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Building biocultural approaches into Aotearoa – New Zealand’s conservation future

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ABSTRACT

Indigenous peoples’ roles in conservation are important because they offer alternate perspectives and knowledge centred on the quality of the human–environment relationship. Here, we present examples of Māori cultural constructs, mechanisms, legislative warrants and customary (traditional and contemporary) interventions fundamental to the development and delivery of biocultural approaches within NZ’s future conservation system. Biocultural approaches emphasise greater decision-making for the environment at the local institutional level, and contribute towards rebuilding a ‘tuakana–teina’ relationship (a reciprocal learning relationship and responsibility shared between older and younger persons) between societies and their environments. We further posit that the matching of social scales with ecological scales within local management is necessary for the effective implementation of biocultural approaches. Failure to do so could undermine motivation, action, energies and confidence of local communities.

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Introduction

Contributions of Indigenous peoples to conservation and environmental management are important globally because they offer alternate perspectives centred on the quality of the human–environment relationship (Berkes 2004; Sobrevila 2008; Thaman et al. 2013; Bron-dizio and Le Tourneau 2016; Timoti et al. 2017). Indigenous peoples’ societies are commonly embedded within dynamic social-ecological contexts (Berkes et al. 2003), characterised by biocultural approaches for coupling with the environment. Biocultural approaches have been defined as, “*conservation actions made in the service of sustaining*

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the biophysical and sociocultural components of dynamic, interacting and interdependent social-ecological systems” (Gavin et al. 2015, p. 141). Further, these actions “*comprise the diversity of life in all of its manifestations – biological, cultural, and linguistic – which are interrelated and likely co-evolved within a complex socio-ecological adaptive system*” (Maffi and Woodley 2010, p. 5). A conservation system that employs biocultural approaches will be organised within multilevel governance and institutions that are linked to place, and responsive to local contexts, diverse objectives including economic aspirations, and inter-generational planning. The recognition and promotion of diverse worldviews, values, knowledge systems, and the rights and responsibilities of partners are also fundamental features of biocultural approaches to conservation (Gavin et al. 2015).

Degradation of land and water, declines in biodiversity, conflict over access to and use of natural resources, rural-to-urban migration, marginalisation, and the intrusion on rights by government and non-government organisations, interfere with Indigenous peoples’ relationships with the environment (Moller 1996; Mistry and Berardi 2016; Lyver and Tylia-nakis 2017; Parlee et al. 2018). The effects of these drivers become accentuated as Indigenous peoples spend an increasing amount of time removed from their cultural context. Many of these factors are issues for Māori [the Indigenous peoples of Aotearoa – New Zealand (NZ)], despite the protection of rights and property of Māori guaranteed within Te Tiriti o Waitangi 1840 (Treaty of Waitangi 1840); the constitutional framework between Māori, commonly known as tangata whenua (the original inhabitants which literally means “people of the land”), and the NZ government (Orange 2011; Jones 2016).

Since the late 1800s, the colonial government in NZ has applied a conservation paradigm and laws for the environment that were derived from historical European norms, which have subverted Māori rights and responsibilities for the environment (Ruru 2004). Although a few early philosophical works that contributed to the nascent conservation movement argued for an intimate relationship between people and nature (Thoreau 1854), the modern conservation movement gained its momentum primarily from a drive to protect the natural environment from exploitation and conversion to agriculture, particularly in the British colonies during the mid-nineteenth century. In this context, the view of humans as a destructive force against (rather than a natural, sustainable component of) ecosystems was extolled (Cleghorn 1861) and led to the formation of early forest conservation programmes and prohibition of certain land uses (e.g. shifting agriculture) in the British colonies. This paradigm persists in today’s protectionist conservation ethos worldwide, where nature has a right to exist free from human interference. Moreover the protectionist perspective is supported by many non-governmental conservation organisations and multilateral instruments globally (discussed below). In contrast, Indigenous peoples, including Māori, see themselves as an intrinsic part of the ecosystem and connected to it through whakapapa (genealogical connections) in which conservation is fundamental to maintaining future use of, and connection to, the environment (Richardson 2008; Harmsworth and Awatere 2013). While neither of these perspectives have greater scientific validity (i.e. they are subjective aspirations), the European, protectionist view has had legislative primacy in NZ (e.g. Wildlife Act 1953; Conservation Act 1987). In fact, the seizing of sovereignty for the environment progressively from tangata whenua by the Crown after the signing of the Treaty of Waitangi has been a source of grievance and ongoing conflict. Regaining levels of governance and decision-making for lands and environment therefore have been significant parts of Treaty of Waitangi claims and

settlements for Māori since the mid-1990s (New Zealand Government 1998; Waitangi Tribunal 2011, 2013).

In response to the resurgence and recognition in law and policy of Māori land and resource rights over the last three decades, the NZ Department of Conservation (DOC, the government ministry responsible for conservation in NZ), has entered into more than 40 conservation protocols, accords, relationship agreements, and memoranda of understanding with tribal authorities allowing Māori to exercise some of their environmental responsibilities as kaitiaki (guardians; Ruru 2004; NZ Government 2014; Controller and Auditor-General 2016). While these governance and co-management arrangements have delivered biodiversity gains and opportunities for Māori community engagement (e.g. translocation of Snares Island snipe, *Coenocorypha huegeli*, to Putauhinu Island; Miskelly et al. 2012), the scope and context of these arrangements are still largely bounded by conservation statutes focused on the preservation of flora and fauna (e.g. Wildlife Act 1953; National Parks Act 1980; Conservation Act 1987). Missing from these partnerships however, are the rights and aspirational goals of tangata whenua to use NZ's native biodiversity once populations reach safe levels (Moller 1996; Timoti et al. 2017; Ruru et al. 2017). Māori are, in effect, being asked to engage with and contribute to a national conservation system that often conflicts with their constitutional right to engage with the environment on their own terms which was guaranteed under the Treaty of Waitangi (e.g. "*Her Majesty the Queen of England confirms and guarantees to the Chiefs and Tribes of New Zealand and to the respective families and individuals thereof the full exclusive and undisturbed possession of their Lands and Estates Forests Fisheries and other properties and other properties which they may collectively or individually possess so long as it is their wish and desire to retain the same in their possession; ...*" (Wilson 2016).

With this in mind, the objective of this paper is to explore how biocultural approaches in conservation better support the relationships tangata whenua have with their local environments, and contribute to reversing the decline of biodiversity. We describe examples of cultural constructs important for understanding the biocultural linkages tangata whenua have with their landscapes and plants and animals. We also propose te ao Māori (Māori worldview) constructs, mechanisms, and legislative warrants that could contribute to the development and delivery of biocultural approaches in conservation. Examples of customary (implying both traditional and contemporary) interventions that inform biocultural approaches within conservation are presented. Lastly we consider the roles of local institutions in delivering biocultural approaches, the importance of matching social and ecological scales, and how biocultural approaches could assist with a broader societal re-evaluation of the human–nature relationship.

Confronting cultural asymmetries within NZ's current conservation model

Cultural bias in conservation management practices continues to be a point of contention in NZ. The current interpretation of NZ's conservation law (e.g. Conservation Act 1987, National Parks Act 1980, Wildlife Act 1953) by Crown representatives and courts provides the greatest barrier to Māori expressing tino rangatiratanga (absolute chieftainship or unconditional sovereignty) and practicing kaitiakitanga (cultural institutions, values, strategies and practices for environmental management). Much of NZ's conservation legislation was enacted prior to the first treaty settlement in 1995 with the Waikato–Tainui Iwi (tribe),

and represents an ideology of generations from the mid-20th Century or earlier (Ruru et al. 2017). Despite the development of *sui generis* legislation through treaty settlements (e.g. Te Urewera Act 2014 – New Zealand Government 2014), the rights, values and aspirations of tangata whenua (e.g. Lyver et al. 2017) are still largely interpreted and enacted in the context of over-arching statutory regulations. Moreover, despite some legislative amendments and policy language (e.g. “... give effect to the principles of the Treaty of Waitangi”; Section 4 Conservation Act 1987) attempting to reflect changing attitudes in society and enact treaty settlements, the fundamental ethos of NZ’s conservation law offers limited rights and opportunities for tangata whenua to apply their own environmental ethic. While some policy documents (e.g. *The General Policy for National Parks*) do offer the potential for implementation of customary management and use of plants and animals, the language is heavily qualified. Kawa (customs and protocols), tikanga (practices or behaviours) and rights to decision-making often remain subordinate to the relevant Acts, regulations and management plans. Ministerial consent and oversight remains mostly paternalistic and a cornerstone for all legislation (Ellison 2001; Solomon 2014). In its application, conservation law has criminalised tangata whenua for practicing traditions that should have been protected as a treaty right (Ruru 2017). Māori elders have described the conservation protection objective as “hostile to the customary principle of sustainable use, and the spiritual linkage of Iwi with indigenous resources is subjected to paternalistic control” (Ellison 2001).

The inconsistent application of conservation law is a significant issue that confronts Māori (see examples below). While the majority of native birds in NZ are legally protected (Wildlife Act 1953), four species of native waterfowl species (Paradise shelduck, *Tadorna variegata*; Grey duck, *Anas superciliosa*; Australasian shoveler, *Anas rhynchotis*; Black swan, *Cygnus atratus*) that are managed by Fish and Game, NZ (a body set up under the Conservation Act 1987 with the statutory responsibility for the sports of freshwater sport fishing and game-bird hunting) can be legally hunted by members of the public that hold season gamebird licence or a permit to cull. This is despite one of the four species, the grey duck, being classified as ‘nationally critical’ (Williams 2013). Fish and Game, NZ also releases invasive non-native salmonid species (e.g. brown trout, *Salmo trutta* and rainbow trout, *Oncorhynchus mykiss*) into NZ’s lakes and waterways for sports fishing (e.g. Fish and Game 2017) which prey on native freshwater fish species (e.g. *Galaxias spp*; Townsend and Crowl 1991; McIntosh 2000) and invertebrates (Townsend 1996). Moreover, the offspring of threatened galaxiid fish species (commonly called ‘whitebait’) are widely harvested and sold commercially, with little management oversight. In contrast, tangata whenua have been blocked from managing culturally significant species such as the kererū (NZ pigeon, *Hemiphaga novaseelandiae*) for harvest, which is listed as ‘not threatened’ but nevertheless receives full legal protection (Powlesland 2013). As stated by Wright et al. (1995, p. 83), “there is no clear universal rationale for the present mixture of use and harvest prohibition”. Moreover, legislative protection of wildlife from direct harvesting has not been matched by protection of wildlife from the impacts of widespread western methods of food production and resource use through farming (e.g. continued removal of wetlands from non-public conservation lands – Ewans 2016). The removal, intensification and disturbance of habitat essential for supporting native biodiversity has been recurrent, while rights and aspirations of tangata whenua to access and have use of important mahinga kai (traditional foods and its procurement) have been blocked (e.g. kererū, Lyver et al. 2008, 2009; Miskelly 2014).

Efforts to engage biocultural approaches in NZ's current conservation model

Against this backdrop of a western conservation ethos, efforts to address issues of governance with Māori have advanced the engagement of tangata whenua in conservation initiatives over the last three decades. For example, Rakiura Māori from the southern Tītī (Muttonbird) Islands, adjacent to Stewart Island, have maintained legally sanctioned rights to access and manage the islands, which include the sustainable harvest of tītī in accordance with their kaitiakitanga (Tītī (Muttonbird) Islands Regulations 1978; Bragg et al. 2007; McKechnie et al. 2010). However, conditions governing the return of the former Crown Tītī Islands within the Ngāi Tahu Claims Settlement Act (1998) still require the Rakiura Tītī Islands Administering Body “... to control and manage the Crown Tītī Islands as if they were a nature reserve, ...”, thus ensuring that the management of these islands remain largely under a protectionist ethos. Processes related to threatened species recovery groups provide similar circumstances (see Box 1).

Box 1.



Photo 1. Ian Hogarth (DOC) and Clive Stone (Ngātiwai) with a radio-tagged pāteke at Mimiwhangata, Northland, New Zealand. Photo credit: Clive Stone

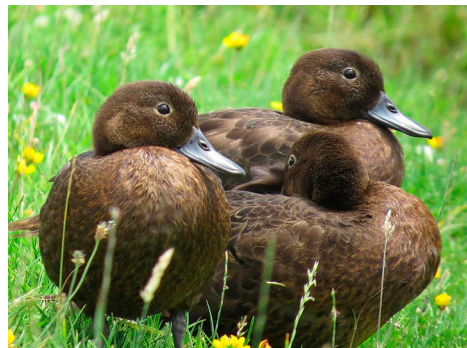


Photo 2. Pāteke (brown teal, *Anas chlorotis*). Photo credit: nzbirdsonline.org.nz

The last populations of pāteke (brown teal, *Anas chlorotis*) were situated within the tribal area of Ngātiwai giving the Iwi kaitiaki obligations for this species. These obligations are partly recognised within Department of Conservation's Pāteke Recovery Strategy 2014-2024 and processes whereby Ngātiwai are consulted about pāteke population restoration and translocations to other regions of New Zealand, including secondary and tertiary translocations. As part of this consultation process, Ngātiwai review the ecological and cultural integrity of new habitat and receivers respectively before transfer of the species occurs. In this regard, translocations represent not just a physical movement of species between regions, but also a mana (authority and prestige) enhancing, relationship building exercise between all parties, especially the Iwi groups involved. The experiences of Iwi with other species recovery groups around the country in terms of models for joint decision-making have been variable.

The re-classification of the landscape that was Te Urewera National Park represents a potentially novel opportunity to apply biocultural approaches to the management of a tribal homeland and mountainous forest landscape. As part of a treaty settlement between the tribal federation of Tūhoe and the Crown, Te Urewera ceased to be a national park in 2014, and became its own legal entity with the legal rights of a person (Te Urewera Act 2014). New settlement legislation makes possible a pluralistic

place-based governance framework for implementing biocultural approaches in the caring for this place. The newly created Te Urewera Board with a majority mix of Tūhoe and some Crown appointed representatives can consider and give expression to biocultural approaches such as *rāhui* (“conveys the sense of the prohibition or limitation of a use for an appropriate reason”), *te tapu me te noa* (“conveys, in *tapu*, the concept of sanctity, a state that requires respectful human behaviour in a place; and in *noa*, the sense that when the *tapu* is lifted from the place, the place returns to a normal state”), *te mana me te mauri* (“conveys a sense of the sensitive perception of a living and spiritual force in a place”), and *ngā tohu* (“connotes the metaphysical or symbolic depiction of things”; section 18, Te Urewera Act 2014).

Cultural constructs relevant to the development and understanding of biocultural approaches

Cultural constructs such as *whakapapa* (genealogy), *mauri*, *mana*, *ihi* (vitality), *wairua* (spirituality) and *tapu* (sacredness, prohibition) are integral to the development and understanding of biocultural approaches (Table 1). *Whakapapa* links people directly with the physical and meta-physical components of their environment, and bestows *tangata whenua* with the *mana* for a species or habitat. The maintenance and enhancement of *mauri* is a key socio-ecological construct for *tangata whenua* in a biocultural system (Timoti et al. 2017). *Mauri* is a concept that describes the representativeness and condition of the relationships and responsibilities between elements of the physical and meta-physical environment. In addition, it denotes the interconnectedness and appropriate sequential order of elements within *whakapapa*. It is therefore recognised that if the *mauri* of the environment is healthy and vibrant then there is a greater likelihood that the *mauri* (and *mana*) of people and other significant values (e.g. *mahinga kai*) will be enhanced and supported (Morgan 2006, 2007; Lyver et al. 2017; Table 1). How people identify and link themselves with place (e.g. *ahikāroa* – connection with place; *tūrangawaewae* – sense of identity and independence associated with traditional place), the diversity of knowledge and practices (e.g. *mātauranga* – traditional knowledge; *kaitiakitanga* – customary guardianship), and transformative experiences to grow the culture (e.g. *whāngai mokopuna* – instruction and guidance by elders, *whakaheke kōrero* – language and knowledge transmission, *te whakaora reo* – to use the language as a living language) are also key constructs within biocultural approaches. These constructs are integral to the practice of caring for people and their environments (*manaakitanga* – caring for people), a commitment to community togetherness (*mate-mateāone* – a commitment to community caring and togetherness; *mahi tahi* – working together as a community), and individual and community health and well-being (*oranga* – wellbeing, *whānau ora* – family wellness). These activities are also vital mechanisms for the practice and reinforcement of customary lore and processes, the transfer of knowledge, monitoring forest health and maintaining community interaction and resilience. The maintenance of *ahikāroa* is a crucial principle that instils an inherited right to contribute to and make decisions about the land and environment (O’Regan et al. 2006). The enhancement and protection of these types of constructs therefore need to be recognised as relevant parts of biocultural approaches in, and the rationale for, conservation.

Table 1. Examples of te ao Māori (Māori worldview) constructs that underpin biocultural approaches (revised from Norton et al. 2016; Lyver et al. 2017; Timoti et al. 2017).

| Te ao Maori constructs | Definition |
|------------------------|--|
| Ahikāroa | <i>Ahikāroa</i> translates as the maintenance of your long burning fires of occupation, which refers to the continuous undisturbed occupation of a place by a group over a long timeframe. The construct relates to a binding connection to place and ancestral homeland. Ahikāroa is fundamental to the implementation of local environmental governance institutions, and the right to make decisions locally. It is also integrally linked to the concept of <i>tūrangawaewae</i> which refers to having a place to stand on your ancestral homeland. |
| Kaitiakitanga | <i>Kaitiakitanga</i> relates to guardianship obligations and responsibilities that engage <i>kawa</i> (customs and protocols), <i>tikanga</i> (cultural correct procedures and practices) and <i>ture</i> (societal guidelines) for the purpose of protecting, restoring and using the environment. Kaitiakitanga relates to the exercise of authority and action over a particular place or environment in accordance with <i>kawa</i> , <i>tikanga</i> , and <i>ture</i> including tools like <i>rāhui</i> (temporary prohibitions). |
| Mahinga kai | <i>Mahinga kai</i> relates to the acquisition of traditional foods and places for sourcing food and resources, but importantly it links <i>tangata whenua</i> (original people of the land) to place, identity, <i>tūpuna</i> (ancestors), <i>whānau</i> (family), <i>mātauranga</i> (Māori traditional knowledge), <i>taonga</i> (e.g., biodiversity such as <i>tīti</i> , <i>Puffinus griseus</i> and <i>Rakiura</i> ; <i>kererū</i> , <i>Hemiphaga novaeelandiae</i> and <i>Tūhoe</i>), and expectations. |
| Mana | <i>Mana</i> is the authority and prestige that is derived from within <i>whakapapa</i> (genealogy – defined further below) and the relationships that exist through this sequential order. Mana can be assigned in varying degrees to a person, object or entity. Virtually every aspect of an activity has a link with the maintenance and enhancement of mana. The notion of mana can be inherited and provides a person with an unbroken link to their past, as well as connecting them to their future. It was also recognised that mana could be earned and acquired by an individual or grouping of people throughout the course of their lives. |
| Manaakitanga | <i>Manaakitanga</i> relates to the principle of reciprocity, respect, act of hosting, or looking after and respecting people. It includes concepts such <i>matemateāone</i> (practice of camaraderie, bonding and staying connected within and between communities) and <i>mahi tahi</i> (working together as a community). The health of the environment influences the ability and capacity of <i>whānau</i> and communities to provide and offer manaakitanga. |
| Mauri | <i>Mauri</i> is the essential quality and vitality of a being or entity (life essence). Mauri describes the representativeness and condition of the relationships and responsibilities between elements of <i>whakapapa</i> . Mauri also denotes the interconnectedness and appropriate sequential order of elements within <i>whakapapa</i> . |
| Taonga tuku iho | <i>Taonga tuku iho</i> relates to cultural heritage and the intergenerational transfer of knowledge and practice. It includes concepts such as <i>kōrero tawhito</i> which relates to the history and memories of land and people including knowledge of land, dwellings of <i>taniwha</i> and <i>kaitiaki</i> (guardians), <i>waahi tapu</i> (sacred sites) including <i>urupā</i> (burial grounds), traditional harvesting sites, knowledge of people, transfer of land, stories held within the creation of natural world, cosmological concepts, and moral direction or guidance. <i>Mātauranga</i> and <i>māramatanga</i> refers to Māori knowledge and wisdom respectively, which together represent a unique Indigenous way of knowing and processing and interpreting information. <i>Te ahurea o te reo</i> refers to the 'living' of the Māori language, and the need for people to be engaged with a healthy and functional environment to grow and evolve the language. <i>Whakaheke kōrero</i> refers to the inter-generational transfer of knowledge and wisdom. <i>Whāngai mokopuna</i> is about the guidance of elders to the younger generations. Central to these themes is the ' <i>tuakana-teina</i> ' relationship (a reciprocal learning relationship between older and younger persons) which emphasises the reciprocity between humans and nature. |
| Tapu | <i>Tapu</i> is something that is set apart, sacred, or forbidden with an untouchable quality. It can be described as having innate qualities drawing those from its origins within <i>whakapapa</i> . The designation of <i>tapu</i> places animate or inanimate objects under restriction, therefore often imbuing those objects with mana or a greater level of reverence. The function of <i>tapu</i> was to provide boundaries and protect the mana and mauri of a place, object, time, species, person or people. <i>Tapu</i> is a value that is pivotal for understanding and exercising <i>wairua</i> . |
| Wairua | <i>Wairua</i> is used to speak of the spiritual essence and characteristics pertaining to the spirit of an individual. It is the soul carried within a person which is released upon death. <i>Wairua</i> refers to the qualitative relationships that connect individuals to self, to others, to the environment, and to the past, present and future. It can be the way an individual seeks and expresses meaning and purpose. |
| Whakapapa | <i>Whakapapa</i> can be broadly interpreted as genealogy, however it relates more specifically to a sequential system that portrays the interconnectedness between all elements of the natural and super-natural realms. It refers to the tangible and intangible genealogical connections, relationships, and linkages between the natural environment and the cosmological domain. <i>Whakapapa</i> connects individuals with their <i>tūpuna</i> and defines their obligations to their environment. |

Mechanisms and legislative warrants for the implementation of biocultural approaches

Guided by key cultural constructs (examples in Table 1), the enactment of mechanisms and legislative warrants would be key to the implementation of biocultural approaches in conservation (Table 2). The cultural constructs of tino rangatiratanga, mana motuhake (autonomy; self-government), kaitiakitanga, tūrangawaewae, mātauranga, and whānau-gatanga (inter-relationships between humans and the environment) would be fundamental to developing a biocultural conservation system and its delivery (Table 2). The assemblage of these constructs would link communities, including Iwi, hapū (sub-tribe) and whānau (related families) based facilitated by to place and facilitate multi-level institutional linkages, knowledge exchange, and decision-making.

In some situations, it is possible that priorities of tangata whenua will differ significantly from those of the current conservation model, and potentially extend to species or environmental states that are not representative of endemic ecosystems. For example, a Memorandum of Agreement between DOC and Ngātiwai relating to Mauitaha and Araara Islands within the Hen and Chickens Nature Reserve (Reserves Act 1977), permits Ngātiwai to manage kiore (Polynesian rat, *Rattus exulans*) on the island as a taonga (treasure), which might include a cultural harvest (Department of Conservation and Ngātiwai Trust Board 2010). An agreement of this nature, which acknowledges the close cultural association of an Indigenous federation with an introduced species is rare, however, a biocultural approach could accommodate cultural significance of a species or ecosystem as a factor in prioritising conservation.

A biocultural conservation approach would also accentuate a 'systems' approach, which raises the importance of human agency, reciprocity between humans and nature, connection of people to place, and of operating within a knowledge–practice–belief complex (Table 2; Janzen 1988; Stephenson et al. 2014; Gadgil et al. 1993; Berkes et al. 2000). Tribal elders, kaitiaki and/or tangata tiaki (local guardians and practitioners) would draw their mandate and directionality from their presence on the land and relationship with the environment. Responsibilities of tangata tiaki could include identifying biocultural priorities for their region based on community constructs (e.g. Fisheries (South Island Customary Fishing) Regulations 1999; Table 1); the protection and restoration of flora and fauna; the monitoring and reporting of regional abundance and the state of local ecosystems; elucidating customary management interventions; delivering solutions and tools for management action; engaging the community; and supporting mechanisms for learning and the inter-generational transfer of knowledge (Table 2). Resourcing of tangata whenua in their roles would be crucial to their success. Iwi, hapū and whānau should not be expected to shoulder the burden of conservation costs in their regions, nor fund it through a quantum provided as part of their treaty settlements. The ongoing cost of conservation would be recognised and accommodated as part of the public contribution through the Crown.

Customary interventions that guide biocultural approaches

Kaitiakitanga-based interventions that form the basis of responses and solutions to environmental issues would be a significant part of a biocultural conservation approach.

Table 2. Mechanisms and legislative warrants for the implementation of biocultural approaches within Aotearoa – New Zealand's conservation system.

| Mechanisms and legislative warrants for the implementation of biocultural approaches in NZ's conservation system | |
|---|---|
| Themes | Descriptors |
| Support and enactment for <i>tino rangatiratanga</i> (absolute authority) and <i>mana motuhake</i> (autonomy; self-government) fundamental within a biocultural conservation system | <ul style="list-style-type: none"> • Governance frameworks give effect to the principles of the Treaty of Waitangi and reflect the constitutional status of Māori as a sovereign Treaty partner with the Crown • Governance frameworks with the Crown empower Iwi (tribe) and hapū (sub-tribe) in their expression of chieftainship over lands, waterways, forests and resources • The Crown recognises and respects its constitutional obligations of dual sovereignty with Māori through the application of the common-law doctrine 'Honour of the Crown' • Governance frameworks enable the concepts of <i>tūrangawaewae</i> (sense of identity and independence associated with traditional place) and <i>ahikāroa</i> (maintenance of home fires) for both Māori and Pākehā • Governance frameworks recognise and deliver both cross-cultural conservation values and outcomes for Māori and Pākehā • Conservation (e.g. Conservation Act 1987) and other environmental (Resource Management Act 1991) legislation, policies and plans are adjusted to enable and set the scales of decision-making roles for tangata whenua (original people of the land) |
| Reforms within current conservation system enable <i>kaitiakitanga</i> (customary stewardship) empowering tangata whenua at local scales | <ul style="list-style-type: none"> • Biocultural conservation priorities are focused on reversing the decline in biological (e.g. threatened species) and cultural diversity (e.g. cultural expressions within the traditional knowledge, language and customary practices) • Conservation institutions empower Māori through the fair and honest interpretation and delivery of legislative provisions • Interpretation and delivery of legislative provisions support manawhenua (authority, agency and responsibility of the local people) and facilitate decision-making by kaitiaki and tangata tiaki (local guardians and practitioners respectively) • Conservation institutions have the presumption of favour in relation to kaitiakitanga and customary use • Iwi and hapū form strong environmental units that are proactive in defining their conservation and research priorities and supporting the role and activities of tangata tiaki • Resourcing of Iwi environmental units and tangata tiaki becomes a national financial obligation – not a burden carried by the Iwi |
| <i>Mātauranga</i> (Māori knowledge) reshapes new conservation paradigm and informs the application of <i>kaitiakitanga</i> | <ul style="list-style-type: none"> • Legislation, policy and plans are reviewed, aimed at reconciling the different approaches to conservation represented by Māori and Pākehā worldview representations and values • Complementarity and co-production of customary and scientific knowledge informs decision-making and adaptive management approaches (e.g. learning by doing; cultural practices associated with a species or habitat) • Adaptive customary and scientific strategies inform each other and are applied in practice |

(Continued)

Table 2. Continued.

| Themes | Descriptors |
|---|---|
| <p><i>Whanaungatanga</i> (relationship development and maintenance) and <i>manaakitanga</i> (caring for people) are important</p> | <ul style="list-style-type: none"> • Mātauranga and scientific knowledge systems used in problem definition, identifying trigger points for action, and deciding when, where and how much to intervene • Crown and Iwi teams consisting of members that are bilingual with a comprehensive understanding of scientific and mātauranga knowledge systems [including kawa (customs and protocols) and tikanga (practices, procedures and behaviours)] • A biocultural conservation approach emphasises a ‘systems’ approach focused on linkages and reciprocity between humans with nature, and delivering on values that underpin the relationships that both Māori and Pākehā have with the environment • A biocultural conservation approach refocuses on strengthening culture as part of strengthening biodiversity. The links between people-to-people, people-to-place, and place-to-biodiversity are retained and strengthened • A biocultural conservation approach operates within a Knowledge–Practice–Belief complex supporting linkages to place, interpreting and responding to feedbacks from the environment, and the continuity of resource use practices by both Māori and Pākehā • Legislative reforms facilitate the transition from Crown ownership of wildlife to ‘no one owns flora and fauna’ • Legislative reforms recognise tangata whenua lawful ownership of the taonga (treasure) crafted from approved use of protected wildlife |

Kaitiakitanga is often embedded within traditional belief systems and ideology (Roberts et al. 1995; Lyver and Moller 2010; Selby et al. 2010), characterised by resource use (Moller et al. 2004; Lyver et al. 2009, 2015), and enforced by the communities themselves (Kitson and Moller 2008). Within the kaitiakitanga system, the influence of kawa, tikanga and ture (societal guidelines) range from: (i) preparing the individual mentally, physically and spiritually for interaction with the land, fauna and flora; (ii) to the customary mechanisms for conservation (e.g. tapu; rāhui – temporary closure and prohibitions; taiāpure – coastal water space of special significance to tangata whenua; muru – social deterrent; mātaítai – customary fishing reserves which exclude commercial fishing); and (iii) to specific behaviours (Table 3). Indeed, best practice around kaitiakitanga has been shown to be effective at managing biodiversity sustainably (Kitson and Moller, 2008; Moller et al. 2009; Jones et al. 2015; Lyver et al. 2015).

The role of local institutions in delivering biocultural approaches

Governance arrangements that enable local institutions and Indigenous peoples as active agents in the management of lands and biodiversity are key to the delivery of biocultural approaches. Local institutions are fundamental to providing the context for which Indigenous worldview representations, values and knowledge systems can be conveyed and interpreted as they relate to the local community and environment. Beyond NZ, a range of governance frameworks have been adopted to deliver biocultural approaches

Table 3. Examples of Māori customary interventions that could inform biocultural approaches in conservation in Aotearoa – New Zealand (reformatted from Moller et al. 2004; Kitson and Moller 2008; Lyver et al. 2009; Lyver et al. 2015).

| Ecological concepts | Kaitiakitanga strategies |
|--|---|
| Respect for species and its habitat | <ul style="list-style-type: none"> • Teachings and directorship of harvest should come from kaumātua (respected elders) |
| Reducing the demographic impact | <ul style="list-style-type: none"> • You do not prepare or eat your food where you catch it • Vital life history stages (e.g. adults) are not harvested • Harvest at the appropriate development stages. To protect your future breeding population do not harvest well-developed individuals with higher probability of recruiting into population • Timing of harvest important to minimise disturbance interference and desertion of adults • Rāhui (temporary access ban) and tapu (sacred rulings) used to protect specific times of breeding cycle |
| Allowing for escapement | <ul style="list-style-type: none"> • Use the appropriate harvest techniques to avoid capture of non-target life stages • Harvest only occurs during a designated period • Rotation or resting of sites (e.g. areas of ground or islands) harvested each season • Tohu (environmental indicators) are used to determine whether harvest should proceed or not • Use the appropriate harvest techniques to avoid capture of excess • Seabird chicks are caught down burrows and not at night when they emerge to fledge |
| Protection of habitat | <ul style="list-style-type: none"> • Access to populations controlled or limited to specific iwi or individuals within an iwi • Digging should be minimised to avoid damage to burrows • Cutting of live trees for firewood is prohibited • Tohu (signs) are used to show ownership of harvesting grounds |
| Enhancement of populations and habitat | <ul style="list-style-type: none"> • The digging of burrows can create breeding space reducing issues of density dependence • Translocations and seeding of new populations promotes resilience and spreads harvest pressure |
| Provision of refugia | <ul style="list-style-type: none"> • Tapu (sacredness; prohibition) was used to restrict access or harvest to specific areas or islands |
| Minimisation of waste | <ul style="list-style-type: none"> • Do not harvest more of the resource than you can process effectively |

and better empower local institutions in the management of the environment (e.g. Indigenous Protected Areas in Australia – Gilligan 2006; Smyth 2008; Ethnic Reserves in Ecuador – Brady 1997; Sámi Act 1987 in Norway – Falch et al. 2016; and Nisga'a Final Agreement in Canada – Richardson 2008). It is through these local institutions that communities can enable social learning relating to the perception of environmental change; the formulation, education and delivery of interventions and responses to that change; the use of both customary and science-based tools and methodologies, and the equitable sharing of benefits (Gavin et al. 2015).

At present New Zealand conservation law remains inimical to the locally-placed role and authority of Iwi, hapū and whānau, and continues to impose limitations on Māori environmental decision-making (Ruru et al. 2017). Recognition of the responsibilities that each Iwi and hapū have for the local environment would be expressed through members setting relevant conservation direction and priorities, and making decisions as they see relevant to their relationship with the environment without being bound to governmental or ministerial oversight. However, Māori have observed that the Crown largely continues to serve and maintain its own conservation agenda, and tangata whenua are invited to contribute and/or participate, in the context of any other stakeholder, rather than as an equal treaty partner. The failure to interpret legislation in accordance with the principles of the Treaty of Waitangi suggests that te ao Māori constructs and values of biocultural approaches are neither

recognised, nor well understood by Crown representatives, or that the Crown does not want to share power. New *sui generis* legislation and acts of parliament that have emerged recently from Treaty of Waitangi settlements (e.g. Te Urewera Act 2014) offer opportunities to deliver biocultural approaches, but are still potentially vulnerable to legal interpretations (Warren 2016). The effective enactment of biocultural approaches and benefit-sharing also depends heavily on the vesting of power and resource allocation in the wider community and its subjects, not just in community leaders and executives.

Re-evaluating the human–nature relationship

Indigenous peoples represent a large proportion of the world's cultural diversity, and are either custodians or have tenure rights to more than a quarter of the world's land surface, which also holds significant biodiversity (Garnett et al. 2018). Indigenous cultures are also strongly interconnected with the natural world, with elements of the environment deeply ingrained within value-belief systems, identities and cultural expressions such as customs and protocols, stories, songs, dreaming, and association with place (Berkes 2012; Gould et al. 2014; Pert et al. 2015; Walsh et al. 2013; Timoti et al. 2017). Therefore, indigenous worldviews, local institutions and actions have an important part to play in national and global conservation, and the recovery of both cultural and biological diversity. Central to Indigenous peoples' philosophies and approaches is the concept of reciprocity within the human–environment relationship (Caillon et al. 2017). In this relationship, the wellbeing of the people is inextricably linked to the health of the environment, but also the health environment is reliant on the wellbeing of the people (Berkes et al. 2003; Dick et al. 2012). Within Māoridom, this concept is realised through the 'tuakana-teina' relationship (a reciprocal learning relationship between older and younger persons) humans have with nature. As global environmental health declines in many regions of the world, holistic Indigenous philosophies will have an increasingly significant role in influencing the way societies see themselves within the landscape, and how they perceive their relationship with the environment (Folke et al. 2011; Diaz et al. 2018).

In many places the conservation paradox (Lyver and Tylianakis 2017) continues to compromise the realisation and delivery of biocultural approaches. Declines in biodiversity and degradation of ecosystems continue to directly or indirectly (via legislative responses by governments) challenge the abilities of communities to maintain and adapt their biocultural approaches. Stemming from declines, protectionist land classifications (e.g. national parks) and conservation policies of government continue to exclude Indigenous peoples from their landscapes, plants and animals. For some Indigenous cultures, the modern context means that many of their community members now live in urban centres, or are engaged in lives away from their traditional lands and environment. Drivers and mechanisms such as these have potential to damage both cultural and biological diversity irreparably. While the isolation of Indigenous peoples from their environments might be perceived to have low risk to biodiversity within the current conservation framework, it poses a huge risk for Indigenous peoples from a socio-ecological perspective (e.g. loss of identity and knowledge). Moreover, the separation of people from environment can be detrimental to mainstream conservation objectives (Pyke et al. 2018). To that end, collaborative partnerships that deliver place-based collective action, considered decision-making, outcomes for communities, and equitable benefit

sharing are needed. A new biocultural-centred space offers an opportunity for greater solidarity, common ground and greater cooperation between Indigenous peoples, state governments, and the wider stakeholder groups and institutions.

Matching scales within biocultural approaches

Matching the appropriate ecological and social scales is an important consideration in the effective delivery of biocultural approaches. The mismatch between the scale of management and the scale(s) of the ecological processes being managed, has caused issues for many societies (Cumming et al. 2006), and facilitated the decline in both biological and cultural diversity. It can be difficult for Indigenous peoples to apply interventions and make a difference where populations and habitats are continually being degraded by factors beyond their control. For example, the populations or ecosystems within Indigenous reserves or food gathering sites can be heavily influenced by biophysical and anthropogenic factors remote from those locations [e.g. impact of land conversion on kanakana (NZ lamprey, *Geotria australis*) spawning sites and hydro-electric dams blocking migration paths – Closs et al. 2014; tītī, Sooty shearwater, *Puffinus griseus*, and climate shifts in the Pacific Ocean – Humphries and Moller 2017]. Failure to recognise and account for these issues can result in management or actions that do not achieve the desired conservation objectives (Guerrero et al. 2013), or biocultural outcomes. Mismatch of scales also has the potential to seriously undermine local action and energies. This can be particularly acute for Indigenous peoples operating at the local scale. Power asymmetries in favour of governments over Indigenous peoples continue to contribute to a mismatch in management scales and cross-scale conflict between national and local institutions (Alcorn et al. 2003). Effective delivery of biocultural approaches that mitigate a mismatch in ecological and social management scales therefore relies on the integration of multiple levels of governance and the promotion of vertical institutional linkages (Gavin et al. 2015). The approach is likely then to include actions, interventions and responses delivered at spatial (e.g. local, national, or international) and time (e.g. seasonal, annual, inter-generational) scales at which the objective requires, or the problem arises.

Societal awareness of biocultural approaches is important

Broader societal awareness and understanding of biocultural approaches will be important for wider public support and implementation. Increasingly there has been emphasis on the social and cultural licence to operate and apply interventions in the environment. While Māori have a constitutional right guaranteed under the Treaty of Waitangi to apply their kaitiakitanga, it is important that wider society observe and have confidence that tangata whenua are monitoring the state of the environment and operating in a sustainable way. This will remove the basis for sections of society that may criticise or make uninformed judgements about the kaitiakitanga interventions of tangata whenua. To facilitate public support and understanding for biocultural approaches, there is a need to have a group of people engaging with the public, showing the face of the locals, and communicating to the wider public about what communities are doing. It highlights the importance of initiatives such as the Māori Cultural Heritage Project, which is a partnership between Auckland Council and the Iwi of Tāmaki Makaurau that promotes the values of mana

whenua, and weaves their mātauranga into management of taonga and significant sites of cultural and historic heritage (<https://www.aucklandcouncil.govt.nz/arts-culture-heritage/heritage/>).

Conclusion

Biocultural approaches to conservation can provide governments with contexts in which to work with Indigenous peoples, reduce cross-cultural conflict around how to manage the environment, mitigate the potential for cultural appropriation when engaging traditional knowledge, and give Indigenous communities greater confidence that the system better understands their relationship with the environment. The implementation of biocultural approaches will require a systems approach involving a greater array of actors, partnerships, and networks within communities and government agencies and industry, opening up communication, information-exchange, significant new revenue sources, skill development and trust across different organisational levels from local to regional, national, and often global (Carlsson and Berkes 2005; Nursey-Bray and Rist 2009; Ross et al. 2009). Biocultural approaches can also suggest different directions and methods for success, and trigger transformation of personal and community values that extend well beyond conservation goals themselves. We contend that the combination of these factors will contribute to improved health of both the environment and the communities. Biocultural approaches encourage the revaluation of our relationship with the environment; reanimate our materialistic perspective of the natural world; and reassess methods for responding to its pressures (Tyler 1993). It can also help to resolve power imbalances between governments and Indigenous peoples, provide more beneficial ways of interacting with the environment, rebuild society's relationship with the natural world, and work towards reversing declines in biological and cultural diversity.

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