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Drawing from Indigenous ontologies and practices to rethink European water policy

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Abstract

The purpose of this article is to begin a discussion of how Indigenous ontologies and practices might be brought to bear on water policy and management in Europe. Such a discussion represents an ironic historical shift in the sense that these ontologies and practices have survived and continue to evolve in countries that have been characterized by European colonization (i.e., Australia, Canada, US, New Zealand, countries of Africa and South America, and not excluding the Sámi people of northern Europe). Increasingly research and policy interest has been directed toward the inclusion of Indigenous knowledge and perspectives in water governance in some of these places, especially Australia, Canada, and New Zealand. Here, we ask whether they might be a source of inspiration for rethinking the water policy in Europe. We argue that certain elements of Indigenous water knowledge and practices can be drawn from to reform European water policy on the ontological premise that people are part of nature and based on establishing and nurturing moral and legal relationships between water and people based on principles of respect and reciprocity.

KEYWORDS
European water policy, hydrosocial relations, indigenous ontologies and practices, water governance

1 | INTRODUCTION

"*Omama* created the *xapiri* in large numbers and scattered them in every direction from our land and far beyond, to the other side of the waters, all the way to where the white people live… Yet the white people do not see them. Perhaps their ancestors knew them? But today their children and grandchildren have forgotten them." (Kopenawa & Albert, 2013, p. 65)

Representing the words of a Yanomami shaman from Brazil, the quote above suggests that the spirit guides of Yanomami might be discovered among us modern Europeans, along with the kinds of relations and practices that might render us and our actions more respectful of our environment, including the waters that sustain all life. The shaman, Davi Kopenawa, hints that Europeans might once have maintained such relations and practices but that we have lost sight of or have allowed them to fall into disuse. With this article, we hope to begin a discussion in which we might *re-member*—in the sense of bringing together things that have become separated over time and space—for the purpose of practicing different/alternative hydrosocial relations and rethinking European water policy. For this purpose, we take inspiration from Indigenous ontologies and practices. As described below, Indigenous peoples have an understanding—an ontology—of *what water is* that differs radically from the modern European ontology: instead of a resource and an object reducible to a compound of hydrogen and oxygen, water *is a living being* for Indigenous peoples. As a fellow living being, the kinds of relations and practices that Indigenous peoples have with and with respect to water differ radically from the "water resources management" practices of modern Europeans.

Such radical shift we[1] feel is warranted, among other things, by the failure of present European water policy strategies to achieve their own stated objectives. Achieving "good ecological status" for all

water bodies is the primary objective of the European Water Framework Directive, which came into effect in 2000. After more than two decades, the latest status report confirms that only around 40 percent of European surface water bodies (rivers, lakes, transitional, and coastal waters) are in "good status" with virtually no improvement in status reported since 2009 (European Environmental Agency, 2021). Although there have been notable successes in reducing levels of some individual pollutants, the overall situation remains disappointing, contributing to the need to adopt a reflective view of the European Directive (Moss et al., 2020).

The objective shortcomings of European water policy are matched by what appears to be a moment of widespread critical reflection on our current hydrosocial predicament: As we write this article in the summer of 2022, the European public as well as water managers are having to face up to a "new normal" of water scarcity, highlighting some basic problems associated with our traditional approaches to water and demanding new ideas and practices (Henley, 2022). Recognition of such a "new normal" contributes to what appears to be a profound reflection of the need for radical and transformative change in approaches to water and water management (Pahl-Wostl 2020). The basic ontological question of what water is, and the implications of this question for water policy are increasingly raised by researchers (de Lourdes Melo Zurita et al., 2015; Yates et al., 2017; Herrington, 2017; Wilson & Inkster, 2018; Cortesi, 2021; Viaene, 2021; Vogt & Walsh, 2021; Linton & Krueger 2020; Linton, 2022; Laborde & Jackson, 2022). Indeed, as discussed in the next section, Indigenous scholars and those who have worked with and taken inspiration from them have made important contributions to advancing alternative ontologies for water, especially with respect to water as a living being. Indigenous peoples articulate concepts and arguments respecting water with roots that are "centuries old yet radical" (McGregor, 2019, 242), yet are often forged out of the struggle with Western concepts and colonial hegemony. We believe that such concepts and arguments offer valuable insights applicable to the current European situation. We argue that at such a moment of introspection and reflection among water researchers and water managers, a turn toward Indigenous ontologies and practices can help suggest productive ways forward.

One reason for looking to Indigenous sources for inspiration to reform European water policy at this time is because these have been shown to work elsewhere. As Indigenous peoples often correctly point out, their traditional practices have been proven to be effective and sustainable for millennia (e.g., McGregor, 2019). Moreover, they are increasingly influential in reforming modern water policy in spaces colonized by the European powers. As described in Section 3 below, Indigenous peoples and ideas are having a growing impact on the evolution of modern water policies in places such as Canada, Australia, and New Zealand. Here, it is important to point out that in such places, these changes occur in the context of decolonization—the political struggle involving "the repatriation of Indigenous land and life" (Tuck & Yang, 2012). Applying Indigenous ontologies and practices to water in such places must be associated with this political struggle of decolonization. Indeed, to reference Indigenous ideas and

ontologies without acknowledging their association with this struggle has been described by Kwakwaka'wakw scholar Sarah Hunt as a form of "epistemic violence" (quoted in Wilson & Inkster, 2018, p. 4).

This raises an obvious question for us: What does it mean for Europeans to take inspiration from Indigenous peoples, and how can we avoid the "epistemic violence" described by Hunt? First, we suggest that it means attending to the demands, as well as the ideas of the Sámi people—the only recognized Indigenous peoples of Europe, inhabiting the northern portions of Norway, Sweden, Finland, and Russia. As noted below, the Sámi maintained ideas, relations and practices that are radically different from modern European approaches. Second, as suggested in the epigraph of this introduction, the ideas and practices that we find inspiring are not necessarily foreign to Europeans. As discussed below, the emphasis in Indigenous thought and practice on relations and on what might be called relational approaches is not without correspondence in European traditions.

Perhaps the most important aspect of taking inspiration from Indigenous ontologies, ideas, and practices in the European context is to emphasize that such ideas and practices cannot be dissociated from politics and from the political and economic power that might bring them to life. As noted, this link between knowledge and power is salient in colonized territories such as Canada, Australia, and New Zealand, where Indigenous knowledge claims are inseparable from their material claims to land and water and the benefits therefrom. This is also relevant in those parts of northern Europe where the Sámi people struggle to maintain their traditional lives and livelihoods. In Europe as elsewhere, to have any positive effect, the ideas/approaches described below need to be married to power. This highlights the importance of Indigenous struggles for "water justice", as without a redressing of the historical injustices brought upon by colonial theft of Indigenous lands and waters, the ontologies and practices that might inspire policy change in Europe and elsewhere will have no future (Robinson et al., 2018).

We acknowledge that this article comes two decades or more after earlier studies lauding "Indigenous" or "traditional" water management practices and a decade or more after a wave of critique of these studies as idealizing, romanticizing, or reifying Indigenous knowledges and technologies. As Shah and Boelens have pointed out, many of these studies have "uncritically made pre-modern knowledge systems and artifacts into reified objects of virtue irrespective of their social and historical location." (Shah & Boeens, 2021 p. 98) We are less interested in the specific knowledge, artifacts, and material aspects of Indigenous water management than in what we identify as basic orientations and what Indigenous peoples have taken in their relations with their waters. The thinking aspects of European water policy based on these orientations suggest some basic changes in the way we approach water. As we hope to describe with the examples below, it is not out of the reach of what is possible, and can be said to correspond to certain ideas and approaches that are already present in the European context.

We also acknowledge the epistemological and political challenges involved in the proposition of defining and drawing from Indigenous knowledge and practices for the purpose of reforming water policy in

a European context. Some of these challenges can be met by identifying corresponding ideas and practices within the European tradition as well as within the currents of European thought, particularly with respect of what are termed "relational" approaches. After defining the key terms of our argument and identifying what we mean by these relational approaches, we discuss some examples where these approaches have been adopted, or have been influential in reforming water management concepts and water governance policies in territories colonized by European powers. Here, we focus on recent developments in the establishment of river flow regimes and the legal personhood to rivers. Following this, we explore possibilities for the convergence of these ideas with water governance and policy in the European context, with particular attention given to how Indigenous-inspired approaches might help us rethink the concept of "good ecological status", which is the principal objective of the European Water Framework Directive, and focus instead on more relational values. We conclude with a discussion of how this initiative might be furthered through processes of engagement with Indigenous peoples, especially with the Sámi of northern Europe, but also with people from places formerly colonized by the European powers who are engaged in reforming water governance and policy in their respective countries.

2 | RELATIONS, RESPECT AND RECIPROCITY

There is no universally accepted definition of Indigenous peoples or of Indigeneity. Indeed, the concept of Indigeneity and the question of who is Indigenous is highly controversial, opening up "a Pandora's box of possibilities" (Weaver, 2001, p. 240). The International Labour Organization Convention no. 169 on Indigenous and Tribal Peoples of 2007, defines Indigenous peoples as those having ancestors living in a given territory before the settlement or formation of modern state borders. In addition, the Convention holds that Indigenous peoples have maintained either wholly or partly their own social, economic, cultural, and political institutions (Sarivaara et al., 2013, p. 370). It is important to stress that Indigenous peoples currently and actively "mark out our own discursive space in which to debate the meaning of Indigeneity…" (Paradies, 2006 p. 355). For our purposes, we take those who self-identify as Indigenous as such, and to highlight this we capitalize the word "Indigenous". Most of the references we draw from are from Indigenous scholars or researchers collaborating with Indigenous peoples. It is significant to note that most of the sources we draw from are authored by women, perhaps not surprisingly, as in most Indigenous traditions, women are responsible for looking after water and maintaining healthy relations between water and people (McGregor, 2015). We rely especially on Indigenous scholars and non-Indigenous researchers working with Indigenous peoples living in North America (Yazzie & Baldy, 2018; Lavalley, 2006; Wilson & Inkster, 2018; Wilson et al., 2019; McGregor, 2015; McGregor, 2019; Tallbear, 2017), Australia (Jackson, 2022) and New Zealand (Salmond, 2014; Talbot-Jones & Bennett, 2022).

We are not particularly interested in identifying which Indigenous techniques or solutions might be directly applied in a European context. Rather, our aim is to draw from Indigenous ontologies and practices to help reinvigorate tendencies that are, or were, already in place in Europe with the aim of improving relations with water. The main themes, or concepts derived from our reading of these Indigenous sources and perspectives on water practices that we wish to reflect on in relation to European water policy could be summarized in terms of "relations", "respect" and "reciprocity". These themes, or principles, are interrelated and flow from what is perhaps *the* fundamental aspect of Indigenous ontology and practice respecting water: to Indigenous peoples, water is a living being. This ontological position reflects the basic fact that, as with all aspects and components of non-human nature, water is alive in Indigenous thought and practice, which stands in contrast to dominant, although not all, Western thought and practice, as simply put forth by the Sámi of northern Europe:

> "The Sámi view of nature as an animated, living being stands in strong contrast to the Western view of nature. Our view of nature has characterized our values, customs, social structures, and relationships. Our view of life builds our common core value that is reflected in the Sámi language." (Sametinget, 2021)

In Canada for example, water is often traditionally regarded among First Nations peoples as "lifeblood", connoting the sense in which water is "an animate being" that exists "in a relational connection with humans and other living beings" (Yates et al., 2017, pp. 4, 6; see also Blackstock, 2001, p. 12; McGregor, 2015; Wilson & Inkster, 2018). Such an understanding implies a radically different way of relating to water than is characteristic of the modern European water policy. As long as the basic nature of water is understood as a lifeless compound of hydrogen and oxygen, it is possible to imagine and maintain policies that aim to achieve a particular status for such an object, or for aquatic objects such as rivers, lakes, aquifers, wetlands… If, on the other hand, waters, lakes and rivers are understood as living beings, like ourselves, then prescribing a fixed status for them is less appropriate than developing and maintaining a proper relationship.[2] "Indigenous peoples often view water as a living entity or a relative, to which they have a sacred responsibility." (Wilson & Inkster, 2018, p. 1; see also McGregor, 2015) The notion of having such a "sacred responsibility" can hardly apply to water so long as it is regarded as a mere object. However, when understood as a relation, our duty to water is undeniable. "The Elders indicated that First Nations peoples believe that the water is a relation, our brother and sister; and as such must be protected, respected, and cared for." (Lavalley, 2006 p. 13) Thus, the main principle of an Indigenous-inspired water policy might be considered in terms of establishing the conditions that allow for proper hydrosocial relations. Respect, implying a certain mutuality of regard and interest, can be considered a prerequisite for establishing such relations, and this might be considered a second principle. As reciprocity concerns the practices that flow

from such respectful relationships, this might be considered a third key principle of an alternative European water policy.

Finally, in proposing to draw from Indigenous ontologies and practices to rethink European water policy, one distinction in particular stands out as demarcating European from Indigenous approaches: the concept of nature as a category or domain separate from and excluding people does not exist in Indigenous thought and practice. This is a well-known distinction that numerous historians, anthropologists, philosophers and others have long observed and commented upon (e.g. Descola, 2013; Ingold, 2000; Latour, 1993; Latour, 2004). Moreover, it follows that a cosmos in which our primary concern is for relations of respect and reciprocity with others could hardly imagine such others as inhabiting an ontological domain that is radically different from our own. Practicing the principles of relations, respect, and reciprocity, in other words, can only take place in a world where there is no radical ontological distinction between people and non-human nature, including the waters. As discussed below, this presents an obvious contrast and challenge to many of the foundational concepts of environmental protection, restoration, and management, including those that are characteristic of European water policy, which are based on restoring lakes, rivers, wetlands, etc. to their "natural" condition, i.e., to the condition that would pertain in the absence of humans or human intervention (Linton & Krueger, 2020).

2.1 | Relations/relationality

"People must relate to water in order to live." (McGregor, 2015, p. 71).

This seemingly obvious, unremarkable statement captures one of the main ideas we want to convey by this article: instead of focusing on water, on our needs for water resources, and on aquatic ecosystems, we draw from Indigenous scholars and others to suggest that more attention be given to the relations between such things. In our dealings with water, it is the (hydrosocial) relationship that counts. Such a "relational" approach to water has been adopted by geographers, anthropologists, and others, often inspired by Indigenous scholars.[3] In this section we describe such an approach based on Indigenous ideas and practices, and in Section 4 we suggest how it might be applied in a European context.

Indigenous peoples emphasize the importance of relations, but not in the substantialist sense that pre-existing *things are in relation with one another*: "Identity for Indigenous peoples," as Shawn Wilson notes, "is grounded in their relationships with the land, with their ancestors who have returned to the land and with future generations who will come into being on the land. Rather than viewing ourselves as *being in relationship* with other people or things, *we are the relationships* that we hold and are part of" (quoted in Wilson & Inkster, 2018 p. 10, emphasis added). Similarly, Kim Tallbear (2017 p. 187) points out that "nonhumans, including nonorganisms, such as stones and places, ... help form (Indigenous) peoples as humans constituted in more complex ways than in simple biological terms." These observations bear striking similarities to the dialectical observation that things are related internally, meaning that entities do not pre-exist the

relations that bring them into being and transform them (Levins & Lewontin, 1985). This idea is represented in philosopher of science Karen Barad's statement that "relata do not precede relations" (Barad, 2007, pp. 140, 334). This internal-dialectical tradition, while having been subordinated to more substantivist positions in modern European thought, is hardly foreign to the European tradition (Castree, 2003; Harvey, 1996; Levins & Lewontin, 1985; West et al., 2020; Whitehead, 1960). Moreover, such thought is gaining currency recently; a "relational turn" has been observed in the humanities and social sciences, and it is suggested this is beginning to influence sustainability science (West et al., 2020).[4]

A relational approach is an important, basic characteristic of Indigenous ideas and practices, rooted in an understanding of non-human nature as part of the society shared by humans, and by seeing humans as members of the same ontological community as non-human animals, waters, forests... As Carroll describes it, this "relationships-based approach", prioritizes the "agency of nonhuman beings and the maintenance of relationships with them" (Carroll, 2015, p 8). Thus, maintaining healthy, mutually beneficial relationships is basis of an ethical stance toward what Europeans call nature, including water. With reference to McGregor's statement cited above, it is obvious that people must relate to water to live; we owe our very existence to this relationship. Less obvious—especially to those of us who presume the nature of water as an eternal abstraction, a compound of hydrogen and oxygen—is that water is also a relational entity: each instance of water owes its particular existence to the relations—cosmological, hydrological, ecological, and increasingly, on Earth at least—social, in which it occurs (Linton, 2010). The notion that the physical characteristics of the Earth's water are increasingly influenced by human processes is now well accepted (Vörösmarty et al., 2004; Vörösmarty et al., 2013). In a representational and discursive sense also, water on Earth becomes what it is in the context of human social processes (Linton & Budds, 2014).

On Earth, people and water engage in a mutual relationship that needs constant attention and tending. Certainly, people must relate to water to live, and to an ever-greater extent, the life of waters, lakes and rivers depends on the quality of this relationship. As a place to start, European water scholars and managers can begin to reflect on the way we talk about and identify water. For example, the habitual, almost reflexive way we refer to "water resources" and to water as a "resource" in English should be recognized as establishing a particular kind of relation, one that precludes possibility of mutual benefit and wellbeing.[5] Contrast this with an Indigenous view, as expressed by Yazzie and Baldy:

> "Within this framework of relationality, water is not seen as a resource... No, within an Indigenous feminist framework, water is a relative with whom we engage in social (and political) relations premised on interdependency and respect." (Yazzie & Baldy, 2018 pp. 2-3)

Establishing and maintaining healthy relationships with water has been "a pre-occupation of Indigenous peoples since time immemorial"

(Lavalley, 2006 p. 19). This emphasis on relations and on the quality of hydro-social relationships as opposed to focusing on attaining a fixed, objective status for water might be an explanation for the relative success of sustaining the health of waters in Indigenous traditions. As discussed in Section 4 below, it now offers an alternative to Europeans at a time when rapidly changing conditions and abrupt shifts in socionatural systems problematize policies aiming for fixed status: As Robin Wall Kimmerer observes:

> "We might debate the authenticity of the desired reference ecosystem. But ultimately, she [the earth] will decide. We're not in control. What we *are* in control of is our relationship to the earth. Nature herself is a moving target, especially in an era of rapid climate change... Here is where our most challenging and rewarding work lies, in restoring a relationship of respect, responsibility and reciprocity. And love" (Kimmerer, 2013, p. 336).

2.2 | Respect and reciprocity

To paraphrase Kimmerer slightly, restoring hydrosocial relationships of respect, responsibility and reciprocity might be taken as the bottom line for an alternative approach to European water policy. Such an approach is greatly at odds with the artifacts that shape our relation to water in Europe today. Technical infrastructure, regulations, planning procedures and risk management approaches are an expression of and still enact a command-and-control paradigm (Pahl-Wostl, 2007). Here, the phrase "command and control" is revealing. The morphology of rivers has been altered to make them and the surrounding landscapes serve human needs in a way that affords little or no possibility for developing and maintaining relations of mutual respect and reciprocity between people and water. The straightening of the river Rhine in Germany, initiated in the 19th century serves as a classic example of the hundreds of "river improvement" projects undertaken throughout Europe, initially praised as emblems of progress, but more recently recognized brute impositions of human will upon rivers, fluvial processes that might more profitably be considered relations, or partners (Blackbourn, 2007). Today these serve as classic examples of a growing awareness of the drawbacks of relations of dominance rather than respect.

> "Rarely, have we witnessed a conversation about water or water governance in Yukon, Canada, where First Nations there have not emphasized the importance of respect for water." (Wilson & Inkster, 2018, p. 2)

As noted in the previous subsection, Indigenous peoples tend to view water, literally, as a relative, a living entity. And the appropriate attitude toward a relative could best be described as respectful. However, as Wilson and Inkster, who have worked with First Nations peoples in the Yukon, Canada stress, the notion of "respect" in this context involves more than it typically does in the Western usage of the term. Rather than merely a "deferential regard or esteem felt or shown towards a person, thing, or quality, to 'respect' water is to engage in a manner consistent with the protocols or conventions required to maintain appropriate social relations, whether in relation to the spirit of a certain body of water or in reference to more general protocols for respecting water." (Wilson & Inkster, 2018 p. 11).

A relation characterized by respect thus involves *actions* and practices conducive to maintaining appropriate social relations. And underlying such actions, protocols and practices is the principle of reciprocity. "Reciprocity is therefore about engaging with water according to protocols to ensure mutual survival. In other words, if you take care of the water, it will take care of you." (ibid.)

Engaging with water through practices that ensure our mutual well-being might seem a romantic notion to many Europeans, including water managers. But as discussed in the following section, the principles of relation, respect, and reciprocity—inspired by Indigenous ideas and practices—are increasingly finding their way into water governance and management in spaces colonized by Europeans. The implication is that such developments might also be relevant in the European context.

3 | EXAMPLES FROM TERRITORIES COLONIZED BY EUROPEAN POWERS

The ontologies and practices of Indigenous peoples are increasingly acknowledged by a broader scientific community as providing valuable insights into human relationships with water, supporting transformative changes in water management (ISC, 2020). This acknowledgement is a corollary of the political struggles of Indigenous peoples to regain a measure of control over the lands and waters in territories that have been colonized by Europeans. These struggles for legal jurisdiction and for self-determination are internally related to Indigenous demands for control over resources, including water: The ontological perspectives and practices that we highlight in this paper cannot be separated from these broader political issues, whereas it is recognized that the inherent rights of Indigenous peoples to their lands, territories and resources derive from "their cultures, spiritual traditions, histories and philosophies" (UN General Assembly, 2007, p. 3). Researchers have studied new water governance arrangements emerging in colonized spaces around the world that reflect these struggles, stressing "how Indigenous peoples' pursuits for authority, self-determination, resistance, and recognition are transforming approaches to the governance and management of freshwater..." (Parsons & Fisher, 2020). In this section we give some examples of these transformations in colonized spaces.

3.1 | From environmental flows to cultural flows

The concept of environmental flows provides an example of reframing of a Western scientific concept in light of Indigenous ontologies and practices (Anderson et al., 2019). The concept of environmental flows was originally introduced to counter the negative influence of certain

human activities on the flow regime of rivers. In particular, the building of numerous large reservoirs for hydropower production and irrigation had reduced and changed the temporal pattern of water flows to the detriment of riverine ecosystems. The normative application of the concept followed a conservation paradigm based on the modern Western ontological separation of people from nature, which posits an ideal state of nature in terms of the complete absence of human influence (Linton & Krueger, 2020). Thus, the ELOHA (Ecological Limits of Hydrological Alterations) framework developed by Poff et al. (2010) introduced "natural flow regimes" that framed all human influence as "disturbance" hindering the ideal state.

Subsequently, researchers have revised the concept of environmental flows, increasingly intaking into consideration the human presence in the life of rivers. First, the SUMHA (Sustainable Management of Hydrological Alterations) framework (Pahl-Wostl et al., 2013) introduced governance and management aspects including participatory stakeholder processes. The concept of ecosystem services was employed to define desirable states for riverine ecosystems that took human interests into consideration. However, by making use of the concept of ecosystem services SUMHA only sustained the ontological divide between people and rivers by focusing on the instrumental benefits that rivers provide for people (Anderson et al., 2019 p. 9). More recently, there have been advances in research of hydrosocial flow assessments in Australia, particularly in determining the flow requirements to sustain Indigenous peoples' relations with rivers (Jackson et al., 2015). Such work is based on an ontological stance that posits people and rivers as being in a living relationship. Below we consider how the concept of environmental flows has been transformed in Australia, followed by a discussion of similar developments in Canada.

3.1.1 | Australia

Most parts of Australia are characterized by low levels of precipitation. Dealing with low water availability has been a persistent challenge for water governance. In the late 1990s, severe droughts triggered a shift toward market governance that had already started earlier (Hussey & Dovers, 2006). Water was converted to a tradable commodity, and water licences were decoupled from land tenure (Alston et al., 2016). The Australian National Water Initiative (2004) introduced as principles cost-recovery and consumption-based pricing but also environmental water allocations to counter the severe degradation of the aquatic environment by the overexploitation of water for irrigation purposes. As water markets were the dominant policy instrument for water allocation, the government set up funds to purchase water rights to meet environmental needs (Cooper & Crase, 2016; Doolan & Hart, 2017). Nevertheless, the environment suffered greatly during the so-called millennium drought (1997–2009) in the Murray Darling Basin (Bunn, 2017), leading to calls for radical reform of the regulation of flows.

Australia's neo-liberal water policies have institutionalized different water uses—including water for the environment—as competitors. In such a scheme the relation between humans and the environment is structured as adversarial, as for example when the national government buys water entitlements for environmental flows in the Murray-Darling basin, directly competing with farmers, whose response is often to abstract groundwater illegally (e.g. Alexandra, 2018; Jackson, 2022). Another example is that instead of promoting better connexions between people and rivers, the concept of ecological connectivity has been implemented in a way that Indigenous people regard as having only further alienated people from rivers. A particularly interesting case is cited by Jackson in her analysis of a high-flow event that was induced in the Murray-Darling basin for the purpose of reconnecting ecosystems during a period of prolonged drought. When asked about the merits of this event, a member of the Ngemba, who traditionally have lived along the river, responded:

> "Connectivity? They use words that don't mean nothing [sic] to traditional owners. Every creek and billabong has gone. Those creeks and billabongs filter the river. That was their function before white man. Now, in 200 years, they've totally devastated it and they don't care, not for their future ... They've taken everything off us, and now they've taken the water. They've fenced off all the rivers. They've got us secluded and confined to the levee banks. Our people are on the highway to extinction." (Jackson, 2022, p 13.).

Instead, Indigenous groups in Australia have been at the forefront of advocating for policy reforms based on restoring sociofluvial relations characterized by respect and reciprocity. Eschewing the limited notion of ecological flows, they have introduced the concept of *cultural* (water) flows that sustain the livelihoods of First Nations and their relations with the rivers. The concept of cultural flows is inextricably tied to restoration of *Indigenous control* of these relations: *"Cultural flows are water entitlements that are legally and beneficially owned by the Indigenous Nations of a sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of those Nations. This is our inherent right."* (MLDRIN Echuca Declaration, 2007). How such flows could be assessed and implemented was investigated in several pilot projects in the Murray-Darling Basin (Jackson et al., 2015). Researchers engaged with traditional land owners and Elders to elicit water requirements based on Indigenous knowledge, values, and priorities. A relation characterized by respect and reciprocity would entail a substantial reallocation of water to the environment, particularly to sustain certain wetlands permanently.

Such an approach can hardly be realized under the umbrella of the prevailing techno-scientific commodified water management approach; fundamentally, it would require Indigenous peoples be granted sovereignty over rivers. During the recent rounds of water governance reform in Australia, the rights of Indigenous groups did not receive much attention (Finn & Jackson, 2011; Macpherson, 2019a). In the National Water Act Indigenous issues were characterized as non-commercial and thus non-consumptive. Cultural flows were limited to spiritual, cultural, and environmental purposes, while the economic needs of the Aboriginal groups were ignored. Indigenous groups were not granted authority to make

autonomous decisions and did not even receive unfettered control of water in their traditional territories. Arising from a deliberate policy choice, this outcome palliates powerful agriculture lobbies and extractive industries. However, it does not address distributive injustice with respect to the allocation of water use rights for Indigenous peoples, let alone realize the ideal of cultural flows (Macpherson, 2019a, page 75 ff).

The example of Australia shows how realizing water policies based on relations of respect and reciprocity are inextricably tied to questions of water rights and water justice for the Aboriginal peoples involved. Entrenched interests and the power structures and legal frameworks that serve those interests have so far prevented the concept of cultural flows from being written into law. For that to happen Indigenous peoples would need to be granted water rights and water justice ensuring them a prominent role in a holistic management of the riverine landscapes (Nelson et al., 2018).

3.1.2 | Canada—Province of British Columbia

Water governance in Canada is highly fragmented with most authority at the provincial level (Renzetti & Dupont, 2017). Although this is often regarded as an impediment to progress in drinking water provision and pollution prevention affecting First Nations communities, the weak influence of federal jurisdiction on provincial water management has also provided opportunities for sub-national arrangements that can favor First Nations' involvement in water policy (Curran, 2015). Particularly innovative approaches have been developed in the Okanagan basin of the Province of British Columbia involving the Syilx people, who nurture dialogue and entertain plural ontologies of water through a traditional governance framework and process of dialogue known as *Enowkinwix*[w] or En'owkin (Jatel & Brian, 2018; Yates et al., 2017):

> "En'owkin is the kind of plural ontology we hope to foreground, and it is an approach that has been successful in protecting and preserving hydrologic environments for many in the Okanagan valley… [T]he success of the approach relates specifically to its relational perspective, as human and natural rights are conceived as inter-dependent, meaning that one cannot exist without the other. Thus, any discussion of indigenous rights or a human right to water must inevitably also engage with the rights of nature and water." (Yates et al., 2017 p. 12)

This framework embraces the notion of water as *Siwlkw*, which has been described as "a more-than-human processes of emergence, rather than simply a resource available for consumption" (Yates et al., 2017). Such a holistic understanding of water as emerging through processes involving people, implies ethical responsibilities toward water that contrast with European perspectives. In 2014 the Syilx Nation adopted the Siwlkw (water) Declaration as an expression

of their water law (Curran, 2019). Applying this Declaration, a project to determine environmental flow needs (EFNs) for 19 streams in the Okanagan Watershed was implemented in 2016 by the Syilkx Nation in cooperation with the Okanagan Water Board and the provincial government. This project adopted a holistic approach to determine flow needs considering the diverse relationships between humans and water and Indigenous knowledge of what is required to sustain them (Associated Environmental Consultants, 2020).

A conference on Environmental Flow Needs organized in 2018 on Syilx Okanagan Nation Territory in Kelowna, British Columbia went one step further in fostering dialogue on different water ontologies and world views. The conference was attended predominantly by water professionals from government, industry and consulting groups, NGOs, and academia (Jatel & Brian, 2018), however some 20 of the 150 participants were members of the Syilx First Nation. The conference was designed as a kind of social learning experiment, with talks given by scientific experts (e.g., one of the authors of this paper) and by Elders of the Syilx people. The Syilx Enowkinwix[w] Governance (SEG) Framework guided the organization of the discussions in interactive round tables. This setting allowed an equitable exchange characterized by mutual respect between ontologies rooted in Western Science and Indigenous world views emphasizing the indivisibility of humans and nature and the spiritual dimension of relations. Some important insights can be drawn from this conference (Derrickson et al, in preparation): There was consensus on the need and desire for bridge-building and trust-building between relevant organizations, people and ontologies to improve prevailing management approaches. Second, the Syilx Enowkinwix[w] Governance Framework proved to be a valuable system to explore complex issues such as Environmental Flow Needs—emphasizing different perspectives and value systems emergent in complex dialogue—enhancing information sharing and knowledge generation. Third, while good data and science are essential to setting credible EFNs, trust-based human relationships are perhaps even more important in achieving successful aquatic ecosystem management involving a transformation in human-nature relations toward respect and reciprocity. These insights are based on the results from the workshops which show that a reframing and a pluralistic approach respecting multiple ontologies is possible in dialogue settings.

In January 2022 the provincial government of British Columbia adopted an "Environmental Flow Needs Policy" for the implementation of the Water Sustainability Act. The document specifies a multiphase and multi-level risk-based approach to determine EFNs based on expert assessments of potential impacts of water diversions. This is a step toward a more transparent process to determine EFNs even when there is scope for improvement to give more emphasis to collaborative approaches and coordination with Indigenous governments which can be productive and transformative as the example of the EFN conference has shown. Furthermore, such developments are embedded in a political climate where First Nations have increasingly claimed their Indigenous rights, if needed also in court cases. Broadly similar to the process outlined above in Australia, environmental flow needs have been reframed in more cultural terms that explicitly

recognize the central place of people in the life of rivers in British Columbia. Furthermore, the British Columbia case has been particularly successful in having such perspectives adopted into the law. As highlighted by (Curran, 2019), "*Water governance conflicts cannot be resolved by greater consideration of traditional knowledge or Indigenous worldviews without addressing the locus of decision-making and attending to its depoliticizing tendencies.*"

3.2 | Legal personhood of rivers

Among the often-cited examples of how Indigenous ideas and practices are influencing water policy in colonized spaces is the granting of legal personhood to rivers. While the concept of granting legal rights to rivers and other aspects of non-human nature may be criticized as only entrenching European colonial legal discourses (c.f. Rawson & Mansfield, 2018), in at least some circumstances these developments complement Indigenous peoples' demands for the right to maintain and protect their distinct relationships with rivers. (e.g. O'Bryan, 2017; Salmond, 2014; Salmond et al., 2019) Nevertheless, the question remains: How can a European concept of legal rights do justice to Indigenous values and symbiotic relationships with rivers in these places? Some have argued that this question hinges on how these rights are constituted and implemented, and to what extent such constructs lead to legal pluralism and innovative approaches in governance (O'Donnell, 2020; O'Donnell & Macpherson, 2019a).

The idea of rivers (and other aspects of what Europeans consider "nature") as persons—putting them on the same moral and legal plane as humans—is not entirely alien to European history. For example, numerous records of legal procedures throughout Europe from the 13th to the 18th century show that animals were recognized as having moral and legal status equivalent to humans (Ferry, 1992, pp. 9–20). More recently, the legal scholar Christopher Stone introduced these notions into the scholarly and public debate drawing on broader ethical and moral arguments in the early 1970s with his famous 1972 book, *Should Trees Have Standing?* (Stone, 1972). In the past decade, such ideas are becoming the law in colonized spaces. Legal personhood has been granted to rivers in New Zealand, Colombia, India, Bangladesh (Macpherson, 2019b) and most recently Canada (Barkham, 2021).

However, it should be pointed out that the effectiveness of such legal arrangements may be questioned. O'Donnell (2020)argued that they are ineffective without appropriate institutional arrangements for their implementation and enforcement. Furthermore, having legal status does not necessarily imply that rivers hold specific rights. O'Donnell (2020) compared examples of riverine personhood (in Aotearoa New Zealand, India, Bangladesh, and Colombia) with examples of two Australian rivers that were granted living-entity status rather than legal rights. Her analysis showed that neither status guarantees the river's right to water. Existing water abstraction rights are not touched by the new legal status of rivers, nor are environmental flows guaranteed. As such, the river is just one of a number of competing rights-bearing uses such as irrigation agriculture or hydropower production that need to share water under a resource exploitation paradigm. This illustrates a critique of rights-of-nature strategies identified by Macpherson (2019a) and O'Donnell (2020) among others, who argue that such strategies do not represent a real paradigm shift allowing rivers to resist existential threats. The rights of rivers, they point out, can be effective where, instead of rights-bearing objects, the right constitutes a river-subject and strengthens socio-fluvial relations rather than inducing competition between the river and other uses. Such a notion of rights is more reflective of Indigenous world views, beliefs, and practices. The Whanganui River in New Zealand provides an example where steps have been taken in this direction.

3.2.1 | New Zealand

The Whanganui River is located in New Zealand's central North Island and has a length of 290 km. It has high spiritual importance for the local Maori, the Whanganui River Iwi. The river is a living ancestor toward whom they have a responsibility to care. However, river health has faced serious challenges from dam schemes for hydropower production, urban development, agriculture, and forestry in its catchment. The hydrological regime has been perturbed significantly and water quality has deteriorated. In 2017, an act of the New Zealand parliament granted the river legal personhood and settled a long dispute with the Whanganui River Iwi. The Te Awa Tupua Act recognises the status of the Whanganui River and its tributaries as "an indivisible and living whole". Such an understanding reflects an Indigenous ontology, fundamentally different Western views of what a river is or can be. It overcomes the fragmented Western conceptions of riverine landscapes where resource components (e.g., water, minerals, timber, wildlife) are segmented in their regulation and use.

The Act introduces representatives to act and speak on behalf of the river; one such representative is nominated by the Crown and another is nominated by the Whanganui River Iwi. The introduction of a human representative shifts more decision-making power to local communities. However, the Te Awa Tupua framework does not engage with demands of Whanganui River Iwi for substantive rights to own the river territory. As in Australia, the common law of New Zealand does not allow ownership of water in its natural state. Water is vested in the Crown on behalf of the New Zealand public. Hence, a variety of different public (e.g., fishing, navigation) and private uses (e.g. hydropower production) continue to exist and are managed under the umbrella of the Resource Management Act (Macpherson, 2019c). Despite these limitations, Talbot-Jones and Bennett (2022) highlighted the Whanganui River as an example of how granting rights to rivers can foster bottom-up governance. In this case the decision-making framework has been designed based on social norms, traditions, beliefs, and values of the local communities. Their role as stewards empowers them to enact these values in decision-making processes. It is yet too early to assess to what extent this empowerment will improve the state of the river and affect the relation of other non-Indigenous groups to the river.

However, apart from its direct effects, it should be noted that the Te Awa Tupua Act, and similar laws enacted elsewhere, can have powerful effects in terms of changing the way people think, and how they relate to rivers. As suggested by environmental lawyer and activist, Mumta Ito, "The changes in the legal system deeply affect the psyche. If the law says I'm in relationship with the ocean and the river then it won't be long before people start behaving as if we are interconnected with the other life forms on the planet." (quoted in Barkham, 2021).

4 | CONSIDERATION OF INDIGENOUS ONTOLOGIES AND PRACTICES IN THE EUROPEAN CONTEXT

Many Europeans are aware of the initiatives indicated in the section above, and the notion of applying such ideas and practices to the European context appears to be gaining traction in some quarters. For example, at least some EU commissioners and legislators have shown interest in recognizing legal rights of nature, including rivers (Barkham, 2021). Moreover, as already noted, there exist elements of ideas and practices within the European tradition that may be regarded as corresponding to Indigenous counterparts. However, applying Indigenous ideas and practices to water governance in Europe is complicated in the obvious sense that, except for the Sámi people, there are no recognized Indigenous Europeans. Putting the sort of relational and ontological ideas discussed so far in this article into effect is part of the political struggle of Indigenous peoples themselves who subscribe to, and practice alternative, non-European ontologies, and relationships with water.

With the notable exception of Sámiland, the application of such ideas and practices in Europe must be brought for the most part by non-Indigenous Europeans. However, such application involves no less a political struggle for transformation, albeit one that necessarily differs from the decolonization project involving "the repatriation of Indigenous life and land"[6] of Indigenous peoples in other continents. The application of these ideas to Europe is not merely a technical or managerial challenge. At a minimum, the struggle to (re)establish respectful and reciprocal relations with water in a European context involves reforms, especially to grant all Europeans the right to enter into such relations, as for example by guaranteeing the right and facilitating the (public) access to lakes, streams, rivers and other water bodies for all.

4.1 | Reconnection, Re-materialization, and restoring relations

Indigenous peoples often associate material water-related problems such as water pollution and aquatic ecosystem degradation with the breakdown of healthy relations between people and water resulting from European colonization. In Canada for instance, where unsafe drinking water in First Nations communities has been a critical issue for decades, many of the people most affected identify the problem with the extent to which "the original relationship" between people and water has been broken (Lavalley, 2006 p. 19; see also Wilson et al., 2019). In a study of aboriginal traditional knowledge and source water protection in the Province of Ontario, Canada, Lavalley reports

> "The Elders acknowledged that the relationship between the Anishinaabe peoples and water has changed dramatically over the years since contact with the settler population... All of the groups referred to a current estrangement from the water, resulting from the federal government's present-day control of water consumed by the community. They don't know the water coming into their homes." (Lavalley, 2006 p. 19)

The drinking water crisis in Canada's First Nations communities is complicated: In a material sense, it hinges largely on the discrimination, poverty and neglect resulting from colonization. Comparisons with water services in Europe would seem to be unfounded—except in the sense that Europeans hardly know the water coming into their homes either. Although reliable information is difficult to obtain, it is safe to say that most Europeans do not know the "raw water" source from which their tap water comes. Nor do they know where the water goes after having gone down the drain of the kitchen sink or flushed down the toilet.

An anecdote told by the mathematician and philosopher Olivier Rey is instructive. Rey's mother, a primary school teacher in France several decades ago, upon asking her class to name the three states of water, was surprised by the answer of one of her students: "tap water, toilet water, and pool water" the student replied. But as Rey correctly points out, such an answer is perfectly consistent with the experience of a typical European city-dweller (Rey, 2021 p. 127). Historical and anthropological research on hydrosocial relations in Europe describes a wealth of connections between people and water that existed in the past, but that have been almost entirely lost through our dependence on modern infrastructure and in modern scientific and managerial representations of water (Kalaora, 2001). Veronica Strang describes how:

> "Water has become "de-materilalized"... This "de-materialization"—a metaphorical abstraction of water in which it ceases to be particular to any place or group—is also a 'de-socialization' that denies the reality of local, specific human-environmental relationships and alienates the medium through which individuals can identify with a locale and its other inhabitants." (Strang, 2004 p. 246)

As a guideline, one means of applying Indigenous ideas and practices involving water in a European context would be to bring about the conditions in which water might be "rematerialized" for *all* Europeans, thereby allowing for the possibility of establishing respectful and mutually beneficial hydrosocial relations.

4.2 | Reference relations

As per the Water Framework Directive, the main objective of European water policy is that measures be put in place such that water bodies (lakes, rivers, wetlands, aquifers...) should attain "good ecological status". Good ecological status, in turn, is defined in terms of a reference condition for each type of water body. The Directive defines reference conditions generally as the conditions that would prevail in the absence of human activities, which are explicitly referred to as "disturbances" (European Commission, 2000: Annex V, Section 1.2). One could scarcely imagine a policy whereby humans and non-human nature are so entirely separated conceptually: The WFD considers human activities primarily as a source of disturbance that prevents water bodies from reaching their natural reference status (Steyaert & Ollivier, 2007). As such, the basic relations between water and people are pre-defined in our most important water policy document in the most negative of terms, a kind of original sin of disturbance, which can then at best be mitigated by measures ("responses") in the language of the models used to describe the WFD system.

This has been criticized as an "ontological fallacy", whereby failure to meet the goals of the Water Framework Directive is ascribed less to implementation deficits than to the "fundamental conceptual problem" built into the Directive whereby its objectives are based on the radical conceptual separation of humans from nature (Linton & Krueger, 2020). Our purpose however is to move beyond this critique to suggest a positive alternative—or at least a complementary—policy that can be described in terms of striving toward achieving improved hydrosocial relations that might be termed "reference relations". Taking inspiration from the Indigenous sources and from the kinds of relations maintained and practiced by Indigenous peoples as discussed above, the idea of reference relations shifts the focus away from attainment of/approximation to an idealized, state of the objective aquatic environment, and toward a focus on the existence and quality of relations between people and water and between people and their aquatic environments. In other words, we shift the focus away from water and toward (hydrosocial) relations, specifically characterized by respect and reciprocity.

A focus on reference relations would at once recognize and put into effect a way of understanding and acting that does not hinge on a basic, ontological distinction between people and nature: On the contrary, it would aim to have the effect of improving the overall quality of life (human and aquatic) through improvements in hydrosocial relations. Focusing on hydrosocial relations rather than the condition of aquatic ecosystems does not neglect the importance of the latter. On the contrary, the condition of aquatic ecosystems, the health of our waters is seen as a corollary, an effect of respectful relations. Implicit in the reciprocal quality of such relations is that all the parties involved benefit. This approaches McGregor's contention that water justice needs to include the waters themselves in the equation. Describing the principle of Mnaamodzawin—a theory and practice rooted in Anishinaabe and Cree cultures by which "humanity is obliged to care for its relatives, as they are obliged to care for us in reciprocity" (McGregor, 2019 p. 241)—McGregor describes how it has been practiced by Indigenous women participating in the Mother Earth Water Walk[7]:

> "Water justice will be achieved when Mnaamodzawin is realized, not only for people, but for the waters as well. The work of the Mother Earth Water Walk movement extends the current conception of water justice to include the well-being of the waters, not just for the sake of humanity, but for all of Creation." (McGregor, 2015 p. 76)

What specifically might reference relations with water look like? How might such a concept be put into practice? As is the case with reference conditions, we recognize that this represents a kind of ideal that would need to be defined through processes of consultation, concertation, and compromise. In other words, as with reference conditions, there is no "natural" reference upon which to base a precise definition for such relations. Further, while we may be inspired by an understanding of salutary relations that might have been maintained in other places and times, we do not rely on anthropology or history to serve as the legitimate basis for establishing such relations. What then is the referent for this notion of reference relations? Can we set standards for such relations? Several suggestions are offered:

First, some standard or basic coefficient for public access to water, to waterways, rivers and lakes would constitute a fundamental reference relation to water. Defining measures of public access would constitute a basic category reference relation to water. Such measures might help curb the growing tide of privatization of shoreline in Europe and around the world that increasingly make it increasingly difficult for most people to have any kind of direct, physical relation with lakes, rivers and ocean shoreline (Bertrand, 2022; Micallef, 2020; Ankersen, 2021; Habtemariam, 2022; Zafiropoulos, 2014).

One way of setting reference hydrosocial relations could be based on what Kondolf and Pinto describe as the "social connectivity" of urban rivers. The concept of connectivity is well developed in fluvial geomorphological, hydrological, and ecological discourse, referring generally to "water-mediated transfer of matter, energy and/or organisms within or between elements of the hydrologic cycle" (Pringle, 2003, quoted in Kondolf & Pinto, 2017 p. 182). Measured in longitudinal, lateral, and vertical dimensions, this serves as the basis for establishing the policy of "ecological continuity" in the European context. Restoring the ecological continuity of streams and rivers is a leading European water policy objective (Perrin, 2018); it has been described as "the flagship tool for achieving good ecological status of rivers" (Germaine & Barraud, 2017 p. 18) and "the panacea of the policy of river restoration in France" (Bravard, 2017 p. 10).

In effect, Kondolf and Pinto's concept of social connectivity extends an understanding of the river's natural connections to include people. They describe it (2017 p. 182) as "...the communication and movement of people, goods, ideas, and culture along and across rivers, recognizing longitudinal, lateral, and vertical connectivity, much as has been described for other rivers for hydrology and ecology."

For Kondolf and Pinto, the concept focuses mainly on social connectivity; rather than emphasizing connections between people and urban rivers, the rivers themselves count mainly as supports for longitudinal, lateral, and vertical connectivity between people. We would emphasize a shift in the axis of connection: Inspired by an Indigenous relational approach, we would emphasize the hydrosocial relations, and thus the "hydrosocial connectivity" of rivers. Coming up with measures of hydrosocial connectivity, much as European water managers have come up with definitions and measures of ecological connectivity and continuity, would be a step in the direction of establishing reference hydrosocial relations. For example, a standard reference relation might be defined in terms of a measure of the ability of the most disadvantaged of a city's population to access urban rivers and to exercise the three types-dimensions of connectivity described by Kondolf and Pinto.

Finally, as per the relational approach described in Section 2 of this article, the idea of establishing reference hydrosocial relations is less an end in itself than helping produce the conditions in which respect and reciprocity might characterize relations between people and water. A further point made by Kondolf and Pinto speaks to this: Describing "opportunities to enhance connectivity of the city with the river" they emphasize how "These connectivity concepts can serve ... to inform the increasingly widespread efforts to restore urban rivers." (2017 p. 183) Here, we draw attention to the principle of reciprocity flowing from a respectful relationship. The dictum cited above by Wilson and Inkster, "If you take care of the water, it will take care of you", applies equally in the reverse sense. The implication is that enhancing connectivity will help establish the hydrosocial relations conducive to motivating more people to take an interest in, and to take care of, the river, or the water in question. This, in turn, suggests what to us is a critically important point: from a relational perspective, the ultimate success of any water policy objective hinges on participation and involvement of people, of the public, in its realization. However, it will be important that such participation pays attention to re-establishing relations between humans and non-human nature on a long-term basis. This would require institutional innovations to establish and sustain foundations for co-management and co-decision making (e.g., citizen stewardship councils for rivers). As documented in Kochskämper et al. (2019) citizen and public participation as practiced in the implementation of the European Water Framework Directive has mainly followed an instrumental approach and has not been particularly effective in leading to improved environmental outcomes.

On this basis, we suggest that setting standards for reference relations and striving to meet them in concrete terms could conceivably help improve the record of public engagement and participation in European water policy and management. Moreover, the principle of respect and reciprocity suggests that public involvement and participation needs to be a positive policy objective. Setting standards for, facilitating, and adequately financing the participation of the wider public in water governance represents one means of achieving reciprocal hydrosocial relations in a modern, European context. Here, the need for positive action is readily apparent. Despite being a recognized objective of the Water Framework Directive (Section 14), it is widely recognized that "public participation" in water policy and management at the basin scale is dominated by powerful stakeholders who have the resources and the immediate motivation to act in their own interests (Crémin et al., 2018). As Rimmert, Baudoin, Cotta, Kochskämper & Newig (2020 p. 453) demonstrate, even public officials responsible for WFD implementation accept that citizen participation has had practically no impact on either environmental standards or implementation of measures. The initial confidence placed in the power of participation and consensus-building to deliver environmental quality objectives often lacked an appreciation of the asymmetrical power relations at play in many contexts (Bouleau et al., 2020; Rimmert et al., 2020).

These critiques of public participation processes for water management have points in common with the critique of Indigenous peoples and their allies of these models. For example, as Jeremy Schmidt has pointed out, the implementation of decision-making mechanisms allowing for public participation in water management in Alberta, Canada, has arguably had the effect of diminishing the legal standing First Nations people and working against aboriginal rights by requiring them to" articulate claims through procedures backstopped by the authority of the Canadian state" (Schmidt, 2014). Furthermore, the ontological foundation of liberal public participation processes presumes that the various "stakeholders" involved in the process have a stake in the *same thing*. The observations of Bruce Braun on participatory processes for governance of the Canadian west-coast rainforest are pertinent:

> "I began to wonder whether the language of 'stakeholders' and 'interests' was, in important ways, inadequate. I was struck by the spatial organization of the sessions, with chairs set in circles. Circles assume a centre, and the physical arrangement of chairs implied that, despite the varied economic and political 'interests' of participants, they were all contemplating and discussing the same object." (Braun, 2002, pp. 4–5)

Given that, as discussed above, Indigenous peoples are often not talking about the same *thing* as Europeans when they refer to water, we suggest that focusing participatory processes around questions of hydrosocial relations rather than around fixed water standards, statuses or outcomes could provide a basis for more meaningful participation.

4.3 | Hydrosocial flows

Before concluding, we want to consider how the "cultural flows" concept described in Section 2 might be taken up and applied in a European context. The most relevant current European policy—the "ecological continuity of rivers" (ECR)—has already been mentioned above. Combining measures to restore or facilitate the connectivity of aquatic organisms in rivers with the transport of sediments, it is perhaps the single most important policy guiding European river

restoration.[8] In practice, it aims at the removal of the tens of thousands of small dams and weirs that feature along most European rivers and streams. And yet, as with the experience of applying the environmental flows concept in Australia, ECR has run up against real problems when put into practice. This is especially the case in France, where the application of ECR has been met with fierce and largely unexpected opposition from owners and defenders of watermills, people living or owning property along rivers, producers or would-be producers of small-scale hydroelectricity, local fishing associations, local and national politicians including many members of parliament and hundreds of mayors, and senior and well-respected water scientists (Linton, 2022).

Such opposition can be explained, at least in part, by the contrast between the presumed "natural" reference conditions, which the policy seeks to "restore", and the actual nature of European rivers. Rivers in Europe (Nones, 2016) could be described as hybrid objects, internalizing natural and social processes that have been underway for hundreds if not thousands of years (Lespez, 2012). This makes any appeal to an ahistorical natural status as a basis or reference for restoring rivers complicated (Bouleau & Pont, 2015; Dufour & Piégay, 2009; Lespez et al., 2015). To give one example, ECR is based on a way of defining the nature of rivers that favors free-flowing watercourses, which in turn favor certain fish species, notably migratory fish including trout and salmon. The irony in this is that one of the arguments contributing to the critique of ECR in France comes from fishing associations, particularly those associated with practices of still-water fishing (Perrin, 2018). These groups have successfully argued that well managed and maintained mill dams and weirs support healthy ecosystems that are not only beneficial to fish but are conducive to the maintenance of riverbanks and the oxygenation of the water (Barraud & Le Calvez, 2017 p. 138).

Throughout this paper we have attempted to show how maintaining good hydrosocial relations with waters rather than attempting to procure or "restore" abstract "natural" reference conditions might be considered a guiding principle of Indigenous water management. Critics of the ecological continuity concept have pointed out that as well as a scientific and technical matter, river restoration always involves politics and questions of social relations (Linton, 2022). At the very least, to be successful, river restoration needs to become "a more democratically accountable process" (Wohl et al., 2015 p. 5984). Such democratic accountability necessarily entails opening the conversation to include a variety of different social relations with rivers as well as an expansion of the idea of what a river is. French researchers Germaine and Barraud recommend that we stop thinking of rivers and valley bottoms as "natural" and instead recognize them "as geographical objects humanized, constructed, represented and inhabited" and thus moving "from the question of ecological continuity to the development of real territorial projects" (Germaine & Barraud, 2013 p. 382). Similarly, Le Calvez (2017) has shown how ECR is based on a particular view of nature that is radically different from that of users and indeed of many citizens in general. Rivers are often apprehended as lived and familiar spaces—to which affective attachments are formed and familiar relations are established—as opposed to the objective, abstract phenomena rendered and acted upon by scientists and administrators implementing the policy of ECR. While tools for public participation (mediation, translation, etc.) are suggested to resolve the contradiction, Le Calvez admits that this is inadequate in a situation involving such radically different ways of perceiving rivers.

Making a similar argument, Perrin (2018) observes that, in most projects to restore ecological continuity, local residents express a desire that nonscientific appraisals of the river play a role in defining a territorial project rather than restoring something that might never have actually existed. Drawing on the work of Kondolf and Pinto (2017), he recommends rethinking the territory of river governance in terms of the "social connectivity" that rivers facilitate: "Thinking first about social connectivity instead of ecological continuity would, he argues, allow for a much wider range of participation in river restoration projects, and would help ensure their sustainability (Perrin, 2018, pp. 266, 267).

5 | CONCLUSION

> "The traditional native peoples hold the key to the reversal of the processes in Western civilization that hold the promise of unimaginable future suffering and destruction. Spiritualism is the highest form of political consciousness. And we, the Native peoples of the Western Hemisphere, are among the world's surviving proprietors of that kind of consciousness. We are here to impart that message." (Akwesasne Notes 1978, 91)

The above quote is taken from the Haudenesaunee (Iroquois) "Basic Call to Consciousness" originally published in 1978. Now, over four decades later, the "future suffering and destruction" alluded to by its authors is becoming more and more obvious. Among those for whom it is readily apparent are many of us in what might be described as the water community, whose job it is to pay attention to hydrological and hydrosocial phenomena, to try to understand current trends and to suggest what can be done about it.

We have drawn inspiration from Indigenous ontologies and practices to inform our call for rethinking and reforming European water policy to help dissolve the dichotomy between humans and nature and to re-establish relations between people and water on a basis of respect and reciprocity. Re-establishing lost or broken relations between rivers and people will take time: Beyond the raising of individual consciousness, it will require institutional innovation and transformative change in water governance inspired by political consciousness of the kind that might be understood in terms of spiritualism, in the sense that it puts people and waters on the same ontological plane. "Ko au te awa, ko te awa ko au" (I am the river, and the river is me) say the Whanganui people of Aotearoa—New Zealand (Salmond, 2014, p. 293). As we have seen, the Whanganui have succeeded in transforming this political consciousness into legal reality in having their River recognized as a legal person. Achieving something

similar for European rivers and other water bodies might seem far-fetched to some, but as we have tried to show, it is not without correspondences in European historical and philosophical tradition.

New institutional settings will have to emerge blending place-based procedures and situated local knowledge with technical expertise and scientific knowledge. Exchanges between established and emerging perspectives need to be characterized by mutual respect. Open processes and periods of change are prone to be abused by actors who want to impose their vested interests. Transparency and the quality of deliberation on what are desirable relations between rivers and humans need to be guaranteed by procedural rules. Establishing those would already be a major advance compared to the current unsatisfactory state of implementation of the European Water Framework Directive.

The principle of reciprocity means that we owe something to those from whom we have taken inspiration. At the very least we can signal solidarity with the peoples whose ideas and practices have begun to influence water governance and policy in at least some of the spaces colonized by European powers. Inasmuch as their ideas must be wedded to power to have effect, in the name of improved water governance, we would signal support for "the repatriation of Indigenous life and land" intrinsic to processes of decolonization in such places.

The "Indigenous life and land" most salient to our project is that of the Sámi people of northern Europe. We note that the Sámi Parliament upholds the principle that the Sámi, as an Indigenous people, should define "who we are" based on Sámi traditions and practices (Valkonen et al., 2017, p. 159). Such traditions and practices, including those involving water, might serve as an example of radical sustainability for the rest of Europe and specifically as a basis for reimagining and restoring European hydrosocial relations. However, Sámi traditions and practices can occur only in the context of their continued enjoyment of their traditional lands and waters. Sámi claims to the lands and waters in their region must therefore be respected and guaranteed by law. However, such guarantees are far from being realized, and they are ever more threatened in the face of proposals to accelerate resource extraction (including water) on their traditional lands (Eriksson, 2021; Kuokkanen & Bulmer, 2006).

Finally, we intend this paper as a first step, to be followed up with processes of engagement with Indigenous peoples, especially with the Sámi, but also with Indigenous peoples living in the colonized spaces mentioned above. The guiding principle for such processes of engagement would be that they be mutually beneficial to the peoples and the waters involved.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ENDNOTES

[1] Jamie Linton is a Canadian citizen living in France since 2013, who has long been interested in the relations between Indigenous people and water and in how modern water projects affect Indigenous people (e.g., Linton, 1991; Linton, 2019). Claudia Pahl-Wostl is a German citizen and researcher who has long been working on transformative change in water management and has become interested in the role of Indigenous worldviews in this respect (Pahl-Wostl, 2015, Pahl-Wostl, 2020).

[2] See Unity Earth (2022), "Restoring Right Relationship with Water." In this exchange, Indigenous scholars Anne Poelina and Pat McCabe discuss the importance of restoring right relationship with water as a foundation of life.

[3] For example, introducing a special issue on the theme "Thinking relationships through water", Krause and Strang (2016, p. 633) "hope to contribute to a more explicitly relational study of water in society. Water is not just the object of social relationships, or merely a natural resource on which claims are made, to which meanings are attached, and over which political conflicts erupt. We suggest that if we study how social and hydrological relationships are interconnected and mutually constitutive, a much deeper understanding of the role of water in human social lives can be gained, and significantly better management and policy can be designed." See also Linton (2010, pp. 24–44).

[4] West et al. show how "the 'relational turn' in the humanities and the social sciences" has begun to influence sustainability science (West et al., 2020). They point out that "Scholarship associated with relational thinking now spans a dizzying number of disciplines and fields, including human geography, sociology, science and technology studies, psychology, policy studies and public administration, Indigenous studies, social and political theory, political ecology, organization studies, environmental humanities, and many more." (ibid., 308)

[5] The same applies in French, with habitual, frequent reference to "les ressources en eau" to describe water generally.

[6] Such actions may be seen as contributing to the project of decolonization, whereby ontological difference is an intrinsic-relational component of the "deeply materialist" political project "that centers on the repatriation of Indigenous life and land [including water]" (Yazzie & Baldy, 2018, p. 6; see also Tuck & Yang, 2012; Tuck et al., 2016, pp. 8–11).

[7] Between 2003 and 2009, Josaphine Mandamin, an Anishnaabe elder from Thunder Bay, Canada, led numerous walkers around each of the North American Great Lakes and down the St. Lawrence River to where it meets the Atlantic Ocean. This is known as the Mother Earth Water Walk. At the mouth of every stream and river tributary to the Great Lakes, Mandamin and her companions would stop and speak directly to the water, offering prayers, tobacco and thanks (McMahon, 2009).

[8] This is certainly the case, at least in France, where it is described as "the flagship tool for achieving good ecological status of rivers" in France, as called for by the EU WFD (Germaine & Barraud, 2017, p. 18), and even "the panacea of the policy of river restoration in France" (Bravard, 2017 p. 10).

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