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Conservation with Equity: A Framework for Effective Governance and Ecological Reconciliation in Biosphere Reserves

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Abstract

Conservation governance frameworks assess equity through recognition, procedure, and distribution. These dimensions give limited attention to Indigenous authority over land and conservation decisions in settler-colonial contexts, including the relationships, responsibilities, and governance conditions that shape equitable conservation. This study develops and pilots the Conservation with Equity framework across three UNESCO-designated Biosphere Reserves in Canada: Clayoquot Sound, Mount Arrowsmith, and Redberry Lake. Using document analysis of UNESCO governance documents, complemented by semi-structured interviews with Biosphere Reserve managers, we examined how equity is reflected in conservation governance practices. The pilot application identified ecological reconciliation as a fourth and foundational dimension of equitable conservation governance, extending existing equity frameworks. Results show that the Biosphere Reserves incorporate Indigenous knowledge into conservation activities, involve communities in decision-making through governance processes, and support local livelihoods and restoration initiatives. However, these practices improve participation and benefit sharing without consistently shifting decision-making authority over land and conservation. Indigenous-led initiatives, including Tribal Parks, land-based education, healing initiatives, and food production systems, demonstrate pathways where Indigenous communities direct land use and conservation decisions. The Conservation with Equity framework provides a basis for assessing conservation governance with greater attention to Indigenous authority, governance, and relationships with land.

Keywords: Biosphere Regions; Biosphere Reserves; conservation governance; ecological reconciliation; equity; Indigenous Peoples and Local Communities



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1. Introduction

Conservation has long been framed as a conceptual divide between “nature-first” (biocentric) and “people-first” (anthropocentric) paradigms. Nature-first approaches emphasize the intrinsic value of biodiversity and intact ecosystems [1,2], while people-first frameworks highlight nature’s role in supporting human well-being [3,4]. Yet neither fully addresses the concerns of Indigenous Peoples and Local Communities (IPLCs). Indigenous Peoples are generally defined as peoples who identify as Indigenous and descend from the original inhabitants of a region, and maintain close cultural, spiritual, economic, and ecological relationships with their territories [5]. Local Communities, while not Indigenous in the legal or self-identifying sense, are long-established social groups who maintain close livelihood and cultural relationships with specific ecosystems [6].

Conservation models focused primarily on environmental protection marginalize IPLCs, restricting access to ancestral lands and undermining customary governance [7–9]. Development-oriented approaches to conservation similarly displace IPLCs and position them mainly as implementation partners, not as rights-holders [10,11]. Even in co-governance contexts, IPLCs are often treated as stakeholders rather than shared responsibility holders with inherent authority [12,13]. These entrenched colonial power structures continue to ignore IPLCs' sustained calls for rights-based conservation grounded in Indigenous knowledge and governance [14,15]. Recognizing and responding to these calls is both a moral imperative and a pragmatic necessity. Indigenous-managed lands overlap with much of the world's remaining biodiversity and often conserve biodiversity as effectively as state-managed protected areas [16–19]. This effectiveness reflects a fundamental difference in worldview. Western environmental ethics often treat conservation as “a one-way street in which it is the humans who are to extend their ethics to include nature” [20] (p. 122). In contrast, Indigenous and local stewardship is rooted in “reciprocity and harmony with nature, including Mother Earth” [21,22] (p. 8).

Although global conservation frameworks increasingly recognize IPLC rights and knowledge, they often adopt a narrow conception of equity. The Convention on Biological Diversity (CBD), in Decision 14/8, defines equity as recognition of rights, participation in decision-making, and fair distribution of costs and benefits [23]. This three-dimensional model has influenced global conservation targets, including protected areas and Other Effective Area-Based Conservation Measures (OECMs), many of which are governed by IPLCs using customary practices such as rotational harvesting and low-impact agriculture [12,24,25]. However, the model fails to account for deeper structural conditions that shape access, participation, and benefit sharing. These omissions reflect the exclusion of contextual equity, despite its identification as essential to equitable outcomes [26,27]. Bennett et al. [28] (p. 3) define contextual equity as “the surrounding social, economic, [cultural] and political conditions that influence people's pre-existing status . . . as well as the structures that enable or undermine people's ability to achieve recognitional, procedural, distributional, managerial, and environmental equity.” In other words, contextual equity highlights the systemic and historical conditions such as colonial legacies, legal exclusion, economic marginalization, and cultural erasure that create inequities. When left unaddressed, these conditions undermine even well-intended participation or benefit-sharing mechanisms.

Such context-specific barriers are particularly acute in settler-colonial states like Canada. Protected areas often overlap with Indigenous territories, yet state and industry actors retain land-use control [9,29]. Indigenous law is frequently sidelined unless upheld in court, and even where title is recognized, procedural tools and fragmented jurisdiction constrain Indigenous authority [30]. Approaches such as Two-Eyed Seeing, introduced by Mi'kmaw Elder Albert Marshall [31], and ethical space, developed by Ermine [32], promote co-learning between knowledge systems and inform shared responsibility for conservation [13,33]. Yet failure to address power imbalances can allow these approaches to be co-opted to maintain settler dominance. Tuck and Yang [34] (p. 10) call this co-optation a “settler move to innocence,” referring to tactics that ease settler guilt without requiring meaningful changes in land ownership, power, or privilege.

To address these limitations, this study advances Conservation with Equity as an approach to biodiversity conservation that extends existing equitable governance frameworks. Through the development and pilot application of the Conservation with Equity (Co-WE) framework across three Biosphere Regions (BRs), this study identifies ecological reconciliation as the fourth and foundational dimension of equitable conservation governance. The Conservation with Equity (Co-WE) framework operationalizes this approach by

foregrounding contextual equity beyond narrow understandings of equity based only on inclusion or benefit-sharing. Throughout this paper, we use the term “Conservation with Equity” to refer to the broader approach to biodiversity conservation and “Co-WE” to refer to the framework developed to operationalize and assess that approach. In the Canadian context, ecological reconciliation addresses the contextual conditions that shape Indigenous authority, governance, and responsibilities to land [35,36], providing the conceptual foundation for this fourth dimension. This is described in more detail in Section 2. Ecological reconciliation is particularly important in Canada given the legacy of State and/or Church-run residential schools (1884–1996) for Indigenous children and the establishment of an apartheid-style reserve system, both of which disrupted Indigenous governance systems, land relationships, and cultural continuity [37,38].

To assess the practical utility of the Co-WE framework, we examined it in relation to governance processes in three UNESCO-designated Biosphere Regions (BRs) in Canada: Clayoquot Sound (CSBR), Mount Arrowsmith (MABR), and Redberry Lake (RLBR). Although UNESCO officially uses the term “Biosphere Reserve,” this paper uses “Biosphere Region,” adopted in Canada, to reflect efforts toward reconciliation and more inclusive, community-centered conservation. Designated in 2000 under a shared national framework, the three BRs vary in ecology, livelihood strategies, institutional capacities, and governance [39–43]. They also span diverse legal contexts: CSBR is situated on Tla-o-qui-aht territory and other Nuu-chah-nulth Nations; RLBR on Treaty 6 territory and the homeland of the Métis, and MABR lies within the territories of several Coast Salish and Nuu-chah-nulth First Nations and includes lands associated with the Douglas Treaties. The locations of the three BRs are shown in Figure 1.

In each region, we used two complementary qualitative methods, document analysis and semi-structured key-informant interviews, to examine how BR activities, governance processes, and conservation practices aligned with the four Co-WE dimensions, including ecological reconciliation. The term “review” reflects the framework’s role as a learning tool, not as a benchmarking exercise. This approach aligns with the BR model as a platform for experimentation [44], adaptation, and learning in supporting both conservation and sustainable development [40,45].

Section 2 reviews the theoretical foundations of equity and ecological reconciliation. Section 3 outlines the research design. Section 4 presents the findings across Co-WE’s four dimensions. Section 5 discusses implications for conservation governance and Indigenous rights. Section 6 presents recommendations for policy and practice, and Section 7 concludes by outlining the study’s contribution, limitations, analytical transferability, and directions for future research.

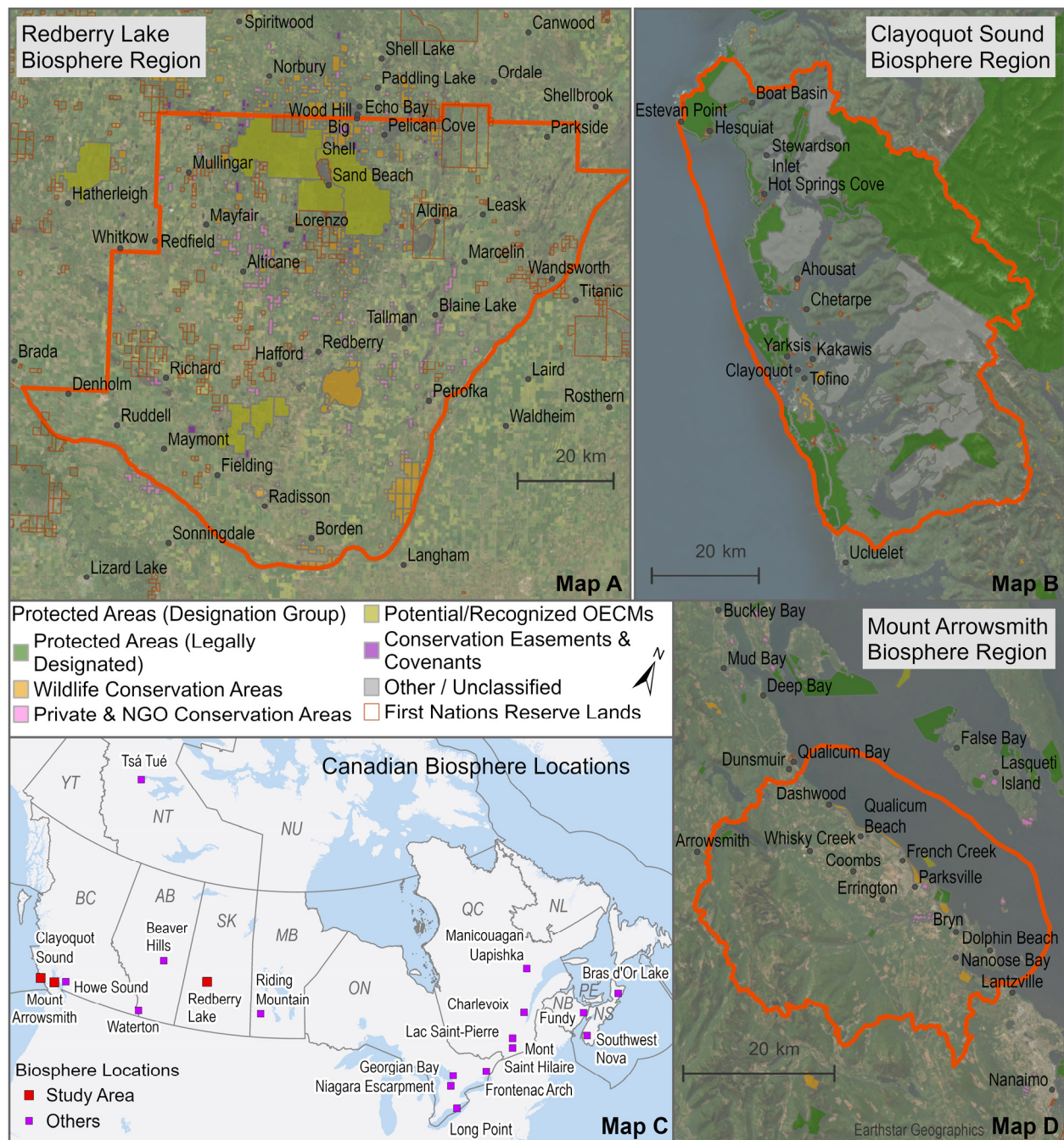


Figure 1. Location of the three UNESCO-designated Biosphere Regions in Canada: Map A, Redberry Lake Biosphere Region; Map B, Clayoquot Sound Biosphere Region; Map C, national location of the three study Biosphere Regions; and Map D, Mount Arrowsmith Biosphere Region. The Redberry Lake Biosphere Region is shown with its extended operating area, which is pending approval by the International Coordinating Council of UNESCO’s Man and the Biosphere Programme. Map created in ArcGIS Pro 3.3.0 (Esri) using boundary information from Biosphere Regions Canada and the respective Biosphere Region sources. Basemap imagery: Earthstar Geographics.

2. Theoretical Framework for Equity and Reconciliation in Conservation

This section presents the theoretical foundations of the Co-WE framework by tracing the evolution of equity in conservation governance, critiquing prevailing models, and proposing ecological reconciliation as a fourth, foundational dimension.

2.1. The Evolution and Limits of Global Equity Frameworks in Conservation

Conservation was originally framed as a crisis response to protect nature, with Soulé [1] emphasizing the need to protect species and ecosystems while giving limited attention to human relationships with nature. By the late 1980s, global policy began to shift. The Brundtland Report [46] and the 1986 Conservation with Equity conference [4] linked ecological protection to development goals. By the early 2000s, community-based models challenged exclusionary approaches [47], but many protected areas still denied Indigenous Peoples access to their lands. Although the 2003 World Parks Congress and the 2007 UN Declaration on the Rights of Indigenous Peoples (UNDRIP) advanced rights-based approaches, IPLCs were still often treated as stakeholders rather than rights-holders [7,8].

Until the adoption of the Convention on Biological Diversity (CBD) Decision 14/8 in 2018, conservation policy treated equity in fragmented ways and often equated it with abstract notions of fairness or justice [48,49]. CBD Decision 14/8 and emerging conservation literature frame equity through three core dimensions: recognition, procedure, and distribution [50–52]. Recognition refers to formally acknowledging IPLCs' rights, knowledge, and identities. Procedure involves fair, inclusive, and culturally appropriate decision-making, as exemplified in the principle of Free, Prior, and Informed Consent (FPIC) introduced by First Nations in Canada. Distribution concerns how conservation's costs and benefits are shared. Decision 14/8 now guides the 30 × 30 agenda as well as the CBD's 2050 Vision of "living in harmony with nature" [53].

Despite these advances, the Decision 14/8 framework omits contextual equity. Contextual equity refers to the systemic conditions that shape people's ability to claim rights, participate in decision-making, and receive benefits. These include land tenure arrangements, colonial legacies, income and education disparities, gender relations, and unequal access to information, political influence, and legal mechanisms [26–28]. As Franks and Quesada-Aguilar [54] note, contextual factors are often considered beyond the reach of many policy interventions and are therefore omitted from operational frameworks. Although earlier scholars emphasized the need to treat contextual equity as a separate and necessary concern [26,27], its exclusion from CBD guidance has contributed to conceptual confusion and limited uptake in practice [28,55,56].

Some efforts have expanded the definition of recognition to cover these conditions. For example, Martin et al. [57] proposed a typology of recognition that includes cultural, economic, and political harms. This has the effect of folding contextual equity into recognition rather than treating it as a separate dimension. Two factors help explain why contextual equity has been largely omitted or collapsed into recognition in global equity frameworks. First is the failure to distinguish Indigenous Peoples from Local Communities. Grouping these categories obscures the specific land rights, legal recognition, and governance roles of Indigenous Peoples [58]. Second is the CBD's origins in development-oriented policy, especially in Global South contexts where equity has often been equated with participation in projects or access to resources, with less emphasis on land restitution, jurisdictional authority, or legal pluralism [50]. This conflation has made it difficult to see how deeper conditions such as dispossession, legal exclusion, or intergenerational disadvantage continue to affect access, representation, and benefit-sharing in conservation [51,52]. As Howard et al. [59] (p. 101) noted, many efforts "miss out 'contextual equity,' despite finding that this dimension poses the biggest challenges."

In response to these limitations, emerging frameworks [55,60–62] propose reinstating contextual equity as a fourth equity dimension. However, aside from a few exceptions such as Bennett et al. [60,61], most frameworks offer limited guidance for translating contextual equity into actionable principles and indicators. As Campbell et al. [63] warn, without such guidance, equity assessments risk becoming disconnected from the underlying conditions

that affect conservation outcomes. While contextual equity identifies the structural conditions that shape equitable conservation, it does not specify how these conditions can be addressed within particular governance contexts. In the Canadian context, we argue that ecological reconciliation provides a governance approach for addressing these conditions and serves as the fourth dimension of the Co-WE framework.

2.2. *Toward Ecological Reconciliation and the Role of Biosphere Regions*

Ecological reconciliation responds to the limitations of global equity frameworks by centering Indigenous law, intergenerational responsibilities, and place-based governance [35,36,64]. In Canada, the Truth and Reconciliation Commission's Calls to Action, particularly Call 43 on the application of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and Call 45 on treaty renewal, highlighted the need to restore Indigenous legal orders and treaty relationships [37]. The Indigenous Circle of Experts further described reconciliation as "identifying the appropriate healing process for restoring relationships: first, between Crown and Indigenous Peoples ... and second, between all people (Indigenous and non-Indigenous) and the lands" [64] (p. 104). This framing situates conservation within shared responsibilities for renewing relationships among peoples, lands, waters, and more-than-human beings. Though the term is recent, the relational ethics it describes are ancient across Indigenous cultures. Indigenous philosophies such as All My Relations (Anishinaabe [in Canada]), the Great Law of Peace (Haudenosaunee [in the United States]), and Ubuntu (in southern Africa, meaning "I am because we are") emphasize mutual responsibility, kinship, and reciprocity with more-than-human life [21,35,65,66].

UNESCO BRs function both as geographic territories and as convening platforms that facilitate collaboration among governments, Indigenous Peoples, civil society organizations, researchers, and local communities [67]. In Canada (as elsewhere), BRs do not possess regulatory or jurisdictional authority and cannot supersede provincial, federal, municipal, or Indigenous governance systems. Rather, they operate through voluntary cooperation, partnership-building, research, education, and knowledge-sharing initiatives that support conservation and sustainable development across multiple governance scales [68,69]. Their role is therefore primarily facilitative, helping to connect diverse actors, coordinate regional initiatives, and foster dialogue around shared social-ecological priorities.

Based on their explicit commitment to uphold Indigenous rights, including commitments such as the Pessamit Call for Reconciliation by BRs and the Canadian Commission for UNESCO [70], BRs offer an opportunity to apply and evaluate ecological reconciliation as a fourth dimension of conservation governance. BRs have been envisioned as "special places for people and nature" [71] (p. 12), "sites of excellence to demonstrate approaches to conservation and sustainable development" [68] (p. 451), "regional innovation systems" [44] (p. 4), and "open laboratories for sustainable development" [72] (p. 1). Their zonation structure includes a core area with protection typically provided through provincial or national jurisdiction, surrounded by buffer and transition zones. These outer zones allow more flexible governance arrangements. They provide opportunities for Indigenous authority, knowledge systems, and community-led conservation and sustainability initiatives to influence land use and stewardship [45,64,73]. While core areas are typically established under state-designated protection regimes, emerging Indigenous-led governance models within BRs, including Indigenous-managed regions such as Tsá Tué, suggest evolving governance arrangements that may challenge this distinction [74].

Despite this potential, Indigenous participation and authority within BR governance remain uneven across many settler-colonial contexts, including Canada. Core zones are characterized by private and public property regimes that were established and are main-

tained by longstanding state and colonial powers. Consequently, tensions may persist between state-led conservation priorities and Indigenous land use, governance systems, legal orders, and responsibilities to land and water. These gaps persist, even as Indigenous and local scholars have long called for governance that prioritizes Indigenous resurgence, equity [39,40,68,69], and shared responsibility [13]. International and national guidance, including UNESCO's Seville Strategy [75], the Lima Action Plan [76], and the Conseil des Innus de Pessamit Call for Reconciliation [70], also support these priorities. More recently, although references to reconciliation and equity have become more common in BR policy discourse [77], implementation remains uneven and often lacks clear mechanisms for advancing Indigenous authority and ecological reconciliation. Bruce and Mulrennan [33] argue that co-management arrangements in Canada are increasingly shaped by reconciliation processes, while Lemieux et al. [78] emphasize that effective conservation governance depends not only on participation but also on how authority, responsibilities, and stewardship relationships are structured across institutions and Indigenous communities. These observations align with broader calls for Indigenous leadership, shared governance, and ecological reconciliation in conservation [64,67]. The Co-WE framework responds to these challenges by providing a four-dimensional structure for embedding equity and ecological reconciliation in BR governance.

2.3. Conceptualizing the "Conservation with Equity" (Co-WE) Framework

The Co-WE framework provides a structured governance approach to advancing equity in conservation governance. Its name reflects a dual commitment. "Co" signals co-responsibility, drawing on Reed et al. [13] to highlight the obligation of settlers to uphold fair and accountable governance. "WE" expresses mutual responsibility and collective belonging, aligning with Indigenous worldviews grounded in relational accountability to land, people, and more-than-human beings [64].

The Co-WE framework is grounded in four interlinked and mutually reinforcing dimensions of equity: recognition, procedure, distribution, and ecological reconciliation.

- **Recognition.** Co-WE adopts the Royal Commission on Aboriginal Peoples (RCAP)'s framing of mutual recognition as respect for the distinct rights and responsibilities held by Indigenous Peoples and non-Indigenous communities [79]. For Indigenous Peoples in Canada, this includes Section 35 of the Constitution Act, 1982, such as treaty rights (e.g., hunting and fishing), Aboriginal title (e.g., land and resource governance), and self-government (e.g., conservation authority). In this case, Indigenous Peoples require recognition of distinct rights, governance authorities, and responsibilities. Meanwhile, non-Indigenous communities contribute to conservation through long-standing stewardship and local knowledge systems [5,6]. Co-WE maintains this distinction to ensure conceptual clarity by avoiding conflation of recognition with equity or with ecological reconciliation.
- **Procedure** emphasizes Indigenous-led decision-making grounded in Indigenous legal traditions and responsibilities. Other actors support these processes by participating ethically and transparently, and by helping to create decision-making structures that are relationally accountable and just [12,13,21,32].
- **Distribution** addresses how benefits, costs and risks are shared in culturally and contextually appropriate ways [21,80]. Indigenous Peoples determine priorities for land-based well-being, while others contribute to equity through measures that address exclusion and improve access to resources and opportunities [48].
- **Ecological Reconciliation** is foundational. It refers to structural and relational repair led by Indigenous law, ceremony, and governance. This dimension involves restoring responsibilities to land and renewing relationships among peoples and with more-

than-human kin [35–37,66]. Only actions grounded in Indigenous jurisdiction and authority are included here. Symbolic or normative efforts that do not involve legal or governance shifts are classified under Recognition.

Each dimension is designed to be assessed through concrete criteria and indicators, making the Co-WE framework a usable and context-sensitive governance tool. Figure 2 illustrates the relationships among the four dimensions and their contribution to equitable conservation governance.

Conservation with Equity (Co-WE) Framework

Four dimensions working together to achieve equitable conservation

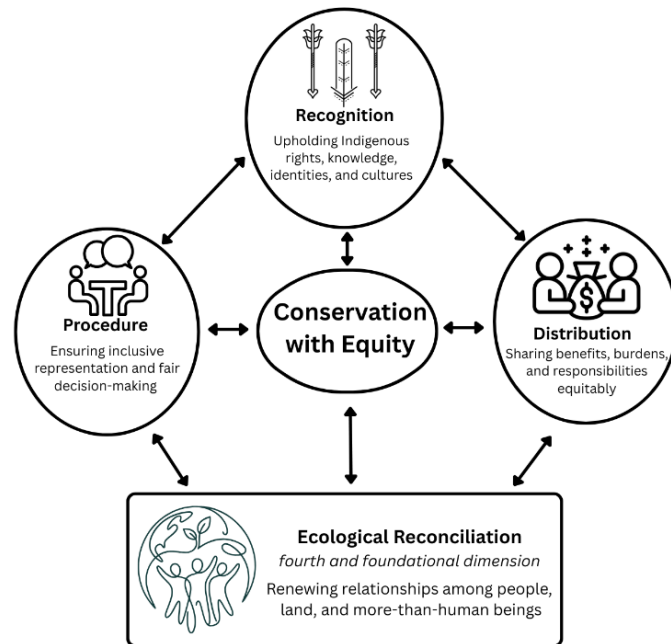


Figure 2. Conservation with Equity (Co-WE) framework. Building on the recognition, procedure, and distribution dimensions of equity identified by Schreckenberg et al. [48], the framework identifies ecological reconciliation as the fourth and foundational dimension of Conservation with Equity, addressing the contextual conditions that shape equitable conservation governance.

3. Methodology

3.1. Research Design and Case Studies

We used a qualitative comparative case-study design to develop and pilot the Conservation with Equity (Co-WE) framework across three UNESCO-designated Biosphere Regions (BRs) in Canada: Clayoquot Sound Biosphere Region (CSBR) and Mount Arrow-smith Biosphere Region (MABR), Vancouver Island, British Columbia, and Redberry Lake Biosphere Region (RLBR), Saskatchewan (Figure 1).

The three BRs operate within Canadian federal and provincial policy and legal contexts, but UNESCO Biosphere Region designation itself does not confer regulatory or jurisdictional authority. The two British Columbia BRs operate within a provincial context shaped by the Declaration on the Rights of Indigenous Peoples Act (DRIPA), whereas RLBR operates in Saskatchewan, which lacks a comparable provincial reconciliation policy. In addition, only CSBR received a \$12 million federal endowment at the time of designation. These variations provide an opportunity to examine how the Co-WE dimensions operate across different ecological, legal, and institutional contexts. Detailed governance and ecological contexts for the three BRs are provided in Table S1.

3.2. Data Collection

Within the qualitative comparative case-study design, we used two complementary qualitative methods: qualitative document analysis of official UNESCO governance documents and semi-structured key-informant interviews. Document analysis provided the primary documentary evidence for examining how the four Co-WE dimensions were reflected in governance practice, while the interviews were used to assess the framework's relevance and applicability, clarify terminology, contextualize and qualify case-specific interpretations, identify potential omissions, and contribute to refinement of the framework.

Official UNESCO Biosphere governance documents were purposively selected because they provide a consistent, publicly available record of governance from designation through successive review cycles. These included UNESCO Biosphere Nomination Forms, UNESCO Biosphere Periodic Review Reports, and UNESCO Biosphere Periodic Review Self-Study Reports (Table 1).

Table 1. UNESCO documentary sources used in the analysis.

Documentary Source	Timeframe	Information Used in the Analysis	Role in This Study
UNESCO Biosphere Nomination Forms	BR designation (1999–2000)	Objectives, governance arrangements, zonation, and institutional commitments	Provided the historical and institutional context for each BR.
UNESCO Biosphere Periodic Review Reports	First UNESCO periodic review (2010–2011)	Governance developments, management changes, and implementation since designation	Provided historical context for interpreting contemporary governance and conservation practices.
UNESCO Biosphere Periodic Review Self-Study Reports	Most recent UNESCO periodic review (2020–2024)	Current governance practices, partnerships, conservation activities, achievements, and challenges	Provided the primary documentary evidence for analysing how the four Co-WE dimensions were reflected in governance practice.

The most recent self-study reports served as the primary documentary source for identifying operational examples of the four Co-WE dimensions, whereas the nomination forms and earlier periodic review reports provided historical context for interpreting changes in governance over time. Although periodic ten-year reviews are central to UNESCO's Man and Biosphere (MAB) Programme, these reviews often prioritize compliance over governance flexibility, thereby limiting continuous learning [40,73,81,82]. To complement these documentary sources, we conducted interviews with executive directors of the three BRs following institutional ethical approval and informed consent procedures. The interviews aimed to: (1) assess the Co-WE model's relevance in each context, particularly the four equity dimensions; (2) clarify terms like "youth" and "local"; and (3) explain and contextualize examples identified during the document analysis. We provided questions in advance to support reflection and informed responses. The interview questions are provided in Supplementary File S1. The interview guides reflected a preliminary version of the Co-WE framework containing 12 criteria and 15 indicators. During framework refinement, overlapping criteria were consolidated, resulting in the final 11 criteria and 15 indicators presented in Tables 2 and S2.

3.3. Development of the Conservation with Equity (Co-WE) Framework

We developed and refined the Co-WE framework through a four-step qualitative process. First, we conducted a targeted literature review, with CBD Decision 14/8 as a starting point. We traced foundational studies on conservation equity,

including [26,27,48,49,57]. We then identified reviews and empirical studies that built on or critiqued the three-dimensional equity framework, including [50–52,60,61]. These sources informed the development of the framework’s first three equity dimensions—recognition, procedure, and distribution—along with the associated criteria and indicators. Snowball sampling helped identify influential and thematically relevant studies across an evolving body of literature, an approach used in similar conservation framework studies [18,48,49].

To address gaps in existing frameworks, particularly the exclusion of relational and place-based approaches grounded in Indigenous law and governance, we introduced ecological reconciliation as a fourth equity dimension. This addition draws on scholarship focused on responsibilities to land and more-than-human relations [33,37,38,64,66]. The Co-WE framework centers Indigenous-led governance, intergenerational land-based knowledge, and reciprocal human–nature relationships.

Second, we conducted qualitative document analysis of the official UNESCO governance documents described in Section 3.2, organizing evidence from each BR in relation to the preliminary Co-WE dimensions, criteria, and indicators. Third, we used semi-structured key-informant interviews to assess the framework’s clarity, relevance, suitability, and applicability, contextualize case-specific evidence, and identify potential omissions. Fourth, we compared evidence across the three BRs and used the documentary and interview evidence to refine the framework. Overlapping criteria were consolidated during this process, resulting in the final Co-WE framework of 11 criteria and 15 indicators presented in Table 2.

4. Results

4.1. The Conservation with Equity (Co-WE) Framework

The proposed Co-WE framework is operationalized through a set of criteria and indicators summarized in Table 2. It includes eleven criteria and fifteen indicators that reflect observable governance practices.

Table 2. Equity dimensions, criteria, and indicators in the Conservation with Equity (Co-WE) framework.

Equity Dimension	Criteria	Indicators
Recognition	1. Land and resource rights	Legal and customary recognition of Indigenous land and resource governance
	2. Indigenous Knowledge and legal orders	Support for Indigenous and Local Knowledge (ILK), including its application in planning and management
	3. Self-determination and autonomy	Cultural continuity through land-based education, place names, and language
Procedure	4. Indigenous-led decision-making processes	Capacity building and leadership development programs, including feedback from Indigenous participants

Table 2. *Cont.*

Equity Dimension	Criteria	Indicators
5. Defined roles and responsibilities		• Governance boards that reflect regional demographic and cultural diversity • Gender inclusion in staffing and governance
		• Youth engagement in decision-making • Public and local participation • Accessible and effective grievance or conflict-resolution processes
	7. Free, Prior, and Informed Consent (FPIC)	• Documentation and implementation of FPIC processes
Distribution	8. Equitable access to opportunities	• Indigenous and local community access to well-being and livelihood opportunities
	9. Effective mitigation of harms and burdens	• Programs or measures preventing or compensating for harms, including climate impacts, industrial forestry, or mining
Ecological Reconciliation	10. Reconciliation between Indigenous and non-Indigenous peoples	• Indigenous-led conservation initiatives grounded in Indigenous law, ceremony, and territorial responsibility
	11. Reconciliation with land, legal orders, and more-than-human kin	• Sites for ceremony and cultural practice under Indigenous authority • Healing events or legal reforms addressing past and ongoing injustices

4.2. Application of Conservation with Equity (Co-WE) to Governance Practices in the Three Biosphere Regions

We applied the Co-WE framework to evaluate conservation equity practices across the three BRs. The following sections present the findings for each equity dimension, with detailed operational examples provided in Table S2.

4.2.1. Recognition

The findings indicate that all three BRs formally acknowledge Indigenous rights, histories, and knowledge. This recognition is reflected in the Canadian Biosphere Regions Association's adoption of the term "Biosphere Region" in place of "Biosphere Reserve" as part of broader efforts toward reconciliation. Historically, the term "reserve" is closely associated with the colonial reserve system established under the federal Indian Act, through which many First Nations were confined to reserves while their broader traditional territories were alienated and controlled by the Crown. The adoption of the term "Biosphere Region" in place of "Biosphere Reserve" reflects a conscious move away from the colonial connotations of the term "reserve" and signals a commitment to more inclusive, place-based governance that recognizes Indigenous Peoples as rights holders and shared responsibility holders in conservation. This commitment is further reflected in how these three BRs engage with Indigenous Peoples through relationship building, language revitalization, and the recognition of Indigenous knowledge, governance protocols, and

histories. For example, in CSBR, governance includes Indigenous stewardship groups such as the K^wuuth-wiltəm Rangers, who hold significant decision-making authority within the territory. Indigenous languages, particularly Nuu-chah-nulth dialects, are visibly integrated through signage and official documentation, reinforcing cultural identity in public spaces and governance processes. MABR incorporates First Nations participation through its Roundtable governance structure. Elders and knowledge holders are actively engaged in shaping research initiatives, educational programming, and outreach activities, such as the “Experience the Biosphere” project, which centers Indigenous perspectives and cultural values. In RLBR, Cree and Métis worldviews are foregrounded through inclusive land-use planning processes. The region’s astam, pī-pīkiskwātōtān (“Come, let’s talk together”) workshops exemplify collaborative dialogue spaces that honor Indigenous knowledge and foster community engagement. These recognition practices collectively affirm Indigenous identities and knowledge systems as foundational to governance and conservation efforts in each region.

4.2.2. Procedure

Procedure is demonstrated as the three BRs demonstrate increasingly inclusive governance practices. First, governance structures have diversified to reflect more voices. In CSBR, partnerships support Indigenous leadership training and participation in the Forest Management Forum; the board includes five Indigenous members and several women. MABR’s roundtable brings together First Nations, civil society, and local governments. Similarly, RLBR recently amended its bylaws to formally recognize members of First Nations with traditional or land-based ties to the region as full participants in its governance. This marks a shift from previous landowner-based rules and reflects RLBR’s commitment to honouring treaty relationships and Indigenous rights. Second, the three BRs prioritize youth and public engagement through open meetings, surveys, and citizen science. CSBR’s youth council and events foster intergenerational participation; MABR involves students and reserves a youth roundtable seat; RLBR connects with Mistawasis schools. Third, collaborative processes support conflict resolution, transparency, and collaborative learning. CSBR’s WildCoast initiative manages infrastructure disputes; RLBR holds public forums on land-use; and MABR’s research institute provides neutral data for dialogue.

Finally, all the BRs reflect FPIC by emphasizing that research and agreements proceed with Indigenous knowledge, participation, and approval. In CSBR, a formal Research Code of Conduct requires researchers to follow Nuu-chah-nulth protocols prior to initiating research [83]. In RLBR, the astam, pī-pīkiskwātōtān report highlights the importance of recognizing Traditional Knowledge and involving knowledge holders across all stages of research and decision-making [42,84]. In MABR, the Guiding Principles for Collaboration with First Nations outline processes that prioritize respect, Indigenous stewardship, and the inclusion of First Nations perspectives in decision-making [43].

4.2.3. Distribution

Each BR tailors approaches to equitably share conservation’s benefits and burdens. CSBR supports Indigenous employment, cultural guiding, and language revitalization, and waives park fees for Indigenous visitors. MABR promotes food security, cultural events, aquaculture, and ecotourism. RLBR collaborates with Indigenous and rural communities on projects like the Food Forest, includes culturally significant lands, and supports planning reform and job creation. The three BRs also address environmental burdens through restoration initiatives. CSBR restores salmon habitat recovery using Indigenous land-use visions, RLBR promotes prairie recovery, and MABR rehabilitates eagle nesting sites and

monitors buffer zones. Together, these initiatives link conservation benefits with local livelihoods, cultural continuity, and ecosystem restoration.

4.2.4. Ecological Reconciliation

Ecological reconciliation involves structural and relational shifts that restore Indigenous authority, legal orders, and land-based responsibilities within conservation governance. Across the three BRs, this dimension is reflected in Indigenous-led governance and stewardship initiatives grounded in Indigenous law, ceremony, and reciprocal relationships with the land (Table 3).

Table 3. Application of the Conservation with Equity (Co-WE) framework across three UNESCO-designated Biosphere Regions, highlighting shared patterns and context-specific differences in governance and conservation practice.

Co-WE Dimension	Clayoquot Sound Biosphere Region (CSBR)	Mount Arrowsmith Biosphere Region (MABR)	Redberry Lake Biosphere Region (RLBR)	Cross-Case Synthesis
Recognition	Indigenous governance is centred on Tribal Parks, Nuuchahnulth laws, and cultural revitalization.	Collaborative governance strengthens First Nations engagement, Indigenous knowledge, and cultural revitalization.	Treaty relationships, Cree and Métis partnerships, and land-based learning strengthen Indigenous recognition.	Recognition provides the foundation for Conservation with Equity by affirming Indigenous rights, knowledge, cultures, and relationships. However, meaningful equity depends on moving beyond recognition toward greater Indigenous authority in conservation.
Procedure	Indigenous Nations shape decisions through shared governance, governance protocols, and free, prior and informed consent.	Roundtable governance and long-term partnerships strengthen collaborative decision making.	Governance reforms expand Indigenous representation, collaborative planning, and relationship building.	Long-term relationships create opportunities for more inclusive decision making. The extent to which participation becomes shared authority remains shaped by each BR's legal, institutional, and historical context.
Distribution	Benefits strengthen Indigenous livelihoods, cultural revitalization, stewardship, and ecological restoration.	Benefits support stewardship, restoration, research partnerships, and community learning.	Benefits support food sovereignty, biodiversity conservation, sustainable livelihoods, and community well-being.	Equitable outcomes reflect local priorities rather than a single development model. Although benefits are widely evident, how costs, risks, and benefits are governed remains less consistently addressed.
Ecological reconciliation in practice	Tribal Parks reconnect Indigenous law, governance, and stewardship with conservation practice.	Healing Gardens, Language Nests, collaborative stewardship, and emerging OECMs reconnect Indigenous knowledge with biodiversity conservation.	Bridge to Land Water and Sky, the Food Forest, and emerging Indigenous OECMs strengthen reciprocal relationships among Indigenous Peoples, land, water, and biodiversity.	Ecological reconciliation represents the clearest expression of Conservation with Equity. Across the three BRs, Indigenous-led conservation initiatives demonstrate multiple pathways for restoring relationships between people and nature while advancing more equitable conservation governance.

In CSBR, ecological reconciliation is evident through the formal declaration of multiple Tribal Parks by the Nuuchahnulth Nations, which assert Indigenous jurisdiction and stewardship grounded in Indigenous law and ceremony. These Tribal Parks embody land-based governance that challenges conventional protected area models and restores Indigenous authority over ancestral territories. As described in the literature, Tribal Parks often lack full formal recognition within state governance systems, which may limit their inclusion in official BR mapping [85]. The ongoing work to integrate these Tribal Parks within the BR's governance framework reflects a significant structural realignment toward ecological reconciliation.

The MABR demonstrates ecological reconciliation through collaborative governance innovations, such as the establishment of a Culture of Engagement that fosters partnership between Indigenous and non-Indigenous shared responsibility holders. Initiatives like the Snaw-naw-as Garden of Spiritual Healing and the Qualicum Language Nest Project reinforce cultural continuity and revitalization deeply rooted in place and Indigenous knowledge systems. The MABR's efforts to qualify buffer and transition zones as OECMs, in partnership with First Nations and other stakeholders, further operationalize Indigenous stewardship and contribute to biodiversity conservation under Indigenous leadership.

In the RLBR, ecological reconciliation is expressed through a broad suite of Indigenous-led conservation initiatives, including the Indigenous-led Bridge to Land Water and Sky Living Lab, focused on integrating farming systems with biodiversity and climate resilience. The RLBR is working with First Nations to support the designation of Indigenous traditional territories as Indigenous-led OECMs. These proposals seek to restore legal recognition and governance systems of Indigenous traditional territories. Additional partnerships on species at risk management and agricultural stewardship with Cree and Métis communities reinforce land-based responsibilities and reciprocal relationships with the territory. These efforts ground reconciliation in local governance, cultural resurgence, and shared responsibility.

5. Discussion

Our findings demonstrate how applying the Co-WE framework across three BRs in Canada reveals both promising practices and ongoing challenges in advancing equity in conservation governance. The pilot application of the Co-WE framework across the three BRs identified ecological reconciliation as a fourth and foundational dimension of equitable conservation governance. In this discussion, we reflect on three key insights through the lens of the Co-WE framework: (1) recognition without restored Indigenous authority reinforces settler control, (2) OECMs' support for all four equity dimensions through relational governance, and (3) gendered and generational exclusions continue to limit transformative leadership.

5.1. From Recognition to Ecological Reconciliation

Our findings show that recognition alone is insufficient to advance Conservation with Equity. Evidence across the three BRs shows that recognition and ecological reconciliation play different roles in conservation governance, yet both are essential to Conservation with Equity [56,59]. While recognition affirms Indigenous rights, knowledge, cultures, and histories, ecological reconciliation asks whether these forms of recognition are accompanied by changes in authority, governance, and stewardship. Distinguishing these dimensions helps explain why recognition alone has not consistently shifted authority over land and conservation decision making [51,52,57].

Across the three BRs we studied, recognition was expressed through symbolic and institutional actions such as land acknowledgements, Indigenous language revitalization, and bilingual signage. These included efforts to restore Indigenous place names and the national decision to replace the term "Reserve" with "Region." While such recognition efforts have expanded over the past decade [40,86,87], our findings indicate they remain largely performative when not accompanied by structural change. For example, RLBR includes the Cree name Mihkomin sâkahikan (Redberry Lake) in signage and outreach, although its use is not yet consistent across official documents, websites, and signage. Similarly, while "Biosphere Region" was adopted nationally to reject colonial legacies, the English place names of the three BRs remain unchanged since their designation in 2000. These examples suggest that symbolic recognition has outpaced changes in governance

that reflect Indigenous priorities, consistent with findings from other contexts around the world [88,89]. As Shaw et al. [90] also observed, relational engagement has increased, but progress toward Indigenous-led governance remains limited.

Our findings show that ecological reconciliation requires substantive transformation. The strongest examples move beyond recognition by strengthening Indigenous authority, governance, and stewardship while reinforcing procedural and distributional equity [27,52,54,66]. In CSBR, this is reflected in the reassertion of hereditary leadership and the establishment of Tribal Parks governed by Indigenous law, alongside Language Nests and Nuu-chah-nulth cultural programming. In MABR, Indigenous partners co-lead Healing Gardens and cultural restoration, supported by co-developed protocols that signal shared authority. At RLBR, an exemplary reconciliation initiative is Bridge to Land Water and Sky, a three-year project funded through the federal government agency, Agriculture and Agri-Food Canada. Led by Mistawasis Nêhiyawak, it is Canada's only Indigenous-led Living Lab and reflects Cree-led conservation grounded in ceremony and Indigenous legal traditions. These initiatives align with what Coulthard [91] describes as the "resurgence paradigm," shifting conservation from inclusion within colonial frameworks to Indigenous resurgence and law-based authority.

Our findings support recent scholarship advocating for contextual equity as a foundational dimension of conservation justice [27,52,54]. Recognition alone, without corresponding changes in governance, risks reinforcing the very structures it seeks to critique. When recognition is accompanied by Indigenous authority, legal pluralism, and shared stewardship, it supports ecological reconciliation. These changes move conservation beyond symbolic inclusion by recognizing Indigenous Peoples as rights holders, decision makers, and stewards of their lands and biodiversity [13].

The next section considers how these principles are being advanced through Indigenous-led conservation mechanisms, including emergent OECMs. These are areas that achieve long-term biodiversity conservation outside formally designated protected areas.

5.2. Indigenous-Led OECMs as Pathways to Ecological Reconciliation

Across the three BRs examined, Indigenous-led conservation increasingly takes shape through initiatives that extend beyond existing governance and spatial arrangements. Several of these areas share key characteristics of Indigenous-led OECMs [12,24]. When led by Indigenous Peoples, they also align with all four dimensions of the Co-WE framework: recognition, procedure, distribution, and ecological reconciliation.

In CSBR, Tribal Parks governed by Nuu-chah-nulth hereditary leaders uphold Indigenous legal orders while delivering measurable biodiversity outcomes. In MABR, Healing Gardens co-developed with First Nations combine ecological restoration with cultural teaching. At RLBR, the Cree-led Food Forest and ceremonial sites support food security, species protection, and intergenerational knowledge transfer. Although none of these sites are formally recognized as OECMs, they align with core CBD criteria, namely sustained biodiversity outcomes, Indigenous governance, and cultural continuity [12,24,92]. Each initiative affirms Indigenous law and authority (recognition), reflects shared planning and Indigenous leadership (procedural), and delivers tangible land-based benefits (distributional). Ecological reconciliation is expressed through restored responsibilities to land and renewed relationships among peoples and places.

Our findings suggest that UNESCO BRs can support Indigenous-led conservation while advancing global biodiversity commitments. This supports Barraclough et al.'s [93] argument that UNESCO BRs should be more fully recognized within the Kunming-Montreal Global Biodiversity Framework's (GBF) 30 × 30 Target. While formal coordination between

BR governance and Indigenous-led OECMs remains limited, our findings indicate that BRs can create space for Indigenous-led conservation founded on ecological reconciliation. Despite this alignment, fewer than 1% of Canada's registered OECMs are Indigenous-led as of mid-2025 [94–96]. This reflects a persistent disconnect between Indigenous conservation leadership and state-controlled designation processes.

Recognizing initiatives such as the Tribal Parks, Healing Gardens, and Food Forest as OECMs would help address this gap and support implementation of the GBF's 30 × 30 target, the United Nations Declaration on the Rights of Indigenous Peoples, and Canada's related Truth and Reconciliation Commission's Calls to Action [37,53,64,97]. As Shore and Potter [98] (p. 8) remind us, "We'll never have Reconciliation between Crown and Indigenous Nations until there's Reconciliation with the land." In their view, and as our findings suggest, OECMs offer one such pathway for achieving this form of reconciliation if they are committed to centering Indigenous customs, restoring land-based responsibilities, and redistributing authority in conservation governance.

5.3. *Advancing Gendered and Generational Equity*

Across the three BRs, women and youth are taking on increasingly prominent roles as research directors, advisory members, and grant reviewers. These developments reflect growing attention to gendered and intergenerational equity [99–101], and build on evidence that Indigenous women and youth make important contributions to environmental governance and climate adaptation within and beyond BRs e.g., [101–103]. Our findings suggest that these developments represent important progress but do not necessarily translate into greater Indigenous authority within conservation governance [101].

Our review and interviews indicate that executive and senior leadership remains concentrated among settlers, many of whom have longstanding ties to the BRs. This concentration of authority often limits Indigenous participation to advisory or project-based roles, constraining broader equity goals. Our findings point to systemic barriers embedded within conservation institutions rather than to individual shortcomings. Three interrelated institutional factors help explain why these inequities persist.

First, equity is often framed in generic terms that emphasize broad community inclusion rather than recognizing the distinct governance responsibilities of Indigenous Peoples. This framing obscures the legal and political status of First Nations and weakens initiatives aimed at redistributing authority [58,77]. For instance, in CSBR, the Living Wage campaign emphasized economic justice using settler-defined metrics, sidelining Indigenous economies rooted in reciprocity and land-based responsibilities [21,80].

Second, initiatives described as Indigenous-led often continue to operate within settler institutional frameworks. We observed this governance structure in the Food Forest initiative at Muskeg Lake Cree Nation. RLBR, a formal partner, describes the site in its periodic review as a model of reconciliation-oriented collaboration. While the initiative is presented as Indigenous-led, coordination was at times overseen by trusted settler practitioners. Frequently, these arrangements emerge not from intent to dominate but from the limited financial and staffing resources available to First Nations governments [100]. Without sustained investment and institutional support from governments, partner organizations, and other shared responsibility holders [13], efforts to devolve authority can become untenable, placing additional burdens on already overstretched communities [39,104]. Yet, regardless of intent, such structures risk entrenching settler control and limiting opportunities for Indigenous self-determination [18,105], particularly given the multiple, immediate priorities that communities must navigate with limited capacity.

Third, based on broader research insights, hiring practices and leadership models grounded in settler norms often privilege formal qualifications and managerial experience

over Indigenous knowledge, legal orders, and community-based leadership. Such hiring criteria contribute to inequity when they are treated as the primary indicators of expertise. As a result, Indigenous candidates, especially women and youth, may lack role models and mentors, and face persistent barriers to accessing roles with decision-making authority, even when they already lead conservation efforts within their communities [106,107].

Our findings suggest that achieving gendered and generational equity requires more than representational inclusion. It demands rethinking how leadership is defined, how power is shared, and how Indigenous knowledge and responsibilities are institutionally supported [50–52]. In line with George and Reed [104] (p. 4), “It is important that processes are inclusive and fair —meaning that [decision-makers, including those in BRs] should reflect [the] affected population, not only in terms of demographics (age, gender, ethnicity), but also in terms of values and interests.”

These findings should also be interpreted in light of the institutional role of BRs. Because BRs do not possess regulatory authority, many inequities identified through the Co-WE framework originate within broader provincial, federal, and historical governance structures that extend beyond the direct control of BR organizations. In this context, the Co-WE framework helps distinguish challenges that BRs can address through partnerships, dialogue, and collaborative initiatives from those requiring broader policy and governance reforms.

6. Recommendations for Practice and Policy

Our findings point to four priorities for strengthening BRs as platforms for equitable conservation and ecological reconciliation. These recommendations build directly on the opportunities and barriers identified across the three case studies.

6.1. Institutionalize Indigenous Leadership

BRs should strengthen Indigenous leadership by embedding Indigenous law, governance, and representation within their governance structures. The soft-law status of Canada’s BRs limits their authority to enforce decision-making reforms, and Indigenous Peoples often lack meaningful decision-making power. Progress has involved co-developed governance and formal recognition of Indigenous legal orders. Advancing these models aligns with Section 35 of the Constitution Act, 1982 and UNDRIP, moving beyond symbolic inclusion toward decision-making power—a shift UNESCO can champion through leadership advocacy [44].

6.2. Embed Long-Term, Indigenous-Directed Funding

Provincial and federal governments should provide stable, long-term funding to enable BRs to build and sustain equitable conservation partnerships. Despite substantial effort devoted to securing support from provincial and federal governments, BRs often remain dependent on short-term grants and pilot funding. This instability undermines continuity, organizational capacity, and long-term relationship-building with Indigenous communities. Sustained public investment is needed to support shared governance, Indigenous-led land-based programmes, and Indigenous knowledge revitalization. Funding mechanisms should align with Indigenous self-determined priorities and reconciliation commitments while advancing biodiversity objectives, consistent with commitments recognized at CBD COP16 [108] and broader calls for Indigenous-led conservation financing [109].

6.3. Advance Indigenous Protected and Conserved Areas (IPCAs) and OECMs as Pathways to Ecological Reconciliation

BRs should support ecological reconciliation by helping address the fragmented legal and administrative recognition of Indigenous Protected and Conserved Areas (IPCAs)

and OECMs across Canada [94,110,111]. This fragmentation is partly driven by the complexity, procedural length, and relational nature of Indigenous-led conservation processes. To advance Indigenous-led conservation effectively, BRs should develop streamlined, community-driven pathways that uphold Indigenous sovereignty and self-determination. As BRs are part of national and international networks, they can demonstrate leadership by supporting diverse governance arrangements, including sole Indigenous authority and hybrid co-governance, while providing targeted capacity-building and resource sharing [93]. In this context, BRs must demonstrate how to adopt patience and flexibility, allowing Indigenous communities to navigate these processes on their own terms without compromising autonomy or long-term biocultural outcomes [64,95].

6.4. Mainstream Co-WE in Man and the Biosphere Programme's Reviews of Biosphere Regions

Our findings show that the Co-WE framework provides a practical approach for assessing conservation with equity across BRs. UNESCO's Man and the Biosphere Programme should integrate the Co-WE framework into its periodic review guidelines, building on more than two decades of efforts to strengthen evaluation [73,81,82]. Doing so would strengthen the World Network of Biosphere Regions' capacity to generate actionable, place-based knowledge that advances equitable conservation and sustainable development [112].

7. Conclusions

Drawing on Indigenous governance scholarship [e.g., 18,19,38,100] and ecological reconciliation theory in settler-colonial contexts [e.g., 35,36,91], the pilot application of the Conservation with Equity (Co-WE) framework identified ecological reconciliation as the fourth and foundational dimension of equitable conservation governance, complementing the recognition, procedure, and distribution dimensions. The framework is grounded in Indigenous resurgence [14,64,113] and informed by the Truth and Reconciliation Commission of Canada [37] and the United Nations Declaration on the Rights of Indigenous Peoples [114], which call for conservation governance that upholds Indigenous rights, responsibilities, authority, and relationships to land.

Piloting the Co-WE framework across the BRs of Clayoquot Sound, Mount Arrow-smith, and Redberry Lake demonstrated its utility for assessing conservation with equity. Importantly, the pilot identified ecological reconciliation as a distinct and foundational dimension of equitable conservation governance that was not adequately captured within existing equity frameworks. Its inclusion expanded the analytical scope of the framework to encompass relational responsibilities, treaty obligations, land-based governance, and processes of restoration that were not adequately addressed within the recognition, procedure, and distribution dimensions. The accompanying criteria and indicators provided a structured approach for examining the historical and institutional conditions that shape conservation practice.

Applying the framework also revealed uneven progress across the four equity dimensions, highlighting how legal contexts, governance arrangements, and Indigenous-state relationships shape conservation. Although the cases used in this study represent diverse governance arrangements, they are all situated within the Canadian legal, policy, and reconciliation context. We therefore suggest that the Co-WE framework is analytically transferable across governance contexts, although its applicability beyond Canada requires further empirical testing.

As a pilot study, this research demonstrates the conceptual and practical utility of the Co-WE framework for understanding and assessing conservation with equity. At the same time, the study recognizes the limitations of the documentary and interview data, which primarily reflect institutional perspectives and do not fully capture the diversity of

Indigenous experiences across different conservation contexts. More detailed empirical research that engages Indigenous Peoples directly across diverse Indigenous-state and conservation contexts will provide deeper insights into how ecological reconciliation, recognition, procedure, and distribution are experienced in practice; how authority shifts over time; and how the framework can be strengthened across different governance contexts. The Co-WE framework nevertheless offers a flexible approach that can be adapted to diverse legal, cultural, and political settings and can support meaningful collaboration among rights holders, governments, and others who share conservation responsibilities. We therefore encourage researchers to apply and adapt the framework in other conservation settings, including Indigenous Protected and Conserved Areas (IPCAs), Other Effective Area-based Conservation Measures (OECMs), protected areas, and community-conserved areas, where Indigenous-state relationships, governance arrangements, and historical contexts may differ.

Supplementary Materials: The following supporting information can be downloaded at <https://www.mdpi.com/article/10.3390/environments13080459/s1>, Table S1, Governance and ecological contexts of the three UNESCO-designated Biosphere Regions examined in this study; Table S2, Operationalizing the Conservation with Equity (Co-WE) framework across four equity dimensions in three UNESCO Biosphere Regions in Canada; File S1, Case-specific semi-structured interview guides used across three UNESCO Biosphere Regions in Canada. References cited in Tables S1 and S2 are included in the main reference list [39–43,115–122].

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Informed Consent Statement: Verbal informed consent was obtained from all participants prior to participation and audio recording. The study used the oral informed consent procedure described in the ethics protocol approved by the University of Saskatchewan.

Data Availability Statement: Most of the data supporting the conclusions of this article are publicly available through the sources cited in the manuscript and Supplementary Materials. Interview data are not publicly available due to research ethics requirements but may be made available by the authors upon reasonable request, subject to approval and alignment with the research ethics certificate.

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Abbreviations

The following abbreviations are used in this manuscript:

BR	Biosphere Region (or Biosphere Reserve)
CBD	Convention on Biological Diversity
Co-WE	Conservation with Equity
CSBR	Clayoquot Sound Biosphere Region
DRIPA	Declaration on the Rights of Indigenous Peoples Act
FPIC	Free, Prior, and Informed Consent
ICE	Indigenous Circle of Experts
ILK	Indigenous and Local Knowledge
IPCAs	Indigenous Protected and Conserved Areas
IPLCs	Indigenous Peoples and Local Communities
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IUCN	International Union for Conservation of Nature
MAB	Man and the Biosphere Programme
MABR	Mount Arrowsmith Biosphere Region
OECMs	Other Effective Area-Based Conservation Measures
RCAP	Royal Commission on Aboriginal Peoples
RLBR	Redberry Lake Biosphere Region
TRC	Truth and Reconciliation Commission
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
WNBR	World Network of Biosphere Reserves/Regions

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