on Indigenous-led initiatives and protected/conserved areas. Notably, some Indigenous Peoples' protected/conserved areas are either not labelled as ICCAs, by the choice of Indigenous groups managing them or for other reasons, or they are labelled as such without Indigenous consent (Smyth, 2015; Jonas et al., 2017). Second, ICCAs include areas managed by both Indigenous *and* local communities (IUCN, 2004; Borrini-Feyerabend et al., 2004; Smyth, 2015). Indigenous Peoples face critically different historical and contemporary contexts, aspirations, and challenges compared to local communities, which include: "their own historical continuity with pre-colonial societies; their close relationship with the land and natural resources of their own territory; their particular socio-political system, language, culture, values and beliefs; and not belonging to the dominant sectors of their national society and seeing themselves as different from it" (Borrini-Feyerabend et al., 2004, page 8). As Opaskwayak Cree scholar Dr. Shawn Wilson (2008, page 34) notes: "the term Indigenous has important implications politically, as in the face of colonization we assert our collective rights as self-determining Peoples at an international level". State and other actors seeking to establish or increase support for IPCAs need to carefully consider the specific contexts surrounding specifically Indigenous initiatives and should follow visions set forth by Indigenous Peoples.

Some academic research on IPCAs has explored their social-ecological benefits, challenges, lessons learned, and provided advice for their development and recognition. Most academic publications about IPCAs describe specific case studies, such as Australia's Indigenous Protected Area program (e.g. Davies et al., 2013; Muller, 2003); Indigenous-led Tribal Parks in North America (e.g. Murray and King, 2012; Carroll, 2014), co-managed protected areas in Latin America (e.g. Ruiz-Mallén et al., 2014 and Reyes-Garcia et al., 2013), and long-standing Indigenous conserved areas in Malaysia (e.g. Massey et al., 2011; Vaz and Agama, 2013) and Nepal (e.g. Stevens, 2013). Research is warranted to identify and address the common issues, motivations, approaches, and challenges faced by Indigenous Peoples, to inform state and other actors interested in better supporting these initiatives and the Indigenous Peoples who are striving to achieve state and external recognition and support for IPCAs. No comprehensive review of research on IPCAs based on the academic literature exists; we seek to fill this gap.

Given the urgent and ongoing need for biodiversity conservation and recognition of Indigenous Rights, IPCAs are an important avenue forward for achieving both simultaneously (Schuster et al., 2019). Future initiatives can benefit from understanding the successes and challenges of existing IPCAs. We reviewed peer-reviewed literature to characterize research to date on IPCAs, in order to describe the conditions, successes, challenges, and lessons associated with IPCA creation. Our primary objectives in this literature review were to: (1) identify and characterize IPCA initiatives documented in the academic literature; (2) describe socio-cultural, ecological, and political motivations behind IPCA creation, as well as external support, and recognition by state and other non-Indigenous actors; (3) summarize successes and challenges facing various initiatives; and (4) draw from lessons learned to provide recommendations for Indigenous, state, and other external actors to improve multi-sector support and recognition of IPCAs.

2. Methods

2.1. Literature selection

We focused our literature search on English-language, peer-reviewed articles. Literature search methods and selection involved a key term search, reviewing papers based on selection criteria, and coding relevant literature for achieving our objectives, following similar methods by Pittman and Armitage (2016) and Ban and Frid (2018). We searched three interdisciplinary databases: Web of Science, SCOPUS, and Google Scholar in January 2018 using keywords and phrases related to IPCAs (see Table A1). We then imported full references and related information (e.g. containing abstract, key words from the articles and the database, etc.) into Endnote, a reference management software, for review. For Google Scholar, we imported the first 10 pages of each search.

We initially collected over 900 references from our database searches. We removed articles: that were not from academic journals or were duplicate entries; where titles, abstracts, or keywords (within the article and given by the database) did not contain our key search terms; and any articles not written in English. Afterwards, we reviewed

[1] Note that some ICCAs are led by non-Indigenous communities and we do not consider those to be IPCAs.

Table 1
Examples of different definitions that can encompass Indigenous Protected and Conserved Areas. Parentheses denote the organization or location where each definition is applied.

Framework	Definition	Reference
Indigenous and Community Conserved Areas (IUCN)	Natural and modified ecosystems, including significant biodiversity, ecological services and cultural values, voluntarily conserved by Indigenous, local, and mobile communities through customary laws or other effective means	IUCN, 2004; Borrini-Feyerabend et al., 2004; 2013
Indigenous Protected Area (Australia)	Areas governed by the continuing responsibilities of Aboriginal and Torres Strait Islander peoples to care for and protect lands and waters for present and future generations … [and] may include areas of land and waters over which Aboriginal and Torres Strait Islanders are custodians, and which shall be managed for cultural biodiversity and conservation, permitting customary sustainable resource use and sharing of benefit	Hill et al., 2011
Indigenous Protected and Conserved Areas (Canada)	Lands and waters where Indigenous governments have the primary role in protecting and conserving culture and ecosystems through Indigenous laws, governance and knowledge systems. Culture and language are the heart and soul of an IPCA	ICE, 2018

abstracts for papers that met all the following criteria:

1) The people involved were described by the authors as Indigenous or specific Indigenous group names were stated that could be verified by a search online;
2) The initiative was framed as protecting or conserving a defined area; and
3) The articles described, evaluated, or analyzed an IPCA initiative.

If it was unclear from the abstract whether these criteria were met, we scanned the entire paper to determine its relevance. We then fully reviewed and evaluated all remaining articles according to our objectives. Our intent with this literature review is to summarize the state of knowledge up to the time of the literature search. Hence we refer to literature reviewed in past tense, while fully acknowledging the current and ongoing nature of initiatives and circumstances discussed herein.

2.2. Analysis

We summarized information for each of our objectives (i.e. describe IPCA locations and governance/management characteristics; motivations behind creation, support; successes and challenges faced; and lessons from research) for each publication and specific IPCA initiative. We then coded the summarized information for common themes. We developed these themes through a combination of pre-determined categories during data collection (see Table A2 for data collection template) and grounded theory approaches (i.e. emerging from similar results during coding, Pittman and Armitage, 2016).

We determined the year of publication, geographic location(s) described, and research purpose for each article. We also identified and grouped initiatives by location, specific name (used by the community or author), and by Indigenous Peoples involved, as well as characterised the governance and management structure (e.g. Indigenous-led or collaborative with other organizations). For each initiative, we collated information about the socio-cultural, political, and ecological context in which they exist. This included specific Indigenous and others relationships to the area, and local, national/international events, policies, and legislation, and motivations that influenced the creation, support, and/or external recognition of the IPCA. We distinguished state support and recognition as formal (e.g. with state legislative designations, voluntary/formal/lease agreements with communities, state programs to fund or certify IPCA initiatives) or informal (e.g. shared values with state authorities that helped maintain Indigenous control and/or recognition and support from local state managers). We reviewed successes, challenges, and lessons from each article to derive common themes from the data. Finally, we developed recommendations drawing from the common themes within the objectives, supported by lessons within the literature. We directed these recommendations towards Indigenous, state, and external actors interested in creating, supporting and recognizing IPCA initiatives.

2.3. Limitations

There are some limitations to our review, necessary to make the scope tractable. We focused on peer-reviewed literature written in English as indexed in three interdisciplinary databases. Our review therefore excluded potentially relevant reports, book chapters, and books related to IPCAs. Articles on IPCAs in other languages without clear connection to our criteria were also not captured. Additionally, our results are based on descriptions contained in the papers, representing the point of view of the authors (who may or may not be Indigenous Peoples and/or from Indigenous communities). Finally, the connection (and therefore lack of division) between management, use, and protection of areas and resources is common within the worldview of many Indigenous Peoples (Berkes, 2009). However, we focused only on IPCAs and not on related but broader literature on resource management.

We quantified the frequency of key themes (i.e. percentages from numbers of papers or IPCAs) related to our objectives to provide a sense of prevalence in the literature. The literature, however, is influenced by academic interests and may differ from values or perspectives held by Indigenous Peoples or IPCA managers. Furthermore, it is a matter of interpretation of what frequency values correspond to high or low occurrences, and our selection of literature is relatively small. Some nuances may also be missed because we grouped themes through thematic coding. While we attempt to highlight some details in the text, full discussion of all themes is beyond the scope of this review.

A lack of clarity regarding governance exist in some of the papers reviewed. Our IPCA definition includes a range of governance arrangements, from Indigenous-led to shared arrangements between Indigenous and other actors. Though there is a difference between governance (i.e. who holds decision making power, responsibilities and accountabilities) and management (i.e. the execution of objectives and actions; Borrini-Feyerabend and Hill, 2015), many papers reviewed did not provide sufficient detail to differentiate between the two. As such, we group governance and management together, unless explicitly distinguished in the papers. Additionally, we rely on interpretation by authors of the papers reviewed regarding governance and management structure and caution that true effectiveness is difficult to assess without evaluation by the Indigenous Peoples involved (see Ross et al., 2011; Stevens, 2014), which was beyond the scope of our review.

3. Results and discussion

3.1. Characterization of IPCA initiatives

The sources that we reviewed discuss 86 site-specific initiatives (i.e. with specific names and/or Indigenous Peoples/communities) involving at least 68 distinct Indigenous Peoples from at least 25 different countries (see Table 2 for examples, Table A3 for full list). A total of 58 articles met the selection criteria (see Table A4, Fig. A1). The majority

Table 2
Examples of Indigenous Protected and Conserved Area (IPCA) initiatives by region and country. A full list of IPCA initiatives encountered in the literature review can be found in Table A3. Italicized descriptions are ones used by authors, and not necessarily by Indigenous Peoples involved. Names in brackets are the Indigenous Peoples involved and the numbers in 'Examples in Literature' refer to reference numbers in Table A4, where specified.

Region	Country/Location	Description	Example in Literature
Africa	Ethiopia	Traditional territories/conserved landscapes	Borana ethnic territory/conserved landscape (Borana/Borana-Ormo)[1, 6, 19]
	Ghana	Sacred forests/groves	Asantemanso[4]
	Morocco	Agdals	Mesioui agdals (Mesioua Berber)[12]
	Nigeria	*Indigenous and Community Conserved Areas*	unnamed (Ekuri)[19]
	Senegal	*Indigenous and Community Conserved Areas*	Kawawana (Jola)[8]
	South Africa	Co-management of national parks	Kruger National Park (Makuleke)[19, 21]
Asia	China	*Indigenous and Community Conserved Areas*	unamed (Khampa)[21]
	India	Sacred forest/groves	
	Malaysia	Native Reserves	Bundu Tuhan Native Reserve (Kadazandusun)[53]
		Sacred sites	Gumantong (Rungus)[26]
		Indigenous and Community Conserved Areas	
	Nepal	Sacred valleys or Beyuls	Khumbu Beyul/Community Conserved Area (Sharwa)[21, 47, 51]
		Sacred natural sites	
		Community-managed forests	unnamed (Sharwa)[51]
		Community-managed rotational grazing systems/grassland commons	
		Indigenous and Community Conserved Areas	Lakyok Bird Conservation Area (Sharwa)[21, 51]
		Indigenous Conserved Territories	
	Philippines	*Indigenous and Community Conserved Areas*	unnamed (Tagbanwa)[19]
	Taiwan	*Traditional agricultural/conserved landscapes*	unnamed (Fata'an of the Amis Indigenous Nation)[6]
	South Pacific	Locally managed marine areas	
Australia/ New Zealand	Australia	Co-management of national parks	Kakadu National Park[22, 38, 50, 52, 58]
		Co-management of state parks	Barrberm (Miriuwung-Gajerrong)[15]
		Indigenous Protected Areas	Dhimurru Indigenous Protected Area (Yolŋu)[22, 33, 35, 48, 49, 54]
	New Zealand	*Traditional agricultural/conserved landscapes*	unnamed (Maori)[6]
North America	Canada	Biodiversity reserves	Paakumshumwaau-Maatuskaau Biodiversity Reserve* (Cree Nation)[2, 30]
		Co-management of national parks	Tawich (Marine) Conservation Area* (Cree Nation)[30]
		Co-management of state parks	Tombstone Territorial Park (Tr'ondëk Hwëch'in)[44]
		Tribal Parks	Tla-o-qhi-aht Tribal Parks (Tla-o-qui-aht First Nation)[7, 31, 32]
		Indigenous and Community Conserved Areas	
	Mexico	Áreas Comunales Protegidas (protected communal areas)	La Raíz del Futuro (Tzeltal)[27, 36, 40]
		Áreas de Conservación por Manejo Forestal (Forestry management protected areas)	Nuevo San Juan Foresty Enterprise[2]
		*Areas for Payment for Ecosystem Services***	unnamed (Chol, Tzeltal, Tzotzil***)[41]
		Reservas Comunitarias Certificadas (Voluntary and Conservation Areas, Certified community reserves)	La Sabana (Yucatec-Maya)[36]
		Sitios Naturales Sagrados (Sacred natural sites; SNS)	
		Unidades para la Conservación, Manejo y Aprovechamiento Sustentable de la Vida Silvestre (UMAS; Wildlife management areas)	
	USA	Co-management of national monuments	Canyon de Chelley National Monument (Navajo/Diné Nation)[24, 42]
		Tribal Parks	Monument Valley Tribal Park (Navajo/Diné Nation)[42, 56]
South America	Argentina	Co-management of national parks	Lanin National Park (Mapuche)[19, 43]
	Bolivia	Co-management of biosphere reserves	Pilón Lajas Biosphere Reserve and Indigenous Territory (Tsimane')[13, 39, 41]
		Co-management of national parks	Kaa-Iya del Gran Chaco National Park (Izoceño-Guaraní)[3, 21]
	Brazil	Indigenous Reserves/Territories	Jaquiera Reserve (Pataxó)[41]
	Chile	Co-management of national parks	
		Private protected areas	unnamed (Mapuche)[43]
	Colombia	Co-managed national parks	Makuira National Park (Wayúu)[34]
		Indigenous Territories	unnamed (Yapu)[21]
	Ecuador	*Sacred sites*	
	Panama	Indigenous Territories	Comarca Ngöbe – Buglé Indigenous Territory (Ngöbe – Buglé)[19]
	Peru	Biocultural heritage sites, Traditional agricultural/conserved landscapes	El Parque de la Papa (Quetchua)[2, 6]
		Territory/communal reserves	Native Community of Infierno (Ese'Eja***)[23]
		Traditional agricultural conserved landscapes	
	Amazon Rainforest	Indigenous protected areas/reserves/territories	

* Both of these areas were declared through the Indigenous-led Wemindji protected areas project.
** Some areas created for Payment for Ecosystem Services can overlap with other Indigenous-led protected and conserved area initiatives.
*** Mestizo community members were also involved.

of articles (52 of 58, 90%) focused on initiatives within individual countries, while some (6 of 58, 10%) discussed regional or global IPCA initiatives. Most articles (32 of 58, 55%) directly evaluated IPCA initiatives (typically through ethnographic and perception studies), commonly within a case study approach. The majority of site-specific initiatives originated from Australia and Mexico (30 and 10 of 86, 35%

and 12%, respectively). IPCA initiatives included co-managed protected areas such as national/state parks and biosphere reserves, Tribal Parks, sacred sites, and entire Indigenous Territories and managed landscapes (Table 2).

Governance of these areas ranged from leadership by Indigenous institutions (e.g., customary governance bodies; Table A3) to collaborative arrangements with varying organizations, including state departments, state-recognized land title holders, industry, not-for-profit organizations, and local councils and assemblies. Of the site-specific initiatives, a third (29 of 86, 33%) have been Indigenous-led from the start. Approximately half of the literature (31 of 58, 53%) indicated that Indigenous customs, norms, and laws guide decision-making and management within their respective IPCAs. Decision-making was sometimes carried out through existing Indigenous customary practices, such as long-standing governance structures in Mountain Mesioui agdals (mountain pasture lands, Dominguez and Benessaiah, 2017) and religious institutions in the beyuls in Nepal (sacred mountain valleys, Kothari et al., 2013; Stevens, 2013; Skog, 2017). Some Indigenous Peoples created new or contemporary institutions for management. For example, the Navajo Nation created a Parks and Recreation department to manage its Tribal Park (Zeman, 1998); in Australia, Indigenous Land Corporations commonly hold land titles for IPAs and are involved in their management, representing their respective peoples' interests (Smyth and Jaireth, 2012). Hybrid governance and/or management institutions that included both Indigenous and non-Indigenous representations were commonly developed to enable co-management (e.g. Tombstone Territorial Park, Shultis and Heffner, 2016).

3.2. Motivations behind IPCA creation and external support and recognition

3.2.1. Creation

The literature highlighted multiple socio-cultural, ecological, and political motivations for creating IPCAs. Approximately 20% (18 of 86) of the site-specific initiatives had explicitly stated both socio-cultural and ecological purposes. A variety of Indigenous cultural, spiritual, and livelihood values were associated with IPCAs. These values included ceremonial sites, burial grounds, storied landscapes, and long-term relationships through land and natural resource management for Indigenous livelihoods and economies. Socio-cultural motivations for creating IPCAs included maintaining/improving economic opportunities (e.g. employment, Martin et al., 2011), protecting cultural/spiritual/religious sites (e.g. Pulu IPA, Hitchcock et al., 2015), facilitating intergenerational knowledge transfer (e.g. Muller, 2003), supporting cohesion and cultural identities (e.g. Berkes, 2009), and improving health and well-being (e.g. Moritz et al., 2013). Ecological motivations included protecting biodiversity values (e.g. Vaz and Agama, 2013), limiting natural resource use/extraction (Mulrennan et al., 2012), and maintaining ecological functions and services (e.g. Massey et al., 2011). For many Indigenous Peoples, the lack of distinction between socio-cultural and ecological goals may have resulted positive socio-cultural outcomes being inherently linked to ecological protection and conservation (Verschuuren et al., 2014; Ruiz-Mallén et al., 2014), especially in cases where conservation ethics have long-standing cultural and religious histories in communities (e.g. ICCAs in Malaysia, Vaz and Agama, 2013; sacred forest groves in India, Sinha, 1995). These inherent relationships between socio-cultural and ecological values can influence biological conservation within IPCAs. In fact, 38% of articles (22 of 58) mentioned IPCAs containing key ecological values such as high biodiversity, rare species and habitats, and/or important ecosystem services.

Political motivations included affirming Rights and Title over land and resources (e.g. the Mapuche in the Andes, Sepulveda and Guyot, 2016), establishing self-government and sovereignty (e.g. Tla-o-qui-aht First Nation in Canada, Murray and King, 2012), enacting authority over access and management (e.g. the Yolŋu in Australia, Langton et al., 2005), maintaining customary and religious practices (e.g. the Sharwa/Sherpa in Nepal, Stevens, 2013), and creating collaborations and accessing resources (e.g. funding) for community aspirations (e.g. many Aboriginal and Torres Strait Islanders of Australia, Smyth and Jaireth, 2012).

Many of the underlying socio-cultural and political reasons behind establishing IPCA initiatives were to improve conditions for peoples and territories that have been (and continue to be) severely impacted by colonial practices and values (e.g. Muller, 2003; Ross et al., 2009; Carroll, 2014). These motivations are a direct reflection of losses caused by violent, oppressive, and dismissive policies and legislation against Indigenous Peoples (e.g., forced assimilation, reduced access to traditional lands). Therefore, IPCAs were an approach towards reclaiming, restoring and/or revitalising Indigenous Territory management practices and access.

Indigenous Peoples have shown great adaptability in order to enable IPCAs to persist and/or develop within their traditional Territories. As such, IPCAs were created and supported through many mechanisms: some were designed by Indigenous groups, who then may have sought external support or recognition, while others were jointly initiated/created with one or many external actors, such as state agencies and non-government organizations (NGOs). In some IPCAs, such as sacred sites in India (Sinha, 1995; Singh and Kushwaha, 2008), Indigenous People have maintained stewardship for millennia. Seven initiatives began as state-led protected areas and evolved through co-management arrangements to become IPCAs. The Pilón Lajas Biosphere Reserve and Indigenous Territory (Bolivia) and the Kruger National Park (South Africa) became co-managed after Indigenous groups established state-recognized title over that land (Kothari, 2008; Kothari et al., 2013; Ruiz-Mallén et al., 2015, 2017; Gambon and Rist, 2017). Approximately 36% (31 of 86) of the site-specific initiatives were preceded by Indigenous Peoples securing some form of land and/or natural resource title or tenure over the area.

3.2.2. External support and recognition

Evolving state-Indigenous relationships have influenced the development of IPCAs. Two thirds of articles (38 of 58, 66%) highlighted state-Indigenous relationships within the historical (both negative and positive) context of the IPCAs. For example, Ross et al. (2009) emphasized the impact of histories of state-level protected area establishment though dispossession and marginalization within the history of co-management of National Parks in Australia. Dominguez and Benessaiah (2017) and Martin et al. (2011) mentioned the history of resistance and rebellion against state governments in Morocco and Mexico respectively as important factors for maintaining some relative autonomy of Indigenous Peoples involved in their respective IPCAs. As well, state support and recognition of IPCAs were influenced by national and international policies, and commitments to Indigenous Rights (e.g. International Labor Organization Convention 169 and UNDRIP, Stevens, 2013). This includes rights for meaningful engagement within conservation, land management, and protected areas (e.g. Parks with People Policy in Colombia, Premauer and Berkes, 2015). Support also was motivated through the potential for protecting valuable biodiversity areas (e.g. Den Maar IPA, Wallis, 2010), creating more comprehensive and connected protected area networks (e.g. many ICCAs, Kothari et al., 2013), and improving monitoring/enforcement to limit access to the area and its natural resources (e.g. Makuira National Park, Premauer and Berkes, 2015). More than half of the countries with formal recognition of an IPCA initiative also have legislation that facilitates Indigenous Title and/or Rights over land/resources (9 of 15, 60%; Table 2). Australia and Malaysia were the only countries where authors mentioned state-led institutional reports that highlighted the potential value of a state-supported IPCA program. Furthermore, Australia was the only country where growing understanding of Traditional Ecological Knowledge (TEK) and the value of Indigenous relationships and management were mentioned as important factors that enabled state support and recognition (e.g. Preuss and Dixon, 2012).

Table 3
The existence of formal and informal mechanisms for recognition and support of Indigenous Protected and Conserved Area initiative types by country. Italicized initiative types are terms used by literature authors. Countries with an asterisks (*) were described to have legislation allowing for Indigenous Title and/or Rights over land and/or natural resources.

Region	Country	Initiative types	Formal	Informal	None	Unspecified
Africa	Ethiopia	Traditional agricultural/conserved landscapes			✓	
	Ghana	Sacred forests/groves		✓		
	Morocco	Agdals				✓
	Nigeria	*Indigenous and Community Conserved Areas*				✓
	Senegal	*Indigenous and Community Conserved Areas*	✓			
	South Africa*	Co-management of national parks	✓			
Asia	China	*Indigenous and Community Conserved Areas*				✓
	India	Sacred forests/groves	✓			
	Malaysia*	Native Reserves	✓			
		Sacred sites			✓	
		Indigenous and Community Conserved Areas	✓			
	Nepal	Sacred valleys or Beyuls		✓		
		Sacred natural sites		✓		
		Community-managed forests		✓		
		Community-managed rotational grazing systems/grassland commons		✓		
		Indigenous and Community Conserved Areas		✓		
		Indigenous Conserved Territories		✓		
	Philippines*	*Indigenous and Community Conserved Areas*	✓			
	Taiwan	*Traditional agricultural/conserved landscapes*				✓
Australia and New Zealand	Australia*	Co-management of national parks	✓			
		Co-management of state parks	✓			
		Indigenous Protected Areas	✓			
	New Zealand	*Traditional agricultural/conserved landscapes*				✓
North America	Canada	Biodiversity reserves	✓			
		Co-management of national parks	✓			
		Co-management of state parks	✓			
		Tribal Parks			✓	
		Indigenous and Community Conserved Areas				✓
	Mexico*	Áreas Comunales Protegidas (protected communal areas)			✓	
		Áreas de Conservación por Manejo Forestal (Forestry management protected areas)	✓			✓
		Areas for Payment for Ecosystem Services	✓			
		Reservas Comunitarias Certificadas (Voluntary Conservation Areas, Certified community reserves)	✓			
		Sitios Naturales Sagrados (Sacred natural sites; SNS)				✓
		Unidades para la Conservación, Manejo y Aprovechamiento Sustentable de la Vida Silvestre (UMAS; Wildlife management areas)				✓
	USA	Co-management of national monuments	✓			
		Tribal Parks		✓		
South America	Argentina	Co-management of national parks	✓			
	Bolivia*	Co-management of biosphere reserves	✓			
		Co-management of national parks				✓
	Brazil*	Indigenous Reserves/Territories	✓			
	Chile	Co-management of national parks	✓			
		Private protected areas			✓	
	Colombia*	Co-managed national parks	✓			
		Indigenous Territories				✓
	Ecuador	*Sacred sites*				✓
	Panama	Indigenous Territories				✓
	Peru*	Biocultural heritage sites, Traditional agricultural/conserved landscapes				✓
		Territory/communal reserves	✓			
		Traditional agricultural/conserved landscapes				✓

State-recognized Indigenous ownership and related state policy and legislation changes also arose from internal pressures of Indigenous advocacy, resistance, and political action to meet international standards of Indigenous Rights recognition. For example, leveraging national and international discourses and policy changes, the Mapuche shaped changes spanning the Andes, changing Chile's legislation to recognize protected area co-management, while in Argentina they advocated and developed co-management arrangements for Lanin and Nahuel Huapi National Park (Sepulveda and Guyot, 2016). Other initiatives were preceded by Indigenous-led projects and institutions that led to IPCA initiatives recognized by the state (e.g. the Wemindji Protected Area Project by the Cree Nation in Quebec, Canada, Mulrennan et al., 2012; Chinantec organizations in Oaxaca, Mexico, Bray et al., 2012). There were various formal and informal state mechanisms for recognizing and supporting IPCAs (Table 3). Mexico, for instance, has legislative designations for 'Voluntary Conserved Areas', where designation is applied and removed through a state-led process initiated by Indigenous groups and local communities (Ibarra et al., 2011; Bray et al., 2012).

Agreements between state and Indigenous Peoples preceding recognition and support could be created through combinations of legislation and voluntary and/or lease agreement (e.g. contract arrangements that may or may not be legally binding). For example, IPAs in Australia are facilitated by voluntary, formal agreements with the Australian government and provided funding without legislative recognition (Thackway and Brunckhorst, 1998; Muller, 2003; Langton et al., 2005; Zeng and Gerritsen, 2015). Informal support through shared values of communities and authorities have helped maintain community control in places such as sacred sites in Ghana (Bossart and Antwi, 2016). Relationships with local state-park managers in Nepal has allowed for informal, local state support and resources towards management (Stevens, 2013). There can also be differences between

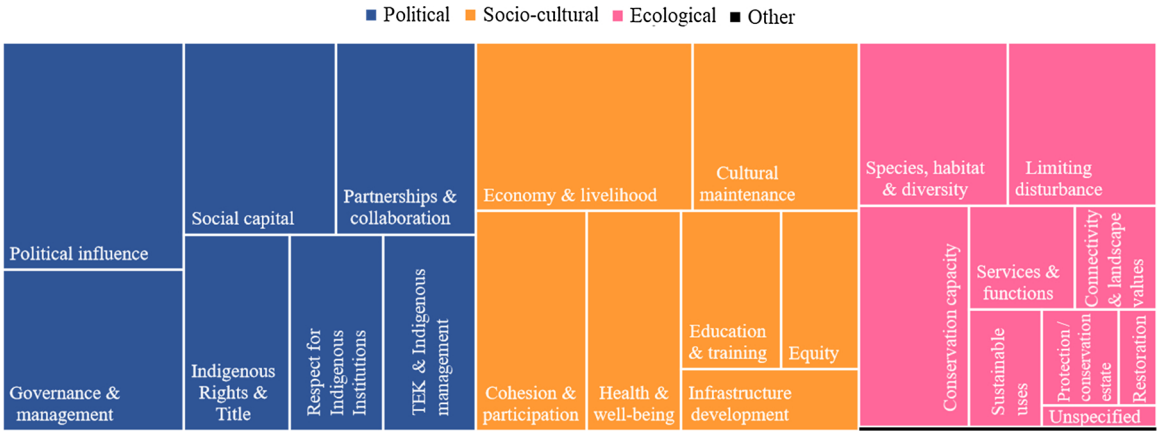

Fig. 1. Themes of successes and benefits of Indigenous Protected and Conserved Areas, by broad categories: political (relating to politics), socio-cultural (relating to individuals and groups within societies or its organization), and ecological (relating to the natural environment).'Other' includes any benefits not mentioned in the other themes. Box sizes are proportional to the relative frequency of appearance within the literature review.

official recognition and support mechanisms compared to jurisdictional categorization or designation. For instance, though Canada has co-management arrangements with First Nations for some national parks (Kothari, 2008), there is no unique designation given to these areas within Canadian legislation. In contrast, Chile has legislation that recognizes co-management arrangements within protected areas, but official use of this designation has been limited (Sepulveda and Guyot, 2016).

In certain countries, IPCA initiatives were supported indirectly through additional legislation, policies, and programs. Such indirect support included state court decisions that upheld Indigenous Rights and Title (e.g. a Supreme Court decision that preceded the development of the Tla-o-qui-aht Tribal Parks in Canada, Murray and King, 2012; Murray and Burrows, 2017), technical/advisory support for management plan development and implementation (e.g. the US National Park Service assisted in the development of the Monument Valley Tribal Park Plan, Sanders, 1996), reports and other state publications that have promoted the inclusion of Indigenous People within conservation initiatives (e.g. Bornean Biodiversity and Environmental Conservation Programmes in Malaysia, Vaz and Agama, 2013), and state registries for sacred sites and other culturally important areas (e.g. Northern Territory Aboriginal Sacred Sites Act 1989, Muller, 2003; Smyth, 2006; 2013). Australia and Mexico were the only countries identified to have additional programs to support IPCA initiatives via direct economic and educational opportunities for Indigenous Peoples to participate in conservation initiatives. Australia's Working on Country Program provides training and employment to Indigenous Peoples to work as park rangers (Ross et al., 2009; Preuss and Dixon, 2012; Smyth and Jaireth, 2012; Davies et al., 2013; Moritz et al., 2013). Mexico's Payment for Ecosystem Services Program provides compensation for areas set aside for conservation directly to land-owners, who can be Indigenous (Ibarra et al., 2011; Bray et al., 2012; Reyes-Garcia et al., 2013; Mendéz-Lopéz et al., 2014; Denham, 2017).

Partnerships with other external actors, such as NGOs, academic researchers, and industry have also supported IPCA initiatives, directly through funding and indirectly through support roles (e.g. advisory roles). For example, Mulrennan et al. (2012) described how their partnership with the Cree Nation through the Wemindji Protected Areas Project was able to contribute to the Cree Nation's aspirations for protected and conserved areas within their Territory. Partnerships could also assist in capacity building for management and monitoring, particularly funding. For instance, La Raíz del Futuro was initiated through support of a local NGO and funding from a British program (Reyes-Garcia et al., 2013). Partnerships likewise enabled and promoted participation in state-supported IPCA initiatives, such as in many Chinantec communities in Oaxaca, Mexico (Bray et al., 2012).

There was a wide range of timeframes described for IPCAs to progress from creation, through engaging with external actors, to achieving (if any) external recognition and support. For example, the first areas of the Tla-o-qui-aht Tribal Parks were declared by the Tla-o-qui-aht First Nation in the 1980s (Murray and King, 2012; Murray and Burrows, 2017). Yet, despite improved engagement with industry actors in the years since, without formal legal recognition of the IPCA by the government of Canada, the security of industry agreements and conservation achievements remains ambiguous and insecure (Murray and King, 2012; Murray and Burrows, 2017). Australia's IPA program began only in areas with recognized Indigenous ownership, which required Indigenous organizations to seek tenure before establishing an IPA (e.g. land tenure was obtained in 1993 before establishing Den Maar Indigenous Protected Area in 1999, Wallis, 2010). Makuira National Park was declared by the state in 1977 but the area (and parts of the surrounding peninsula) became state recognized as Wayúu Territory in 1984; however only decades later did co-governance negotiations occur in 2004 to 2006, and official agreements signed were signed in 2011 for establishing co-governance (Premauer and Berkes, 2015).

3.3. Successes and challenges

3.3.1. Successes

Most articles (57 of 58, 98 %) mentioned successes or benefits from IPCA initiatives. We grouped these into three themes: political, socio-cultural, and ecological (Fig. 1 and Table 4). Themes within political and socio-cultural categories related to creating equity for Indigenous Peoples and marginalized demographicsvia increasing political capital, promoting social justice, and capacity building across various scales. By facilitating opportunities for capacity building (e.g. funds to support Indigenous aspirations, Davies et al., 2013), IPCAs elevated Indigenous governance and management in IPCAs and beyond. Indigenous Peoples used IPCAs to increase political influence and external recognition of Rights and Title within and beyond IPCAs boundaries through creating multi-scale and sector partnerships (e.g. management of Dhimurru Indigenous Protected Area, Langton et al., 2005; Smyth, 2015) and promoting social capital between actors, through developing respect, trust, and reciprocity (e.g. between the Wayúu and state organizations in Makuira National Park, Premauer and Berkes, 2015). For instance, hybrid approaches utilizing TEK and western conservation science in management created external respect for Indigenous institutions and traditional land management within western conservation (e.g. Thackway and Brunckhorst, 1998; Preuss and Dixon, 2012; Hitchcock et al., 2015; Murray and Burrows, 2017).

IPCAs facilitated increased agency of Indigenous Peoples for self-determination by providing opportunities and support for Indigenous

Table 4
Common themes of political (relating to politics), socio-cultural (relating to individuals and groups within societies and its organization), and ecological (relating to the natural environment) successes and benefits of Indigenous Protected and Conserved Areas, with examples from the literature. Numbers correspond to references in Table A4.

Themes	Example from literature
Political	
Governance and management	Obtained funds to support Indigenous Territory-based aspirations[9]
Partnership and collaboration	Established working partnerships with tourism and logging companies[31]
Political influence	Shift from consultation to shared decision-making over protected areas[7]
Respect for Indigenous institutions	Acknowledged resiliency of Indigenous Peoples and their institutions[6]
Rights and Title	Ensured recognition of Rights over Territory[15]
Social capital	Created trust, reciprocity, and respect in cross-sector partnerships[34]
Traditional Ecological Knowledge and Indigenous management	Management principles and policies derived from traditional teachings[32]
Socio-cultural	
Cohesion and participation	Lowered conflict between local user groups[11]
Cultural maintenance	Supported preservation of cultural heritage[55]
Economy and livelihood	Increased employment for Indigenous Peoples[42]
Education and training	Created professional development opportunities for local rangers[35]
Equity	Promoted social justice[22]
Health and well-being	Promoted spiritual, collective, and intergenerational well-being[16]
Infrastructure development	Provided resources to build traditional houses and a school[41]
Ecological	
Connectivity and landscape values	Enhanced conservation linkages with surrounding protected areas[57]
Conservation capacity	Created legal support for conservation at multiple levels[28]
Limiting disturbance	Prevented habitat loss from mining, logging, and oil extraction[13]
Protected and conserved area estate	More area under protection than state-led protected areas[24]
Restoration	Regeneration of native plants[11]
Services and functions	Conservation of land and water ecosystem services[2]
Species, habitat, and diversity	Created refuge for endangered/threatened/vulnerable species[46]
Sustainable uses	Balancing well-being within ecological limits[20]

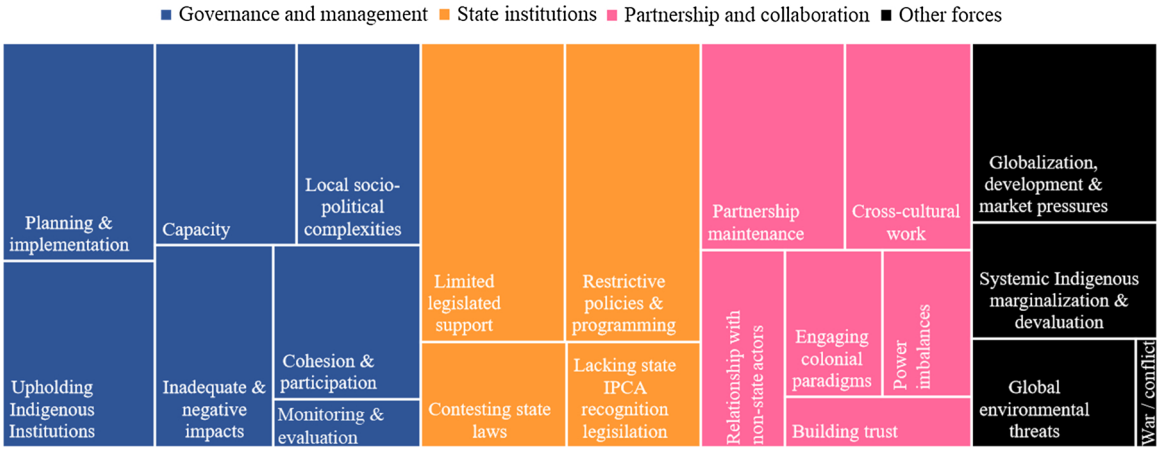

Fig. 2. Themes of challenges faced by Indigenous Protected and Conserved Areas (IPCAs), by broad categories: governance and management (relating directly to the governance and/or management of the area); state institutions (directly resulting from state policies and legislation); partnership and collaboration (arising from partnership and collaboration for the support, recognition, and/or management of an IPCA); and other forces (additional challenges not belonging to the previous three categories). Box sizes are proportional to the relative frequency of appearance within the literature review.

individuals, families, to larger social scales. Individuals benefited from IPCAs, for example, through increased economic and livelihood opportunities (e.g. creating employment within Monument Valley Tribal Park management, Sanders 1998) and subsequent improved health and well-being (e.g. through fostering financial independence and better access to traditional foods, Smyth and Jaireth, 2012). Across social scales, IPCAs also fostered cultural revitalization and resurgence by providing opportunities to continue customary practices and (re)invigorating others (e.g. containing culture camps that facilitate traditional activities on the land and sharing of that knowledge, Shultis and Heffner, 2016).

IPCAs provided tangible benefits towards ecological conservation, particularly the conservation of species, habitat, and biodiversity. Directly securing resources (e.g. funding for conservation actions, Martin et al., 2011) and fostering monitoring and research (e.g. Paakumshumwaau-Maatuskaau Biodiversity Reserve, Mulrennan et al., 2012) helped IPCAs to protect, conserve, and manage ecological issues, and to regulate development to support conservation of species and habitats. IPCA initiatives directly protected threatened and culturally significant species (fish species important for livelihoods, Cormier-Salem, 2014) and habitat (e.g. preventing mining, oil, and forestry extraction in the Pilón Lajas Biosphere Reserve and Indigenous Territory Gambon and Rist, 2017), as well as promoted restoration (e.g. return of native plants in Nantawarrina Indigenous Protected Area, Muller, 2003). Across larger geographic scales, IPCAs also increased the protected area estate (e.g. more than half of the protected areas are IPAs in Australia, Smyth, 2006) and created connectivity or promote large landscape scale conservation linkages (e.g. Bundu Tuhan Native Reserve in Malaysia, Vaz and Agama, 2013).

3.3.2. Challenges

Many articles (57 of 58, 98%) also mentioned challenges facing

Table 5
Common themes regarding challenges faced by Indigenous Protected and Conserved Areas (IPCAs) by broad category: governance and management (relating directly to the governance and/or management of the area); state institutions (directly resulting from state policies and legislation); partnership and collaboration (arising from partnership and collaboration for the support, recognition, and/or management of an IPCA), and other forces (additional challenges not belonging to the previous three categories), with examples from the literature. Numbers correspond to references in Table A4.

Themes	Example from literature
Governance and management	
Capacity	Lack of funding cultural management activities[10]
Cohesion and participation	Disputes within communities regarding management goals[5]
Inadequate and negative impacts	Limiting livelihood practices[17]
Local socio-political contexts	Existing local gender inequalities and power dynamics[12]
Monitoring and evaluation	Need for more baseline monitoring of cultural and natural values[16]
Planning and implementation	Addressing different Indigenous member groups' distinct values and aspirations[58]
Upholding Indigenous institutions	Erosion of cultural values[45]
State institutions	
Contesting state laws	State-retained legal power over selling, leasing, and renting communal property[24]
Lacking state IPCA legislative recognition	Inadequate recognition/respect for IPCA in national legislation[51]
Limited legislated support	Lacking state-supported legal ability to enforce compliance[54]
Restricted policies and programming	Lacking guidelines for equitable treatment of Indigenous law and culture[15]
Partnerships and collaboration	
Building trust	History of distrust, grievance, tension, and conflict[2]
Cross-cultural work	Bridging understanding across epistemologies[34]
Engaging in colonial paradigms	Perpetuating colonial practices such as restricting land access[7]
Partnership maintenance	Reconciling diverging objectives/values in partnerships[32]
Power imbalances	Lack of autonomy with certain management decisions[22]
Relationships with non-state actors	Lack of multi-sector cooperation[2]
Other forces	
Globalization, development, and market pressures	Increased tourism pressure[56]
Multi-scale environmental threats	Impacts of natural disasters, overgrazing, and invasive species[28]
Systemic Indigenous marginalization and devaluation	Blaming Indigenous traditional practices for conservation/biodiversity decline[17]
War and armed conflict	Civil war[8]

IPCA initiatives, from the past, present, and anticipated in the future. Some challenges had been overcome, while others were ongoing. Challenges were more diverse than successes, and often case-dependent. Our analysis grouped challenges into four themes: those related to IPCA management directly, those related to state institutions, partnerships and collaboration with external actors, and other external forces (Fig. 2 and Table 5).

IPCA governance and management faced challenges at many levels. When planning and implementing IPCAs, managers had to balance diverse rights and interests of Indigenous members (e.g. La La Raíz del Futuro, Ruiz-Mallén et al., 2014), including members living outside IPCA boundaries or traditional Territories (e.g. Adnyamathanha Indigenous Protected Area, Langton et al., 2005). Additionally, equitable sharing of benefits within communities could be limited by existing local divisions and power dynamics. Often, marginalized groups within communities, such as women, experienced fewer benefits from IPCA initiatives because governance and/or management typically remained with male community or household members (e.g. male-only tribal assembly managing Morocco's agdals, Dominguez and Benessaiah 2017). Governance and management capacity was also hindered by many forces. Past and current colonial injustices (e.g. forced separations of people from Territory, Carroll, 2014) have meant that Indigenous Peoples had to, and must still, work towards maintaining and rebuilding Indigenous institutions, such as intergenerational knowledge transfer (e.g. passing on knowledge about the existence of beyuls in Nepal, Skog, 2017) and customary or religious values and practices (e.g. regarding sacred groves in India, Sinha, 1995). Allocating resources directly to managing IPCAs areas also was commonly a challenge. Notably, almost a quarter of the literature (14 of 58, 24%) indicated lack of funding as a challenge for IPCA management. Limited capacity among Indigenous governments and/or managers are reflected in the limited/lack of monitoring and evaluation frameworks for social-ecological benefits and management effectiveness in IPCAs. Without sufficient monitoring or reporting on indicators and outcomes, it is difficult to evaluate whether IPCAs are achieving success in their conservation and social goals, or the timeframes to do so (e.g. Australia's IPA Program, Muller, 2003; Ross et al., 2009; Zeng and Gerritsen, 2015).

State institutions such as legislation, policies, and programs cause challenges for Indigenous organizations and IPCA management bodies, particularly where there exists no state-recognized legislation for IPCAs. In fact, approximately 20% (12 of 58) of the literature mentioned the lack of, and the need for, state-recognized IPCA legislation as a major challenge. For example, obtaining Quebec-recognized legislative designation was the only way to have the Wemindji protected areas in Cree Nation Territory protected against the state-sanctioned mining laws (Mulrennan et al., 2012). Even with official support from the state, those and other legislations, policies, and programs can also create additional challenges, particularly if they do not reflect Indigenous Peoples' views of their Rights and responsibilities to Territory. Lack of adequate recognition and respect of Indigenous Rights and Title within states was frequently cited (15 of 58, 26 %) as a substantial challenge facing these initiatives. Where state institutions and policies challenge Indigenous relationships and responsibilities on Territory, Indigenous participation and engagement with state actors and programs can be limited (Kothari, 2008). For example, Ibarra et al. (2011) mentioned an IPCA initiative in Santiago Lachiguiri, Mexico, where a Zapotec community decided to cancel its 'Voluntary Conserved Area' state designation and refuse payment for ecosystem services because the emphasis on conservation impeded on subsistence uses of the land. Even in places with official state legislation or policies that support and recognize IPCAs, there are sometimes other legislation and policies that directly conflict with Rights and Title and other Indigenous aspirations. Bolivia, for example, had legislation that allows for Indigenous Title through establishment of Indigenous Territories, but there is also legislation that allows private property purchases to occur within them (Gambon and Rist, 2017). Legislation for state-recognized title could be limited in extent (e.g. to top soil only in Bolivia, Gambon and Rist, 2017) or difficult to obtain (e.g. in marine environments in Australia Hitchcock et al., 2015), which can contradict Indigenous views and aspirations of Territory.

Partnership and collaboration with external actors sometimes came

at a cost of added burden to the capacities of partnering organizations and IPCA managers. Collaborative partnerships required additional resources (i.e. time and funding) to manage diverging goals and objectives and resulting tensions (e.g. Red Cliff Band and multi-sector representatives governing Frog Bay National Tribal Park, Carroll, 2014). These resources were also needed to work across knowledge systems with customary and western approaches (e.g. Tr'ondëk Hwëch'in and Canadian approaches to managing Tombstone Territorial Park, Shultis and Heffner, 2016), and improve awareness of the value of Indigenous institutions in conservation (e.g. in Southern Tanami Indigenous Protected Area, Preuss and Dixon, 2012). Further resources were also sometimes used to satisfy bureaucratic processes (e.g. state funding bodies for Northern Tanami Indigenous Protected Area, Davies et al., 2018). Distrust of state organizations and their representatives because of colonial impacts was an issue, particularly for initiatives that required collaboration with state organizations (e.g. Nantawarrina Indigenous Protected Area, Langton et al., 2005) or participation in state-recognized programs (e.g. Mexico's Voluntary Protected Areas program, Denham, 2017). Collaborating with state and other non-Indigenous organizations was seen by some as a 'colonial entanglement': it can provide access to state support and resources but at the same time requires sacrificing certain levels of self-determination (Dennison, 2012; Carroll, 2014).

IPCAs also faced common worldwide environmental threats. These threats include climate change (Ross et al., 2009; Kothari et al., 2013; Stevens, 2013; Ruiz-Mallén et al., 2017), invasive species (Singh and Kushwaha, 2008; Moritz et al., 2013), tourism/recreation impacts (e.g. Monument Valley Tribal Park, Zeman, 1998), and globalization and market pressures for increasing and encroaching development/resource extraction (e.g. Sinha, 1995; Licona et al., 2011).

3.4. Lessons and recommendations

Through review and analysis, which cross-referenced common themes from our research objectives with lessons identified in the literature, we arrived at recommendations directed towards Indigenous, state and other external actors (e.g. researchers, NGOs, industry, etc.) to improve existing and future IPCA initiatives.

3.4.1. Beyond IPCAs

The literature demonstrates links between IPCAs and the broader issues of systemic, socio-political, and colonial relationships between Indigenous People and state and other actors that continue to marginalize Indigenous Peoples, even in cases where Indigenous Peoples establish IPCAs outside of state policies and legislation. For example, while the lack of tenurial security and defined authority within state laws can be both beneficial and challenging to Indigenous initiatives (Murray and Burrows, 2017), state-recognition and external partnerships can be challenging to consider for Indigenous organizations, because states might limit Indigenous decision-making and can potentially uphold colonial practices (Muller, 2003; Hitchcock et al. 2005; Berkes, 2009; Ibarra et al., 2011; Smyth and Jaireth, 2012; Davies et al., 2013; Carroll, 2014; Gambon and Rist, 2017) Also, IPCA development may not shift colonial practices and values at larger socio-political scales (e.g. Muller, 2003; Ross et al., 2009; Carroll, 2014). This power dynamic cannot be ignored. Building equity and trust for effective collaboration in conservation requires Indigenous and especially state and external organizations to invest time and resources (Kothari et al., 2013). These resources can include investment in building Indigenous capacity/institutions (Ross et al., 2009) and reflecting Indigenous worldviews in state policy/legislation through mechanisms that respect their roles in land/sea management within their traditional Territories (e.g. supporting large-scale territory planning across state-recognized tenures, Smyth, 2015). Various international conventions and human rights treaties such as UNDRIP and the International Labor Organization Convention 169 on Indigenous and Tribal Peoples (2019) relate to IPCAs. Thus, efforts from all actors to apply these frameworks and promote discourse in supporting the value and visibility of Indigenous Title and Rights is needed not only for IPCAs and conservation, but for human rights equity (Stevens, 2010; 2013). Supporting Indigenous-led efforts for upholding their Rights and (re)connection to traditional Territories, as well as greater efforts to reconcile colonial injustices, can create powerful alliances for IPCAs. A thorough articulation and exploration of the extensive systemic changes needed to uphold Indigenous Rights, Title and Territory responsibilities is beyond the scope of this paper.

3.4.2. Recommendations for IPCA support and recognition

In this section, we present six recommendations for actors interested in developing and supporting IPCAs. The recommendations are derived from our analysis, and supported by the common lessons described in the reviewed literature.

1 States and external actors should provide functional pathways through policies, legislations, and resources, to support and recognize IPCAs, as defined by Indigenous Peoples.

With state support for IPCAs, involved actors can more effectively distribute their resources to achieve conservation goals. One major benefit of the IPA program for the Australian government was that collaborating with Indigenous land owners meant creating protected areas without the need for state purchase of the land (Smyth, 2006). Recognition leading to more areas under protection can improve landscape connectivity and abilities to establish protected area networks (Kothari, 2008). Functional political, regulatory, and fiscal pathways to support IPCAs and recognize IPCAs are needed to overcome the siloed approaches typical of state governments and other bureaucratic organizations. Many Indigenous Peoples do not share the same distinctions as state governments between people, land, sea, and natural resources. This separation within colonial laws and policies often restricts Indigenous Peoples' abilities to manage IPCAs holistically, stretching their capacity as these Indigenous organizations expend further resources to seek added pathways to achieve their goals (Smyth, 2015). Our analysis indicates that laws and policies which oppose or conflict with Indigenous worldviews can deter Indigenous Peoples from seeking the support and resources they need to manage IPCAs. States should expect to change multiple policies and legislations in order to effectively support IPCAs. State resources — especially funding — need to be allocated to Indigenous organizations and IPCA managers to engage with these state pathways. In fact, states providing incentives (economic and otherwise) have been used successfully to actively support Indigenous Peoples in state-recognized conservation (Berkes, 2009; Bray et al., 2012; Ruiz-Mallén et al., 2015).

2 States and external actors ought to seek and provide resources for Indigenous Peoples to lead the process in developing and improving mechanisms that establish IPCAs

Indigenous Peoples have many possible motivations for engaging in state policies and legislations. Therefore state-level recognition generally exists in contexts of diverse Indigenous Peoples, cultures, and interests where standardization is not necessarily useful or effective. Consequently, when states engage Indigenous Peoples to lead the development of state policies and legislations for IPCAs, states should create flexibility in the process and structure of these same policies and legislations. Berkes (2009) and Moritz et al. (2013) emphasized that adaptability, flexibility and a variety of state and other mechanisms for support and recognition can allow for increased participation and better solutions to local social and environmental problems. When state agencies understand and consider place-based power dynamics as part of their recognition of Indigenous institutions, the result is often that IPCA initiatives are more adaptable to local conditions and able to

create equitable benefits for marginalized people, such as Indigenous women (Kothari, 2008; Mendéz-Lopéz et al., 2014; Ruiz-Mallén et al., 2014, 2017; Skog, 2017). When states engage meaningfully with Indigenous Peoples (see Section 3.4.1), Indigenous Peoples can use these processes to promote and maintain TEK in western conservation discourse, exercising more control over their sustainable economic futures and engagement in the global market (Smyth, 2015).

3 States and external actors should commit to creating new internal structures and/or positions to facilitate engagement and partnerships with Indigenous Peoples regarding IPCAs.

Our results suggest that Indigenous Peoples have worked simultaneously from within and outside of colonial frameworks to successfully develop IPCAs, despite the challenges created by some partnerships. The burden of improving external and colonial structures cannot remain with Indigenous Peoples. Individuals and groups working with states and other non-Indigenous organizations need to commit resources and effect changes within their respective institutions to break down barriers and create opportunities for engagement with Indigenous Peoples in a way that minimizes the operational and institutional burden on Indigenous groups. It is important for state and non-Indigenous actors to facilitate positive engagement by approaching partnerships with Indigenous organizations with openness to forms of governance and management that work with both Indigenous and non-Indigenous approaches (Moritz et al., 2013; Preuss and Dixon, 2012). Such openness can be facilitated through the involvement of people and resources to facilitate cross-cultural learning and dialogue (Langton et al., 2005).

4 Indigenous Peoples can benefit from seeking and building partnerships, where desired and appropriate, to support and manage IPCAs.

Indigenous Peoples can achieve tangible benefits from partnering with other actors to manage their IPCAs. In some cases, partnering with state legislative agencies may increase the financial stability of IPCA management for Indigenous leaders (Smyth and Jaireith 2012). Seeking state recognition and support can help IPCA managers to access more resources for capacity building and increase political capital for Indigenous organizations. In addition, Indigenous actors can build partnerships to leverage funding and in-kind support to achieve management goals (Davies et al., 2013), such as with philanthropic and non-governmental organizations and researchers.

Indigenous organizations embracing hybrid management approaches can benefit from both Indigenous and western conservation science and land management to create unique and adaptable management tools, such as the land use zoning with Indigenous law guiding principles in Tla-o-qui-aht Tribal Parks (Murray and King, 2012; Murray and Burrows, 2017). NGOs, academics, and non-Indigenous employees can play a role in enhancing advocacy and provide technical support for IPCAs through additional resources, increasing local capacity and participation to address local needs and achieve goals (Preuss and Dixon, 2012; Kothari et al., 2013). Organizations in partnerships can also support advocacy on behalf of Indigenous Peoples and influence policies and legislation that recognize and support IPCA initiatives (Kothari et al., 2013). Moreover, actors in external partnerships can provide ongoing cross-cultural services to enable more effective and efficient communications across different sectors (Kothari et al., 2013). Indigenous Peoples will have to consider the trade-off of various partnerships, particularly the commitment and additional resources to establish and maintain effective working relationships, which may not be feasible in all cases (Verschuuren et al., 2014). Partnerships, when desired, need to be mutually enabling without building long-term dependence on external expertise (Mulrennan et al., 2012).

5 IPCA managers and collaborators should commit resources to effectively manage and monitor IPCAs

A lack of resources, particularly funding, described in much of the literature reflects a need for more operational support for IPCA initiatives. More research and resources are needed directly for monitoring and evaluating socio-cultural and ecological impacts of IPCAs (Brown and Kothari, 2011; Zeng and Gerritsen, 2015) in order to support their development and management. IPCAs can further be supported by conducting and facilitating planning at Territory-wide scales and depths reflective of Indigenous perspectives (Smyth, 2015). Also, IPCA initiatives strengthened by investment in on-the-ground and cross-cultural training and educational opportunities for both Indigenous and non-Indigenous collaborators, managers, and staff (Preuss and Dixon, 2012; Moritz et al., 2013; Premauer and Berkes, 2015). IPCA managers can engage multi-sector partnerships to address many challenges related to resourcing and capacity, as mentioned in the previous recommendation above.

6 IPCA managers need to be aware of local and larger scale social and environmental issues affecting their IPCAs, and take them into account for management actions within their borders.

IPCAs have proven ecological conservation benefits (see Section 3.4.1). However, they also face the same local and global threats that impact other types of protected and conserved areas around the world. Pressure for resource exploitation, climate change, invasive species, tourism/recreation, other global and market pressures, and the cumulative impacts of these factors threaten terrestrial and marine ecosystems and protected areas around the world at scales far greater than any single territory or jurisdiction can tackle (Schulze et al., 2018; Lotze et al., 2018). Commitments and tangible efforts to address these conservation issues are required of Indigenous-led and non-Indigenous conservation initiatives alike, including in protected and conserved areas.

4. Conclusion

The rise in number and visibility of IPCAs has been significantly influenced by Indigenous advocacy regarding the roles and rights of Indigenous People in conservation across geographic scales. Indigenous Peoples have shown great resiliency and adaptability in working alongside and pushing against colonial frameworks to maintain and develop IPCAs. Peer-reviewed literature reflects multiple and tangible benefits of IPCAs. IPCAs can be a beneficial tool towards achieving the socio-cultural and ecological goals of various Indigenous and other organizations. While partnerships have been beneficial in these initiatives, much more work is needed to lessen the burden on Indigenous groups developing IPCAs and to shift power towards them.

Supplementing information with additional research, such as site-based research by Indigenous Peoples and co-research with non-Indigenous researcher partners can provide critical insights and more context-appropriate recommendations for specific places and peoples. Indigenous perspectives on IPCA creation, development, governance, and management are limited within the literature, as “different researchers from different cultural backgrounds … have different observations and perspectives” (Zeng and Gerritsen, 2015, page 26). As such, additional primary research is needed – ideally by Indigenous Peoples or through partnerships using participatory approaches (Zurba et al., 2012; Mulrennan et al., 2012) – to monitor the delivery of these initiatives on socio-cultural and ecological goals, evaluate governance and management effectiveness, investigate adequate mechanisms for bridging western and Indigenous approaches to conservation, and provide support through action-based research to assist Indigenous Peoples to achieve goals (Verschuuren et al., 2014). We are not Indigenous researchers ourselves, and while we cannot conclusively assess how many authors are or are not Indigenous, we respect the need

for Indigenous voices in discourse about IPCAs. At the same time, our role is to support the work of Indigenous colleagues engaged in IPCA work by contributing to a better understanding of their initiatives. More research on "strategies and principles for the two-way approach" to cross-cultural partnerships can benefit non-Indigenous collaborators and individuals working with Indigenous organizations; their IPCAs can assist in bridging Indigenous and western knowledge (Preuss and Dixon, 2012, page 3). Future research could expand the scope of our review by: including books, book chapters, and grey literature; adding additional key search terms that encompass the various governance structures encountered in this review (e.g. shared and co-governance and management); and including literature in multiple languages.

As with other forms of protected areas, IPCAs alone will not solve the biodiversity conservation crisis (Kothari et al., 2013). Similarly, they cannot fully rectify a systemic lack of respect for Indigenous Rights and Title. However, IPCAs are one way that Indigenous Peoples are taking steps to assert their self-determination and responsibilities to lands and waters, even within colonial legacies. Actors and organizations across various sectors, including those only indirectly involved in conservation, have a role to play supporting IPCAs. Our results suggest that there is a need to move from rhetoric to more tangible action in relationships with Indigenous Peoples, particularly where they intersect with issues of conservation and stewardship of lands and waters.

Declaration of Competing Interest

The authors confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

Acknowledgements

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Appendix A

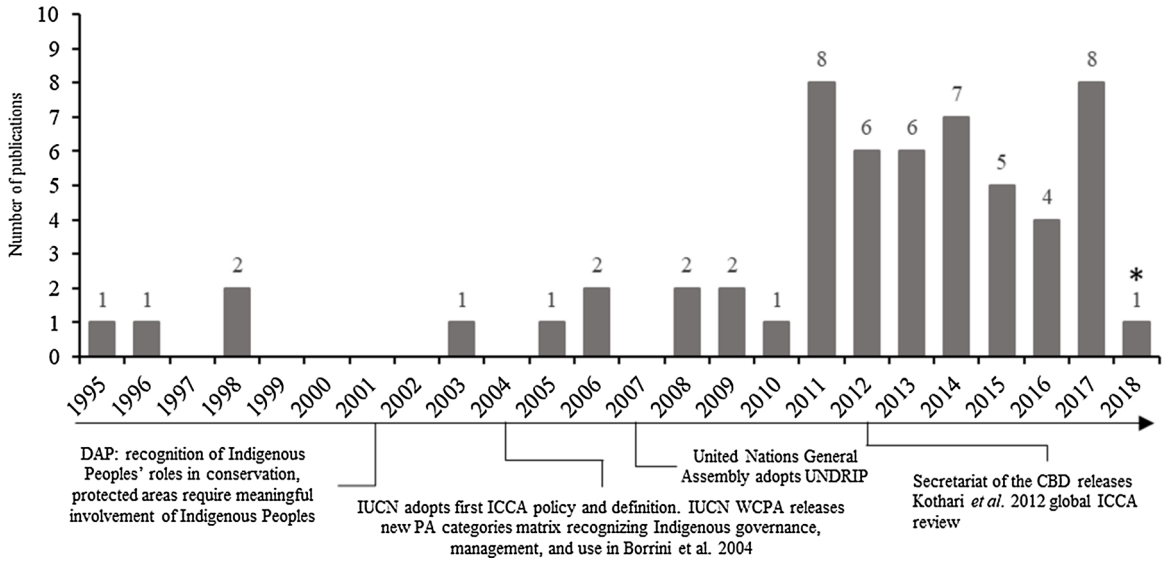

Fig. A1. Number of publications.
Number of publications about Indigenous Protected and Conserved Areas that met our selection criteria from the literature review by year up to January 2018 – denoted by an asterisk (*) and thus included only publications from the first month of 2018. The timeline below the graph contains examples of key events contributing to the international discourse regarding Indigenous Peoples, conservation, and protected areas. It is important to note that reports releases are not considered IUCN policy themselves, and do not have the weight of IUCN resolutions and policy adoptions. CBD = Convention on Biological Diversity, DAP = Durban Action Plan; ICCA = Indigenous and Community Conserved Areas; IUCN WCPA = International Union for the Conservation of Nature's World Commission on Protected Areas; PA = Protected Area; UNDRIP = United Nations Declaration for the Rights of Indigenous Peoples.

Table A1
Searches and Key terms.

Search	Date	Database	Key terms
1	2018-01-26	Web of Science	(“indigenous protected area*” OR “indigenous and community conserved area*” OR “indigenous and local community conserved area*” OR "Indigenous Peoples’ and community conserved territories and area*" OR “indigenous protected and conserved area*” OR “indigenous community conserved area*” OR “tribal park*”) OR ((“IPA*” OR “ICCA*” or “IPCA*” OR “community conservation area*” OR “community-conserved area*” OR “community-based conservation*” OR “protected area*” OR “conserved area*” OR “biosphere reserve*”) AND (“indigenous*” OR “First Nation*” OR “aborigin*” OR “tribal*”))
2a*	2018-01-26	SCOPUS	“indigenous protected area*” OR “indigenous and community conserved area*” OR “indigenous and local community conserved area*” OR "Indigenous Peoples’ and community conserved territories and area*" OR “indigenous protected and conserved area*” OR “indigenous community conserved area*” OR “tribal park*”
2b*	2018-01-26	SCOPUS	(“IPA*” OR “ICCA*” or “IPCA*” OR “community conservation area*” OR “community-conserved area*” OR “community-based conservation*” OR “protected area*” and “conserved area*” OR “biosphere reserve*”) AND (“indigenous*” OR “First Nation*” OR “aborigin*” OR “tribal*”)
3a*	2018-01-29	Google Scholar	“indigenous protected area*” OR “indigenous and community conserved area*” OR “indigenous and local community conserved area*” OR "Indigenous Peoples’ and community conserved territories and area*"
3b*	2018-01-29	Google Scholar	“indigenous protected and conserved area*” OR “indigenous community conserved area*” OR “tribal park*"
3c*	2018-01-29	Google Scholar	(“IPA*” OR “ICCA*” or “IPCA*” OR “community conservation area*” OR “community-conserved area*”) AND (“indigenous*” OR “First Nation*” OR “aborigin*” OR “tribal*”)
3d*	2018-01-29	Google Scholar	(“community-based conservation*” OR “protected area*” OR “conserved area*” OR “biosphere reserve*”) AND (“indigenous*” OR “First Nation*” OR “aborigin*” OR “tribal*”)

*Search terms were broken up into several search strings because of character limits for SCOPUS and Google Scholar.

Table A2
Data collection template.

Reference	Country	Location	Initiative Description	Initiative Name	Governance/ management	Motivations	Success	Challenge	Lessons

Table A3
Indigenous protected and conserved area (IPCA) initiatives by region and country. Italicized initiative descriptions are ones used by authors, and not necessarily adopted by communities. Names in brackets for the examples are Indigenous Peoples involved, where specified. Check marks (✓) indicate if an article mentions the type of governance and management structure: Indigenous (e.g. by single or various Indigenous institutions), collaborative (in partnership with one or more external organizations), or varies. Numbers for references are from Table A4.

Region	Country/ Location	Description	Examples in Literature	Governance/Management Structure		
				Indigenous	*Collaborative*	*Varies*
Africa	Ethiopia	Traditional territories/ conserved landscapes	Borana ethnic territory/conserved landscape (Borana/Borana-Ormo)[1,6,19]	✓		
	Ghana	Sacred forests/groves	Asantemanso[4]	✓		
			Bobiri[4]	✓		
			Bonwire[4]	✓		
			Gyakye[4]	✓		
			Kajease[4]	✓		
			Kona[4]	✓		
			Owabi[4]	✓		
	Morocco	Agdals	Mesioui agdals (Mesioua Berber)[12]	✓		
	Nigeria	*Indigenous and Community Conserved Areas*	unnamed (Ekuri)[19]	✓		
	Senegal	*Indigenous and Community Conserved Areas*	Kawawana (Jola)[8]		✓	
	South Africa	Co-management of national parks	Kruger National Park (Makuleke)[19,21]		✓	
Asia	China	*Indigenous and Community Conserved Areas*	multiple, unnamed (Khampa)[21]			
			multiple, unnamed[21]			
	India	Sacred forests/groves	[45,46]	✓		✓
	Malaysia	Native reserves	Bundu Tuhan Native Reserve (Kadazandusun)[53]	✓		
		Sacred sites	Gumantong (Rungus)[26]	✓		
			multiple, unnamed on Banggi Island (Bonggi)[53]	✓		
		Indigenous and Community Conserved Areas	multiple, unnamed (Kadazan-Dusun, Murut, Kota Belud Bajau, Bajau Laut, Suluk, Idahan, Tidung, Orang Sungai, Lundayeh)[53]			
	Nepal	Sacred valleys or Beyuls	Khumbu Beyul/Community Conserved Area (Sharwa/Sherpa)[21,47,51]	✓		
			Khenbalung (Sharwa/Sherpa)[51]			
			Kunasa (Dolpo-pa)[51]			
			Yolmo Kangra (Yolmo)[51]			
		Sacred natural sites	multiple, unnamed (Sharwa/Sherpa, Dolpopa, Yolmo, Tamang, Rai)[21,51]	✓		
		Community-managed forests	unnamed (Sharwa/Sherpa)[51]		✓	

(*continued on next page*)

Table A3 (*continued*)

Region	Country/ Location	Description	Examples in Literature	Governance/Management Structure		
				Indigenous	*Collaborative*	*Varies*
			multiple, unnamed (Sharwa/Sherpa, Dolpopa, Yolmo, Tamang, Rai)[51]	✓		
		Community-managed rotational grazing systems/ grassland commons	multiple, unnamed (Sharwa/Sherpa, Dolpopa, Yolmo, Tamang, Rai)[51]	✓		
		Indigenous and Community Conserved Areas	Lakyok Bird Conservation Area (Sharwa/Sherpa)[21,51]	✓		
		Indigenous Conserved Territories	multiple, unnamed (Sharwa/Sherpa, Dolpopa, Yolmo, Tamang, Rai)[51]	✓		
	Philippines	*Indigenous and Community Conserved Areas*	unnamed (Tagbanwa)[19]	✓		
	Taiwan	*Traditional agricultural/ conserved landscapes*	Unnamed (Fata'an of the Amis Indigenous Nation)[6]			
	South Pacific	Locally managed marine areas	multiple, unnamed[19,20]	✓		
Australia and New Zealand	Australia	Co-management of national parks	Booderee National Park -Jervus Bay[52]		✓	
			Garig Gunak Barlu National Park[38,52,58]		✓	
			Kakadu National Park[22,38,50,52,58]		✓	
			Karijini National Park[52]		✓	
			Mount Yarrowyck[52]		✓	
			Mutawintji[52]		✓	
			Nitmiluk[52]		✓	
			Uluru Kata-Tjuta National Park[22,50,52]		✓	
			Witjira[52]		✓	
			multiple[29,38,50,52,58]		✓	
		Co-management of state parks	Barrberm (Miriuwung-Gajerrong)[15]		✓	
			Goomyig (Miriuwung-Gajerrong)[15]		✓	
			Jemandi Winingim (Miriuwung-Gajerrong)[15]		✓	
			Ngamoowalem (Miriuwung-Gajerrong)[15]		✓	
		Indigenous Protected Areas	Den Maar Indigenous Protected Are (Gunditjmara)[55]			
			Dhimurru Indigenous Protected Area (Yolŋu)[22,33,35,48,49,54]	✓	✓	
			Girringun Regional IPA (Bandjin, Djiru, Gulnay, Girramay, Warrgamay, Nywaigi, Jirrbal, Warungnu, Gugu Badhun)[49,58]		✓	
			Kuku Yalanji Indigenous Protected Area[49]			
			Mandingalbay Yidinji Indigenous Protected Area (Mandingalbay Yidinji)[49,50]			
			Nantawarrina Indigenous Protected Area (Adnyamathanha)[21,22,29,38,48,49,50,57]	✓	✓	
			Ngaanyatjarra Lands Indigenous Protected Area[57]			
			Northern Tanami Indigenous Protected Area (Warlpiri)[10,35]	✓		
			Nyangumarta Indigenous Protected Area[49]			
			Preminghana Indigenous Protected Area[33]	✓		
			Pulu Indigenous Protected Area (Goemulgal)[16]	✓	✓	
			Putalina Indigenous Protected Area[57]			
			Southern Tanami Indigenous Protected Area (Warlpiri)[35]	✓	✓	
			Thuwathu/Bujimulla Indigenous Protected Area[49]			
			Warul Kawa (Goemulgal)[16]		✓	
			Yalata Indigenous Protected Area[29]	✓	✓	
			Yanyuwa Indigenous Protected Area[49]			
			multiple[2,9,14,15,16,19,20,21,22,28,29,33,37,38,48,49,50,52,55,57,58]	✓		✓
	New Zealand	*Traditional agricultural/ conserved landscapes*	multiple, unnamed (Maori)[6]	✓		
North America	Canada	Biodiversity reserves	Paakumshumwaau-Maatuskaau Biodiversity Reserve* (Cree Nation)[2,30]			
		Co-management of national parks	Tawich (Marine) Conservation Area* (Cree Nation)[30]		✓	
			multiple[19,21]		✓	
		Co-management of state parks	Tombstone Territorial Park (Tr'ondëk Hwëch'in)[44]		✓	
		Tribal Parks	Dasiqox Nexwagwez?an Tribal Park (Tsilhqot'in)[31]			
			Tla-o-qhi-aht Tribal Parks (Esowista, Ha'uukmin (Kennedy Lake), Tranquil, Wanachis-hilth-hoo-is (Meares Island)) (Tla-o-qui-aht First Nation)[7,31,32]	✓		
		Indigenous and Community Conserved Areas	multiple, unnamed[20]			
	Mexico	Áreas Comunales Protegidas (protected communal areas)	La Raíz del Futuro (Tzeltal)[27,36,40]	✓	✓	
			multiple[6,25]	✓		
		Áreas de Conservación por Manejo Forestal (Forestry management protected areas)	Nuevo San Juan Foresty Enterprise[2]			
			unnamed, from San Miguel Mixtepec (Zapotec)[25]			
			unnamed, from San Juan Juquila Vijanos (Zapotec)[25]			
			multiple, unnamed (Chinantec)[25]			
			multiple, unnamed (Zapotec)[25]			
			multiple, unnamed[6,25]	✓		
		*Areas for Payment for Ecosystem Services***	unnamed, in Calakmul, Campeche (Chol, Tzeltal, Tzotzil***)[41]		✓	

(*continued on next page*)

Table A3 (*continued*)

Region	Country/ Location	Description	Examples in Literature	Governance/Management Structure		
				Indigenous	*Collaborative*	*Varies*
		Reservas Comunitarias	La Sabana (Yucatec-Maya)[36]			
		Certificadas (Voluntary	La Tierra del Faisan (Chinantec)[27,36]	✓	✓	
		Conservation Areas,	Much' Kanan K'aax (Yucatec-Maya)[27,36,40]	✓		
		Certified community	unnamed, in Chinantla, Oaxaca (Chinantec)[5,11,17]	✓	✓	
		reserves)	unnamed, in Santiago Lachiguiri, Oaxaca (Zapotec)[17]			
			multiple[6,25,27,36]	✓		
		Sitios Naturales Sagrados (Sacred natural sites; SNS)	multiple[6,25]	✓		
		Unidades para la Conservación, Manejo y Aprovechamiento Sustentable de la Vida Silvestre (UMAS; Wildlife management areas)	multiple[6,25]	✓		
	USA	Co-management of national monuments	Canyon de Chelley National Monument (Navajo/Diné Nation)[24,42]		✓	
		Tribal Parks	Frog Bay Tribal National Park (Red Cliff Band of Lake Superior Chippewa)[7]		✓	
			Mancos Canyon Tribal Park (Weeminuche Band)[24]			
			Monument Valley Tribal Park (Navajo/Diné Nation)[42,56]	✓		
			Ute Mountain Tribal Park (Weeminuche Band)[7]	✓		
South America	Argentina	Co-management of national parks	Lanin National Park (Mapuche)[19,43]		✓	
			Nahuel Huapi National Park (Mapuche)[43]			
	Bolivia	Co-management of biosphere reserves	Pilón Lajas Biosphere Reserve and Indigenous Territory (Tsimane')[13,39,41]			
		Co-management of national parks	Kaa-Iya del Gran Chaco National Park (Izoceño-Guaraní)[3,21]			
	Brazil	Indigenous Reserves/ Territories	Jaquiera Reserve (Pataxó)[41]	✓		
			Xingu Indigenous Park[2]			
			multiple[18,20]			
	Chile	Co-management of national parks	multiple, unnamed[43]		✓	
		Private protected areas	multiple, unnamed (Mapuche)[43]			
	Colombia	Co-managed national parks	Makuira National Park (Wayúu)[34]	✓		
		Indigenous Territories	unnamed (Yapu)[21]			
			multiple[21]			
	Ecuador	*Sacred sites*	multiple, unnamed[2]			
	Panama	Indigenous Territories	Comarca Ngöbe – Buglé Indigenous Territory (Ngöbe – Buglé)[19]			
	Peru	Biocultural heritage sites, Traditional agricultural/ conserved landscapes	El Parque de la Papa (Quetchua)[2,6]			
		Territory/communal	Native Community of Infierno (Ese'Eja***)[23]			
		reserves	unnamed (Shipibo Konibo)[21]	✓		
			multiple[19]	✓		
		Traditional agricultural/ conserved landscapes	multiple[6]			
	Amazonian Rainforest	Indigenous Protected Areas/ Reserves/Territories	multiple, unnamed[19,21]			
Global		*Co-management of protected areas*	multiple[19,21]		✓	✓
		Indigenous and Community Conserved Areas	Including, but not limited to: whole territories, sacred forests/groves, sacred sites, biocultural heritage sites, indigenous protected areas, locally managed marine areas[2,19,20,21,49,51]	✓		
		Traditional agricultural/ conserved landscapes	multiple[6]			

*Both of these areas were declared through the Indigenous-led Wemindji protected areas project.
**Some areas created for Payment for Ecosystem Services can overlap with other Indigenous-led protected and conserved area initiatives.
***Mezitso community members were also involved.

Table A4
Bibliography of Selected Literature for Review. Referenced numbered in alphabetical order.

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(*continued on next page*)

Table A4 (*continued*)

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Glossary

Indigenous Rights and Title: These concepts are defined differently by various legal and governmental entities around the globe. Conceptually, Indigenous Rights refer most often to Indigenous People's diverse rights to use and occupy their ancestral Territories, including territorial, political, and cultural rights, as they were practiced and enjoyed prior to colonization by other governments, and current contemporary rights. Title refers to the formal rights and recognized legal/political jurisdiction of an Indigenous group over their ancestral Territories

Indigenous Protected and Conserved Areas (IPCAs): Umbrella term (used in the authors' home country, Canada) that references protected and conserved areas where Indigenous Peoples have: a strong spiritual and/or cultural connection; asserted a leading role in decision making in establishment and/or management of the area; and environmental conservation occurs whether it is stated as a goal explicitly or implicitly (ICE 2018)

Indigenous and Community Conserved Areas (ICCAs): territories and areas containing significant biodiversity values and ecological services that are voluntarily conserved by Indigenous and local communities, through customary laws or other effective means (IUCN 2004; Borrini-Feyerabend et al. 2013)

Institution: mechanisms that inform social order and interaction that include formal mechanisms (laws, constitutions, rules), informal mechanisms (self-imposed ethics, behavioural norms, conventions), and structural mechanisms (organizations, groups, and individuals)

State: Though there is no consensus on a definition, the authors use this term to refer to the dominant, centralized political organization of a country (e.g. governmental body) that claims authority and regulates certain geographical areas. In many cases, these governments followed from imperialist colonization of Indigenous Territory