



## The ecosystem commons

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**Auheke:** Kei te ngaro haere ngā tohu taiao o Aotearoa o te ao whānui hoki, pēnei i te wai ora. Ko te mate hoki kāre e āro ana te tangata me pēhea e whakatika, mā wai, me pēhea e whakarite, ka patua tonu. I te tau rua mano tekau ma iwa ka whakaetia te Kāwanatanga me tū te awa o Whanganui hei tangata i raro anō i tōna ake mana. Ahakoa he mea rerekē tēnei ki te ao Pākehā, ehara ki tō te tikanga Māori. Ko te kaupapa o tēnei tuhituhi he pātai mena koianei te huarahi, ina ra te whakatangata i ngā tohu taiao kia rite ai ki te ture Pākehā, kia ngāwari ake te whakatikatika haere.

**Abstract:** Ecosystem services, such as a river's water quality, are in decline, both in New Zealand and worldwide. The tragedy of the ecosystem commons describes the process where 'free' ecosystem services are overused and degraded, yet common economic prescriptions do not provide an effective governance system for ecosystem service loss. In 2017, the New Zealand parliament granted the Whanganui River legal personhood, thereby recognising the River as "an indivisible and living whole comprising the Whanganui River from the mountains to the sea". Assigning legal personhood status to a natural ecosystem aligns with the Māori view of ecosystems and provides a governance framework such that activities of exploitation have to be evaluated against the impact on the ecological health of the system as whole. Ecosystems as legal entities may provide a flexible and durable solution to the tragedy of the ecosystem commons.

**Keywords:** biodiversity, governance, legal entities, natural resources, personhood, resource management

## Introduction

For millions of years, New Zealand's biodiversity evolved in isolation, resulting in an internationally recognised abundance of unique flora and fauna (Tennyson 2010). Over 80% of New Zealand's vascular plants and insects are endemic, and its ecosystems are distinctive including native forests, river systems, geothermal systems and seamounts (DOC 2016). The natural environment is an integral part of New Zealand's identity and contributes considerably to gross domestic product through tourism and the primary sector (Stats NZ 2018). The Government has introduced a Living Standards Framework, with the purpose of measuring the state of New Zealand's natural capital as a constituent of wellbeing (The Treasury 2018). In a statement to the United Nations General Assembly in 2019, New Zealand's Prime Minister wanted New Zealand "to be the best place in the world to be a child"; yet many of the ecosystems human wellbeing depends on have declined (e.g. Díaz et al. 2006; Millenium Ecosystem Assessment 2005, IPBES 2019). In 1997, New Zealand's first State of the Environment Report cited indigenous biodiversity decline as the "most pervasive environmental issue" (Ministry for the Environment 1997).

The problem of ecosystem service loss has been a worldwide phenomenon, solutions to which include changes

in institutional frameworks, the use of economics tools, behavioural changes and technological advancements (Millenium Ecosystem Assessment 2005). However, as a recent report by the UN shows, over 1 million species are now facing extinction as ecosystem functions continue to deteriorate (IPBES 2019). Along with a small number of countries, in 2014, the New Zealand parliament declared that Te Urewera, a forested, sparsely populated hill country region in the North Island, "is a legal entity, and has all the rights, powers, duties, and liabilities of a legal person" (Te Urewera Act 2014). In 2017, the Whanganui River followed suit in becoming a legal entity, thereby traversing the political battlefield of natural resource ownership, and gaining recognition of the Māori view of ecosystems.

The idea to give legal rights to 'natural objects' within the environment, not too dissimilar to how corporate entities legitimately act as legal personhoods, started with a publication in the Southern California Law Review entitled 'Should trees have standing? – Legal rights towards natural objects' in 1973 where the argument was made that extending non-human entities to ecosystems is to simply widen our current understanding of legal personhood (Stone 1973). This shift in conservation ethics, we argue, provides a unique and flexible solution to the tragedy of the ecosystem commons. This article describes the tragedy of the ecosystem services and

its relevance to New Zealand, the Māori view of ecosystems, the history of exploitation of the Whanganui River and the notion of legal personhood.

## Tragedy of the Ecosystem Commons

The tragedy of the ecosystem commons (or ecosystem services *sensu* Lant et al. 2008) plays on Hardin's (1968) famous tragedy of the commons metaphor which describes the process of natural resource degradation and overexploitation due to the "remorseless working of things". Unregulated common pool resources will eventually be overconsumed or degraded due to the economic incentives provided by a resource that is 'free' to use, i.e. free in a sense that it is open access or unowned. Hardin's (1968) metaphor has had a profound effect on the academic discourse of renewable resource exploitation in economics, now routinely taught at university (Tietenberg & Lewis 2018; Field 2001; Hartwick & Olewiler 1998). In 1990, Ostrom published her seminal book 'Governing the Commons' challenging the conventional economic prescriptions of property rights and regulation to address the overuse of common-pool resources (Ostrom 1990). Ostrom provided a general framework of common property management, earning her the Noble Prize in Economic Sciences in 2009, and pioneered a growing literature in the adaptive governance of social-ecological systems (e.g. Dietz et al. 2003; Folke et al. 2005; Folke 2007; Nelson et al. 2008; Ostrom 2009, 2010).

However, translating complex, social-ecological processes into effective governance structures has been challenging (Dietz et al. 2003), and Hardin's tragedy can be understood as one of ecosystem service loss (Lant et al. 2008). The Millennium Ecosystem Assessment (2005) categorises ecosystem services into supporting services (nutrient cycling, soil formation etc.), provisioning (food, fresh water, etc.), regulating (climate regulation etc.) and cultural services (aesthetic, spiritual etc.), which provide the constituents of human well-being in terms of security, basic resources, health and good social relations (Millennium Ecosystem Assessment 2005). The need to recognise and measure the value of ecosystem services is often linked to the concept of 'natural capital' (TEEB 2010), which the Treasury in New Zealand describes as "all aspects of the natural environment. ... and, also includes broader ecosystems and their services – i.e. the joint functioning of, or interactions among, different environmental assets, as seen in forests, soil, aquatic environments and the atmosphere" (Au & van Zyl 2018). The Treasury proposes to measure the quality of New Zealand's capital stock by such indicators as air quality, access to the natural environment, water quality and perceived environmental quality (The Treasury 2018). However, measurement alone does not address the drivers of ecosystem services loss.

In economics the issue of human-induced ecosystem loss is often described in terms of externalities or the public good nature of many of the ecosystem services (Tietenberg & Lewis 2018). For example, the pollution of waterways from dairy farming is an externality in the sense that it imposes a cost on society for recreational, angling or drinking water users. On the other hand, the public goods nature of ecosystem services relates to the fact that society may benefit from the biodiversity and water filtration of wetlands but the landowners of such are not able to appropriate these benefits, and therefore face the incentive to convert land to more profitable uses.

Another way to look at ecosystem services loss is in terms

of Hardin's tragedy of the commons. Many of the ecosystem services are common pool resource that are free to use, i.e. no one owns the capacity of the riverbed to assimilate nitrogen and phosphorus from dairy farming, therefore farmers face the incentive to 'overuse' it for effluent discharge. Similarly, no one owns the capacity of the wetland to provide biodiversity or water filtration, leading to its loss from development. Fundamentally, imperfect or lack of ownership of ecosystem services is what leads to the tragedy of the ecosystem commons.

## A Māori view of ecosystems

The customs, beliefs, and resource management practices of Māori are relevant to avoiding the tragedy of the ecosystem commons because indigenous peoples of the world were / or are what we now sometimes call 'ecosystem people', described by ecologist Raymond Dasmann as "members of indigenous cultures who live within a single ecosystem" (Ulluwishewa et al. 2008). The close interdependence between humans and ecosystems culminated in a nexus of practices that served as a means by which sustainable resource exploitation and survival was ensured (Kawharu 2000). This may provide a framework for effective management of the ecosystem commons (Kahui and Richards 2014).

Pre-colonial Māori resource management has been described widely in the literature (e.g. Kawharu 2000; Paulin 2007; Kitson & Moller 2008; Geary et al. 2019). For example, Williams (2004, 2006, 2012) describes resource management decisions of the southern iwi Ngai Tahu, who occupied a vast territory south of Banks Peninsula in the South Island. Kahui and Richards (2014) applied Ostrom's framework to show that kaitiakitanga (stewardship) as an integrated resource management system provided Ngai Tahu with the tools to govern their ecosystems. While traditional Māori concepts, customs, and beliefs vary by region and iwi across New Zealand (Timoti et al. 2017), many writers such as Durie (1994), Kawharu (2000), and Harmsworth and Awatere (2013) point to the important underlying concept of Māori as seeing themselves as an integral part of the ecosystem, rather than separate. For Māori, the spiritual link between humans and ecosystems is represented by the primordial parents Ranginui (sky father) and Papatūānuku (earth mother); Ranginui and Papatūānuku were forcefully separated by their children, the process of which gave birth to different ecosystems (Patterson, 1998). Accordingly, mana whenua (authority over land and resources) is not held over land but rather in an area (Williams, 2004). The belief in a shared origin by the Māori cosmology of creation negates the notion of ownership over land. Instead, rights to resources were based on the interlocking principles of rangatiratanga (expression of one's chieftainship), mana whenua, and ahikā ('burning fires', a metaphor for permanent occupation) such that ruling iwi, hapū (sub-tribe) and whanau (family) exercised mana whenua within occupied areas (Williams, 2004).

This view of ecosystems stands in contrast to the Judeo-Christian view, which suggests that man is created in God's image, and therefore a superior entity that has dominance over the rest of creation (Roberts et al. 1995). The following provides a historic example of the tension between views on natural resource ownership in New Zealand.

## The Whanganui River owns itself

The history of deliberation of ownership rights for the Whanganui River in New Zealand began during British settlement. The information for this section is taken from

Ruruku Whakatupua, Whanganui River Deed of Settlement between the Crown and Whanganui Iwi (Summary of the historical background to the Whanganui River claims of Whanganui Iwi at [www.govt.nz/treaty-settlement-documents/whanganui-iwi/whanganui-iwi-whanganui-river-deed-of-settlement-summary-5-aug-2014/background/](http://www.govt.nz/treaty-settlement-documents/whanganui-iwi/whanganui-iwi-whanganui-river-deed-of-settlement-summary-5-aug-2014/background/)). In 1848 the Crown jurisdiction had asserted ownership over the greater Whanganui area, which included the river, and after 1885 had implemented a steamer service which required river works for the ‘improvement’ of river rapids. The Whanganui iwi protested against steamer operations on the river, stating that the ‘improvements’ had destroyed many of the eel weirs and fisheries, which were central to the tribes as sources of food.

In 1891 the first Trust Act was passed to ensure conservation and the navigability of the river; however, the Whanganui iwi were not included on the Trusts board, limiting their interests and involvement. The iwi protested against the Trust board’s activities but river works continued and by 1903 legislation was passed to allow the extraction and sale of river gravel by the Crown. The Whanganui iwi continued to protest against the destructive activities carried out by government legislators and in 1927 the iwi demanded monetary compensation in lieu of disregarding scenic preservation, fisheries and eel weirs, extraction of gravels, and profiting from the steamer operation. By 1937, the failure to adequately meet these demands resulted in the iwi claiming ownership of the Whanganui River, a claim that remained unsettled for decades. It was not until 1988 that the Whanganui Māori Trust Board was established to represent iwi beliefs and negotiate the settlement of claims and grievances. To that end, in 1990 the Trust lodged the Whanganui River Claim with the Waitangi Tribunal.

As part of settlement negotiations, the Te Awa Tupua (Whanganui River Claims Settlement) Act 2017 was passed granting personal legal status to the Whanganui River and its catchment, and establishing an innovative governance framework (O’Donnell & Talbot-Jones 2018). The Act recognises Te Awa Tupua as “an indivisible and living whole comprising the Whanganui River from the mountains to the sea, incorporating all its physical and metaphysical elements” with its own legal personality and all the corresponding rights, duties and liabilities of a legal person, including the right to sue and be sued in court.

Efforts to provide legal identity to nature and ecosystems in other countries have had limited success, as few cases had been upheld in court due to lack of enforcement and capacity (O’Donnell & Talbot-Jones 2018). To enforce the legal rights of ecosystems successfully, a human face must be appointed to act on behalf of the ecosystem and uphold rights; sufficient capacity in terms of money, time and expertise has to be provided; and finally, representatives and funding sources have to act independently (O’Donnell & Talbot-Jones 2018). The human face of Te Awa Tupua will be represented by Te Pou Tupua, a guardian who acts and speaks on behalf of the health and wellbeing of the river. In the spirit of the Treaty of Waitangi, Te Pou Tupua will consist of one person appointed by the Crown, and one by the Whanganui iwi, who are required to act in unison (Te Awa Tupua Act 2017). The implementation of the Te Awa Tupua framework is financially supported by the Crown to provide sufficient capacity. To allow for an independent, collaborative decision making process, Te Pou Tupua will be supported by an advisory group and a strategy group comprising representatives of iwi, central and local government, and other groups with interest in the Whanganui River, such as tourism, conservation, recreation, wild game and hydropower.

## Ecosystems as Legal Persons

Black’s Law Dictionary (2019) defines a legal person or entity as “a lawful or legally standing association, corporation, partnership, proprietorship, trust, or individual, which has legal capacity to (1) enter into agreements or contracts, (2) assume obligations, (3) incur and pay debts, (4) sue and be sued in its own right, and (5) to be accountable for illegal activities”. Both human and non-human entities can attain legal personhood and bear rights, where the former is referred to as a ‘natural’ person (Srivastava 2015). Corporations, on the other hand, are an example of non-human entities with legal personhood status, which provides security for the economic wealth and development of the corporate entity. One of the most critical features, limited liability, allows corporations to mitigate risk and attract investors. At the same time, providing the ability to own assets, capital and land in the corporation’s own name means no single investor or stakeholder has majority control, but rather control is vested in the name of the corporation itself. This specifically is what has given rise to the metaphor of ‘corporate personality’ and ‘corporate person’, in the sense that it asserts its own entity separate to that of stakeholders (Srivastava 2015).

The result of the transformation of the Whanganui River from the property of the Crown to a legal entity, such that it owns itself, has reconceptualised the meaning of legal personhood. Three years prior, the Te Urewera region had similarly achieved the status of legal entity, Australia had established the Victorian Environmental Water Holder (VEWH) as a legal person, and a mere five days after the Whanganui River bill passed, the river Ganges in India was recognised as its own legal entity (O’Donnell & Talbot-Jones 2018).

The argument for reconceptualising the meaning of legal personhood is not a radical departure from the practices of medieval legal scholars who had spent hundreds of years struggling with the notion of public ‘corporate bodies’, the Church and the State (Stone 1973). How is it that they would exist in law transcending the Pope and the King? The idea of corporate bodies had been unthinkable at the time, but it is also this ‘unthinkable’ which allowed further deliberation of an extension of rights to nature and the environment (Stone 1973; Stone 2010). Fundamentally, legal personhood for ecosystems allows for the transfer of ownership to natural objects and ecosystems such that the environment as entities have value to flourish for their own existence, and not merely as property expended for human use. The Whanganui River was exploited and degraded under the jurisdiction of the Crown but now operates rights, powers and liabilities of a legal person whose legal rights can be enforced.

## Discussion

The continued depletion of ecosystem services comes down to a lack of, or imperfect, ownership. The ownership of land provides a property right for land use, but the resulting externalities from land conversion, such as biodiversity loss, aesthetic impacts or pollution, arise from the fact that these constituents of supporting, provisioning, regulating or cultural services are provided for free. This leads to the tragedy of the ecosystem commons. Regulatory prescriptions, such as water quality requirements and restrictions on polluting activities, are necessary but insufficient to address Hardin’s tragedy of the commons in the long run. A revision of management

practices is required in order to achieve greater conservation and quality of ecosystems in New Zealand.

An ecosystem that owns itself legally represents a complete shift in conservation management, and aligns with a view of ecosystems that iwi have long held. Mana whenua (authority over land and resources) is held over land, negating ownership of land and emphasising the shared origin of mankind in nature such that humans perform a guardianship role, rather than one of dominion. The Whanganui River as a legal entity provides explicit recognition of this view, such that the river has value to flourish for its own existence, not merely as property expended for human-use. Under the jurisdiction of the Crown, the rights to gravel and water abstractions were exercised at the cost of the loss of ecosystem services such as water quality, spiritual, aesthetic and other important functions.

Under Te Awa Tupua an innovative governance framework will be enacted to address the tragedy of the ecosystem commons by recognising the Whanganui River as “an indivisible and living whole comprising the Whanganui River from the mountains to the sea.” By establishing (1) a human face of the river (a guardian), (2) a supporting advisory and decision making group that is composed of multi-stakeholder representatives, and (3) financial capacity to challenge and uphold legal rights in court, governance structures are set to consider the effects of water resource utilisation on the system as a whole. Every activity that affects the resources of the river has to be evaluated according to its impact and risk on the ecological health of the Whanganui River, as well as the impact on stakeholders. This type of collaborative decision-making provides a way to integrate and govern the effects of human exploitation of ecosystems as a whole, something that would not only align with a growing call for ecosystem based management (e.g. Garcia & Cochrane 2005; Curtin & Prellezo 2010; Millennium Ecosystem Assessment 2005), but is also very much in the spirit of Ostrom’s governance framework of common-pool resources (Ostrom 2010; Talbot-Jones 2017).

However, the success of the Te Awa Tupua, and other such frameworks, will hinge on the quality of the institutional process and transaction costs. Collaborative frameworks with a multitude of stakeholders who hold opposing views can grind decision-making to a halt if the process to arrive at a decision is too complex or costly (O’Donnell & Talbot-Jones 2018). The institutional process has to clearly articulate how decision making will be enacted in a democratic and timely fashion, allowing for difficult decision to be made both in the long and in the short term. Stakeholder representatives need to be effectively compensated for their opportunity cost of travel, and time to avoid process fatigue or capture. These, and other procedural details, need to be carefully considered.

Throughout history, each successive inclusion of rights-bearers had been met with backlash, from slaves, to women, to children, and animals. Proposals which see a transfer from a ‘thing’ such as nature and ecosystems to a rights-holder will be contested as it holds individuals and society legally accountable for the degradation and overexploitation of ecosystem services. We are now at a crossroad where the continued depletion of ‘free’ ecosystem services requires new solutions to ever more complex problems in a world of population growth and multiple stakeholders. The Māori view of ecosystems, in union with New Zealand’s legal system, may provide a flexible and durable solution for future generations to come. In the spirit of Stone’s (2010) ideas, nature as legal entities should now be thinkable.

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