The Institute for Governance and Policy Studies, School of Government at Victoria University of Wellington

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SPECIAL ISSUE

Protecting nature

Governing human - nature relationships for the future

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Editorial Note

Nature is more than a playground and resource repository. Scientists tell us: it is where we come from. Over billions of years, biodiversity contributed to creating landscapes and our atmosphere. It is the reason why our oceans are blue, making our planet that lovely but lonely "blue dot" in the cosmos; in Carl Sagan's words, "the only place in the universe we call home". We know we share Earth with 9 million species. But estimates are that about 86% of land species and 91% of marine species are not yet known to science. The "pale blue dot" is their only home too. As an intelligent species with high-speed planetary impact, our responsibility is not limited to ensuring a fair life for future generations; it extends to safeguarding biodiversity and the evolutionary potential for life. In this context, environmental governance is a matter of geological and cosmological importance. It can influence whether over millennia, the third planet from the sun will still be a "pale blue dot", or will become a 'yellow dot' like Venus, taken over by a run-away climate change phenomenon.

In this special issue, I wish to focus attention on nature, in ways that may trigger deeper reflections than what we are currently used to in policy debates. Biodiversity has been identified as one of the nine planetary boundaries that need to be observed for our own safety. It is also the most significantly overstepped one, considering the rate of biodiversity loss. In the hierarchy of boundaries, it interlinks with the climate boundary, together holding first place. In my paper I take a global, long-term perspective on governing nature, drawing attention to local-global interlinkages for environmental quality. I argue in favour of reconsidering the paradigm underpinning the governance of protected areas, by introducing environmental sustainability as a leading governance principle for all types of protected areas, guided by the recent Planetary Boundaries Framework. However, as many papers in this special issue point out, biodiversity conservation requires a nation-wide effort, involving all types of land ownership and engaging a wider range of actors, policy instruments and governance arrangements. The first five papers adopt a country-wide perspective, while the next four focus on challenges for the governance of specific areas: the Conservation Estate and the high-country in the South Island.

Two important themes emerge from most papers: that better outcomes for nature protection are undermined by a) the lack of coherence across legal and policy instruments relevant for nature; and b) the lack of integration of environmental considerations into nature protection policies, economic growth policies, and other policy domains influencing land use. Jeff McNeill offers a comprehensive analysis of how nature is conceptualised in various laws. He observes diverging approaches: some acts emphasise nature's intrinsic values, others its active or passive utility, or species' origin. The consequence is incoherence in the protection level offered at different scales (species/habitats/ecosystems/landscapes), and sites, and on how similar nature is managed by different actors. Jeff McNeill's findings converge with those of Pip Wallace, who focuses on the protection offered to threatened species. Her research found considerable divergence across Regional Policy Statements (RPS) on what constitutes threatened species. Pip also invokes the lack of integration of biodiversity protection plans adopted under the environmental and conservation legislation, as a factor in poor outcomes for threatened species, with private lands being seriously under-managed.

From Marie Brown and Jemma Penelope we learn that RPS instruments also display incoherence in dealing with biodiversity offsets, and suffer from lack of integration between the Resource Management Act, conservation legislation/policies and two other acts. Biodiversity offsets are conservation projects, or land swaps, for developments with effects that cannot be avoided, remedied or mitigated. Evan Brenton-Rule and colleagues draw similar conclusions regarding post-border pest management through regional plans. Regional/Territorial Councils include diverging numbers and types of species in their control plans. In climatically similar and neighbouring regions, the same invasive species are treated and funded differently, potentially undermining the efforts of those investing more in pest management. The poor integration of environmental, land use and economic growth policies is considered by Theo Stephens and colleagues to be a major factor in New Zealand's failure to slow down biodiversity loss and environmental deterioration. They propose an innovative land tax that reflects its use intensity and likely environmental impacts.

Narrowing analysis to the Conservation Estate, Hugh Logan reviews the institutional phases of nature conservation, offering explanations on what shaped them. Hugh draws on this to map some challenges for how we govern protected areas, including commercial, funding, cultural, ecological and organizational. Christine Cheyne's contribution reflects on a crucial principle of governance for sustainability: public engagement. Her analysis reveals shortcomings to how legal arrangements for consultation are dealt with by the Department of Conservation, including with respect to Conservation Boards. The case-study on the revocation of the Ruahine Conservation Park and land exchange for a proposed dam reveals loopholes and shortcuts that damage public trust in the organization, casting doubts over the biodiversity outcomes of such deals. Further, Ann Brower's paper explores the patterns and processes underpinning land ownership and use changes in the high-country of the South Island since the 1980s. Sustainability requires the prioritization of environmental considerations and public interests in land use and economic policies, towards policy integration. The developments Ann analyses suggest that has not been the case. The distribution of benefits from the tenure review led to substantially higher private economic gains, and land use (hence habitat) fragmentation through subdivisions. Overall, it seems that it is not the number of laws and policies, but their poor coherence and lack of integration through the prioritization of environmental objectives, that is most problematic for nature governance in New Zealand.

Finally, Adrian Macey reflects on the latest international climate change agreement and New Zealand's contributions in Paris.

Guest editor: Valentina Dinica

Jeffrey McNeill

Different Meanings of 'Nature' for New Zealand's Conservation Institutions

'Conservation matters', New Zealand's Department of Conservation (DOC) briefed its new minister in 2014, because 'New Zealand's natural heritage shapes the country's cultural identity and … New Zealanders identify strongly with conservation lands and waters' (Department of Conservation, 2014, p.4). It further explained that the benefits of conservation are much more than improving health and well-being and contributing to a sense of personal achievement. Conservation protects natural capital, delivers infrastructure, and underpins New Zealand's primary production sector and tourism. In short, the country's national and conservation parks and native biodiversity benefit the country's economy, prosperity and future well-being. DOC then informed the minister that New Zealand's biodiversity is declining; its unique native fauna and flora and ecosystem services are reducing. Although the text conflates natural heritage with the outdoors, conservation and biodiversity, it is clear throughout that DOC is referring to New Zealand's nature: the phenomena of New Zealand's physical world, as opposed to its humans or human creations.

It is also clear that DOC frames nature in terms of its utility, underpinned by contemporary conservation theory. Thus, DOC justifies conservation using an ecological economics theory of ecosystem services which holds that natural systems provide unaccounted, but significant, services and economic benefits to society (Daily, 1997). Similarly, DOC's framing of conservation as biota and biodiversity aligns with what Soulé and Lease call 'the living nature of the contemporary Western Biologist' (Soulé and Lease, 1995, p.140). 'Natural landscape' is for DOC synonymous with ecosystems, but also the primary reason 35% of international visitors come to New Zealand. Other meanings of nature are referred to in passing; but, while iwi are identified as partners for addressing key conservation issues, iwi views of nature are not mentioned.

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Simmons (1993) suggests that the environment, or nature, is complex and does not lend itself to a simple, dictionary-like meaning. He argues that humans have not only biophysical surroundings, but an environment that is understood culturally. Critically, as Botkin (1990) points out, how we conceptualise nature determines how we treat it. This cultural understanding is reflected in DOC's reference to cultural identity, but also in its framing of nature as 'conservation economy' (Dinica, 2015) to justify its activities.

Laws, themselves cultural artefacts, can be seen as a crystallisation of society's dominant values and knowledge at the time they are drafted. However, society's understandings of the environment and how it values nature can and do change over time. From a fringe interest, the environment is now part of mainstream public discourse, with public interest in native species decline, freshwater pollution and climate change, to name some issues. As well, terms such as sustainability, which draws from the 1987 Brundtland report (World Commission on Environment and Development, 1987), and biodiversity – given formal currency by the United Nations 1992 Rio de Janiero Earth Summit – are now in common parlance. Accordingly, unless updated or reformed, a body of legislation accumulates over time multiple meanings of nature which frame how administrators make and implement policy choices (Davoudi, 2012). This legislation may ossify values that are inconsistent with contemporary ones if left unchanged. For example, the Forests Act 1949, with its provision for balancing production and protection of native forests by the former New Zealand Forest Service, was seen in the 1970s as becoming increasingly out of touch with contemporary values and provided a touchstone for New Zealand's environmental movement (Williams, 1980), and in turn the government restructuring that led to the formation of DOC and the Ministry for the Environment. More recently we have seen legislation passed as part of settlement packages agreed by the government to address individual iwi claims under the Treaty of Waitangi. These settlements introduce new governance arrangements, but they also explicitly recognise Māori world views of the environment which transcend western scientific ones.

The laws addressing how people utilise the environment were reviewed in the 1980s, with nearly 60 laws repealed and the same number again amended, quite in addition to a new approach being established for managing and utilising parts of the environment under the Resource Management Act 1991 (RMA). Today, regional councils, the organisations primarily responsible for undertaking natural resource management functions, operate under four acts. In contrast, the legislation under which New Zealand's nature is managed remains largely untouched, so that today DOC administers some 27 acts. Two-thirds of the legislation DOC administers predates the department's establishment in 1987, with a third dating from the 1970s. Although some acts have been amended, their overall intents have not been changed, suggesting a range of concepts of nature in New Zealand. Accordingly, we need to consider whether the meanings of nature embedded in the legislation are consistent and still relevant. As a first step, we need to take stock of how nature is realised in New Zealand's body of law.

The remainder of this article overviews New Zealand's nature legislation. It examines legislation that addresses some aspect of the management or protection of some part of New Zealand's natural, as opposed to built, environment. Different meanings of nature manifested in the legislation, suggested by words used in the titles, long titles and purpose statements of individual acts, as well as the scope of the legislation, are identified. Reference is also made to definitions in the interpretation sections. It recognises that legislation is amended over time, and refers to previous legislation where appropriate to identify whether new discourses are imported or replace existing ones.

While this survey focuses mostly on the laws that DOC administers, it also includes laws governing use of New Zealand's native biota administered by other departments: for example, those managing fisheries and native forestry harvesting, administered by the Ministry for Primary Industries. This study does not consider how the legislation is implemented.

Within the body of legislation, nature is framed culturally, as landscape, or scientifically, as its component parts of ecosystems and species.

Meanings of nature in New Zealand legislation

An overview of New Zealand's nature management legislation reveals no single or consistent meaning of nature (Table 1). The different laws operate at different scales, both in their focus, from individual species to whole landscapes, and in spatial terms, from subnational areas such as national parks or iwi rohe (tribal areas) to international. However, the wording within the suite of nature management laws suggests three themes to explore: how nature is defined; its passive utility; and its active utility.

Defining nature

Within the body of legislation, nature is framed culturally, as landscape, or scientifically, as its component parts of ecosystems and species. Landscapes are essentially the visual calculus of smaller-scale management practices, rather than ecological functions (McNeill, 2012). As such, they are social and cultural constructs of space, most obviously as national parks or reserves, where many human activities are excluded. This broad spatial scale is underlined by the Queen Elizabeth the Second National Trust Act 1977 equating

Table 1: New Zealand's nature management legislation

Act	Agency	Species Origin		Passive Utility					Active Utility				Intrinsic value
		native	introduced	landscape/ natural features	amenity	recreation	access	enjoyment	ecological services	tourism	resource	extraction	
International													
Trade In Endangered Species Act 1989	DOC		•										•
National - general													
Marine Reserves Act 1971	DOC												
Reserves Act 1977						•	•	•					•
Queen Elizabeth the Second National Trust Act 1977	DOC			•		•							
National Parks Act 1980	DOC	•	•	•	•	•	•	•	•				•
Environment Act 1986	MfE										•		•
Conservation Act 1987	DOC	•								•	•		•
Resource Management Act 1991	MfE			•					•		•		•
Walking Access Act 2008	MPI						•	•			•		
National - biota focus													
Fisheries Act 1996	MPI	•									•		
Native Plants Protection Act 1934	DOC	•											
Wildlife Act 1953	DOC	•	•										
Wild Animal Control Act 1977	DOC		•			•					•		
Marine Mammals Protection Act 1978	DOC	•											
Biosecurity Act 1993	MPI		•										
Forests Act 1949 (1993 Amendment)	MPI	•									•	•	
Game Animal Council Act 2013	DOC		•			•						•	
Local (selection)													
Manapouri - Te Anau Development Act 1963	MBIE					•					•	•	
Lake Wanaka Preservation Act 1973	DOC			•									
Ngai Tahu (Pounamu Vesting) Act 1997	MBIE											•	
Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010	OTS			•									
Te Urewera Act 2014				•	•	•	•	•	•				•

DOC – Department of Conservation; MfE – Ministry for the Environment; MBIE – Ministry of Business, Industry and Enterprise; OTS – Office of Treaty Settlements

open space with landscape, while the RMA emphasises natural landscapes as opposed to human formed ones.

Other acts view nature scientifically, focusing on biota, the living components of these landscapes, and as such aspatially. An enduring theme in New Zealand's environmental discourse has been the country's biological uniqueness, reflecting the richness of its deep-time endemic species (Brown et al., 2015), popularly articulated in the idea of Moa's Ark, with little concern for introduced species and their ecosystems (MacLeod et al., 2008). Accordingly, many acts distinguish between native and introduced species. None include agricultural production species; nature is mainly native and 'wild'.

The specificity of the legislation relates to origin of the organisms. Introduced biota is mostly defined at the species level: the Wildlife Act 1953 and Wild Animal Control Act 1977 have long schedules specifically identifying introduced species of animals that can be hunted. In contrast, native biota is treated generally, even though New Zealand has as many introduced as native species, so that native biota is essentially defined as being not-introduced. Thus, in the Marine Mammals Protection Act 1978 a native marine mammal is defined simply as any mammal adapted to the marine environment, and 'all species of seal, whale, dolphin, and porpoise, and dugong and manatee' (section 2).

More recent legislation moves from individual species to aggregates of species. This attribute is defined in the RMA through a 2003 amendment: 'biological diversity means the variability among living organisms, and the

ecological complexes of which they are a part, including diversity within species, between species, and of ecosystems' (section 2). This definition very closely matches the definition given in the 1992 United Nations Convention on Biological Diversity. It also chimes with contemporary biologists' thinking of nature as ecological systems operating at different scales simultaneously, rather than as component parts. Nature is native, but assemblages of non-native species are not.

Purpose of nature

The purpose for which nature is used also helps understand how it is perceived. The underlying presumption throughout the legislation is that at least parts of nature can be dominated by humans to achieve public utility. This presumption is expressed in the language of domination employed: to manage, preserve, conserve or control. This intervention is either to protect native nature or to utilise nature for human benefit, viewing nature as multi-purpose.

Nature protection

The purpose of much of the legislation reinforces the perception that New Zealand's nature consists of its unique landscapes and native biodiversity, and that this nature is vulnerable and needing protection, especially from exotic biota. The emphasis is very much on preserving (native) nature in perpetuity in its natural state (National Parks Act 1980, section 4). Similarly, the Wildlife Act 1953 provides absolute protection to wild animals, except for (introduced) deer, goats, tahr and pigs. Such protection can be conditional, however. For example, fish in marine national parks are (largely) protected, but can be commercially fished as soon as they swim outside park boundaries.

Much of the earlier legislation focuses on either protecting native birds and animals from being killed by people, or facilitating killing of introduced ones that threaten natives. The National Parks Act 1980 seeks to preserve native plants and animals within the parks, but introduced plants and animals are as far as possible to be 'exterminated'. The Wild Animal Control Act 1977 seeks generally to control introduced animals – goats, deer and other specified animals – and to 'eradicate' them locally where necessary and practicable.

Nature for passive use

The legislation also reflects a view of nature as something that people, whether as recreationists, conservators or scientists, experience passively as visitors, rather than being part of. Landscapes are valued for the aesthetic appeal of their scenery or features, but also for activities undertaken within them. Significantly, they are not seen as part of people's lives, but somewhere else to be viewed, or visited for various purposes. The Reserves Act 1977 situates nature as a place of scenery and landscapes to which people go for enjoyment and recreation, as well as wildlife protection and scientific study. This theme is also found in the national parks legislation, which defines national parks as 'areas of New Zealand that contain scenery of such distinctive quality, ecological systems, or natural features so beautiful, unique, or scientifically important that their preservation is in the national interest' (National Parks Act 1980, section 4).

The reasons for national parks and for public access to them remain substantially unchanged since 1952: 'for the benefit, use, and enjoyment of the public' (ibid.). The value of nature for recreation is clearly spelt out in the legislation: the Conservation Act 1987 requires DOC to 'foster the use of natural and historic resources for recreation' (section 6(e)). Public access to nature for these passive uses is also legislated for. The National Parks Act 1980 allows 'freedom of entry and access to the parks, so that they may receive in full measure the inspiration, enjoyment, recreation, and other benefits that may be derived from mountains, forests, sounds, seacoasts, lakes, rivers, and other natural features' (section 4(e)). Similarly, the Reserves Act 1977 provides for preserving public access along coastlines, riversides and lakesides. However, access to the outdoors through privately-owned (productive) nature has been a long-standing concern, addressed by the New Zealand Walkways Acts of 1975 and 1990, both repealed, and the Walking Access Act 2008.

Environment for active use

Legislation also provides for people to extract utility from nature. The Wildlife Act 1953, Wild Animals Control Act 1977 and the Game Animal Council Act 2013 all regulate aspects of recreational and commercial hunting and animal recovery of (mostly) introduced species. They combine control of introduced species for native environment protection with recreational and commercial game hunting.

The legislation drafted in the 1980s and 1990s takes a more utilitarian turn by explicitly framing nature as a resource, a storehouse of assets and functions for use at will for human benefit. This is most clearly articulated in the long and short titles of the RMA: the Resource Management Act is '[a]n Act to restate and reform the law relating to the use of land, air, and water'. Further, it defines natural resources to include 'all forms of plants and animals (whether native to New Zealand or introduced)'. This meaning is also embedded in the Fisheries Act 1996, which provides 'for the utilisation of fisheries resources'. Both the RMA and Fisheries Act make clear that this utilisation is for people and communities'

The legislation drafted in the 1980s and 1990s takes a more utilitarian turn by explicitly framing nature as a resource, a storehouse of assets and functions for use at will for human benefit.

'social, economic, and cultural well-being'. The Conservation Act 1987 suggests that even intrinsic values are subordinate to and ultimately valued within utilitarian value systems, defining conservation as: 'the preservation and protection of natural and historic resources for the purpose of maintaining their intrinsic values' (section 2).

The 1990s legislation also specifies how these resources are to be used. Rather than being allowed to be depleted, resources are to be utilised sustainably. For example, the purpose of the RMA is 'to promote the sustainable management of natural and physical resources' (section 5), while the Forests Amendment Act 1993 seeks the 'sustainable forest management of indigenous forest land' (section 67B). The RMA provides an extensive definition of sustainable management which recognises the needs of future generations, life-supporting capacity of environmental components and managing adverse effects of resource use (section 5). More simply, the Fisheries Act 1996 defines 'ensuring sustainability' as 'maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations' (section 2).

However, some legislation embeds tension between protection and utility. For example, the blanket extermination approach to introduced species in national parks is compromised by the privileged status given to introduced trout and salmon in the legislation despite the knowledge that these have significant and ongoing adverse impacts on native freshwater communities (Chadderton, 2001). The RMA requires those exercising functions and powers under the act to have particular regard both to the 'intrinsic values of ecosystems' and to 'the protection of the habitat of trout and salmon' (section 7). Similarly, the Conservation Act requires DOC 'to preserve so far as is practicable all indigenous freshwater fisheries, and protect recreational freshwater fisheries and freshwater fish habitats' (section 6(ab)), while the Manapouri–Te Anau Development Act 1963 explicitly requires consideration to 'minimise any adverse effects on the trout fishery' in these lakes (section 5(b)).

The West Coast Wind-blown Timber (Conservation Lands) Act 2014 similarly places utility above ecological function. In this case, the legislation allows for the removal of native trees blown over by Cyclone Ita from conservation land (other than specified areas of high ecological value) so they can be used for manufacturing. Ecologically, the wind-blown trees can be seen as providing habitat for many indigenous species and completing nutrient cycling, so the trees should be left where they fell, quite apart from any concerns about wider policy implications of timber extraction on conservation land.

Nature as metaphysical

The legislation also addresses the metaphysical aspects of nature. Western discourses have focused on whether nature has intrinsic values. Environmental debate in the 1970s and 1980s pitted ecocentric and anthropocentric views of the environment against each other (Eckersley, 1992). Part of the ecocentric position was that the environment has an intrinsic value incommensurate with utilitarian values. However, recent New Zealand enactments have sought to formalise Māori world views, which meld physical, spiritual and social elements of nature within the European legal system.

Several acts seek to recognise nature as having intrinsic values: that is, values independent of human socio-economic systems. The National Parks Act 1980 seeks to preserve national parks for their 'intrinsic value', among other reasons. The Conservation Act 1987 defines conservation as the 'preservation and protection of natural and historic resources for maintaining their intrinsic values' (section 2). The RMA defines 'intrinsic values' in relation to ecosystems as 'those aspects of ecosystems and their constituent parts which have value in their own right'. The Te Urewera Act 2014 states that it is, inter alia, Te Urewera's 'intrinsic worth' that is being protected.

Recent enactments addressing Treaty of Waitangi settlements between the Crown and iwi reify older conceptualisations of 'nature' that predate the 1840 treaty. They formalise a Māori world view of nature that melds human and natural worlds. Thus, schedule 1 of the Waikato–Tainui Raupatu Claims (Waikato River) Settlement Act 2010 states: 'to Waikato–Tainui, the Waikato River is a tupuna (ancestor) which has mana (prestige) and in turn represents the mana and mauri (life force) of the tribe'. The most far-ranging paradigm change has been to ascribe rights to nature. In returning the former Urewera National Park to Tūhoe, the Te Urewera Act 2014 declares Te Urewera to be a legal entity, with all the rights, powers, duties and liabilities of a legal person (to be exercised and performed on its behalf by a board) (section 11).

> … recent New Zealand enactments have sought to formalise Māori world views, which meld physical, spiritual and social elements of nature within the European legal system.

Discussion and conclusion

New Zealand's body of nature management legislation as described above can be briefly summarised as providing a means for the state to preserve attributes of space, protect native biota or kill introduced species. However, the array of long titles, purpose statements and contents of the individual acts making up this body suggest a legal palimpsest of meanings of nature. The different 'nature' laws all suppose that aspects of our indigenous nature, whether species, ecosystems or landscapes, need some sort of protection from or mediation of human activity

to obtain public good derived from its continued existence. Their existence and purpose reify a range of different discourses of scope, focus, scale and how nature is to be managed.

However, underlying tensions exist within the body of legislation, from the separation of natural and productive nature. This tension is expressed most obviously in the placing of the former in public ownership and through excluding people and their activities. Thus, the national parks and reserves legislation demarcates and severely limits activities within particular landscapes dominated by native nature. In contrast, productive agricultural and plantation forest lands dominated by introduced species are on private land and are largely managed through the RMA. The result is a spatial manifestation of the native/introduced biota dialectic that frames native nature as a zoo that is visited, while introduced nature is harnessed as a means of production where people live and work.

> the purpose of preserving in perpetuity as national parks, *for their intrinsic worth* and for the benefit, use, and enjoyment of the public, areas of New Zealand that contain scenery of such distinctive quality, *ecological* systems, or natural features so beautiful, unique, *or scientifically important that* their preservation is in the national interest. (National Parks Act 1980, section 4(1); 1980 additions to National Parks Act 1952, section 3(1) in italics.)

The notable differences between the two acts are the addition of intrinsic worth and ecological and scientific values in 1980. Significantly, the Te Urewera Act 2014, using many of the same words, underlines the currency of these concepts over 60 years later.

The multiple meanings of nature embedded in the legislation potentially set up conflict within government departments and in their advice to their ministers as they seek to manage conflicting goals.

Some changes in perception of nature and management over time are apparent. Older acts emphasise the qualitative and passive value of nature. Legislation passed since the 1980s, on the other hand, frames nature as a 'resource', together with its sustainable management. The most recent body of legislation introduces the metaphysical, a trend likely to continue as further Treaty of Waitangi settlements are achieved: for example, with the Whanganui River tribes. Nevertheless, concepts can endure. For example, the purpose of national parks given in the National Parks Act 1952 was imported substantially unchanged into the National Parks Act 1980:

Scale of focus also changes with time. Earlier legislation tended to focus on species, while the 1970s legislation recognises ecosystems – the natural systems within which individual populations of species exist – indicating a change of comprehension about how nature operates. Scale has changed again with the emergence of biodiversity as a discourse in the early 1990s, popularised at the 1992 Rio Earth Summit. As a term, it first appeared in New Zealand legislation in a 2001 amendment to the Fisheries Act 1996, and then in a 2004 amendment to the Hazardous Substances and New Organisms Act 1996, both drawing on United Nations conventions that used that term.

The multiple meanings of nature embedded in the legislation potentially set up conflict within government departments and in their advice to their ministers as they seek to manage conflicting goals. This is not new: the strong argument for the 1980s environmental reforms was to remove multiple functions within the former Department of Lands and Survey, Ministry of Works and Development and Forest Service, among others. More recent legislation establishes hierarchies to guide implementation. The National Parks Act 1980 sets a hierarchy in managing multiple uses, providing for public entry and access subject to preservation of native plants and animals and welfare in general (section 4(2)(e)). The Conservation Act 1987 gives DOC a suite of functions: first, to conserve and advocate for natural and historic resources, preserve all indigenous freshwater fisheries, and protect recreational freshwater fisheries and their habitats. It is also to foster the use of these resources for recreation and to allow their use for tourism (section 6). The danger comes if these hierarchies are subordinated to other policy goals.

However, the wider result of the suite of legislation is that DOC is forced to internalise trade-offs between its different legislative goals. Though in a less obvious way, DOC is in a similar position to the former Forest Service, which was required to achieve 'balanced use' in the 1970s under the Forests Act 1949. This potential clash of objectives is less stark than the other anomaly, of different government departments having primary responsibilities for New Zealand's 'nature', and it can be expected that these departments are influenced by their primary legislation foci. In some cases this is perhaps obvious: with the Ministry for Primary Industries, for example, which manages fisheries and native forestry for utilisation and production. But it may be more subtle regarding biodiversity, where regional councils have responsibilities for maintaining indigenous biodiversity under a legislative regime which explicitly regards 'nature' as a resource.

DOC expressed a utilitarian view of the nature it manages in its ministerial briefing. Whether this view is supported by the legislation it operates under is another matter. Critically, very little in the legislation supports privileging this view

over others. Rather, DOC needs to manage a range of management objectives. And aligning practice to a particular theory or world view may prove a double-edged sword: DOC, by justifying its work on utilitarian ecosystem service provision grounds, also exposes itself to critiques of that theory (e.g. McCauley, 2006; Ridder, 2008). Similarly, playing the biodiversity card is not without risk. For example, kākāpō, once New Zealand's third most common bird (Gibbs, 2006), and now represented by some 130 individuals confined to three remote Fiordland islands, clearly have no impact on New Zealand's broader ecosystem functioning. From a population dynamics perspective, triage may be more appropriate, though publicly rejected (Clements et al., 2011; Torrie, 2011).

Whether these meanings are still appropriate can also be questioned. The dominant view of nature as resource, whether or not to be used sustainably, has not halted the degradation of much of New Zealand's natural environment over the 20 years this view has been in vogue (Ministry for the Environment and Statistics New Zealand, 2015). More broadly again, the legislation, with its focus of conservation and preservation, implies a view of nature that is or should be in equilibrium, preferably devoid of introduced biota. And by protecting landscapes, we seek to freeze time, resisting change. Perhaps, as Stott (1998) provocatively argues, we need to recognise the ecological fallacy of this approach. The native/introduced species dialectic was challenged in the early 20th century, and New Zealand may be better seen functionally as an uncontrolled experiment (Holland, 2000), where landscapes consist of ecological systems of productive and protected land with mixes of species (MacLeod et al., 2008). This would require us to accept that New Zealand and its natures are dynamic; that many native species are already functionally extinct, the differentiation between natives and exotics less clear than we would like to believe, and that greater forces of climate change on nature seem beyond human control. The reality is that landscapes are changing as land uses change.

Against this background it is suggested that we need to consider whether our palimpsest of nature management law is still appropriate for the 21st century. It would be tempting for an activist government to implement a nature law reform, similar to the 1980s resource management law reform that led to the RMA. Rolling all the related and sometimes overlapping legislation into one omnibus law would provide administrative neatness and ensure consistency. On the other hand, it would project a particular public good that may prove less than durable. Regardless, the palimpsest of laws with their differing views of nature suggests consideration of whether their mixed conception of New Zealand's nature is appropriate for the 21st century and calls for a wider discussion about how we want to treat it.

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Pip Wallace

Unnatural Divides
species protection in a fragmented legal landscape

Human use and development reshapes land, reconstitutes water, consumes space and natural resources and alters faunal compositions. This presents significant challenges to policy makers and wildlife conservation managers mandated to maintain and enhance biological diversity. In New Zealand a sizeable public conservation estate (approximately one third of the land area) buffers these inroads; however, limitations in terms of the representativeness and extent of the estate (Ministry for the Environment, 2007, p.3; Craig et al., 2000, p.66), conservation management budgetary constraints (Controller and Auditor-General, 2012, p.26) and elevated levels of threatened endemic species (IUCN, 2013) mean that more universal efforts are required to protect threatened species in all environments in New Zealand.

This article examines the disjointed arrangements of the law which frame species protection of animals in New Zealand. A lack of a comprehensive statute directed at threatened species protection means that the protection of threatened and at risk species is shored up by a range of statutes with disparate foci and functions. The analysis demonstrates the manner in which inconsistency in approach arises in the New Zealand context. Among other things, the role of place as a key determinant in the extent of protection is analysed. An argument is advanced that securing more effective protection of threatened species, and co-existence with humans in the New Zealand environment, necessitates a shift in protective focus away from 'place' to be more firmly fixed upon species conservation status.

In making this argument it is accepted that the problem of biodiversity decline needs to be attacked on many fronts. The key purpose of this article is to suggest that animals that are in danger of extinction require greater consistency in treatment by the law in order to be better protected. That is not to suggest that other, more systemic change – for instance, as outlined in other contributions to this issue of *Policy Quarterly*, or as set out in Brown et al. (2015) – are not also needed.

Connectivity and integrity in the landscape are vital components of conservation biology; and habitat fragmentation caused by agricultural intensification, urbanisation and associated infrastructure networks is considered a key driver of biodiversity loss (Bennett, 2003; Gurrutxaga et al., 2015; Jongman, 2002; Lindenmayer and Fischer, 2006). In recognition of this, a range of international instruments affect the implementation of connectivity, including the Convention on Biological Diversity, the Convention on Climate Change, the Ramsar Convention, the Convention Concerning the Protection of the World Cultural and Natural Heritage, and the Convention on the Conservation of Migratory Species of Wild Animals (Farrier et al., 2013, p.36). In a different

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sense, connectivity and integrity are also important characteristics of a regulatory regime. Just as the landscape is dissected and disrupted by human development, the lawscape far from resembles an integrated and comprehensive whole, and the recovery of threatened and at risk species in New Zealand is compromised by this approach.

In this article the terms 'threatened' and 'at risk', as applied by the New Zealand Threat Classification System, are used to discuss those animals in New Zealand that are threatened or at risk of extinction due to decline. The system works on a spectrum, and 'threatened' species include the categories 'nationally critical', 'nationally endangered' and 'nationally vulnerable', in declining order of threat (Townsend et al., 2008). By way of example, the kākāpō is ranked nationally critical, and the North Island brown kiwi is nationally vulnerable, as is the harlequin gecko. The 'at risk' class includes the categories 'declining', 'recovering', 'relict' and 'naturally uncommon'. The kōkako is an example of a bird in the recovering category, due to conservation success. The tuatara is a reptile falling within the relict category, due to it being a species which occupies less than 10% of its original geographical range (Robertson et al., 2013; Hitchmough et al., 2013, p.10).

In New Zealand, levels of threatened species are elevated in contrast with global averages (IUCN, 2013). The accentuated species loss profile is due to unique biogeographical conditions combined with high numbers of endemic species. A 2013 summary of plant and animal species identified that of the 12,223 taxa assessed, 3,540 were listed as threatened or at risk, compared with 2,788 in 2005. Of this change, it is estimated that 59 taxa genuinely worsened in status, while 12 taxa improved in status as a result of successful species management (Hitchmough, 2013, p.4).

A recent assessment of freshwater fish identifies that a concerning 74% are considered to be threatened, and 25% of freshwater invertebrate species are likewise classified (Goodman et al., 2014). Increasing threat status is attributed to 'pressures including eutrophication, habitat loss and population isolation caused by the damming of rivers, habitat destruction, species invasion, overharvesting, and climate change' (Joy and Death, 2014, p.454). Intensification of agriculture causing water quality degradation is seen as a major driver, and is further associated with loss of habitat, particularly wetland loss (ibid.).

For birds, compared with global statistics New Zealand has a higher percentage of threatened or at risk species. Of 417 New Zealand species, 77 (18.5%) are identified as threatened and 92 (22.1%) are at risk (Robertson et al., 2013, p.2). In 2013 the global figures were 1,313 (13.2%) threatened and 880 (8.9%) 'near threatened' (BirdLife International, 2013, p.7). The recent downward trends for New Zealand birds are thought to be related to changes in land use, particularly conversion from sheep farming to dairy farming; changes in oceanic productivity, possibly linked with global warming; and fisheries bycatch and predation (Miskelly et al., 2008, p.123; Wallace and Fluker, 2016 in press).

For birds, compared with global statistics New Zealand has a higher percentage of threatened or at risk species.

The Wildlife Act 1953 governs the protection of wildlife in New Zealand. Section 3 of the act provides for the 'absolute protection' of all wildlife throughout New Zealand and its fisheries waters (the exclusive economic zone). This may sound like strong or complete legal protection for threatened species, yet a closer examination reveals significant exceptions to the provision such that protection is far from 'absolute' (Wallace and Fluker, 2016 in press). Additional statutes which have some application to protection of threatened species and their habitat include the Marine Mammals Protection Act 1978, the Resource Management Act 1991 (RMA), the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012, the Fisheries Act 1996, the Conservation Act 1987, the National Parks Act 1980, the Reserves Act 1977, the Marine Reserves Act 1971 and the Biosecurity Act 1993. This patchwork of incremental legislative effort results in legislative packages where treatment of species is framed largely by place or sector. In particular, it will be demonstrated that the intersection between human activity/development and harm to species is a space where the consistent protection of threatened species is not well resolved.

At an international level, the Strategic Plan for Biodiversity 2011–2020 (including the Aichi targets) was approved at the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (Convention on Biological Diversity, 2010). The strategic plan reflects the need to strengthen efforts to address the underlying causes of biodiversity loss and reduce direct pressures upon biodiversity. Target 12 of the Aichi targets is that 'By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.' In New Zealand, introducing more consistent and effective protection of wildlife, particularly in land and seascapes of production, is a key means to better meet the targets.

At the heart of the problem is the fact that an animal species (and even the same animal) may receive different levels of protection in different areas or media. Thus, a dotterel may be entitled to stronger protection from development effects in coastal areas than in inland terrestrial areas, both consisting of habitat where the bird naturally occurs. Likewise, a bittern may receive more favourable treatment on a Manawatu farm wetland than in Westland. Or the Waikato River environs, as a consequence of co-management legislation directed at protection of the river area (the Waikato–Tainui Raupatu Claims (Waikato River)

Settlement Act 2010), may provide greater sanctuary than elsewhere. To a degree this variation can be expected: between a public nature reserve and private land, for instance, or a zoo and a farm. Yet when an animal has 'threatened' status, a better outcome is for protection to be premised upon that status, rather than place or some other driver. When the legislation intended to prevent harm to wildlife (such as the Wildlife Act 1953) is insufficiently comprehensive, unanticipated consequences tend to arise from the legal responses which fill the vacuum, or lack of them.

Wildlife Act 1953

As observed, the Wildlife Act 1953 governs species protection, and section 3 of the act provides for the 'absolute protection' of all wildlife, with exclusions outlined in schedules 1–5. The protective effect of the act is reduced in a number of ways, including by exceptions (including all threatened native fish, and many marine species and invertebrates); statutory defences (sections 68AB, 68B); lack of clarity surrounding incidental loss, such as habitat destruction; and reduced implementation (Wallace and Fluker, 2016 in press). The act contributes little in terms of active conservation planning for threatened species, and a range of additional deficiencies are evident. Its function is largely to limit a range of actions which may result in hunting or killing of protected species and to legitimise the take of particular species for game. These limitations are confined by reference to 'hunting and killing', thus limiting the reach of the act to other forms of harm (section 63). The act makes no provision for the listing of threatened species, identification and protection of critical habitat, or the preparation of mandatory recovery plans for threatened species. Species' threat status is not related to level of protection afforded. Furthermore, the act does not make provision for comprehensive conservation planning, or for any form of emergency spot zone to provide immediate protection for species where imminent loss may arise.

Statutory mechanisms are not available under the Wildlife Act to map and protect endangered species and their habitat in a holistic and range-focused manner. (Population management plans are provided for by section 14F, but these are exclusive to marine wildlife and not widely used.) Even in the limited cases where thorough and specific species recovery plans are prepared, there is no statutory mechanism to direct their consideration in respect of resource use and development plans made under other statutes. In particular, integration between the Wildlife Act 1953 and the Resource Management Act is absent. The focus of the Wildlife Act tends to reduce down to actions in respect of individual animals or particular populations, rather than promotion of protection at the wider landscape scale. This creates a significant problem where other legislation is fragmented or bounded and fails to comprehensively capture the vulnerabilities and needs of species across their range.

Policy to guide the management and protection of species exists, but the collective force of the instruments falls short of directing rigorous protection.

Protected area legislation

Protected area legislation, including the Conservation Act 1987, the National Parks Act 1980, the Reserves Act 1977 and the Marine Reserves Act 1971, adds a further protective layer to the legislative arrangements. However, these statutes are spatially limited to the extent of the protected area, and, excepting the Reserves Act 1977, are not applied to private land. Threatened and at risk species occur across all New Zealand environments, with the greatest proportion of threatened avian species being found in coastal areas (Miskelly et al., 2008, p.123), which are poorly represented among protected areas.

The spatial division between the public conservation estate and private land is significant in many ways, but particularly so in relation to survival rates of populations and species. Land use change in production areas is identified as a main cause of deterioration in conservation status, and species management (which is reduced in terms of central government effort on private land) is a prime reason for improvement (Miskelly et al., 2008, p.123).

No clear and universal mandate to protect and plan for threatened species across all environments in New Zealand is provided for in the legislative arrangements. Section 57(3) of the Wildlife Act provides that ownership of species is vested in the Crown, and section 41(1)(fa), in describing the general powers of the minister of conservation, provides that he or she may from time to time 'protect and preserve wildlife that are absolutely protected under this Act'. However, pursuant to section 6(a) of the Conservation Act, the conservation management functions of the Department of Conservation are limited to land or resources held under that act, thus constraining activity for conservation purposes on private land without agreement of the landowner. Furthermore, the role of the Department of Conservation reduces to an advocacy function as it concerns private land. Under the current statutory arrangements, mechanisms to methodically carry out conservation planning and protection across both the public and private estates are lacking. Specific powers under the Wildlife Act to prepare conservation policy and plans tend to be limited to wildlife sanctuaries, refuges and management reserves (sections 14B–E).

The outcome of the statutory arrangements is that biodiversity conservation planning documents prepared and administered by the Department of Conservation are largely limited to the

public conservation estate. Policy to guide the management and protection of species exists, but the collective force of the instruments falls short of directing rigorous protection. For the protection of wildlife, the most pertinent statutory instruments are conservation general policy prepared pursuant to sections 17B and 17C of the Conservation Act, and conservation management strategies. Conservation general policy says little about the protection and management of threatened or at risk species. No clear statement of the need to avoid irreversible effects on threatened species is made; nor is there any indication that a precautionary approach should be applied (Wallace, 2014, p.327). As well as lacking conservation plans and strategies with a clear guiding philosophy (Clout and Saunders, 1995, p.94), species management under the Wildlife Act and Conservation Act has been criticised as being inconsistent and alarmingly under-resourced (Joseph et al., 2008, p.155).

Restriction to the public conservation estate further reduces the protective effect of the policies and plans, particularly for mobile species or those species that are not strongly represented on public conservation lands. It is well understood that ecological processes are not well reflected in human governance boundaries drawn on maps.

Resource Management Act 1991

The divide between the public and private estate in New Zealand creates fragmentation of protection that is further compounded by the internal workings of the Resource Management Act. As the principal statute governing resource use and protection in New Zealand, the RMA has a considerable role in regulating the effects of human resource use upon species. Protection of species is not, however, the key focus of the act. Pursuant to section 5, the purpose of the RMA is the sustainable management of natural and physical resources, a mandate fundamentally different from absolute protection of wildlife.

Reflecting its impact on all New Zealand natural and physical resources, the RMA rests upon a different institutional framework than the Wildlife Act. A three-tier structure, comprised of central government and two levels of local government, regional and territorial, anchors the operation of the RMA. Provision is made for the sustainable management of resources, including biodiversity, principally through the creation of resource management policy and plans. On conservation land, development is constrained by both the RMA and the conservation legislation. The RMA applies to conservation areas, although a limited exemption applies to the Crown for land-use activities controlled by territorial authorities where that use is consistent with a conservation management strategy or plan (section 4(3)). On private land, however, the protection of species habitat is the remit of the RMA alone. The role of the Department of Conservation diminishes to advocacy, except for the discretionary power of the minister of conservation to preserve and protect absolutely protected species.

Protection of species by the Crown, by virtue of ownership and protection through the Wildlife Act, tends to be overshadowed on private land. The RMA provides for the protection of species, but, unlike the mandate of absolute protection afforded under the Wildlife Act, decisions are made to a level consistent with the promotion of sustainable management. Habitat, not species protection, is emphasised by section 6(c) of the RMA as a matter of national importance, and, although habitat protection is critical, a purely habitat approach can produce inconsistencies when agency boundaries divide populations or species. The real problem for threatened and at risk species is that there is no clear statutory direction elevating this class to priority, and the protection of biodiversity is just one factor of many that must be considered in achieving the sustainable management of natural and physical resources.

Arguments founded on property rights are commonly made to support limitation of responsibility for species protection falling on individual property owners, but the consequence of this arrangement can be loss to species, and it is an obvious contributing factor to the loss of biodiversity in New Zealand. Where the state owns species but fails to assert rights in terms of protecting its property, or any corresponding duty upon those causing the loss, then those who cause the damage to the species will bear no responsibility for the loss, which will be socialised, whether the loss arises on private or public property. Freyfogle asserts: 'If the public own wildlife, even on private land, then presumably it has a legitimate claim that land uses make room for that wildlife' (Freyfogle, 20110, p.57). The extent of this 'room' or limitation on private rights is currently controlled largely under the RMA and associated resource management plans.

Under the RMA, biodiversity is a concern of both regional and territorial authorities.

Under the RMA, biodiversity is a concern of both regional and territorial authorities (sections 30(1)(ga) and 31(1)(b)(3)). Resource management functions are divided between regional and district councils, pursuant to sections 30 and 31 of the RMA. Regional policy statements are directed by section 59 towards achieving integrated management of all natural and physical resources of the entire region. These documents can be supplemented by technical standards known as national environmental standards (sections 43–44A), and must give effect to national policy statements; both are prepared by central government, and designed to provide nationwide consistency and effect (sections 45–58A). Presently, consistency of approach and integration is hampered by the lack of an operative national policy statement on biodiversity and a silo effect

arises through the division of agency function.

Regional policy statements are tools designed to achieve integrated management, and, within a region, direct allocation of roles for biodiversity protection between agencies in accordance with section 62(1)(i)(iii) of the RMA, to manage overlap in function between local authorities. This measure, together with direction for local authorities to give effect to regional policy statements (sections 67(3)(c) and 5(3)(c)), promotes a measure of consistency between agencies within a region. A limitation in this provision arises in relation to proposed regional policy statements, as the requirement to give effect to the statement does not arise until the policy statement is operative. Section 74(2)(a)(i) requires territorial authorities to give regard to proposed policy statements when preparing district plans, as opposed to effect.

In addition, although section 86B(3)(c) of the RMA is intended to give immediate legal effect to provisions that protect natural heritage, the section is limited to rules in plans, and a proposed policy statement is confined to policy. Unitary plans which combine the provisions of regional policy statements, regional plans and district plans, as is the case with the Proposed Auckland Unitary Plan, may overcome these limitations. For district plans, a further factor limiting the impact of new measures introduced in proposed plans to protect threatened species is that section 86B(3)(c) is directed at provisions that protect habitats, not species, which therefore weakens the rules in proposed district plans directed at protecting species.

Although a regional policy statement may promote consistency and integration within a region, a 2015 analysis of 17 statements (both proposed and operative) throughout New Zealand, prepared for the purposes of this article, reveals considerable divergence in treatment of threatened and at risk species between regions. The analysis demonstrates that although all regional policy statements assessed contained policy directed at the protection of significant habitat, criteria for the definition of significance varied. Of the 17 statements analysed, 14 applied criteria which included consideration of rarity associated with the presence of threatened species in a particular habitat. Although not directly enabling consideration of threatened species, this criterion does adjust the focus from one of habitat to include consideration of species' conservation status. It also extends the section 6(c) focus on significant indigenous vegetation and enables the protection of exotic vegetative habitat, such as the gorse patches inhabited by the Mahoenui giant wētā. The criteria definition was not uniform between the regions: notable variations included the threat classification system applied (New Zealand Department of Conservation, IUCN (International Union for Conservation of Nature) or both), the definition of 'threatened' (for instance, inclusion of at risk species within this class), and whether threatened status was assessed on a local, regional or national basis.

> … it is clear that policy under the RMA affecting the treatment of threatened species varies widely …

Compounding these variations in criteria for identification of significant habitat was the method of identification. Strong variations existed as to whether the policy statement solely provided criteria for subsequent identification, contained schedules describing significant habitat and/or maps defining the areas, or included a direction to a local authority to identify or map the areas. The analysis suggests a lack of rigorous and systematic identification and protection of critical habitat/sites. As noted by Judge Harland in a different context, 'In our view, identifying areas is very different from providing criteria for the assessment of them' (*Opoutere Ratepayers and Residents' Association v Waikato Regional Council* [2015] NZEnvC 105).

The Ōpoutere decision was made in the context of protecting outstanding features and landscapes in the coastal environment, and thus, under the RMA, governed by the New Zealand Coastal Policy Statement 2010, which distinguishes treatment of the coastal environment from the balance of the terrestrial area. The New Zealand Coastal Policy Statement provides heightened protection for species in the coastal environment principally through policy 11(a): indigenous biological diversity. This policy mandates avoidance of adverse effects on a range of values, including indigenous taxa listed as threatened or at risk under the New Zealand Threat Classification System or as threatened by the IUCN. The proposed National Policy Statement on Indigenous Biodiversity 2011 has not adopted a position which matches the stringency of the New Zealand Coastal Policy Statement concerning avoidance of effects on biodiversity. This distinction reflects the lesser treatment accorded to threatened species outside the coastal environment, which largely consists of open public space as opposed to private lands.

Restricting regulatory reach to limit government interference with the use and enjoyment of private property, particularly where it supports economic development, is a common policy goal, and enabling development in a region is a clear function of a regional policy statement (Matheson, 2013, p.3). The analysis of regional policy statements shows broad regional variation in this regard, with the proposed Westland regional policy statement 2015 taking the least restrictive position, as follows:

> 2. While the protection of significant indigenous vegetation and habitat of significant indigenous fauna is provided for within regional and district plans, in the context of the current abundance of conservation land it would be sensible for ownership of all such significant areas to be within the Department of Conservation's land portfolio. (ch.3, p.11)

Given that the Department of Conservation manages some 1,912,000 hectares or 84% of this land in Westland (West Coast Regional Council, 2015, p.24), it is understandable that resistance would be encountered to further habitat/threatened species protection. Despite this, a relative abundance of protected habitat does not necessarily equate to an abundance of threatened species and the two should not be conflated. Protection of threatened species should be determined by threat status, rather than the extent of private land in a region. Landowner incentives and support remain available as complementary methods to provide for limitations on private property, as demonstrated in the Horizons One Plan 2014 (Manawatu-Wanganui Regional Council, 2014, ch.6).

In summary, it is clear that policy under the RMA affecting the treatment of threatened species varies widely, particularly with respect to the definition of the class 'threatened', criteria for significance and associated methods of identification, and the employment of a policy of avoidance of irreversible effects on threatened species. As a result, the level of protection is inconsistent, and predicated on place as opposed to threat status.

The problem is compounded by the reduced application of a policy of avoidance of irreversible effects in relation to the public conservation estate, and an absence of strategic conservation planning between the public conservation estate and the working environment. Conservation policy and management plans stop short at the boundary of the public estate and fail to integrate and 'speak' with resource management plans. Initiatives such as the Department of Conservation ecosystem and species optimisation projects, designed to focus management effort, are also curtailed by the boundaries of the conservation estate (Wallace, 2014, p.335). In this way, the eyes of conservation planners stop short of the horizon and their concerns are bounded.

Additional spatial inconsistencies arise as a consequence of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012, legislation regulating the management of the natural resources of the exclusive economic zone and continental shelf. Unlike the RMA, this act is limited to natural resources, and it applies a more precautionary and protective approach to the use and development of the resources than evident in the RMA. Heightened protection for threatened and at risk species is afforded through the application of decision-making criteria and information principles which require that, where information available is uncertain or inadequate, the minister must favour caution and environmental protection (section 34(2)).

The focus on habitat protection, combined with agency function and spatial limitation, work to fragment protection.

Opportunities exist for a more consistent approach to threatened species. Adopting dedicated threatened species legislation is one such opportunity (Seabrook-Davidson, Ji and Brunton, 2011; Wallace and Fluker, 2016 in press). Drawing variously on the examples of the United States' Endangered Species Act 1973, the Australian Environment Protection and Biodiversity Act 1999 and the Canadian Species at Risk Act 2002, these authors urge the adoption of statutory listing of threatened species, mandatory recovery plans and systematic protection of critical habitat. Protection predicated on conservation status is also central to the European Union approach, developed principally through the European Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC). Establishing the Natura 2000 network of protected areas, the directives ensure protection of the most seriously threatened terrestrial and marine habitats and species (Lausche and Burhenne-Guimin, 2011, p.64).

An alternative approach for New Zealand is to finalise national policy under the RMA which applies consistent standards and methods of protection of threatened and at risk species, based on threat status to all environments. Necessary statutory exceptions could manage competing interests, but commencing with a uniform standard provides some surety concerning protection of species threatened with extinction.

An additional unifying measure is the adoption of a spatial planning system which enables the development of a protected network of species and habitat across all environments. Spatial planning for protection of threatened species and associated habitat on a national basis, governed by a single agency and consistent policy and methods, would enhance consistency and integration of protection. Internationally, a wide range of connectivity initiatives (Farrier et al., 2013) and green infrastructure schemes (Lennon and Scott, 2014) are being developed to provide ecological linkages in landscapes, and defining a national approach would unify conservation effort. Spatial prioritisation of conservation effort would also be enabled beyond the public conservation estate. Local interests and the principle of subsidiarity could continue to be engaged through local biodiversity strategies and conservation partnership efforts.

Conclusion

Protection and planning for threatened species in New Zealand is fragmented through legislative provision and related agency function. The Wildlife Act 1953 provides absolute protection for species, but this provision is limited in a range of respects, and is not supported by comprehensive spatial planning measures designed to limit harm to species from

human activity in the environment. Although conservation legislation enables conservation planning, this is largely confined to the conservation estate and therefore provides inadequate protection for species which inhabit areas outside these boundaries.

Despite extending to both the public and private estate, the Resource Management Act fails to bridge the gap due to a range of factors. The focus on habitat protection, combined with agency function and spatial limitation, work to fragment protection. The analysis here shows that treatment of threatened species is inconsistent, particularly as it relates to level of protection afforded, definition of the class 'threatened', criteria for significance, and identification and mapping effort. In addition, the failure to link resource management planning to statutory species recovery planning processes further limits protection efforts. The law requires revision, and opportunity exists to strengthen consistency through the enactment of dedicated threatened species legislation, or a national policy statement for species protection complemented by comprehensive spatial planning.

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Evan Brenton-Rule, Susy Frankel
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Improving Management of Invasive Species

New Zealand's approach to pre- and post-border pests

Biological invasions are a ubiquitous global concern. Invasive species are non-native species that arrive in a new area, establish and increase in density and distribution to the detriment of the recipient environment. Such species that become invasive are a major threat to biodiversity (Vitousek and D'Antonio, 1997). Unlike inanimate risks, living things establish, reproduce and often spread, leading to enormous environmental and economic effects (Vilà et al., 2010).

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Invasive species have been implicated in large-scale changes in ecosystem composition and function (Vitousek et al., 1987), nutrient cycles (Ehrenfeld, 2003) and agricultural productivity (DiTomaso, 2000). Economic costs are significant. One early study estimated the broad cost of invasive species to the United States as US$120 billion annually (Pimentel, Zuniga and Morrison, 2005). New Zealand is particularly vulnerable because of its unique island ecosystem biota and strong primary sector. Early introductions of rats, mustelids and rabbits have driven extinctions of native species and damaged ecosystems historically (Druett, 1983) and continue to do so. More recently, the accidental introduction of the kiwifruit disease Psa has had large economic impacts and even prompted court action against the Crown.[1] In 2003 the Reserve Bank estimated that a foot-and-mouth outbreak could cost the economy $10 billion (Reserve Bank and Treasury, 2003).

During the last 50 years global trade has been the primary cause of the introduction of non-native species (Hulme, 2009). Introductions may be intentional or unintentional. Intentional introductions are when species are deliberately introduced, legally or illegally, to a new region. Unintentional introductions are of non-native species that are associated with commodities for import: for instance, insects associated with fresh fruit and vegetables. Other unintentional introductions include hitchhiker species, such as those attached to the hull of or in the ballast water of vessels.

The most effective and cheapest method of preventing trade-associated introductions is pre-border risk assessment and management (Springborn, Romagosa and Keller, 2011; Kumschick and Richardson, 2013). Management of pests post-border is a much more expensive and difficult process. Risk assessment characterises the likelihood and severity of potential adverse effects of biological invasion. Risk management is the process of evaluating, selecting and instituting actions designed to reduce that risk. The processes of assessing and managing invasion risk are related, but functionally separate risk analysis activities (Andersen et al., 2004).

Internationally, approaches and policies with regard to pre-border risk assessment and management of invasive species have been described as inconsistent and piecemeal (Secretariat of the Convention on Biological Diversity, 2001; Lodge et al., 2006; Ward et al., 2010). Global trade is largely governed by the rules of the World Trade Organization (WTO). Members of the WTO can impose restrictions on imports based on trade-linked risks associated with invasive species. Such restrictions are permitted provided they are consistent across similar risks and based on scientific risk assessment. Following arrival and establishment of non-native species, domestic agencies may or may not begin pest management. The type of pest management initiated depends on several factors, including the risk posed by the pest to the domestic environment and economy, as well as whether there is a realistic chance of control or eradication.

New Zealand's current regulatory and legislative approach towards pre-border invasive species risk associated with trade is precautionary compared with those of other developed jurisdictions. Leading invasion biologists have cited New Zealand's management and assessment of pre-border invasive species risk as the 'gold-standard' (Simberloff, 2013). Relative to the rest of the world this may be true. However, gaps exist in the current management regime that could be productively addressed to ameliorate the challenge of invasive species in New Zealand. The aim of this article is to highlight these potential gaps. We do this in two ways. First, we illustrate the benefits of New Zealand's risk assesment-based pre-border approach, but highlight its potential conservation failings. Second, we compare the inconsistent post-border approach to the management of invasive species between regions within New Zealand and suggest potential improvements.

> New Zealand's pre-border, relatively risk-intolerant regime and management system attempts to take a 'guilty until proven innocent' approach and has been cited as particularly progressive …

New Zealand's pre-border controls

New Zealand's pre-border framework: legal intentional species introductions

In 2007 the WTO governed 96.4% of global trade (WTO, 2007, ch.1). Under the WTO, invasive species risk associated with international trade is largely regulated by the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). The SPS Agreement imposes requirements on import regulations implemented at a domestic level that are concerned with animal, plant and food safety and health. These requirements are in part aimed at preventing or limiting the establishment and spread of pests (Annex A definitions 1(d)). The SPS Agreement attempts to ensure that any protective regulations in trade are non-discriminatory, transparent and scientifically justified. WTO members are free to determine what the SPS Agreement labels an 'appropriate level of protection', which may be defined as: 'where the politically acceptable benefits produced by any increase in quarantine effort will be insufficient to offset the increased costs' (Cook et al., 2008). Domestic measures implementing a nation's appropriate level of protection, such as import restrictions based on the risk of non-native species, must be founded on risk assessment and scientific justification. An appropriate level of protection is permitted to provide a higher level of protection than relevant international standards, provided there is scientific justification and a risk assessment is undertaken (articles 3.3, 5.1; WTO, 1997, p.173).

A common international approach presupposes that only an organism or commodity that is a proven risk elsewhere poses risk to the country into which it is being imported. This approach has been criticised by invasion ecologists as being insufficiently stringent (Simberloff, 2005; Lodge et al., 2006; Brasier, 2008; Roy et al., 2014). New Zealand's pre-border, relatively risk-intolerant regime and management system attempts to take a 'guilty until proven innocent' approach and has been cited as particularly progressive (Simberloff, 2003, 2013). New Zealand's intended appropriate level of protection is strict compared to that of most other developed countries. New Zealand's Biosecurity Act 1993 was the first national law that took a 'risky until proven otherwise' approach towards regulating the risk of non-native species associated with imports (Simberloff, 2003).

Intentional introductions of new species into New Zealand are governed by the Biosecurity Act and the Hazardous Substances and New Organisms Act 1996. The purpose of the Biosecurity Act is to prevent unintentional introductions of invasive species and their spread within New Zealand (sections 16, 42, 54, 143). The purpose of the Hazardous Substances and New Organisms Act is to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms. Any new organism proposed for import must be approved by both the Ministry for Primary Industries under the Biosecurity Act and the Environmental Protection Authority under the Hazardous Substances and New Organisms Act. The Hazardous Substances Act is governed by Ministry for the Environment, administered by the Environmental Protection Authority and policed by the Ministry for Primary Industries. Both the ministry and the authority undertake risk assessments. The authority considers the risks and benefits of an organism's introduction before granting approval, and must have 'particular regard' to the Department of Conservation (DOC)'s view (Hazardous Substances and New Organisms Act 1996, section 58(1)(c)). The ministry governs accidental organism imports. This involves assessing the potential biosecurity risks from pests and diseases that approved imported organisms may carry. For instance, the Environmental Protection Authority may approve a new plant introduction. The Ministry for Primary Industries would identify any pathogens associated with that introduction and apply appropriate sanitary measures. Proposed introductions may be rejected by the ministry or the authority based on risk posed to New Zealand. Costs of the risk assessments may be borne partly, or wholly, by the importer.

In terms of ability to manage non-native species introduction, nations have far more control over the intentional import of non-native species than over unintentional introductions associated with commodities or transport. It is here, therefore, that risk-intolerant policies are at their most efficacious in reducing non-native species risk and impacts (although risk assessment is applied effectively to unintentional introductions too). Species can be evaluated before introduction and, if found to be high-risk, denied import, thereby directly preventing any impact and costs associated with post-border control.

A risk assessment approach to intentional introductions

No biosecurity regime provides a fail-safe 'zero risk' system. Instead, non-native species risk management of intentional introductions exists on a continuum. At one end of the continuum, no species are accepted for import, although no nation employs this approach. Towards the other end of the continuum, most or all species are accepted for import. New Zealand sits towards the risk-aversion end of this continuum, as the Environmental Protection Authority and the Ministry for Primary Industries undertake risk assessments for all potential importations and only species assessed to be of low risk are accepted for import.

The benefits of risk assessment

Species-specific risk assessment tools and methodologies have been developed that allow for robust and transparent predictions of risk posed by new species (e.g. Pheloung, Williams and Halloy, 1999). Risk-screening systems have been demonstrated to be accurate across many parts of the world (Gordon et al., 2008). Risk assessment protocols have also been shown to produce an economic benefit, even accounting for losses through the incorrect rejection of species with net benefits (Keller, Lodge and Finnoff, 2007). These benefits are consistent across both the animal and plant trades (Springborn, Romagosa and Keller, 2011; Schmidt, Springborn and Drake, 2012).

As noted above, the SPS Agreement makes it clear that countries may choose their own appropriate level of protection, which may be highly precautionary. This holds true so long as there is scientific justification, risk assessment is undertaken and similar risks are treated in a non-discriminatory way so they are not a disguised restriction on trade (articles 2.3, 3.3; WTO, 1997, p.173). International disputes have arisen over inconsistent treatment of risk (WTO, 1998). Formal, transparent and consistent risk assessment policies therefore have the added benefit of reducing the risk of trade-related disputes regarding non-native species risk as well as reducing the economic, environmental and social impacts of invasive species.

From a New Zealand conservation perspective, risk assessment is beneficial, but not a panacea for the invasive species problem.

Potential conservation issues

From a New Zealand conservation perspective, risk assessment is beneficial, but not a panacea for the invasive species problem. Evidence suggests that islands are more easily invaded than mainland environments (Courchamp, Chapuis and Pascal, 2003), and New Zealand has a particularly unique natural history: for instance, the evolution of flora and fauna in the absence of mammals. The WTO's Appellate Body has made clear that risk assessments must explicitly consider the 'probability' as opposed to the 'possibility' of potential consequences of the importation of new species or commodities (WTO, 1998, pp.123-4). This is problematic in a country such as New Zealand with high levels of endemism, as it is difficult to probabilistically predict how endemic species will react to novel invaders. Species for which the Ministry for Primary Industries possesses little information often rate by default as 'low risk' during risk assessment and few if any protection measures are put in place.

This is understandable, as protective measures imposed without evidence could be seen as potential barriers to free trade. However, it means that new organisms entering New Zealand are often not picked up as environmental pests until their impacts are felt. This is most likely an intractable issue from a New Zealand conservation perspective. Risks of international trade disputes will not increase political appetite to reform the risk assessment process for species on which little information exists. It is, therefore, important that the post-border management regime is well-developed and effective at dealing with species that do pass pre-border controls.

Notwithstanding the conservation issues, prevention of unwanted non-native species arrivals is the most cost-effective method of managing risks of invasive species and does have conservation benefits (Keller, Lodge and Finnoff, 2007; Springborn, Romagosa and Keller, 2011; Schmidt, Springborn and Drake, 2012). Empirically validated risk assessment protocols are currently available and are steadily improving (Pheloung, Williams and Halloy, 1999; Lester, 2005; Gordon et al., 2008). New Zealand's pre-border approach to intentional new organism introductions provides a good blueprint for policies and legislation that effectively utilise these tools to prevent the introduction of potentially invasive non-native species. As we have observed, biological invasions are a major driver of extinction and biodiversity loss (Vitousek and D'Antonio, 1997), as well as has having major economic impacts (Pimentel, Zuniga and Morrison, 2005). A consistent, risk-based approach is critical to mitigating the effects of invasive species. Formal risk assessments represent a readily available tool that should form part of governments' policies for managing risks arising from this global challenge. However, if a species does elude pre-border management, or is allowed to be imported because of lack of evidence of harm, then it is crucial that the domestic regime can respond quickly and effectively.

Post-border pest management in New Zealand

New Zealand's post-border management framework

Management of pests at the border has two main goals, species exclusion or eradication. However, New Zealand has a large number of established and establishing pest species. Management of these pests is undertaken by a range of agencies, operating under different strategies, at different geographic levels and under a range of legislation.

> The Ministry [for Primary Industries] is the lead manager of pest management if … the pest is already in New Zealand and an objective has been set to eradicate it or contain it nationally.

Initiatives may be pest-led or site-led. Pest-led initiatives are intended to manage pests across large areas. Such programmes may be undertaken at national, regional or sub-regional scales, and are usually for pests with limited distributions. Site-led initiatives focus on spatially limited areas with high amenity values. Limited area size means pest control is feasible. These programmes usually address widespread animal pests and weeds for which broader-scale management is impractical. Site-led management includes most of DOC's management in reserves and national parks for biodiversity outcomes, community restoration projects and farmers' pest control activities. A wide range of legislation is involved, including the Wild Animal Control Act 1977, the Conservation Act 1987, the Resource Management Act 1991 and the Biosecurity Act. Many groups undertake work, including the Ministry for Primary Industries, DOC, regional councils, TBfree New Zealand, agricultural industry groups, public bodies and private landowners.

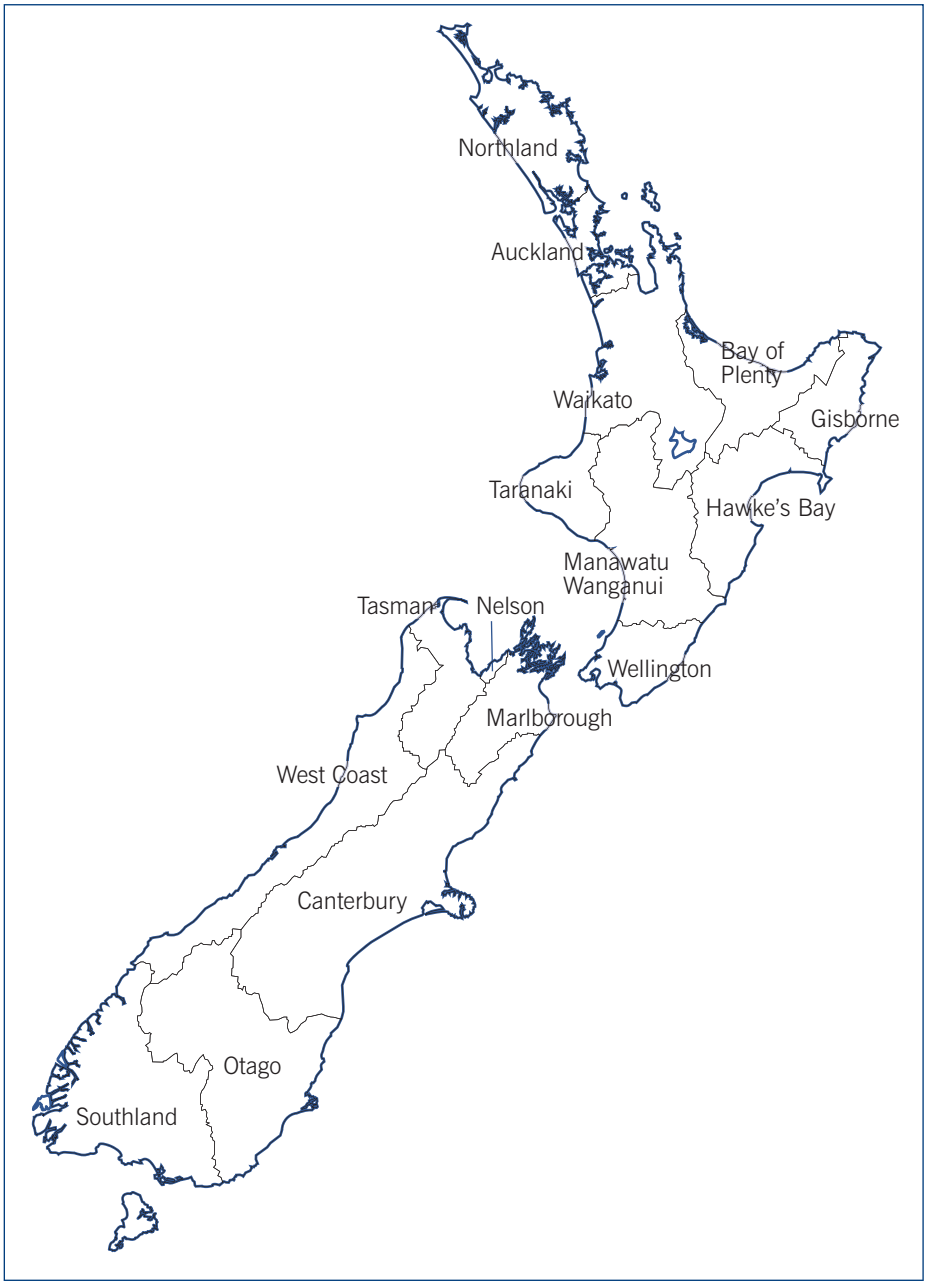
Besides regulation of pre-border risk, the Biosecurity Act also regulates management of invasive species incursions and establishment in New Zealand. Pest management activities take place under part 5 of the act, the purpose of which is to provide for the eradication or effective management of harmful organisms that are present in New Zealand (section 54). It does this by enabling the development of national or regional pest and pathway management plans and small-scale management programmes.

Under the Biosecurity Act, the Ministry for Primary Industries provides overall leadership for pest management in New Zealand (section 12A). Leadership includes overseeing and developing management systems, as well as measuring performance. It also includes promoting public support of an aligned, collaborative approach involving a range of stakeholders. The ministry has a memorandum of understanding on biosecurity with DOC, the Ministry of Fisheries and the Ministry of Health (Ministry of Agriculture and Forestry, 2006). This provides a framework for how these agencies work together on biosecurity matters. Responsibility for management of pests post-border is largely led by the Ministry for Primary Industries, DOC and regional government bodies. The ministry is the lead manager of pest management if (a) an organism has not been previously detected in New Zealand, or (b) the pest is already in New Zealand and an objective has been set to eradicate it or contain it nationally. A recent example is the Queensland fruit fly incursion in Northland. Some pest species that have established are managed by the ministry-led National Interest Pest Response. Species are included in this programme due to their potential to have a significant impact on economic, social and cultural values: examples are the water hyacinth and the rainbow lorikeet. DOC has an interest in any pests or diseases that are potentially harmful to native flora, fauna and natural ecosystems (Ministry of Agriculture

and Forestry, 2006) and will undertake eradication for conservation pests the ministry has decided not to respond to, such as the great white butterfly.

At the regional level, New Zealand is divided into 16 regions for devolved local government (see Figure 1). The regional councils or unitary authorities governing these regions have responsibility for pest management within their regions. Regional councils[2] lead control efforts for pests that are already in New Zealand where no decision has been made to eradicate or contain the pest nationally: i.e. most pest species. The Biosecurity Act (section 12) requires that regional councils provide leadership regionally, and prescribes a nuanced and collaborative approach to pest management, involving aligning interested groups, facilitating management activities and promoting public support (section 12B(2)). Regional council management is done through regional pest management plans, which are drafted under part 5 of the act for the purpose of the eradication or effective management of particular pests in a region (section 2).

Figure 1: Map of New Zealand showing regional councils and their boundaries



National policy direction

The Biosecurity Act requires that the responsible minister enact a national policy direction (section 56(1)). The purpose of a national policy direction is to ensure that activities under part 5 of the act provide the best use of available resources for New Zealand's interests and align with one another. In August 2015 the Ministry for Primary Industries released the 'National policy direction for pest management 2015' (Ministry for Primary Industries, 2015). This aims to achieve its purpose by:

a. clarifying requirements for Part 5 regulatory instruments; and
b. ensuring consistent application of these requirements nationally and between regions as appropriate (p.3).

It provides directions on:

- the setting of plan objectives: the adverse effects being addressed, planned outcomes and the geographic area to which the outcomes apply;
- programme descriptions: limiting programmes to one of five broad categories of pest management – exclusion, eradication, progressive containment, sustained control and site-led;
- analysing benefits and costs: providing criteria to be considered in a benefit-cost analysis;
- allocation of costs: directions on considerations when allocating costs of the plan. For instance, who benefits? Who exacerbates the problem?; and
- good neighbour rules: directions on criteria to be met when setting rules that impose requirements on landowners to manage spread of pests between properties so that the impacts on neighbours are not unreasonable.

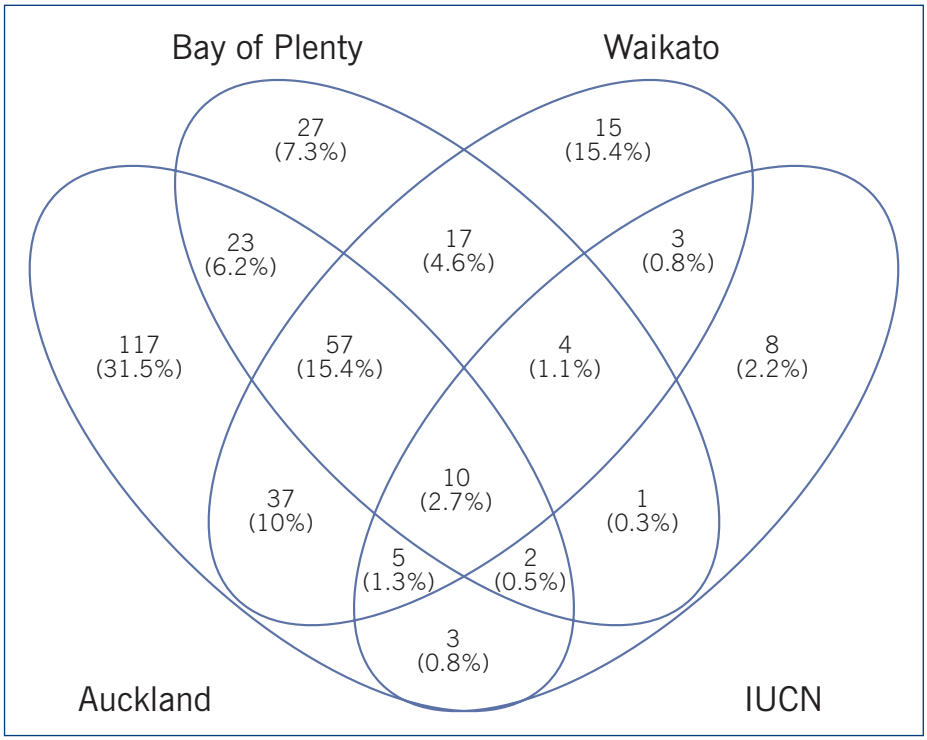
The changes required by the national policy direction to regional pest management plans will very likely improve New Zealand's domestic pest management system. It sensibly aims to provide more consistent management by providing guidance on: the language used to describe programmes; outcomes required of programmes; what is required for robust benefit-cost analyses; and what constitutes the new 'good neighbour' rules. While the national policy direction very usefully adds consistency to the pest management system, there are some notable regulatory inconsistencies and

Table 1: Regional pest management

Authority	Pest plants regulated	Pest animals regulated	Publicly available marine pest management strategy?	Annual regional council spend $/km2
Northland	118	63	Yes	$91*
Auckland	208	46	No	Incomplete data#
Waikato	146	44	Developing	$259*
Bay of Plenty	113	28	Yes	$210*
Gisborne	45	25	No	$131*
Hawke's Bay	24	14	No	$239*
Manawatu-Wanganui	62	35	No	$260*
Taranaki	28	23	No	$271*
Wellington	71	25	No	$658*
Marlborough	34	4	Top of the South Marine Biosecurity Partnership	$110*
Nelson/Tasman	45	17	Top of the South Marine Biosecurity Partnership	$51*
Tasman/Nelson	45	17	Top of the South Marine Biosecurity Partnership	$51*
Canterbury	84	19	No	$74*
West Coast	35	No publicly available animal pest management plan	No	No data#
Otago	20	4	No	$67*
Southland	63	42	Included in RPMP	$72*
				Average: $182

* These figures were sourced from RPMP reports. There may be extra pest management spending not included in report figures.
# Incomplete or no data available from RPMP.
Source: data obtained from regional pest management plans

Figure 2: Venn diagram showing inconsistency of management of pest species within regional pest management plans



The diagram includes pest species regulated by pest management plans of three regionally proximate, environmentally similar councils. Additionally, animal species from the IUCN list of 100 of the world's worst invasive species (Lowe et al., 2000) that are, or have been, present in New Zealand are included.

gaps that should be addressed. Below we provide evidence for this view.

Inconsistency in pest species regulated

The number of pest species directly regulated is inconsistent, ranging from 254 in Auckland to 24 in Otago (see Table 1). It might be argued that the lower South Island regions, such as Otago, are environmentally less hospitable to invasive species and therefore it is reasonable that fewer pest species are regulated. However, the inconsistency is a national phenomenon. For example, Auckland, Waikato and Bay of Plenty are similar climatically and share borders with one another, yet the number of pests species regulated varies significantly between these regional councils: Auckland, 254; Waikato, 190; and Bay of Plenty, 141. Further, the species regulated are different (Figure 2). Auckland has 117 unique species in its regional pest management plan not covered in the Bay of Plenty or Waikato plans. Of all species regulated, only 57 are regulated by all three councils. Moreover, some significant invasive species are being regulated inconsistently across these councils. The IUCN (International Union for Conservation of Nature) list of 100 of the world's worst invasive alien species (Lowe et al., 2000) includes 36 species that are, or have been, present in New Zealand. Eight of these species are unregulated by the three councils. Of the other 28, only ten are regulated by all three councils.

This inconsistency is potentially problematic. First, these regions are broadly geographically contiguous, with well-developed transport connections and frequent inter-region movement. There is a risk that species not regulated in one region could provide a source population to invade or reinvade a contiguous region, or attenuate efforts at population control or containment. Additionally, trade is a major driver of invasive species risk. The top three ports by dollar value for commodities imported to New Zealand are Auckland seaport, Auckland Airport and Tauranga seaport (Bay of Plenty). This year these three ports have imported, by dollar value, 43.7%, 19.9% and 10.6% of New Zealand's total commodity imports respectively.[3] Given the likely import-associated pest pressure, these regions should have consistent approaches to pest management, while consistency

would also help to ameliorate the potential issue of source populations.

We are not suggesting a standardised 'blacklist' approach for all regional pest management plans nationally. Such approaches assume that all potentially invasive species have similar impacts wherever they are found. In reality, invasive species' impacts can vary depending on species' distributions and densities and the climatic suitability of a particular region. Instead, we suggest that in areas where species may pose similar risks – such as Waikato, Auckland and Bay of Plenty – there should be significant coordination, and possible standardisation, of control programmes.

Inconsistency in funding

Domestic pest management spending involves financial contributions from a variety of stakeholders, including private landowners, Māori, regional councils, the Ministry for Primary Industries, DOC and other public bodies. Direct regional council spending is only a part of the total management spend. However, as the Biosecurity Act tasks regional councils with leadership in pest management at a regional level, it is interesting to assess their relative pest management effort.

Pest management under regional pest management plans is partially funded from rates (Biosecurity Act, section 100T). Rates levied on land occupiers can vary depending on the interests of the occupiers; that is, the extent to which they benefit from pest management and the extent to which they exacerbate the pest (Biosecurity Act, section 100T(2)(a)-(d)). However, this funding system is problematic as regions' populations differ substantially in terms of size, demographics and income; therefore, rate-dependent funding for pest management will also differ. These differences may be reflected in the 2013-14 pest management spend per square kilometre across regional councils (Table 1). By far the most spent by any one council was by Wellington Regional Council at $658 per km2, whereas Tasman/Nelson spent $51; the national average was $182 per km2. Per square kilometre spend on pest management may be reflective of variable council pest management effort across regions. This inconsistency may be counterproductive, in that while one region may be controlling pests effectively, neighbouring regions may expend less effort, undermining broader-scale management effectiveness. But it should be noted that other potential explanations exist for inconsistency in management spend. Population variation may lead to variable rate intake across regions. Alternatively, level of expenditure may be influenced by how many pests there are in a region and the vulnerability of habitat to invasion. For example, two councils with relatively low spends per square kilometre, Otago and Southland, are cold environments ill-suited to pest establishment. Finally, councils generally do not undertake management on protected Crown land, so regions with higher proportions of Crown land may have lower council activity.

Marine biosecurity

Maritime transport is a major source of non-native species introductions (Molnar et al., 2008). For example, ballast water harbours many non-native species (Roman and Darling, 2007), and although ballast water exchange protocols have been implemented, their efficacy has been questioned (Tsolaki and Diamadopoulos, 2010). Ships themselves also act as vectors. Hull fouling – the hitchhiking of non-native species on ship hulls – is a major issue (Molnar et al., 2008). Marine invasive species are an increasing threat to marine biodiversity worldwide (ibid.). In New Zealand recent invaders include the Mediterranean fanworm, which has been found in Northland and the Bay of Plenty, and the highly invasive seaweed *Undaria pinnatifida*, which is present in almost all of New Zealand's international ports.[4]

Despite the high risk posed by ballast and hull-fouling, only six of New Zealand's 16 regional councils have specific marine pest management plans in place. Auckland region, whose seaport handles over 40% of all of New Zealand's imported goods by dollar value, does not have a publicly available marine pest management plan. Councils recognise their lack of management plans to be an issue: the Waikato Regional Council has specifically requested direction on this issue in its pest management plan (Waikato Regional Council, 2014, p.254). Encouragingly, the country's second biggest port by dollar value, Port of Tauranga, does have a marine pest management plan. This management plan could be developed or enhanced for use by other ports.

Despite the high risk posed by ballast and hull-fouling, only six of New Zealand's 16 regional councils have specific marine pest management plans in place.

Another encouraging development is the Top of the South Marine Biosecurity Partnership. This regionally focused group was formed with the intention to improve marine biosecurity management in the top of the South Island. It involves representatives from Tasman, Nelson and Marlborough regional councils, the Ministry for Primary Industries, DOC, the aquaculture industry, Māori, port companies and other groups. It undertakes a range of roles, including project management, media and public awareness, development of manuals and plans, scientific support/technical solutions, and incident readiness and response. We suggest that such a regionally focused management approach should be applied to other marine areas with similar risk profiles around New Zealand.

Conclusion

New Zealand's pre-border approach to invasive species management has

been heralded as particularly effective (Simberloff, 2013). Risk assessment for new commodities and species proposed for import has allowed New Zealand to largely avoid many of the damaging species introductions that have occurred elsewhere. Evidence suggests that pre-border risk assessments can result in long-term economic net benefits (Keller, Lodge and Finnoff, 2007; Springborn, Romagosa and Keller, 2011; Schmidt, Springborn and Drake, 2012). However, from a conservation perspective the current paradigm of risk assessment in international trade is imperfect, given the need for probabilistic scientific evidence of harm. New organisms that are environmental pests are often not picked up until their impacts are felt. It seems unlikely that this problem will be addressed, given the differing political priorities attached to trade and conservation.

It is particulary important, therefore, that New Zealand's post-border management of invasive species is well-developed and effective. Funding and species regulated in regional pest management plans is inconsistent across regions, even in environmentally similar areas. Further, key regions lack marine pest management strategies. This is not to say that New Zealand's post-border approach is poor relative to the rest of the world; worse examples exist elsewhere (Quinn, Barney and Endres, 2013). However, New Zealand is world-leading in its pre-border pest risk management. So, too, in certain areas of domestic pest management, such as predator removal on offshore and mainland islands (Bellingham et al., 2010). Trade-related invasive species pressure is highly likely to increase. Therefore, regulatory change should come sooner rather than later. A truly integrated, consistent and effective pest management framework would go some way towards ameliorating the challenge of invasive species to New Zealand.

1 http://thekiwifruitclaim.org/; see also *Strathboss Kiwifruit Ltd v Attorney-General* [2015] NZHC 1596.
2 The distinction between regional councils and unitary authorities is not relevant to pest management, and the term 'regional council' is used in this article to refer to both.
3 http://nzdotstat.stats.govt.nz/wbos/Index.aspx?DataSetCode=TABLECODE7302, accessed 19 October 2015.
4 http://www.biosecurity.govt.nz/pests/undaria.

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School of Government
Te Kura Kāwanatanga

Forthcoming Events

	Title	Speaker/Author	Date and Venue
Chair in Digital Government	Birth of a Child – Life Event	**Jeff Montgomery**, *Registrar-General & General Manager, Births Deaths Marriages and Citizenship*	**Friday 4th March, 12:30 – 1:30pm** Old Government Buildings Lecture Theatre 4 (first floor) RSVP: e-government@vuw.ac.nz
Health Services Research Centre	The Changing Face of the GP Workforce: RNZCGP workforce survey 2015	**Frances Townsend**, Senior Policy Advisor, Royal College of General Practitioners	**Tuesday 15 March, 12:30 – 1:30pm** Old Government Buildings Lecture Theatre 3 (ground floor)
Health Services Research Centre	A Global Comprehensive Measure of the Impact of Natural Hazards and Disasters	**Ilan Noy**, EQC-MPI Chair in the Economics of Disasters, Victoria University of Wellington	**Tuesday 12 April, 12:30 – 1:30pm** Old Government Buildings Lecture Theatre 3 (ground floor)

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Theo Stephens, Suzie Greenhalgh,
Marie A. Brown and Adam Daigneault

Enhancing the Tax System to Halt the Decline of Nature in New Zealand

Managing New Zealand's natural heritage

New Zealand is world-renowned for its nature – its lush forests, spectacular mountain landscapes, wild and scenic rivers, beautiful coastlines and extraordinary biodiversity. This natural heritage is the foundation of New Zealand's identity and its branding, and the premier attraction for the tourism industry. It provides habitable environments, contributes to economic production and assimilates wastes, and is an important source of great enjoyment, health and well-being (Roberts et al., 2015). Nature contributes to the success of the nation's fishing, farming, forestry and tourism industries, which provide about 52% of national export income (Ministry of Business, Innovation and Employment, 2013). But these values and the well-being and prosperity they enable are being diminished and degraded at an alarming rate. Anthropogenic climate change, degradation of the marine environment, land use change and biodiversity loss, impacts of invasive species, deteriorating quality and diminishing availability of fresh water, soil

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contamination and pathogens degrade both nature and human well-being. Ultimately they threaten life as well as livelihoods.

These issues are neither new nor confined to New Zealand. Indeed, they are a focus of considerable public and government attention internationally. In response, New Zealand has around 22 legislative acts that protect nature in some way (Schneider and Samkin, 2012; Brown, Stephens et al., 2015). A government agency dedicated to nature conservation, the Department of Conservation, has been created and other central government agencies, such as the Ministry for Primary Industries, the Ministry for the Environment and the Environmental Protection Authority, as well as local and regional government also have important nature protection roles.

The New Zealand government has signed six international conventions with commitments to protect nature, and prepared a national biodiversity strategy (Brown, Stephens et al., 2015). Legally protected areas now cover about one third of the country, making New Zealand one of 24 countries to have more than 20% of its land area legally protected (Seabrook-Davison, 2014). Fifteen water conservation orders recognise outstanding values of freshwater ecosystems (Water Conservation Order, 2016), and six wetlands are recognised under the Convention on Wetlands of International Importance (Ramsar, 2016). A growing network of marine protected areas will soon include the Kermadec Ocean Sanctuary, the world's largest no-take marine reserve, covering 620,000 square kilometres or about 15% of the exclusive economic zone (New Zealand Government, 2015).

Additional conservation successes are being achieved through community and business partnerships with the Department of Conservation, local and regional government and the Queen Elizabeth II (QEII) National Trust (which helps private landowners in New Zealand protect special natural and cultural features on their land with open space covenants). There are now over 4,000 QEII private land covenants (covering approximately 200,000 hectares or about 0.7% of the New Zealand mainland and inshore islands) and more than 600 community conservation initiatives under way (Peters, Hamilton and Eames, 2015). The growth and increasing professionalism of voluntary community conservation indicates the increasing public demand and willingness to participate actively in conservation.

And yet, despite the level of public support for conservation and the efforts of legislators, communities and conservation agencies, the rate of decline is greater and the state of nature in New Zealand more threatened now than at any time over the last 65 million years (Bradshaw, Xingli and Sodhi, 2010; Ceballos et al., 2015).

The state of nature in New Zealand

The sixth great extinction is under way (Ceballos et al., 2015), and New Zealand leads the world, with more native species already extinct (40 species extinct, and around 70 not seen for more than 20 years) or at risk of extinction than any other country (Bradshaw, Xingli and Sodhi, 2010). Six of ten taxonomic groups assessed have half or more of their living members classified as threatened or at risk of extinction (see Table 1).

In legally protected terrestrial areas (around 30% of terrestrial New Zealand), endemic vertebrates (bats, birds, lizards and freshwater fish) and large invertebrates such as land snails are facing extinction from invasive mammal predators (Innes et al., 2010) and introduced fish species. Extinction risk has increased between 2005 and 2011 for 7% of species assessed and declined for 1.5% (Ministry for the Environment and Statistics New Zealand, 2015). On private land (the other 65% of terrestrial New Zealand), habitat destruction is a further cause of loss (Cieraad et al., 2015), often accelerating underlying declines caused by introduced mammals. Most native freshwater fish species are threatened by water abstraction, migration barriers and/or deteriorating water quality (Parliamentary Commissioner for the Environment, 2013, 2015a), as well as by introduced predators such as trout, mosquitofish, catfish and perch. Anthropogenic climate change is expected to exacerbate many of the threats described above (McGlone and Walker, 2011).

Large areas of New Zealand are subject to invasive mammal control. Some 37% of the 6.4 million hectares of remaining native forest have recently received some form of predator management (Table 2). About 16% of this was aerial 1080[1] control of possums by OSPRI[2] to manage bovine tuberculosis, 9% was aerial 1080 operations by the Department of Conservation aimed at rat and stoat irruptions during the 2014/15 summer, and another 7% was covered for other purposes between 2010 and 2015. However, the continuing decline of

Table 1: Percentages of taxonomic groups threatened or at risk of extinction

Taxonomic group	Percentage threatened or at risk of extinction*
Vascular plants	39
Marine mammals	27
Bats	75
Birds	81
Reptiles	88
Frogs	100
Freshwater fish	72
Freshwater invertebrates	26
Earthworms	19
Marine invertebrates	76

* Data are percentages of species assessed within each taxonomic group. The number of species assessed in the large invertebrate groups may be insufficient to represent the entire group.

Source: based on data from Ministry for the Environment and Statistics New Zealand, 2015

Table 2: Native forest predator management (~6.4 million hectares)

Management type	Percentage of area
Aerial 1080 – DOC Battle for our Birds*	9
Aerial 1080 – DOC other predator control	7
Traps and hand-laid toxins	5
Aerial 1080 – AHB possum control	16
No management of predators	63

* The Battle for our Birds project was undertaken in the summer of 2014/15. All other management is from 2010 until June 2015.

Source: Walker, Monks and Innes, 2015

endemic forest vertebrates shows that the intensity of these efforts and the area covered are still insufficient to halt the decline of forest species threatened by mammal predators (Walker, Monks and Innes, 2015).

There is little management of habitat loss and degradation for biodiversity compared to predator management. Efforts to monitor habitat loss to date have tended to be uncoordinated and irregular, so there is no definitive source for the rate of habitat loss. This should change with the recent introduction of the Environmental Reporting Act. From various sources, however, it is possible to obtain a picture of recent habitat loss.

New Zealand's regulatory and public-funding approaches to managing nature are presently … isolated from economic policy …

Environment Aotearoa 2015 identified a loss of around 10,000 hectares (0.26%) of indigenous forest since 1996 (Ministry for the Environment and Statistics New Zealand, 2015). However, there is a considerably greater portion of non-forest habitat (wetland, grassland, herbfield, shrubland) that has been lost to agricultural intensification (Cieraad et al., 2015). Approximately 70,000 hectares of indigenous grassland in the central South Island alone was converted to intensive agriculture and forestry between 1990 and 2008 (Weeks et al., 2013), with conversion continuing since.

Why is nature so hard to protect?

The question must be asked: why, despite substantial public and private efforts to conserve nature in New Zealand, is New Zealand's natural heritage still declining?

Brown, Stephens et al. (2015) propose that nature protection in general fails to halt decline and loss because current efforts address proximal rather than fundamental causes of loss. The fundamental cause is the misalignment of government, business, private and public interests in nature's protection. For government at all levels, protecting nature is a controversial demand on an already stretched public purse, often resulting in the underfunding of private conservation. Private landowners and businesses often find the opportunity and management costs of retaining/managing nature outweigh the immediate benefits of its loss, and don't consider the cumulative negative impacts of their individual actions on nature. The public, on the other hand, enjoys both the benefits supplied by nature and some economic benefits arising from its loss to development.

These divergent interests motivate a range of behaviours and conflict. Outcomes for nature are shaped by the distribution of power among stakeholders and mediated through phenomena such as the collective action problem (Olsen, 1965), agency capture (Clare and Krogman, 2013) and bureaucratic slippage (Freudenburg and Gramling, 1994). This can result in the regulated community controlling regulatory decisions and/or performances in a way that serves the interests of the regulated community rather than the interests of the public (Clare and Krogman, 2013).

We argue that effectively halting nature's loss must involve an approach that aligns these interests and incentivises behaviours that promote nature's conservation.

A common institution for bringing divergent interests toward alignment is markets. However, markets typically fail nature because many of nature's uses and characteristics are non-exclusive (that is, it is not possible to obtain full payment for the benefits provided by nature, or the full cost of using nature's benefits can be avoided) and/or non-rival (that is, the use of nature by one individual doesn't affect the use of nature by others) (Randall, 1983). In other words, the public-good (Godden, 2006) nature of nature (whether it is on public or privately managed land) means these markets have not been established and are missing (Randall, 1983).

One policy response is to use regulation. New Zealand has pursued environmental regulation primarily through the Resource Management, Conservation and Wildlife acts. The development of rules and regulations (for example, regional policy statements, regional and district plans, conservation plans) in New Zealand is typically highly litigious, involving long public submission and appeal processes.

The cumbersome and often adversarial nature of these processes creates a self-selection mechanism for participation, with participation being more attractive to those with adequate resources to participate (that is, mostly well-organised groups and organisations) and outcomes favouring those who participate (Freudenburg and Gramling, 1994). Given that the private-interest benefits of degrading nature are often higher and less diffuse than the perceived public benefits of preserving nature, there is: (1) little incentive for members of the public to engage in plan and rule development processes, and (2) a temptation for the public to free-ride by relying on the efforts of others to protect one's own interest in nature's protection.

Policy misalignment or lack of policy integration sends conflicting policy signals, further weakening the existing incentives to preserve nature (Pearce and Turner, 1990). Many of these conflicting policy signals enhance the cost-competitiveness of New Zealand businesses. Part of this cost-competitiveness comes from hidden subsidies (such as no charge on nature and environmental services consumed) and minimal enforcement of resource consent conditions (Brown, Clarkson et al., 2013) and animal welfare, employment and health and safety standards. There are also direct financial subsidies, such as the Irrigation Acceleration Fund, which lowers the cost of production in

the primary sector, or the low valuations of public land transferred to private ownership during the high country tenure review process (Brower, 2016). Policies to conserve nature which increase the financial cost of production without concomitant incentives for conservation are likely to create opposition to reform, particularly if this reduces the international cost-competitiveness of New Zealand businesses.

New Zealand's regulatory and public-funding approaches to managing nature are presently also isolated from economic policy, and a lack of coordination and integration leads to conflict between economic goals and environmental protection. Often environmental protection is perceived as creating unwelcome costs and limits on production, as encapsulated in the phrase used in the release of a draft regional mining strategy: 'red carpet not red tape' (West Coast Regional Council, 2015).

The institutional arrangements to support policy integration are also largely absent in New Zealand. The Parliamentary Commissioner for the Environment is arguably the only institution to have a mandate to scrutinise the environmental implications of sectoral policy-making. While the commissioner provides independent advice and may encourage preventive measures and remedial actions to protect the environment, the decisions to change law, policy and institutional arrangements are the responsibility of Parliament and government agencies. The degree to which these institutions respond to the commissioner's recommendations are variable, especially where politicians and decision-makers may have incentives to seek immediate benefits, avoid controversial reforms and allow costs to fall on future generations.

Formulating an alternative policy response

Where private interests degrade nature, it is frequently because perceived benefits exceed the perceived costs of both degradation and the alternative, maintaining nature. Thus, private interests require incentives for conservation sufficient to match the incentive to degrade nature if their interests are to be preserved.

Policy integration is a key aspect to consider when formulating a policy response to strengthen and align policy signals, as well as help achieve intergenerational equity, which governments arguably should be considering on behalf of their population. Policy integration aims, at a minimum, to take environmental considerations into account. Ideally, it would place environmental considerations at the heart of decision-making in other sectoral policies (Jordan and Lenschow, 2010).

There are many interventions available to help preserve New Zealand's natural heritage. Among them are more effective regulation, collaborative governance, regional landscape planning that accounts for natural capital, enhanced agency accountability for environmental outcomes, expanded tools for private land protection, more public funding for conservation, and strengthened public interest litigation (Brown, Stephens et al., 2015). However, while some aspects of these have been adopted by agencies and landowners both internationally and in New Zealand, there is no evidence to suggest that the improvements achieved are sufficient to halt ongoing loss. Brown, Stephens et al. (2015) argue that this is because they do not adequately address the interests and incentives underlying behaviours that cause nature's loss. For example, none of these interventions address incentives underlying the tendency to allow the cost of immediate benefits to fall on future generations, or provide incentives for government to resist pressures from special interest groups (Pearce and Turner, 1990). A policy response, however, that begins to integrate fiscal and environmental policy and that arguably could provide a stronger incentive to conserve nature in New Zealand is tax reform.

An OECD study of taxation, innovation and the environment (OECD, 2010) argues that environmental taxes can be a basis for policy integration that aligns public and private interests while encouraging private and public sector innovation. The report contends that environmental taxes should be central to a country's environmental policy because they incentivise pertinent innovation for harm reduction and its adoption at least cost. Environmental taxes, it argues, complement and support regulation to better internalise environmental externalities through innovations and behaviours that would be neither devised nor adopted without such taxes. Furthermore, the tax should be levied as directly as possible on the pollutant or action causing the environmental damage, as this stimulates abatement incentives for all possible abatement options (OECD, 2010, p.139).

> The intent of [an enviromental] tax would be to integrate economic and environmental management decisions by internalising environmental costs and incentivising conservation.

While tax reform discussions have begun in New Zealand, they are still in their infancy (Tax Working Group, 2010; Salmond, 2011) and have not yet included consideration of the role of corrective taxes such as those proposed by the OECD. Some of the Tax Working Group's key conclusions were that:

- New Zealand relies heavily on the taxes most harmful to growth, particularly corporate and personal taxes on capital income;
- the tax system lacks coherence, integrity and fairness, with the tax burden disproportionately borne by wage earners, since many with wealth can restructure their affairs through

trusts and companies to shelter income from taxes;
- there will be increasing demands on the revenue base arising from demographic change, the rising cost of financing higher public debt, and, we would add, climate change mitigation costs. (Parliamentary Commissioner for the Environment, 2015b)

A land use tax, while being more of a corrective tax, could potentially address these issues raised by the Tax Working Group.

The most environmentally harmful land uses would attract high per-hectare tax rates, with lower rates for more benign uses and rebates for areas remaining in native vegetation or legally protected for conservation.

Conceptual basis for an environmental tax: the land use tax

Taxes based on the capital value of land and any improvements (e.g. buildings etc.) already exist in New Zealand. Local authorities levy rates on this basis, and many offer rates relief for covenanted natural areas (similar to property tax relief in Canada (Ontario, 2016)). The merits of a national land tax levied on capital value (Coleman and Grimes, 2009) and on an area basis (Brandt, 2014) have also been discussed for New Zealand. Their major environmental drawback is that they create disincentives for conservation that need to be countered with exemptions for natural areas.

Most of New Zealand's pressing environmental problems (water pollution, biodiversity loss and greenhouse gas emissions) arise partly or primarily from the intensification of land use. Therefore, an environmental tax based on the intensity of land use is likely to be an appropriate and effective approach to retaining and maintaining nature's capital stocks and subsequent flow of benefits. Such a tax, following the OECD principles, would be internationally novel, although its potential was explored during property tax reform discussions in Germany (Bizer and Lang, 2000, cited in Brandt, 2014). The intent of this tax would be to integrate economic and environmental management decisions by internalising environmental costs and incentivising conservation.

The basis of a land use tax could follow the Accident Compensation Corporation (ACC) model. ACC views workforce health and safety as a form of public wealth (analogous to environmental goods and services) that is diminished and degraded by injury (analogous to environmentally harmful land use). It classifies business activities according to the likelihood of accident (not the actual harm caused) and applies a variable per-dollar earner levy reflecting the risk associated with each activity class. There is also a mechanism for rewarding good safety performance. Rates are periodically reviewed to account for inflation and other factors that change over time.

We suggest that this conceptual framework could be usefully applied to nature by taxing private benefit on the basis of likelihood of environmental impact (as with ACC). In this way, environmental degradation could be estimated from land characteristics and its management, rather than having to measure actual environmental degradation.

Design of a land use tax for New Zealand

While there are many possible technical formulations for a land use tax, we outline a two-tier approach, in an attempt to reduce the administrative burden of such a tax but also provide an incentive to undertake greater nature conservation actions. The outline provided only sketches out how such a tax might work. Additional design and assessment is required to refine the details of the tax, as well as to more broadly familiarise and engage the general public, government, industry and business with the concept.

This two-tier approach uses categories of land use as surrogates for the level of environmental impact of associated activities. The first tier provides the core framework for the approach and could function as a stand-alone system, while the second tier provides the sophistication and differentiation required to incentivise well-integrated production and environmental outcomes. This two-tier approach is similar to that used for forestry in the New Zealand Emissions Trading Scheme, where Ministry for Primary Industries tables can be used to estimate carbon sequestration (based on species, region and age class), or carbon sequestration can be estimated using more precise methods based on basal diameters of trees (as laid out in the Climate Change (Forestry Sector) Regulations 2008).

Tier one: the core framework

The most environmentally harmful land uses would attract high per-hectare tax rates, with lower rates for more benign uses and rebates for areas remaining in native vegetation or legally protected for conservation. In this way, tax rates could be scaled to the level of environmental externality being generated: as an example, taxes on open space would be lower than on land that is no longer permeable because of paving and buildings, and an intensive use (such as irrigated dairying) would be taxed more per hectare than extensive pastoralism. Different parts of a single property may fall into different land use categories and so be subject to different per-hectare tax rates, depending on property size and the spatial resolution of land categories. Land characteristics and its use could be estimated and regularly updated from satellite imagery and existing databases such as Landonline (for

land title data), the land cover database and protected areas database (for land use information), and S-Map (for soil characteristics).

Tier one is essentially a flat tax (i.e. a uniform fixed rate for each land category) which would be relatively simple, with administrative costs falling almost exclusively on the administering agency and few, if any, additional transaction costs for landowners. However, it is a blunt instrument in that it assumes all land within a category has similar characteristics and is used in the same way, resulting in the same level of environmental degradation. A land manager can only affect tax liability by changing land management in ways that alter the area of different land categories within their property.

Tier two: incentives for better environmental management

Landowners and managers would have more opportunity to affect tax liability (and incentive to integrate production and environmental outcomes) if land within each category were further differentiated according to its capability and actual use. Lower rates could be associated with uses which match the capability of the land, while higher rates are applied to areas where land use exceeds capability. For example, a landowner could intensify land use on flatter land with more stable soils that have lower nutrient-leaching potential, and restore or protect more environmentally sensitive areas of land such as riparian margins. Landowners could then further reduce their tax liability by demonstrating that their management practices (within an area of land of a particular category) have a lower environmental impact or improve the condition of land and its subsequent flow of benefits to a standard that exceeds those specified for the tax rate threshold(s) within that land category. The level of tax deduction could be determined using individual land use and management information such as stocking rates, nutrient inputs, types of mitigation practices and sustainability systems (e.g. green roofing) being used, or level of legal protection for natural areas.

The information and design requirements for this second tier would be greater than the tier-one administrative costs for both government and landowners. Landowners would bear the cost of evidence required to demonstrate that threshold standards had been met, and government would have greater review and verification costs. The benefit gained, however, would be better-integrated environmental and production outcomes through expanded opportunity for landowners to manage their tax liability.

Land-use category tax rates

Given the OECD recommendation (OECD, 2010, p.139) that the tax rate should reflect society's value of the harm done (which likely includes non-environmental harms) as well as government's need to raise revenues, the proposed tax rate would be higher than simply the estimated value of environmental damage to society. This is to better account for the damage to and overuse of the environment by individuals or businesses.

> If the tax rates fully reflect the value to society of all externalities related to land use, then the revenue levied should be of sufficient scale to deliver a combination of otherwise-elusive social benefits.

Tax rates are important as they will be what drive the extent of behaviour change by landowners and therefore the level of additional nature conservation that is undertaken. These rates would be routinely updated to match inflation and reflect changes over time in the relative value of different types of environmental harm.

The number of land use categories and the per-hectare tax rate associated with each are matters that require more detailed research and scenario modelling. This is to understand the implications of different tax rates at the property scale as well as in aggregate for the various land-based sectors, and what, if any, unintended consequences may result.

Tax administration

The administration of a land use tax would likely require new or enhanced systems within Inland Revenue (IRD) to store, process and analyse large spatial databases, potentially including satellite spectral imagery. This may require new capability within IRD. Alternatively, cross-agency partnerships could be created, where agencies such as Land Information New Zealand could provide the required information to IRD.

Some of the data required to implement a tier-one system are already available. For instance, a variety of public domain satellite imagery can be used to define land use intensity categories. Land boundaries and ownership are already defined in cadastral land title databases (and used by regional governments to administer the rating system). The data required for tier two would depend on the eligibility criteria for tax rate reductions. Evidence used to demonstrate compliance with existing resource consents and covenant conditions might help serve this purpose.

Anticipated benefits of a land use tax

The ability of a land use tax to arrest the continued degradation of nature in New Zealand lies in its potential to align the interests of land-based primary industries, government and wage earners with conservation and environmental protection.

Growth benefits

The additional revenue raised through a land use tax could allow a reduction in corporate and income tax rates, which may help facilitate economic growth (Barker, Buckle and St Clair, 2008). It would also present an opportunity to

align personal, company and trust taxes to improve the integrity and fairness of the tax system and reduce tax avoidance. If revenue levied by a land use tax exceeds reductions from other taxes, the surplus could be recycled to:

- support community/public conservation efforts;
- assist low-income or disadvantaged landowners reduce their negative impacts on nature;
- fund future commitments, such as those related to climate change mitigation actions;
- fund the level of pest control required on public conservation land to ensure the persistence of our threatened endemic fauna and flora.

If the tax rates fully reflect the value to society of all externalities related to land use, then the revenue levied should be of sufficient scale to deliver a combination of otherwise-elusive social benefits. While the corrective goal of the tax is to maintain the benefits flowing from nature, the tax has potentially broader benefits through any reduction in the wealth gap (Wilkinson and Pickett, 2009). The wealth gap in New Zealand is large relative to other OECD countries (ninth largest out of 34 countries). Compared to Australia, Canada and the United Kingdom, low-income earners face a higher overall tax burden in New Zealand, while high-income earners face a lower tax burden than they would face in those three countries (Salmond, 2011). The inherently progressive character of a land use tax could change this balance. The area of land owned and the intensity of its use are arguably highly correlated with wealth and therefore ability to pay. Most low-income earners own little, if any, land and would be exposed only through what may be passed on in rents. An additional benefit is the potential for additional tax revenue to reduce the tax rates for lower-income earners.

> The political incentives to accumulate environmental debt rather than implement controversial reform mean that effective steps to curtail environmental degradation are unlikely.

Societal benefits

Tax signals affect business growth decisions, wider investment decisions and strategic development decisions. Fundamentally changing that signal to incorporate the positive and negative impacts that decisions have on nature will provide impetus for landowners to manage land differently. Rational landowners will reduce their tax burden through actions that maximise their total tax deductions or rebates.

Over time, benefits above and beyond the direct financial benefits of a reduced tax burden from enhancing nature will begin to accrue. New Zealanders are likely to see the benefits of more sustainable production systems, improved well-being, growth in industries reliant on healthy ecosystems, and expanded business opportunities from the diversification options available by preserving nature. We should also see the creation of safe refuges for flora and fauna currently being lost through habitat degradation.

Private sector benefits

The greatest financial benefit will accrue to landowners with the lowest environmental impacts. Reductions in environmental impact could be achieved by confining intensive uses to small areas, retaining areas in predominantly natural cover, or implementing management practices that lower negative environmental impacts. For instance, Māori landowners or custodians who own/manage land in native vegetation and derive income from low-impact land-based tourism will benefit from having a lower land tax rate, as well as receiving a tax deduction/rebate for any additional actions to improve the state of nature on their land.

Those businesses managing their operations with a clear focus on sustainable management practices may find additional benefit in the substance and authenticity added to their brands related to the conservation of nature. Businesses in sectors such as tourism, information technology, communications, service, manufacturing, health and education would likely enjoy improved competitiveness associated with both reduced tax liability and greater authenticity of environmental sustainability branding. Many businesses may enjoy a boost from broad-based economic growth promoted by the shift towards taxing the private consumption of public wealth rather than taxing the production of private wealth. Businesses in the primary sector that currently receive hidden subsidies will be incentivised to change the way they operate to lower their negative environmental impacts or face larger costs to continue business as usual.

Concluding reflections

Environmental degradation and biodiversity loss continue because there is insufficient incentive for businesses and households to not harm the environment, and for government resources (including financial, political and capacity) to fully utilise the currently available tools for nature conservation. The complexity of environmental issues combined with the collective action problem mean that those who are affected by environmental degradation are not compensated by those causing the degradation. This resulting 'wicked problem' leaves most environmental problems unresolved and demanding government intervention. A corrective environmental tax like a land use tax could provide a way through at least some of these challenges.

Perhaps the most significant remaining challenge not addressed specifically by a land use tax relates to the political economy. Governments are often guided by immediate political priorities which lead governments to incur debt now,

thereby shifting costs onto future generations. Debt can be in any form: built, financial, social and natural capital. Changing the status quo of policy – whether it is tax reform, environmental regulation or some other policy reform – can affect the election aspirations of government. Thus, governments have an incentive to avoid reform, especially controversial and potentially costly reform, and instead allow debt to accumulate for future generations. Applying this to nature highlights how the misalignment of political and public interests is likely resulting in a socially suboptimal accumulation of environmental debt.

The political incentives to accumulate environmental debt rather than implement controversial reform mean that effective steps to curtail environmental degradation are unlikely. However, New Zealand has demonstrated its ability to address equally challenging problems when it implemented new fiscal policy and incorporated fiscal responsibility requirements in the Public Finance Act 1989. This was to promote fiscal sustainability and limit the level of debt passed on to future generations. Similarly, changes to the Reserve Bank Act 1989 enabled interest rates to be set independently by the bank's governor. Perhaps the impacts and mitigation costs of climate change will lead to something akin to the Fiscal Responsibility Act 1994 to promote environmental sustainability, and to the Reserve Bank Act for politically independent setting of tax rates on land use intensity categories.

1 1080 is a poison which is mixed into baits and used to control a range of pests, especially possums, rats and the stoats which eat the poisoned rats (http://www.doc.govt.nz/1080).

2 OSPRI is the not-for-profit limited company that was established on 1 July 2013 when the Animal Health Board and NAIT (National Animal, Identification and Tracing scheme) merged. OSPRI was set up through an agreement between industry and government and manages two world-class programmes, NAIT and TBfree. NAIT captures data to trace individual animal movements. TBfree plays a vital part in eradicating bovine TB and helping keep it out of our herds (http://www.ospri.co.nz/home.aspx).

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Marie A. Brown and Jemma Penelope

Biodiversity Offsets in New Zealand

addressing the risks and maximising the benefits

Biodiversity offsets are proliferating globally, and are commonly offered or required in a development context to address residual impacts on biodiversity. Regulatory requirements for mitigating or offsetting ecological harm are now commonplace, with more than 60 countries having introduced relevant policies (ten Kate and Crowe, 2014; Madsen, Carroll and Moore Brands, 2010). Biodiversity offsets are commonly framed in policy as opportunities to reconcile the competing interests of economic development and environmental protection, and are also viewed as a crucial means of internalising environmental costs and achieving conservation goals. On the other hand, a mismatch in certainty between the guaranteed losses from development activity in exchange for uncertain gains for the public interest in nature creates significant risk, exacerbated by often poor compliance, poor ecological outcomes and often superficial analysis of exchanges (Pilgrim et al., 2013). Of concern is their preponderance as a tool in a context of limited policy and weak evaluation. To safeguard biodiversity, New Zealand must manage their risks and maximise their benefits, and this article considers how that might be achieved.

Biodiversity offsets are one step in the mitigation hierarchy, which comprises the steps 'avoid', 'remedy' and 'mitigate', followed by 'offset' and 'compensation', and requires each lower stage to be completed as far as feasible before the next stage is attempted, thereby creating a hierarchy of preference (PricewaterhouseCoopers, 2010). Although the terminology varies around the world, biodiversity offsets can generally be defined as:

> measurable conservation outcomes resulting from actions designed to compensate for significant residual

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> adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure and ecosystem function and people's use and cultural values associated with biodiversity. (Business and Biodiversity Offests Programme, 2012)

New Zealand has taken up the concept of biodiversity offsets with some enthusiasm, enthusiasm which almost entirely preceded a policy context for such decisions. There is a growing body of case law, numerous subnational instruments, and the government's recently-released, non-statutory *Guidance on Good Practice Biodiversity Offsetting*, yet none truly mandate the practice. Biodiversity offsets are contemplated in different ways within the Resource Management Act 1991 (RMA) regime (although not explicitly within the act itself) and the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ Act). They also have some relevance under the Conservation Act 1987 and the Crown Minerals Act 1991. Biodiversity offsets are negotiated separately under different legislation in the absence of an integrated consenting mechanism.

The EEZ Act is relatively new and does not contain specific guidance on biodiversity offsetting. Signals from consenting processes to date indicate that RMA jurisprudence is likely to provide substantial guidance in decision-making (for example, in the case of Trans-Tasman Resources Ltd). Under the Crown Minerals Act 1991, biodiversity offsets have been contemplated with respect to access arrangements, generally for mining activities.

The Department of Conservation contends that under the Conservation Act 1987 offsets are not permissible to address residual impacts of activities undertaken on conservation land (New Zealand Government, 2014). However, evasion of a hard line 'no' to activities with significant impacts is possible via a land swap being arranged. A land swap is where an existing area of conservation land with stewardship land status is handed to a private entity in exchange for an addition of private land to the conservation estate. The statutory test for such exchanges is that the exchange must enhance the conservation value of land managed by the department and achieve the purpose of the Conservation Act. Such exchanges have sometimes attracted criticism (for example, the Crystal Valley swap to enable a ski field extension) (Parliamentary Commissioner for the Environment, 2013), and the exchange of part of the Ruahine Range to enable the Ruataniwha Dam is presently facing judicial review. There are no clear policies for addressing the complex exchange of values that must be considered for anything more than a very simple arrangement, which probably reflects the exchange provision's genesis as essentially a boundary adjustment provision.

This article primarily focuses on the use of biodiversity offsets under the RMA, via regional policy statements, regional plans and district plans. After some years of ambiguity, the Environment Court distinguished mitigation, offsets and compensation from one another under the act. 'Mitigation' is any action that directly addresses environmental damage within the impact footprints; offsets are explicitly calculated positive actions undertaken outside the direct impact footprint. Compensation is any positive offering from a development proponent that does not meet the other two definitions (*Royal Forest and Bird Protection Society v Buller District Council* at [72]-[76]). While the article primarily focuses on biodiversity offsets, it is worth noting that often these activities are combined as 'packages', so may not be cleanly distinguished in practice. The most common policy setting for biodiversity offsets is regional policy and planning. Second-generation planning instruments under the RMA commonly identify biodiversity offsets as a tool to address residual impacts of development.

Losses and gains that are not equivalent across space lead to a net reduction in habitat availability, cause habitat fragmentation and disrupt ecological processes.

Risks of biodiversity offsets

The risks of trading off biodiversity values are manifold and much discussed in the scientific, legal and planning literature (Business and Biodiversity Offests Programme, 2010; PricewaterhouseCoopers, 2010; Maron, Gordon et al., 2012; Linterman, 2014). Here we present a digest of the risks for the sake of brevity. Risks fall into three key categories: (1) that offsetting will be used in cases where avoidance is most appropriate or necessary to safeguard biodiversity; (2) that the exchange will not be at least equivalent, which will both cause and obscure losses; and (3) that the positive actions will fail, through either non-compliance (the proponent does not carry out required tasks) or a lack of success with the method used (for example, plants will die or another restoration technique won't work).

A primary concern about biodiversity offsets is that they may be used when they are inappropriate. Offsets applied to irreplaceable biodiversity values will result in certain loss. Recognising offset limitations is crucial, and often where policy-based gateway tests do not perform well. Policy must direct when and where offsets may be considered and take full account of the implications of both providing for them and vetoing them.

The second key risk is that the values lost to development compared with the values gained in the offset will not be at least equivalent. Losses can occur over a number of dimensions, such as space,

type and time. Losses and gains that are not equivalent across space lead to a net reduction in habitat availability, cause habitat fragmentation and disrupt ecological processes. Offsets that create or restore one type of biodiversity where a different type is destroyed will always result in net loss of the original values, irrespective of the magnitude or importance of the gain that may be promised. And finally, a lack of equivalency in time tends to result from losses being upfront and certain (i.e. the development proceeds) and gains from long-term endeavours being both uncertain and distant (Salzman and Ruhl, 2002).

Nature does not invite easy accounting. Implicit in the concept of offsetting is a level of assumed fungibility that nature simply does not have. Yet through a sufficiently low-resolution lens, a workable level of fungibility may be identified. When combined with the need to simplify complex exchanges to a point where they can be understood by decision-makers, the likelihood of inappropriate application of this tool increases. For example, a policy framework that enables 'like for like' exchanges within a broad-scale environment type such as 'forest', without accounting for the differences between different forest ecosystems, will obscure the loss of many important values.

The third key risk is that the promised gains will not materialise. A lack of success can be due to a failure of method (the offset is not actually feasible or failed unexpectedly) or a failure to undertake required actions, or both. Uncertainty generated from a lack of understanding of biodiversity can be significant, and there is often significant pressure to approve conservation projects of indeterminate value or feasibility. This risk is exacerbated by the low monitoring and enforcement effort applied to following up such mechanisms (Brown, Clarkson et al., 2013). Uncertain governance arrangements also means that the risk offset mechanisms pose is exacerbated. Concern about the administration of the concept tends to match concerns about its technical aspects (Burgin, 2008; Walker et al., 2009)

Benefits to biodiversity

Notwithstanding the risks, there are potential benefits of biodiversity offsets. Lessening the impact of development through requiring adherence to the mitigation hierarchy and mandating internalisation of common externalities (biodiversity loss) has been hailed as a major contribution of biodiversity offsets (Ecosystem Markets Task Force, 2013). As an extension of the ability to leverage conservation activity, the potential for mitigation and offset requirements to marshal resources to achieve wider conservation goals has not gone unnoticed (Gillespie, 2012). Biodiversity offsets are also recognised as tools to channel resources into landscape-scale conservation which complements the efforts of agencies to stem the tide of biodiversity loss. To examine these proposals in a New Zealand context we first consider the denuded state of our natural heritage, stemming in part from a past failure to mitigate environmental harm.

Seven hundred years of human occupation have irreversibly modified New Zealand's landscapes, freshwater bodies and the surrounding marine environment. The uncontrolled clearance of more than two-thirds of our forests and drainage of 90% of our wetlands, relentless and widespread drainage and pollution of lowland rivers and estuaries, and the introduction of mammalian predators have erased, drained, fragmented and thus imperilled our vulnerable and unique biota (Brown, Stephens et al., 2015). The 'restoration debt' is significant and creates a context of urgency and, sometimes, desperation, as conservation funding is generally static at best. Given the parlous state of our biodiversity, tools which promise privately-funded gains are enormously attractive, and logically so.

How are risks to nature managed in New Zealand?

This section assesses how New Zealand manages the risks identified and whether those strategies are likely to be sufficient. As outlined above, the three key categories of risks are: failing to observe avoidance where appropriate; lack of equivalency of exchange; and non-completion of the requirement through non-compliance or failure.

Reducing emphasis on avoidance

To manage the risk of inappropriate implementation of offsets, the mitigation hierarchy provides, as outlined earlier, a series of steps in preferential order, from avoidance (don't break things unless you have to) through to trading biodiversity to address 'residual' losses. Ensuring the steps are followed generally relies on regulatory instruments requiring that the mitigation hierarchy is clearly demonstrated to have been observed at each stage, before offsets are considered for approval. The mitigation hierarchy is present in much policy at regional levels in New Zealand, but the requirement of demonstrating that options at one stage have been exhausted before moving to the next stage is loose and ambiguous. In some present planning documents, recognising 'limits to offsetting' translates to restricting the use of biodiversity offsets to address particular effects, rather than the more logical application of avoiding the effect in the first place. For example, in the Canterbury regional plan, effects on significant biodiversity cannot be offset, but the plan does not go so far as to limit the effects themselves. Alternative strategies then become mitigation within the footprint, compensation, or no

The mitigation hierarchy is present in much policy at regional levels in New Zealand, but the requirement of demonstrating that options at one stage have been exhausted before moving to the next stage is loose and ambiguous.

reparation for the impacts at all, in the event that the project proceeds.

Ensuring equivalence

The second risk noted is that genuine equivalence will not be achieved. A non-equivalent exchange is when nature will be lost because the development project is allowed and an insufficient corresponding gain is required or delivered. To manage this risk, policies guiding implementation of offsets often include 'exchange restrictions'. Exchange restrictions can be considered to be any mechanism that controls the requirements of biodiversity gains relative to the expected losses from development. Exchange restrictions may limit risk by ensuring that gains are equivalent across time, space and/or type (Salzman and Ruhl, 2002; Walker et al., 2009). They are intended to minimise risks to biodiversity of the exchange of loss (from impact) and gain (from offset).

An example of a common exchange restriction is a requirement or preference for 'like for like' trades (biodiversity to be exchanged only with similar biodiversity), because of a greater chance of comparability in practice. Principled as this may seem, the complexity of biodiversity and its non-fungibility are sticking points (Pilgrim et al., 2013; Gardner et al., 2013). Even a habitat of the same type in macro terms which is managed as an offset will have functional differences and may be only superficially 'similar'. Thus, trading off one of these sites for another will lead to any values in the original site that are not in the compensation site being lost (Walker et al., 2009). The more unlike the biodiversity values of a development site are to the corresponding values of the offset site, the higher the risk of the exchange obscuring losses; and tools for accurate comparison are thin on the ground and introduce further risks (Overton and Stephens, 2015).

Emerging policy under the RMA tends to state 'like for like' as a preference and provide for 'trading up', whereby an area of lower conservation value can be sacrificed for a more significant area in some instances. For example, the second-generation policy statement of the Waikato Regional Council provides for biodiversity offsets and includes principles to guide exchanges that include a preference for 'like for like'. The Waikato regional policy statement confines its direction on exchange restrictions to biodiversity offsets only, excluding all other forms of trade-off. Other forms of reparation are routinely agreed upon outside of the bounds of this policy and in the absence of clear limits. This is in contrast to the Wellington Proposed Regional Policy Statement and the Proposed Auckland Unitary Plan, both of which require that mitigation, offsets and compensation all demonstrate their adherence to the principles (excluding the 'no net loss' goal, which is restricted to offsets only) and use this as a basis for assessing their acceptability for the purposes of implementing part 2 of the act. It is worth noting, however, that discretion is reserved in all cases and proposals can (and likely do) deviate from the principles to varying degrees. Assessing the equivalency of exchanges remains a process of grand discretion under the RMA.

> … if New Zealand is to attain true prosperity, we will need to ensure that our economic aspirations are compatible with maintaining, restoring and enhancing the environment.

Ensuring success

Poor compliance with requirements (that is, the offset does not eventuate) is a notable and common criticism of biodiversity offsets. While negative impacts from development occur with surety, providing a commensurate guarantee for the offset gain is more difficult. Two key risks are: (1) that offsets will not be implemented, and (2) that if they are implemented, in part or in full, they will fail ecologically to achieve their stated goals.

The first risk can be managed with robust follow-through and legal requirements that offsets be implemented, and if they are not, proceeding with enforcement. In the words of Gibbons and Lindenmayer (2008), 'offsets are ultimately dependent on adequate compliance'. Therefore, if the resource management context cannot deliver reliable gains, then a further 'layer' of risk is introduced and resources expended at the front end of the process are lost. The second risk is managed through ensuring that offsets are feasible, sensible and affordable at the outset, or ensuring that the public interest is protected in the case of failure (such as by including triggers and thresholds and providing for iterative decision-making to review requirements).

Both matters in New Zealand can be addressed by robust administration of resource consenting, including having clear and enforceable conditions of consent. Compliance rates under the RMA are underwhelming (64.8% compliant overall), and poorest (49%) for requirements with the greatest ecological implications (Brown, Carkson et al., 2013). The compliance rates under the Conservation Act 1987 are very similar, despite the Department of Conservation yielding the Crown property rights to users of the estate they manage (Heijs, 2015). Neither of these data sets provide confidence that follow-through is currently sufficient in New Zealand.

Maximising the benefits in New Zealand

Potential ecological benefits of biodiversity offsets fall into two categories: (1) the potential for offsets to contribute to lessening the overall project-level and landscape-level impacts of development; and (2) the potential to leverage strategically important conservation gains from the exercise of these policy tools. In either case, the benefits of policy tools that formalise offsetting depend significantly on the inclusion of robust assurances of implementation.

Reducing environmental externalities is recognised as fundamental to sustainable development. Biodiversity offsets provide a means of requiring compensatory conservation projects for adverse effects, in contrast to historical approaches that have rarely demanded the same. This has proven challenging to many resource users, accustomed to obtaining access to natural resources at little or no cost. However, if New Zealand is to attain true prosperity, we will need to ensure that our economic aspirations are compatible with maintaining, restoring and enhancing the environment. The use of biodiversity offset approaches represents an early attempt to internalise the environmental costs of development activity. In the future, rather more sophisticated mechanisms, such as new economic institutions which penalise environmental degradation and incentivise conservation, may be introduced.

Because of predictable and perpetual underfunding, conservation is a triage exercise which relies on astute prioritisation to maximise the difference made by interventions (Margules and Pressey, 2000). In order to appropriately direct conservation funding from any source (including for biodiversity offsets), an understanding of the state of biodiversity and priorities for protection and management is needed. A lack of sufficient biological data to support this kind of decision-making, and indeed effective resource management in general, means that conservation actions are often not targeted to where they will make the most difference. New Zealand's capacity for and commitment to genuine prioritisation of conservation needs remain small and require attention if offsets are to be optimally directed (Brown, Stephens et al., 2015). As a result, offset requirements are usually scattered, disconnected and ultimately non-strategic, and, if the funds are used by agencies, may not even be additional to the status quo.

Conservation agencies are often criticised for financing core work tasks from mitigation funding, rendering them non-additional (Pilgrim and Bennum, 2014; Maron, Hobbs et al., 2015). For example, Maron, Hobbs et al. (2015) levelled criticism at government conservation efforts which drew on offset funding to meet international goals such as the Aichi targets. The authors rightfully highlighted that the use of 'new' money to achieve 'old' goals by public entities led to a net loss at a landscape scale. Increasing concerns are evident about the application of offset funding to protected areas – such as proposed or approved offsets that entail pest control in already protected areas, and formal protection of marginal areas inappropriate for development anyway – and the use by public agencies of funds to bolster core tasks in general. It is fair to say, however, that if we accept that (from a conservationist point of view) conservation will always be underfunded and agencies are unlikely to have enough money to do what they need, then it would seem that brokering a logical middle ground to provide for 'temporary additionality' may be necessary to safeguard what is already protected (Pilgrim and Bennum, 2014).

… to address the risks that biodiversity offsetting poses and leverage maximum gains, much work is still required.

What would it take?

Notwithstanding the lumpy road thus far, and taking into account the improvements that are evident, is it premature to reject offsets as being too risky and try to erase them from policy and investigate alternative methods? It would seem so, and it is politically unlikely to occur anyway. But to address the risks that biodiversity offsetting poses and leverage maximum gains, much work is still required. The necessary improvements fall into three categories: tighter controls on when, where and how these mechanisms are used; targeting their implementation to maximise conservation outcomes; and ensuring success through bolstering follow-up. This section outlines these areas of improvement and sets out what it would take to implement them.

Policy for offsets

In the absence of a clear mandate, goals and exchange restrictions are generally loosely applied and subject to much bureaucratic slippage (Clare and Krogman, 2013; Linterman, 2014). The weak regulatory underpinning of biodiversity offsetting in New Zealand exacerbates the risks offsets pose to nature and does little to enable the potential benefits. Subnational instruments and non-statutory guidance are insufficient and leave much discretion in the hands of local interests, which is commonly regarded as reducing the likelihood of a good environmental outcome (Walker et al., 2008). It would seem that a coherent policy context at a national level is a minimum requirement to guard against their inappropriate use locally. One option is introducing a national policy statement under the RMA which addresses biodiversity offsets (Christensen and Baker-Galloway, 2013; Brown, Clarkson et al., 2013; Brown, Stephens et al., 2015).

Policy development and bolstering scientific information and resources could be drawn together to promulgate clear national policy and a logical information basis for decision-making relating to offsets. It is important to note, however, that decisions and outcomes are likely to be non-uniform even with explicit and identical policy underpinning them (Clare and Krogman, 2013). To address the risks outlined, prescriptive policy should introduce: clear triggers for when avoidance of impact is required (limits to impact and observance of the mitigation hierarchy); consistent definitions; and clearly defined expectations of outcomes (such as no net loss, net gain).

Targeting implementation: making them count

The paucity of conservation funding in New Zealand is often a key driver for approval of projects that entail offsets, because the background decline in ecosystems is often significant (Norton and Warburton, 2015). Most biodiversity

offsets in New Zealand are ecological restoration projects to correct historical or ongoing harm and the opportunities are numerous. Ensuring that, where biodiversity offsets are allowed, they make a meaningful contribution to conservation is an area where much improvement is needed, and indeed possible, in New Zealand. To enable this demands greater focus on improving biodiversity information and implementing robust systematic conservation planning to highlight the most urgent conservation tasks. In compelling a stronger focus on improving biological information and enhancing conservation planning, offsets may serve to help align the interests of developers and public interest advocates. Providing resources and support to conservation and resource management agencies to improve knowledge of their biological resources would be an important first step, and potentially reduce the baseline information that applicants must acquire and provide.

However, if biodiversity offsets are going to realise their potential benefits, far more strategic coordination is likely required. A more robust strategic context for offsets could potentially be achieved through more visible and transparent conservation planning at national, regional and local levels. Systematic conservation planning promises much, and the Department of Conservation's implementation of the fledgling Natural Heritage Management System has helped to kickstart New Zealand's foray into evidence-based conservation. Incorporating offsets into landscape-scale conservation planning and integrating it with other similar activities is likely to yield much-improved outcomes over present ad hoc implementation. A potential solution would be regional biodiversity plans which both set out existing conservation efforts and identifiy other conservation priorities that offsets could target.

Planning for success: follow-up and liability

Ensuring that gains, once agreed, are achieved is well supported in New Zealand law. Providing an offset requirement is enshrined within enforceable conditions, both the Conservation Act 1987 and the RMA having comprehensive enforcement provisions. Fines and prison terms are provided for in the legislation, and regulatory monitoring of permits and consents are cost-recoverable activities. Observed poor compliance monitoring would therefore appear to be rooted not in the inadequacy of the law, but largely in the implementation gap. There are many tools available that can be used to support improved compliance. These include ensuring that enforceable consent conditions are in place, registering covenants, increased agency accountability, and more robust enforcement. Agency capture, however, can significantly constrain monitoring effort (Brown, Stephens et al., 2015). Nationalising compliance and monitoring functions, such as by vesting them in the Environmental Protection Authority, could provide a fix by altering lines of reporting and reducing the potential for political interference.

The application of biodiversity offsets in New Zealand is at present generally sub-optimal and thus likely to be contributing to the degradation of natural capital.

Part of the compliance issue may well also be to do with how gains are delivered. Developers are often uninterested or ill-equipped proponents of conservation, and agencies are often inadequate coordinators of requirements. A third-party model, as is common overseas (in most states of the United States, permittee-responsible requirements are relatively rare), could well assist. This may involve providing for dedicated entities to undertake offsets on behalf of the proponent of development, who may be unwilling or unable to deliver the conservation gains required. This is of utmost relevance in the marine environment. Eyed as the final frontier for economic development, the fragile marine environment will increasingly become the subject of offset requirements. It is highly unlikely that proponents of development there would be capable of efficient and effective marine conservation and alternative delivery modes will be necessary (Bos, Pressey and Stoeckl, 2014).

Conclusions

The application of biodiversity offsets in New Zealand is at present generally sub-optimal and thus likely to be contributing to the degradation of natural capital. However, without provision for them, reparation will be largely absent for approved activities (unless voluntary impact reduction occurs). Improved outcomes could be achieved by:

- improving biological information that informs decision-making on the need for avoidance through enhanced planning and impact assessment;
- investing in sound prioritisation strategies to inform decisions on appropriate destinations for trade-off investments;
- developing a clear national policy to provide a consistent framework for decision-making on biodiversity offsets of all forms, including exchange restrictions;
- bolstering attention to and investment in ensuring that gains are realised, using the suite of tools available and policy innovations that enhance agency accountability and, in turn, the quality and reliability of compliance monitoring;
- investigating alternative modes of delivery of conservation gains that are more secure and strategic than present, ad hoc projects.

Biodiversity offsets, whatever their risks, are likely to be here to stay for at least the near future. Their imperfections and risks are broad and significant, but their use must be considered, against a backdrop of continued (and potentially increasing) development pressures on nature. Offsets can be viewed as an early attempt to internalise the ecological cost of economic development projects that

result in harm to the environment. In the future, novel economic institutions may well supersede biodiversity offsets in full or in part. In the meantime, there are substantial policy options to improve the way risks are managed, ensure impacts on vulnerable and irreplaceable biodiversity are avoided, and deliver more effective and rewarding exchanges when offsets are occur. The time is now to take these steps and improve the outcomes New Zealand's offsets are capable of delivering. In the absence of these fixes, biodiversity offsets are likely to further lock in decline of our natural heritage.

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Hugh Logan

Looking Back – Looking Forward?
Institutional aspects of New Zealand approaches to nature conservation

Introduction

This issue of *Policy Quarterly* examines the issue of governing human-nature relationships for the future. This article aims to provide context by examining the history of how New Zealand's institutions for nature conservation have developed. Some may argue about the strengths or weaknesses, effectiveness, efficiency or legitimacy of New Zealand's conservation governance. But understanding what it is, and how it came about, provides a platform from which to look at the future.

New Zealand has a reputation as a 'clean, green' country with abundant nature. New Zealanders say they like to associate with their natural surroundings. Just how 'clean and green' New Zealand really is, and just how much New Zealanders' national values draw from a nature association, is debatable. What is not in dispute, however, is that nearly 33% of the country is subject to comparatively strict forms of nature protection. An edifice of laws and regulation condition how people interact with nature. This system of protection, management and regulation did not spring up unbidden. To understand New Zealand approaches to nature conservation it is instructive to look back in order to appreciate both current institutional designs of rules and organisations and, to some extent, social attitudes towards human-nature interactions.

This article examines four features, which, it is argued, have given rise to the governance arrangements that exist today. These are: the context of New Zealand's development as a recently settled country; colonial and subsequent 'nation-building' institutional ideas over about 150 years, up until the mid-1980s; institutional design and reorganisation flowing from a radical reordering in the late 1980s and early 1990s; and a recent re-emergence of Māori values and

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interests in management and governance. These influences, both individually and collectively, help explain current New Zealand approaches to governing human-nature interactions. Furthermore, they may provide indications of what lies in the immediate future.

New Zealand's human–nature interaction context

Distinct natural features underlie New Zealand approaches to nature conservation. New Zealand is biophysically unique, with high levels of species endemism, very active tectonics, and diverse climates and landforms (Myers et al., 2000). Its non-mammalian ecology and isolation made it (and continue to make it) highly susceptible to impacts from invasive species (Mack et al., 2000; Logan, 2001). In coastal, lowland and some mountain areas, pre-human landscape and ecology have been almost entirely modified or replaced over a very short period of time (Molloy and Enting, 1982). Nevertheless, there are also large areas of semi-intact pre-human ecology, especially on offshore islands, in the mountain lands of the South and North islands, and in much smaller areas of lowland forest and wetlands (Ministry for the Environment, 2007) – one of the reasons for the large extent of publicly protected lands in New Zealand compared with many other countries.

The human dimensions of nature conservation also have distinctive characteristics. Human arrival is extremely recent in global terms, probably dating from the late 13th century (McGlone, 1999). Although human arrival is recent, and the population comparatively low, however, the impact on nature has been massive and resulted in species extinctions in a very short space of time, and whole-scale transformations of the landscape (Molloy and Forde, 1980). Nevertheless, despite human impact, large areas (especially mountain lands) are not permanently inhabited due to extreme climate, land instability and access problems. This affects management regimes, and how people interact with and relate to those areas (Holloway, Johns and McCaskill, 1982).

Over time, New Zealand has experienced increasing impacts from developmental pressures of land use, industry and population similar to those found in many developed countries, although the intensity of environmental pressures from manufacturing industries is comparatively lower, and primary industry and natural resource use as a proportion of the overall economy comparatively higher (OECD, 2007). Finally, data from surveys, and simple geography, suggest that, compared with other countries, a large percentage of New Zealanders visit and use protected areas and enjoy the natural environment, one factor which most likely contributes to the public valuing and its support for protected areas (Department of Conservation, 2014).

Māori interests towards nature conservation – albeit modified by 150 years of experience – are beginning to partially reshape institutional arrangements for conservation management in New Zealand.

These natural and human dimensions have helped shape approaches to nature conservation in New Zealand. So too has history.

Arrivals, impacts and adaptations

The first stage of New Zealand's nature conservation development can be seen as one of arrival and impact: of Polynesian Māori and then Europeans (predominantly British), with, by the late 20th century, increasing numbers of immigrants from the Pacific and Asia contributing to a more multi-ethnic community.

Arrival and impact were followed by recognition of loss, accompanied by appreciation of value, and then adaptation of practices and control of behaviours. These successive phases characterise both Māori and European experience of human–nature interaction (Young, 2004). Recognition of loss and appreciation of value are one reason for a dichotomy between a comparatively progressive approach to nature protection and variable approaches to wider environmental protection (Bührs and Bartlett, 1993).

Māori settlement, despite low population density and limited technology, was accompanied by widespread deforestation and a large number of faunal extinctions, some resulting in food resource depletion (McGlone, 1989). Māori society adjusted to New Zealand environmental conditions and evolved values, standards and behaviour (tikanga) for the protection of special places and species, maintenance of food supply and protection of human health. Management was kinship- and culturally-based. Māori environmental tikanga was then effectively supplanted (but never completely eliminated at a local level) as the dominant system of environmental governance following large-scale European settlement in the mid-19th century (Ballara, 1999; McGlone, 1989; Roberts, 1995). Aspects of traditional Māori tikanga began to re-emerge in the late 20th century, empowered by the Treaty of Waitangi settlement process (Office of Treaty Settlements, 2013). As a result, Māori interests towards nature conservation – albeit modified by 150 years of experience – are beginning to partially reshape institutional arrangements for conservation management in New Zealand.

European settler development patterns that followed Māori involved even further changes to the natural environment, through settlement, farming, fishing, and quarrying the land for timber and minerals. Transformation of the landscape and nature became

the dominant paradigm institutionally and culturally for nearly 150 years (Belich, 1996, 2001; King, 2003). Nature conservation and environmental concerns, where they existed, sat at the edge of political consciousness. But over time, and episodically, political consciousness shifted (Young, 2004). The sense of loss, a sense of the value of indigenous nature, and a sense of belonging in the landscape gave rise to political and institutional challenges to the developmental paradigm (Pawson, 2002).

Phases of nature conservation institutional development, and explanations

The literature on the history of efforts to constrain developmental impacts and promote nature conservation in New Zealand tends to emphasise two features: protecting iconic natural places, epitomised by national parks, and protecting native species – in effect, tall forest species (especially kauri) and wildlife (especially marine mammals and birds) (Thom, 1987). This literature also places much emphasis on the actions of individual advocates and reformers; the iconography of national parks and endangered birds (an iconography that helped motivate and mobilise public opinion for nature conservation); the influence of romanticism about scenery and landscape; ideas of fairness, free access and collective ownership; and, more recently, ideas about justice, especially to redress past wrongs. Less attention has been paid to the enduring aspects of some institutional features. Understanding the evolution and drivers of institutional arrangments in the 19th and 20th centuries is important, as they helped shape many of the key arrangements we have today.

There were essentially three broad institutional evolutionary phases: the Liberal government era from the late 1890s to the First World War (Thom, 1987); from the early 1950s to the mid-1980s (Galbreath, 1993; Roche, 2002); and after 1987 (Young, 2004). The first phase, borrowing institutional ideas from Britain and the United States, saw the creation of the embryonic legislation for national parks (individual acts for each park) and reserves (particularly the Scenery Preservation Act 1903), and a system of management by local boards overseen by the Department of Lands and Survey. This second feature, local management and direction (a legacy of twin Public Reserves and Public Domains acts of 1881), arose as a practical means of management for 'charitable, educational and recreational purposes' in a country of light population, limited bureaucracy, geographical isolation and dispersed communities. This idea of local influence on management, while morphing in intent over time, has remained a persistent feature of New Zealand's protected area management (Thom, 1987).

By the mid-1980s the governmental approach to nature conservation was in essence a divaricated centrally-run system.

Motivations behind the first phase arose from battles to constrain wholesale destruction of vast areas of native forest and prevent ongoing faunal extinction (epitomised by the loss of the spectacular huia); recognition that natural features were great tourism attractions; a growing sense of (Pākehā) national identity ('parks for the people' and common heritage); and political realism – protecting things that didn't too overtly challenge the developmental paradigm, thus favouring protection of 'unused' and very sparcely or non-inhabited mountain lands (Nightingale and Dingwall, 2003; Thom, 1987; McClure, 2004). The second phase occured after the Second World War. It re-emphasised many of the motivations of the first phase, embedding some of them further (such as the concept of common heritage and free access for all, a principle fought for by recreation organisations) (Thomson, 1975).[1] It saw the environmental protection elements of legislation taken further. Between the late 1940s and early 1950s, encouraged by ideas of scientific management, many key ideas that are now part of New Zealand's environmental legislation emerged. Legislative developments included soil and water conservation measures in 1947 and a revised Town and Country Planning Act in 1953 (together predecessors of many aspects of the Resource Management Act 1991), the National Parks Act 1952, the Wildlife Act 1953 and the Reserves and Domains Act 1953 (Roche, 1994, 2002; Thomson, 1975). The number of new protected areas expanded rapidly in the 1950s, and then slowed. Environmental management capability in the major developmental government agencies also grew during this period (for example, through the Department of Lands and Survey's parks and reserves section, land use planning and the Water and Soil Directorate in the Ministry of Works and Development, expertise in the New Zealand Forest Service, and the wildlife section of the Department of internal Affairs) (Roche, 2002).

By the mid-1980s the governmental approach to nature conservation was in essence a divaricated centrally-run system. It was overseen by a group of large, well-resourced government departments with mixed functions (though with development or administrative responsibilities dominating). It involved a network of protected areas run largely by the development-oriented New Zealand Forest Service and the Department of Lands and Survey, a soil and water conservation and land use planning regime overseen by the Ministry of Works and Development (but operationally run by a network of regional catchment boards), and wildlife protection undertaken by the small Wildlife Service of the Department of Internal Affairs (Roche, 2002). But the system retained some elements of public and local input going back to the 1880s and the boards of management. These instruments partly mediated departmental technocratic domination by requiring management plans with public input and advice from

parks boards (ministerially appointed, but with the possibility of public scrutiny of those appointments) (Thom, 1987; Roche, 1990). The retention of this last feature was distinctive compared with many overeseas jurisdictions.

The third phase of nature conservation development occurred through revolutionary public administration changes in the late 1980s and 1990s. Non-government environmental organisations had long been dissatisfied with what they regarded as poor nature conservation results flowing from the development orientation of government agencies and fragmented legislation. They wanted a clearer institutional and organisational base for conservation (Young, 2004). At the same time, a group of ministers and officials at the centre of government determined to introduce a singular form of contract-based public management which, in institutional terms, emphasised clarity of purpose enshrined in legislative and organisational design (Boston, 1996). The result was a classic example of a policy 'window of opportunity'. A new system of environmental management was introduced. General environmental management at a national policy level became the responsibility of a new Ministry for the Environment (established in 1986), which oversaw a generic act, the Resource Management Act 1991, which applied sustainable management principles to all aspects of land, air and water use (Young, 2001). A new approach to marine management instituted transferable property rights for fish quota, combined with (variably applied) precautionary principles, under the Fisheries Act 1996 (although a comprehensive approach to marine management based on environmental principles did not eventuate until 2013) (McGinnis, 2012).

In the nature protection arena, non-governmental organisations (NGOs) were determined to create their ideal institutional arrangements (Young, 2004). These arrangements involved a mix of novelty and continuity.[2] Nature conservation became a more significant feature of wider environmental management than in the past through provisions in the Resource Management Act (section 6: matters of national importance). However, the key changes sought, and achieved, by nature conservation NGOs were an overarching Conservation Act (1987) which subjected all activity on public protected lands to a strict nature conservation priority. In addition, a new Department of Conservation was created, which took on the nature conservation responsibilities and the managerial and scientific capabilities of the old development agencies (which were abolished) (Young, 2004). Nevertheless, old legislation, such as of the National Parks Act, Wildlife Act, Reserves Act and Marine Reserves Act, remained, albeit subject to the priorities of the Conservation Act. The result, overall, increased the level of protection for public lands.[3] A key monitor within this system was a regional and national version of the old reserves and parks boards. The new conservation boards and New Zealand Conservation Authority were given statutory responsibility for developing (and in the case of national parks approving) policies and objectives for management of public protected places – a mechanism that from time to time sees a dynamic tension with the technocratic impulses of the Department of Conservation (Department of Conservation, 2007, 2013; New Zealand Conservation Authority, 2005).

Thus, three internationally distinctive elements to this system emerged. First, all activities in public protected areas were subject to an overarching priority for nature conservation. Second, a national agency was created to integrate all management functions related to publicly-owned protected areas (comprising nearly 30% of the country's land area, and a relatively small marine area),[4] while its role also included actively promoting nature conservation in the wider environment. And third, a form of statutory public oversight of the management of publicly-owned lands was created. There was also a fourth priority, but it was slightly unclear at the time. This was a direction in the Conservation Act 1987 (section 4) that the system had to give effect to the principles of the Treaty of Waitangi, signalling that Māori interests were to be a feature of management and governance.

Treaty of Waitangi issues have given rise to a new, fourth phase in conservation management in New Zealand. It is one which has seen greater empowerment of Māori interests. The primary vehicle for change is the settlements negotiated between the government and individual Māori iwi and hapū through the Waitangi Tribunal to provide redress for government actions over the past 150 years. More than 50 finalised settlements have altered a number of arrangements for governance, land ownership, land management, species management and conservation programmes. The settlements are designed to protect wāhi tapu (sites of spiritual significance) and wāhi whakahirahira (other sites of significance), sometimes through tribal ownership or guardianship (kaitiakitanga); recognise special and traditional relationships with the natural environment, especially rivers, lakes, mountains, forests and wetlands, by giving claimant groups greater ability to participate in management and requiring decision-makers to be aware of such

> The detail, extent and depth of Māori involvement, direction and consultation in management of protected areas and nature is now materially different from what it was 20 years ago, let alone 100 years ago.

relationships; and give visible recognition of the claimant group within their area of interest (Office of Treaty Settlements, 2013).The number of settlements, their detailed nature, and their attempt to dovetail a Māori cultural 'overlay' with other national and local community interests in nature conservation are distinctive in an international context. The redress, by and large, tends to adapt existing institutional arrangements by providing for stronger Māori input, and in some cases control: through, for example, formalising input into policy; representation in management of places and species; some changes to land classifications, or through special legislation; and formal consultation regarding applications for activities (especially commercial) in protected areas (Office of Treaty Settlements, 2013; Harris, 2015; Bennion, 2014). Areas of tension exist, however, about concepts of ownership, use rights and commercial preferences (Forster, 2014).

The detail, extent and depth of Māori involvement, direction and consultation in management of protected areas and nature is now materially different from what it was 20 years ago, let alone 100 years ago. Direct involvement and consideration of Māori interests is now fundamental to policy and management. This principle, arising from the fourth phase of institutional development, has added an additional factor alongside a number of enduring elements from the past: the idea of community representatives having a voice and role in management and policies (developed in the first phase of institutional development), ideas about common heritage and the principle of freedom of access (enshrined in the second phase), and priority accorded to nature conservation (enshrined in the third phase).

Looking forward

What are the challenges that lie ahead for protected area management in New Zealand? The following list is in no particular order:

- meeting the technical, social and economic demands of trying to arrest biodiversity decline, including addressing the serious impact of invasive species;
- whether new migrant communities will adopt current dominant values regarding protected areas;
- maintaining or increasing funding for conservation management, essentially a large-scale public good operation;
- managing incipient tensions between, on the one hand, varying attitudes within Māoridom to governance of protected areas, and current public expectations about management and access;
- reliance on an effective, single large government management entity, and challenges in maintaining its effectiveness (and accompanying public support);
- whether the current, comparatively strict public attitude to limiting commercial use will endure; and
- how, and whether, to respond to the ecological effects of climate change.

> There remains a question about the level of taxpayer investment in managing protected areas … [c]entre-right governments tend to be parsimonious and centre-left governments more generous.

Of these various challenges, three are more prominent. The most pressing issue in the short term is the decline in indigenous biodiversity. This is one of New Zealand's most severe environmental pressures, due largely to the impact of invasive plants and animals (Ministry for the Environment and Statistics New Zealand, 2015). There are current and possible new technological responses. New Zealand is a world leader in pest control technique, but these are highly expensive and rely on applying good research to the field. They require, too, maintaining public support for some controversial tools, such as the use of existing and new toxins and possibly genetically modified organisms (Parliamentary Commissioner for the Environment, 2011). Holding the line also relies on an effective biosecurity regime, both internally and at the border (Department of Conservation, 2000). Climate change is likely to increase the biodiversity protection challenge through new invasive species that would not have survived in New Zealand's current climate, and rapid change in habitat and climate-related ecological characteristics (Christie, 2014).

New Zealand currently has a high level of inward migration and a changing ethnic and cultural mix. New migrant communities have, to date, shown signs of valuing the current norms regarding nature conservation, although there is some evidence of lower participation rates in terms of visits to public conservation lands (Department of Conservation, 2015). Department of Conservation engagement programmes in Auckland suggest that a nature focus is one of the key motivations for migrating to the country or choosing it as a refugee destination. There is little evidence of any significant differences in attitudes to nature (Lovelock et al., 2011, 2013).

Current public norms seem to reflect a cautious attitude to commercial activity in protected areas, certainly as far as extractive industries are concerned. Proposals for mineral prospecting in national parks in 2010, for example, resulted in a rare instance of large-scale public street protest; the proposals were quickly abandoned (Nippert, 2010). The extent and depth of feeling against the mining proposals suggest the high degree to which New Zealanders value their national parks as a common heritage. However, these norms have yet to withstand the impact of a severe economic downturn or of significant overseas conflict putting pressure on access to resources.[5]

Within Māoridom there are varying views about protected areas. These reflect different iwi and hapū tikanga, relating to spiritual-cultural values of places and species, cultural uses, attitudes to purely commercial uses (and distinguishing cultural and 'pure' commercial uses is the subject of often intense internal debate), and the extent to which traditional cultural practices should also apply to non-Māori. In the one place to date where this issue has been tackled at scale, Te Urewera, the results have been encouraging, demonstrating the capacity to accommodate a broad church of views.[6] The Te Urewera initiative may provide a blueprint, or it may reflect the special circumstances of an iwi with deep cultural norms, the specific history of Te Urewera land alienation, and strong leadership through the combined Tūhoe/Crown board of management. It may not be replicable elsewhere. To what extent these arrangements, or any permutations, could work in places of greater non-Māori association (such as Tongariro National Park, Taranaki, or in any pressure to revisit the Ngāi Tahu settlement regarding the main South Island national parks) remains an open question.

Finally, what of the existing institutional arrangements? Changes brought through the Waitangi Treaty settlements have been described earlier. Greater public recognition of the value and aesthetics of indigenous New Zealand nature, better tools to combat biodiversity loss, and significant successes in some places have increased direct individual and community involvement in nature conservation activity (Forgie, 2001). This trends alone has altered some institutional arrangements (such as internal Department of Conservation structures, funding mechanisms, representation on conservation boards and Māori consultation). But changes that have occurred have been more in terms of representation and voice than any fundamental alteration of the basic premises of protection and management.

There remains a question about the level of taxpayer investment in managing protected areas, which some argue is too low (Press, 2015). Centre-right governments tend to be parsimonious and centre-left governments more generous. The Department of Conservation's annual budget was cut significantly in the late 2000s compared with many other agencies', reflecting where the priorities of the National-led government then lay, but has been less constrained recently, probably reflecting a greater appreciation by that government of the value of both protected areas and the work of the department. Having said that, managing protected areas successfully in New Zealand depends very heavily on the expertise, nationwide reach and critical mass of the department. New Zealand is a small country with a small pool of conservation research and field expertise.[7] Any future shortcomings or management failures by the department (such as an extinction of an iconic species, for example) could very likely lead to loss of public confidence and calls for changes to institutional arrangements, depending on the political climate or how those in positions of influence reassess the principles of the current arrangements.[8]

… New Zealand's conservation management has been conditioned by the unique biophysical conditions of these remote islands and the brief and turbulent human impacts.

Conclusion

The purpose of this article has been to help understand how and why New Zealand's system of conservation management has evolved. The argument made is, first, that New Zealand's conservation management has been conditioned by the unique biophysical conditions of these remote islands and the brief and turbulent human impacts. Knowledge of the extent of impact and loss, as well as active campaigning by individuals and groups, may well be a reason for the comparatively high level of legal protected status and an emphasis in institutional terms on nature protection rather than wider environmental issues. Second, the system's institutional characteristics have been shaped by a combination of ideas and people that have assigned a special value to New Zealand's nature. Such value has been expressed in different ways with differing emphases over time (for example, as spiritual value, scenic value, scientific value, heritage values, fairness in access, intrinsic value, and justice). What this article also argues is that a third category of institutionalism has been at play, that of empirical or historical institutionalism, helping to shape legislation, policies, management and organisations (Putnam, Leonardi and Nanetti; 1993; Peters, 2008). While arguments of historical determinism can be overplayed, there are echoes of the past embedded in today's institutional arrangements: Māori traditional approaches (recently re-empowered) to nature protection; New Zealand localism empowering local voice and action, beginning in the 19th century; the technocratic management of the mid-20th century (and beyond); and the determined influence of environmental NGOs, as well as some public servants and ministers, in creating a priority for nature protection above other activities.

It is always risky to predict the future (as attempted in the preceding section), just as it is easy to overemphasise historical determinism. Certainly, there are challenges which will require adaptation of current institutional arrangements. Nevertheless, there has been a strong element of continuity in New Zealand's nature protection approaches, though punctuated by periods of change. We are in one such period at present with Treaty settlements. While the current phase is still to play out and some tensions remain, the general trend for the immediate future seems to point to a consolidation of the Treaty settlement results, and then melding, through implementation, with

earlier emergent features; a protection priority; access for all; integrated management; and local input, to produce a distinctive New Zealand approach to nature conservation.

1 See also the National Parks Act 1980, section 4(2e), and the Conservation Act 1987, section 17(1).
2 The nature conservation changes did not entirely align with the theoretical prescription of the administrative reforms of the 1980s. The reasons for this are probably the combination of the timing of the creation of the Department of Conservation, early in the administrative reforms of the 1980s–90s, the level of public support for conservation and an organised conservation NGO campaign to create the department, the form of existing conservation management resources of the parent departments, and the large extent, specific nature, and overwhelmingly state-centred characteristics of protected lands and endangered species management in New Zealand (see Young, 2004, pp.206-11).
3 A potential gap in this general level of protection for some classes of land has been identified by the Parliamentary Commissioner for the Environment (Parliamentary Commissioner for the Environment, 2013).
4 This may change if a 620,000km2 Kermadec ocean sanctuary is finalised (Ministry for the Environment, 2015).
5 In World War Two, for example, some protected forest areas were opened up to logging and mineral prospecting for strategic resources such as uranium.
6 http://www.ngaituhoe.iwi.nz/te-urewera.
7 The Department of Conservation underwent a major restructuring in 2013 to boost greater non-government investment in conservation activities. The new internal structural arrangements, however, ended up weakening the coherence of departmental field operations (State Services Commission, Treasury and Department of the Prime Minister and Cabinet, 2014; Taribon, 2015). Structural adjustments are currently under way, reinstituting aspects of pre-2013 arrangements, in order to strengthen field operational efficiency.
8 This occurred at the time of the Cave Creek tragedy in 1995, when 14 people were killed when a departmental viewing platform collapsed. The subsequent commission of enquiry resulted in severe criticism and public disquiet. At the same time, behind the scenes in Wellington there was significant lobbying to change a number of institutional arrangements, including proposals to loosen protection elements of New Zealand's conservation regime.

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Valentina Dinica

Protected Areas
how will they contribute to third millennium challenges?

Biodiversity is valued for its intrinsic worth and for its role in generating ecosystem services, such as soil fertility, clean air, renewable bio-resources, and water quality and availability. While biodiversity outcomes are generally pursued by nations for land in various types of ownership, this article focuses on protected areas on publicly owned lands.[1] Currently, the internationally agreed protected area classification used by the United Nation's Convention on Biological Diversity differentiates them in terms of nature conservation objectives and 'compatible' human uses. This suggests that protected areas can be arranged along a spectrum of protection stringency, from reserves and wilderness areas at one end, to so-called 'sustainable use lands' at the other (Dudley, 2008, p.24). Some apply even more extreme interpretations, viewing protected areas and approaches to their management in terms of dichotomies: segregated/'fortress conservation' versus integrated conservation (Mose and Weixlbaumer, 2007; Rodary and Milian, 2011).

Drawing on an overview of protected area evolution and key contemporary challenges faced, this article argues that the idea of compatibility with specific human uses gives a false sense of security. Human activities occur in protected areas of most types. The expected exponential increase in population growth compounds the challenges surrounding their use. The complex biogeochemical processes generated by harmful human interventions reverberate beyond local level. They exert an impact on regional biosphere processes, contributing to negative global environmental changes. Over various timeframes, biodiversity and ecosystem health in protected areas will also be affected (Rockstrom et al., 2009a). Acknowledging these multi-scale interactions, and taking a long-term view, compels us to rethink the regulatory conditions applicable to human access to protected areas and the governance objectives underpinning them.

This article proposes the use of the recently developed Planetary Boundary

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Box 1: Values of protected natural areas

Use values			Non-use values	
Direct use	Indirect use	Option value	Bequest values	Existence values
Recreation and tourism	Ecosystem services	Future information	Use and non-use values for legacy	Biodiversity
Sustainable harvesting	Climate stabilisation		Future uses	Ritual or spiritual values
Wildlife harvesting	Natural services Watershed protection			
Gene harvesting	Flood control			Culture, heritage
Fuel-wood	Groundwater recharge			Community values
Grazing	Carbon sequestration			Landscape values
Research	Habitat			
Agriculture	Nutrient retention			
Education	Natural disaster prevention			

Source: IUCN, 1998, p.13

framework (Steffen et al., 2015) as a reference point in the effort to select a more comprehensive set of objectives to guide protected area governance. This revised set draws on global environmental sustainability considerations, an approach that does not undermine the prioritisation of various aspects and features of nature at protected area level. The article also suggests a broad research agenda, to tackle the implications of revising objectives for how protected areas are regulated and integrated into the wider policy and institutional settings. Brief reflections on the New Zealand situation flesh out theoretical discussions.

A brief history of protected areas: values and management objectives

Governments and other landowners have employed the concept of protected areas for centuries. Protected areas were first established as reserves in the 16th century, to prevent the extinction of individual iconic species, such as the bison and chamois, in some European countries (Dixon and Sherman, 1990, p.9). National parks emerged in late 19th century: Yellowstone was the first national park established, in the United States, in 1872.

New Zealand established its first national park in 1887, when Ngāti Tūwharetoa chief Horonuku Te Heuheu gifted the volcanoes Ruapehu, Ngāuruhoe and Tongariro to the Crown. The Tongariro National Park was formed, to be managed by the government for the enjoyment of all New Zealanders. A key motivation was to protect the volcanoes, which are sacred to Māori, from acquisition by British settlers (Department of Conservation and Tongariro Natural History Society, 1998). Many national parks were created with an emphasis on recreational needs, through the enjoyment of quality landscapes and/or hunting, and minimising other uses. The initial management approach is referred to in the literature as 'segregated use' or 'land sparing' (Ellis, 2013). Western countries (especially Anglo-Saxon) later exported this model to colonised countries in the developing world. This often involved removing indigenous populations from their lands (Adams and Mulligan, 2003).

From the middle of the 20th century there has been a diversification of the values underpinning nature protection, to include, for example, their intrinsic worth, education and research, and future values. Societies have also started to acknowledge that many benefits of protected areas can be harnessed through economic instruments, like user-pay fees and payment for ecosystem services. The International Union for Conservation of Nature (IUCN) proposed a classification of protected area values that can be monetised, as shown in Box 1.

Given that some areas are more ecologically valuable and/or vulnerable than others, there have always been differences in how nature values are prioritised across locations. This has resulted in countless protected area types. For example, New Zealand distinguishes among 60 types of protected areas, the most important of which are: national parks; conservation parks; nature reserves; scientific reserves; scenic reserves; historic reserves; land, recreation (and other) reserves; specially protected areas; and protected marine areas (Molloy, 2016). To enable international agreements and improve communication, the IUCN elaborated a protected area typology in the 1960s. The decision was taken at the first world congress on protected areas in 1962 (Rodary and Milian, 2013, p.13). The classification is not compulsory for national governments, but it has been revised several times to incorporate criticism. Currently it defines six categories, as adopted at the 1992 Caracas World Congress on National Parks and Protected Areas (Dudley, 2008). Category I is split in two, as shown in Box 2. The United Nation's Convention on Biological Diversity was opened for signature by national governments in 1992 and uses this classification.

An important observation is that protected area definitions are narrowly focused on nature. According to the IUCN, a protected area is a space 'recognised, dedicated and managed … to achieve the long-term conservation of nature with associated ecosystem services and cultural values' (Dudley, 2008, p.8). Assessing the prospects for successfully meeting the Convention on Biological Diversity targets for 2020 (see next section), a group of IUCN affiliated authors and collaborators write:

> For our purposes, nature, defined as 'biodiversity', comes first. The protected area definition used by CBD, defined in Article 2 of the

Box 2: Types of protected area under the IUCN/Convention on Biological Diversity classification

Category I	Ia: *Strict Nature Reserves*: are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphical features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Ib: *Wilderness Areas*: usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.
Category II	*National Parks*: large natural or nearly natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities.
Category III	*Natural Monuments*: set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.
Category IV	*Habitat/Species Management Areas*: to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category
Category V	*Protected Landscape/Seascapes*: where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value; and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.
Category VI	*Managed Resource Protected Area*: protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.

Source: Dudley, 2008, pp.12-24

> Convention, is similar in intent and scope and we treat both definitions as being essentially equivalent: 'The term protected area is a geographically defined area, which is designated or regulated and managed to achieve specific conservation objectives'. (Woodley et al., 2012, p.31)

Such definitions differ from those adopted by many countries. The implication is that protected areas identified by the same terms, such as reserve or national park, can be classified in any IUCN category. For example, 15 of the United Kingdom's national parks are classified as category V, while the rest are listed as in 'not reported' management status. In contrast, all New Zealand's national parks are acknowledged as category II. In the United States, 132 national parks are recognised as category II, but others are not (UNEP–WCMC, 2014). In this article, the term protected area is used broadly, to also include national efforts not reflected in the IUCN/Convention on Biological Diversity classification shown in Box 2.

The expansion of protected areas and challenges ahead

Globally, the number and extent of protected areas remained low until the end of the Second World War, and they were predominantly found in developed countries. Developing countries have been expanding their protected area network quite rapidly since the mid-1970s. The total area protected under the Convention on Biological Diversity constituted 15.4% of terrestrial and inland water areas in 2014, but only 8.4% of the global ocean (United Nations Environmental Programme, 2014, p.ii). Only 65% of these areas used the IUCN classification (ibid., p.4). Target 11 of the Aichi Strategic Plan adopted under the convention in 2010 aims to lift the minimum percentage of terrestrial protected areas globally to 17% by 2020, and of marine and coastal areas to 10%. This includes those with 'not reported' status, because, although their primary objective may not be 'to achieve the long-term conservation of nature', this is often a helpful secondary objective (ibid.).

Table 1 shows the shares and types of protected areas for some key regions, including the ocean/marine-based ones. With the exception of Oceania, categories I and II have the lowest shares. Strikingly, only around 1% of Europe's national parks are recognised as category II national parks in the IUCN classification. This is often because human habitation pre-dates protected area establishment and the types and levels of human use are considered insufficient to warrant such classification (Mose and Weixlbaumer, 2007). Categories III and IV were very popular until a few decades ago. Category III sites are usually small-scale (less than 10km^2), while category IV sites focus narrowly on protection of (often individual) species and habitats (Rodary and Milian, 2011, pp.20-1). The highest shares are represented by protected areas with 'not reported' management forms, dominating in Africa. Since the 1990s, categories V and VI have been growing most strongly (Rodary and Milian, 2011, p.21).

Conservationists and biologists call for a significant expansion of all protected area types, striving for an average of 50% of the planet (Noss et al., 2012). However, population growth will limit that, and may influence the social acceptability of some protected areas, especially categories I and II. On 6 January 2016 the global population passed 7,392,818,500.[2] The United Nations estimations are that by 2100 there will be almost 11 billion human beings on Earth. Table 2 indicates the expected growth across regions.

Population growth is expected to have an impact on biodiversity and ecosystem health both directly and indirectly, through increased demand for housing, food, energy, and other goods and services (Mora and Sale, 2011). Many developed countries, which do not suffer yet from population pressures, are above the Aichi target of 17% already: for example, protected areas cover 28% of the United States, one third of New Zealand, and around half of Tasmania (UNEP–WCMC, 2014). The problem lies with the prospects for protected area increase in Africa, Asia and South America. For example, less than 12% of land is uninhabited in Africa. According to Balmford et al. (2001), the lands with high ecological value have already been occupied, and many of these areas exhibit strongly positive relationships between biodiversity and people. This makes protected area network expansion, even preservation, difficult. Ehrlich and Pringle give as an example Venezuelan president Hugo Chávez's plans to relocate 100,000 people in El Álvila National Park to address overcrowding in Caracas (Ehrlich and Pringle, 2008, p.11580). If protected areas are to be defendable in the context of population growth, decision-makers need to rethink how they govern human–nature interactions in such spaces, starting with a reconsideration of the objectives to be pursued.

Table 1: Protected areas by region

Continent/ Region	Shares in Terrestrial areas (%)	Marine areas (%)	Protected area types, listed in decreasing order of their shares
Africa	14.7	2.4	NR: ~86%;
Asia	12.4	4.5	III & IV: ~45%; V & VI: ~32%; I & II: 18%
Europe	13.6	3.9	NR: 43%; III - IV: ~39%; V - VI: ~11%; I: ~6%; II: ~1%
Middle East	15.2	1	NR: ~45-50%; III - IV: ~33%; V - VI: ~12%; I & II: ~6%
North America	14.4	6.9	V & VI: ~44%; IV: 30.1%; I & II: ~15%
Oceania	14.2	15.6	III & IV: ~60%; I & II: ~23; V & VI: ~12%
South America	25	3.9	NR: ~55%; III & IV: ~18%; I & II: ~16%

Source: column 2 from UNEP, 2014, p.9 and 12; column 3 from UNEP-WCMC, 2014

Key debates around protected areas

The philosophy underpinning the first four protected area categories in Box 2, and how various countries operationalise their objectives in legislation and management practices, is not uncontroversial. For example, in New Zealand the National Parks Act 1980 requires that these protected areas should be 'preserved as far as possible in their natural state' and that 'the native plants and animals of the parks shall be as far as possible preserved and the introduced plants and animals shall as far as possible be exterminated'; further, it requires that 'their value as soil, water, and forest conservation areas should be maintained' (section 4.2). These are the only underpinning environmental values; a holistic, multi-level environmental perspective is missing, particularly concerns regarding air, soil and water impacts above local level, the exhaustion of non-renewable resources, and contributions to climate change of protected area-based activities.

Two important assumptions transpire from the objectives pursued for categories I–IV and from the New Zealand national park example. First, 'nature = non-human nature' (Hammer, 2007, pp.21, 26): for example, a specific objective of category IV is 'To provide a means by which the urban residents may obtain regular contact with nature' (Dudley, 2008, p.19). Second, the assumption is that good conservation is selective conservation, eliminating what lawmakers or dominant stakeholders view as non-native and not deserving to live. For example, trout and salmon are not native to New Zealand, but protected and tolerated for economic and recreational reasons; there are no policies around domestic cats threatening bird life, but possums are targeted with aerial poisoning.

In a book focusing on New Zealand's conservation approach, Benfield argues that managing nature areas is:

> a quest to recreate a perfect word with everything in its place and all non-native species excluded. It also seeks a 'freeze frame moment', a moment frozen in time under a bell jar, the moment when in theory, evolution reached a point of perfection in balance and harmony – and then it stopped. In many New World cases like the US or New Zealand, the restoration model is often the time of first European contact. As nature is dynamic, as the world is in constant flux, to freeze evolution is an unachievable goal. We must seek to understand how regulatory authorities now try to

Table 2: Historic, current and future population

Year	Africa	Americas	Asia	Europe	Oceania	World
1950	228,826,701	339,484,233	1,395,749,366	549,043,373	12,674,996	2,525,778,669
2000	808,304,337	841,695,330	3,717,371,723	729,105,436	31,223,602	6,127,700,428
2100	4,184,577,429	1,249,292,969	4,711,514,029	638,815,665	69,648,478	10,853,848,570

Source: UN–DESAPD, 2013

> lock native species into their 'range'. An example would be the Monterey Cypress. Endangered in its natural range, it is put down as an 'alien' only a few miles away from it as being 'out of range'. (Benfield, 2015, p.10)

Mose and Weixlbaumer (2007, pp.10-11) refer to this approach as the 'protection and segregation' or 'static preservationist' paradigm. Others use terms like 'land sparing' (Ellis, 2013) or 'fortress conservation' (Rodary and Milian, 2011). This paradigm dominated the world until the mid-20th century, and is still preferred in some regions and by large and powerful international nature organisations (Aubertin, Pinton and Rodary, 2011). Increasingly, however, the usefulness of this paradigm has been challenged. Already in 1986 Tighem deplored that national parks persistently failed to deliver the expected biodiversity conservation objectives. He argued that:

> [National parks] have not drawn us into a more thoughtful relationship with our habitat. They have not taught us that land is to be used frugally, and with good sense. They have encouraged us to believe that conservation is merely a system of trading environmental write-offs against large protected areas. They have more than failed, in fact, they have become a symptom of the problem. (Tighem, 1986)

As shown in Table 1, categories I and II now have the lowest shares of all protected area types, except in Oceania.

An increasing number of academics and stakeholders consider that a better integration is needed of regulations on conservation and human development, which should include viable funding mechanisms for protected areas. Mose and Weixlbaumer identify this as the second paradigm, referring to it as the 'dynamic-innovation approach (integration protection)' or 'preservation and use integrated approach'. This builds on the principles of sustainable development and 'attempts to overcome the "protection and pollution area" dichotomy' (Mose and Weixlbaumer, 2007, pp.12-13). Other terms used are 'land sharing' (Ellis, 2013) and 'sustainable land use' (Rodary and Milian, 2011). Categories V and VI were added by the IUCN in 1992 (and classified retroactively: Dudley, 2008) to reflect criticism regarding the narrow focus on local nature. They are generally viewed as forming the backbone of this second paradigm, next to areas with 'not reported' management status. Rodary and Milliam (2011) found that more than half of 'not reported' areas are indigenous or forest reserves.

Currently, some activities permitted by governments inside protected areas contribute to biodiversity decline and environmental quality deterioration, within and outside protected areas.

This article argues that the dichotomy approach to protected area governance conceptualisation is misleading and sets us on unproductive analytical tracks. A softer interpretation of protected area differences uses a spectrum approach, claiming that the degree of areas' naturalness decreases from category I to category VI (Dudley, 2008). The corollary is that their compatibility with human uses, and the de facto impacts, would increase from I to VI. Leroux and colleagues tested the common assumption that 'The gradient, from most natural to least natural, follows categories Ia=Ib > II=III > IV=VI > V', whereby natural 'is defined relative to both ecosystem structure and human activity'. Using the 'human footprint' technique, they found that 'the present assignment of protected areas to IUCN categories does not correspond to the expected gradient of naturalness in a globally consistent manner'. Interestingly, they also concluded that 'the grand mean Human Footprint of IUCN Category Ia areas is higher than for Category Ib, and is roughly equivalent to Categories II, III, and VI' (Leroux et al., 2010, p.610).

Consequently, it would be misleading to rely on general assumptions about compatibility with human uses to get a sense of the degree of (local) nature protection across protected area types. The way human access is regulated and implemented in various types of protected area is important. As always, 'the devil is in the detail'.[3] In some countries category II sites may be more exposed to (risks of) environmentally unfriendly developments compared to category V or VI areas in other countries. The findings of Leroux and colleagues seem to suggest that this has happened, despite the 'freeze frame moment' approach to biodiversity management still embedded in some national legislations regarding category I–IV areas.

Development threats at the dawn of the third millennium

Currently, some activities permitted by governments inside protected areas contribute to biodiversity decline and environmental quality deterioration, within and outside protected areas. This is the case when they consume significant amounts of fossil fuels, and when activities such as fracking or the mining of minerals are allowed. An intensified use of motorised vehicles and the construction of numerous facilities with fossil fuel emissions within protected area boundaries will increase the deposition of nitrogen on flora, water bodies and soils; it will also lead to acidification through ground-level ozone and particular matter pollution. These factors may also affect fauna.

In New Zealand some national parks, or areas of national parks, are open to intensive tourism-related vehicle use (cars, buses, helicopters, motor boats).

Since 2009 New Zealand governments have attempted to open up national parks for gold and coal mining. Recent attempts at coal extraction in national parks have been reported mostly in developing countries, but attempts at fracking under protected areas in developed countries are not uncommon (see Greenpeace, 2015). The following is a list of development threats to national parks (from Watson et al., 2014, p.70) posing environmental risks, from local to global:

- Indonesia: permits were issued for mining inside 481,000 hectares of national parks and protected areas in 2010.
- Belize: permit approved in 2012 for petroleum exploration inside Sarstoon Temash National Park, the second largest national park in Belize and a Ramsar-listed site.
- Democratic Republic of Congo: intention to explore for petroleum inside Virunga National Park was affirmed in 2012.
- Japan: restrictions on drilling were eased to allow diagonal drilling inside national parks in 2012.
- United Kingdom: Cairngorms National Park management plan, announced in 2010, expands development inside the park, including plans for the construction of 1,700 houses.
- Australia: recent changes in protected area management allowed grazing, recreational shooting, fishing and other uses.

In New Zealand, coal mining in the conservation estate is still possible. In 2014 the conservation minister approved a concession for an open-cast coal mine covering over 106 hectares on the Denniston Plateau, near Westport. He stated: 'I have approved this mine because the loss of conservation values is compensated by a $22 million package by Bathurst Resources. The compensation will fund pest and predator control' (Smith, 2013). Bearing in mind that the Department of Conservation's restructuring resulted in 312.7 permanent full-time equivalent staff being dedicated to 'partnerships with businesses and communities' (Department of Conservation, 2015), the question arises: are donations the new currency for concession allocation in New Zealand's protected areas? Irrespective of where this coal will be used, it will contribute to climate change, which is expected to have a significant negative impact on native biodiversity (McGlone and Walker, 2011). Is the developer's donation going to do more good to biodiversity than climate change will eventually do damage, in the medium and long term? New Zealand may indeed be an island, but local–global environmental linkages cannot be denied. In early 2016 public consultation was opened on another concession, for Rangitira Developments Limited. The intended activity is again open-cast coal mining, on 12 hectares on Mt Te Kuha near Westport.

Of relevance here are also pollution incidents. These can be expected to increase with the intensified commercialisation of protected areas based on narrowly considered environmental risks. In 2013 the concessionaire Ruapehu Alpine Lifts was responsible for spilling thousands of litres of diesel into the water supply of neighbouring communities. It was claimed that 'about 19,000 litres was pumped into the Tongariro National Park, a World Heritage Area', and the company was subsequently convicted and fined $300,000. Local residents have recently laid a complaint to police, as 15,000 litres of diesel cannot be apparently accounted for (next to the 3000-4000 litres believed to have spilled during the incident on 26 September 2013), and they struggle with the question whether the water supply was affected by pollution before the incident (see Brooker and Wall, 2015).

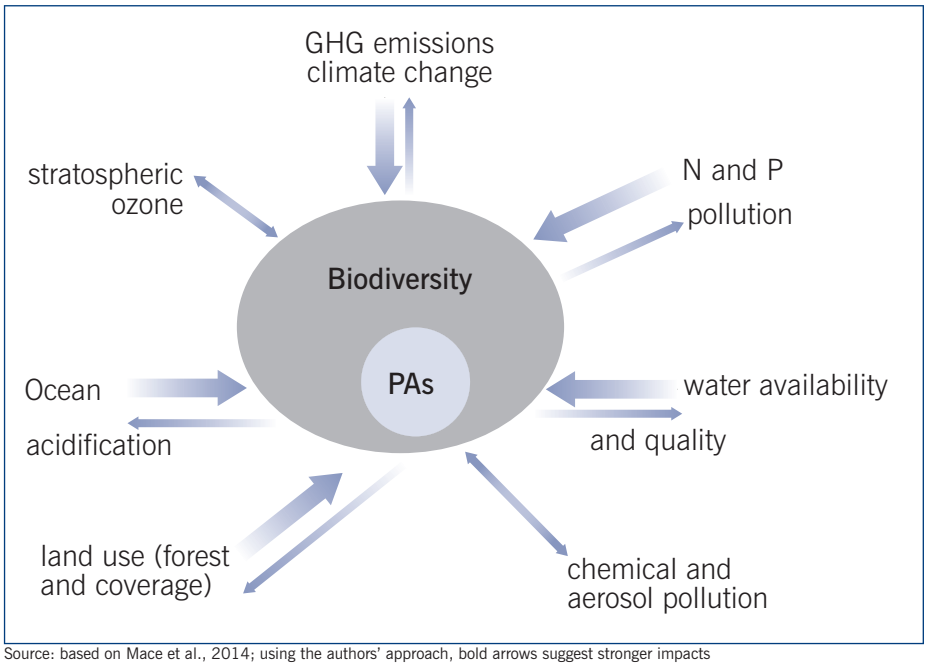
This article argues in favour of widening the operationalisation of the term 'compatible with' – in the definitions of protected areas' objectives and the larger legal-policy frameworks – by using the concept of strong sustainability. Rather than looking narrowly at potential direct negative impacts on species, local ecosystems and habitats, natural monuments, or only some environmental resources, authorities need to screen all human access and infrastructure proposals in terms of compatibility with strong sustainability objectives and principles, and the relevant recent scientific insights; when science is uncertain, the precautionary principle needs to be applied to decision-making.

> The Planetary Boundary framework offers a reminder that proper care for protected areas needs to consider the multi-scale interactions between humans and planetary biogeochemical systems.

Strong sustainability approaches to human uses can be applied across all protected area categories without undermining their distinctiveness, because human access is allowed in various forms anyway. Concessions (permits, licenses, leases) are regulatory tools typically applied to enable access to protected areas. They can be used as tools for the implementation of sustainability objectives. The new types of concession conditions will need to be reflected in the higher-level nature management plans and strategies. They also need to be harmonised with national environmental policies and legislation, which in their turn may need revision.

For example, at concession level, users are typically required to refrain from actions resulting in environmental damage (see Dinica, forthcoming, 2017). In New Zealand, the Conservation Act 1980 uses the terms 'avoid, remedy or mitigate'. But, by applying a strong sustainability approach, concessionaires and other users could also be required to proactively engage in activities that reverse already

Figure 1: Planetary boundaries and interlinkages with biodiversity and protected areas



Source: based on Mace et al., 2014; using the authors' approach, bold arrows suggest stronger impacts

sustained damage (ecological restoration, for example) or aid transitions, such as towards renewable energy use (see Green and Winebrake, 2006), sustainable transport, organic multi-crop agriculture or sustainable waste management, within or outside protected areas. In this way, all protected areas could become 'exemplary landscapes', spaces of human–nature interaction that people and businesses would like to emulate elsewhere, and which societies may be more willing to support financially (Ervin, 2013).

Strong sustainability and planetary boundaries

The strong sustainability concept maintains that 'the stable functioning of Earth systems – including the atmosphere, oceans, forests, waterways, biodiversity and biogeochemical cycles – is a prerequisite for a thriving global society' (Griggs et al., 2013, p.305). This means that in the process of human development, societies should not alter the ecosphere – which includes fauna, flora, the atmosphere, and water and soil quality and availability – to an extent that poses risks to human and non-human life or disrupts evolutionary processes irreversibly. In contrast to weak sustainability, the strong sustainability approach does not accept that natural and human-made capital can be seen as interchangeable. Rather, the economy is seen as an element of society, which in turn is seen as an element in the global eco-geosphere. The strong sustainability approach considers that human development needs to focus on poverty reduction, and on human well-being and health, rather than economic growth (Neumayer, 2013).

In 2009, 28 internationally acknowledged scientists, working in collaboration with the Stockholm Resilience Centre, published the Planetary Boundary framework, underpinned by the strong sustainability concept and inspired by the famous book *The Limits to Growth* (Donella Meadows et al; 1972). The underlying idea is that nine interlinked boundaries need to be observed to maintain 'a safe operating space for humanity'. These refer to: biodiversity; climate change; the nitrogen cycle (tightly linked to the phosphorus cycle); change in land use; stratospheric ozone depletion; ocean acidification; global freshwater use; atmospheric aerosol loading; and chemical pollution (Rockstrom et al., 2009a, 2009b). In their revised version, the authors argue that the first five listed boundaries have already been broken. For the climate and land-system change, the planet is still in the zone of 'increasing risk', while for the other three, the high-risk zone, which is 'beyond the zone of uncertainty', has already been reached. The biodiversity and nitrogen boundaries have been 'overstepped' the most, quantitatively.

The climate boundary needs to be watched very closely. Climate changes are expected to generate many other rapidly occurring planetary changes, threatening all life forms. In the hierarchy of boundaries, biodiversity and climate are the ones that radically influence all transitions across geological eras, and need to be urgently addressed by decision-makers. But they are influenced by all others. The strongest interlinkages are between the following boundaries: biodiversity, climate change, land-system change, water, nitrogen and phosphorus, and ocean acidification. The strongest impacts on biodiversity are from these (Mace et al., 2014, pp.294-5). Figure 1 represents these relationships and their relevance for protected areas. These interactions are highly complex and occur at all levels, from local to global.

As hotspots of biodiversity, protected areas are exposed to many pollution forms from neighbouring areas, as well as regional and global anthropogenic environmental changes. Mora and Sale explain how biodiversity is significantly influenced by residential areas, agriculture and food industries, and energy production systems (Mora and Sale, 2011, pp.257-9; Mace et al., 2014; Rockstrom et al., 2009a). These influences occur through over-exploitation, invasive species, sewage pollution, leakages from landfills, erosion, climate change, and eutrophication and acidification through various air pollutants such as sulphur dioxide, nitrogen oxides, ozone, particulate matter and ammonia. However, as argued earlier, what happens within protected areas will also reverberate outside these spaces, at regional and global levels. The Planetary Boundary framework offers a reminder that proper care for protected areas needs to consider the multi-scale interactions between humans and planetary biogeochemical systems.

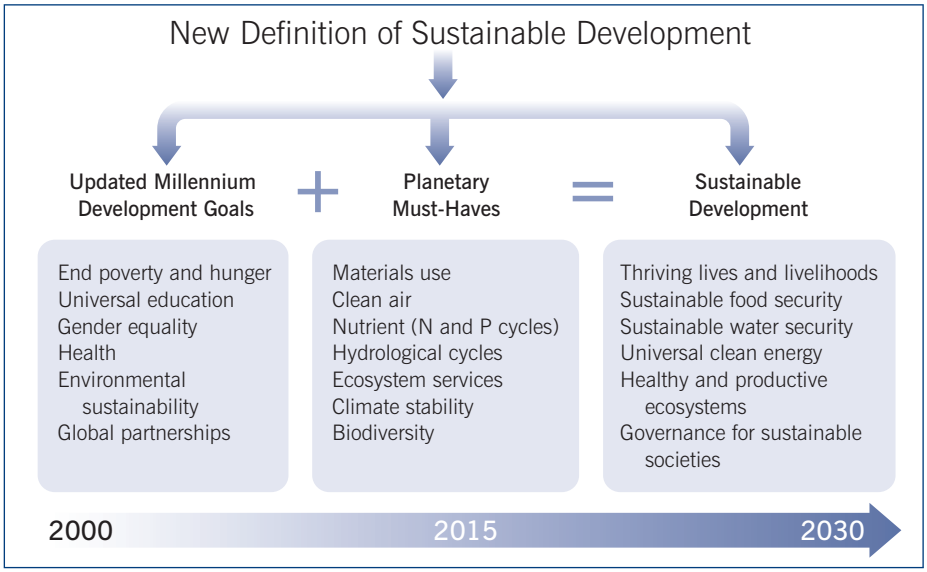
Jamison Ervin (an advisor with the United Nations Development Programme) argues also in favour of integrating sustainability into protected area governance, writing that 'we must fundamentally change how we think about protected areas. We must repurpose protected areas to obtain not only ecological but also sustainable

development goals' (Ervin, 2013, pp.76-7). Such a fundamental rethinking of protected areas can only start with the widening of the objectives underpinning the governance and management plans of all protected area types, to reflect the state of the global environment. Social, economic and cultural values are already represented in protected areas' conceptualisation, but they need to be refined and qualified in the light of the more comprehensive range of environmental sustainability values.

This requires balancing perspectives from the outside in (focusing on the negative impacts on and the positive impacts emanating from protected areas) with inside-out perspectives (how can protected area governance be improved to avoid negative impacts at regional and global level, and engage more proactively in multi-scale environmental improvements). While so far the focus of protected area governance and of traditional conservationists has been on the bolded arrows in Figure 1, the thinner, outwards-pointing arrows cannot be ignored any longer. Box 1 – the IUCN's delineation of use and non-use values – mentions climate stabilisation as a benefit of protected areas (often in the hope of attracting financial support for ecosystem services). However, how much of a benefit is there if activities permitted within protected areas extract and/or consume (often intensively) fossil fuels (contributing also to acidification)? Likewise, the extraction of non-renewable resources and the logging of native forests detract from the 'future uses' value of protected areas.

The revised Planetary Boundary framework proposes to monitor the

Figure 2: Proposed sustainable development goals to integrate planetary boundaries ideas with Millennium Development Goals (revised in 2015)



Source: Griggs et al., 2013

Table 3: Expanding the objectives for protected area governance (the range and hierarchy of socio-economic objectives may vary across protected area types)

What is to be sustained through protected area governance (objectives)?		
The environment (holistic view)	Socio-cultural aspects	Well-being and green commercial innovations
• biodiversity (managed and monitored for phylogenetic species variability: see Mace et al., 2014; Steffen et al., 2015) • air quality • water and soil quality and availability (for services to the ecosphere, including human society) • climate stability • ocean biochemical stability • non-renewable mineral and organic resources (e.g. no extraction of non-renewables within protected areas; use rates or organic resources that consider sustainability impacts at all levels; resource efficiency; sustainable architecture) • the diffusion of renewable resources; energy efficient technologies/ behaviours	• (local/national) cultural and historical artefacts and traditions • social equity, inter- and intra-generational facilities/activities • environmental justice • human spiritual development and health • education and research	• opportunities for environmentally friendly and equal opportunity employment • businesses facilitating environmentally friendly innovations and user adoption • an adequate material standard of living (locally to nationally), through ethical investments by national businesses or individuals (to reduce financial leakages from the national economy)

land-system change boundary based on forested area, suggesting a maximum 50% loss from the potential/initial forest cover globally for temperate forests, and no less than 15% loss of original forest cover for tropical and boreal forests (Steffen et al., 2015, pp.1259855-7). While governments may view the logging of native forests as environmentally sustainable locally, it may undermine global environmental sustainability. There can be no such thing as local sustainable development without development that is globally environmentally sustainable.

Griggs and colleagues argue that the Planetary Boundary framework offers the opportunity to redefine a set of sustainable development goals, as reproduced in Figure 2. They believe that decision-makers at all levels should reconsider the Brundtland definition of sustainability[4] by incorporating scientific findings that have emerged during the decades since 1987. They consider that a new definition of sustainable development is necessary in the Anthropocene: 'Development that meets the needs of the present while safeguarding Earth's life-support system, on which the welfare of current and future generations depends' (Griggs et al., 2013, p.306).

A preliminary research agenda

Considering the age of the protected area concept, this article set out to examine what such spaces should aspire to achieve in the third millennium, given contemporary pressures and challenges. Arguments were offered in favour of incorporating a strong sustainability approach into protected area governance. Table 3 suggests, in column 1, an extended range of environmental objectives. The social and economic objectives suggested draw on existing practice, particularly the IUCN/Convention on Biological Diversity approach, but have been refined to be coherent with the more comprehensive, multi-scale environmental objectives. The list represents just a preliminary proposal for further thinking and research.

This approach necessitates a new research agenda, which should address questions such as:

- What sustainability-driven objectives are most suitable for which protected area categories, and in what hierarchy? What indicators and criteria should be selected to reflect progress in their achievement at protected area level?
- What governance innovations would be required to implement the new set of sustainability-driven objectives for various protected area categories? What legislative changes, institutional designs and interactions, new governance principles, processes, instruments and actor arrangements are likely to be effective? What cultural, societal, geographical, economic and other preconditions may influence their effectiveness?

Some immediate, more specific research questions would be:

- How should environmental impact assessments, strategic environmental assessments and other comparable policy instruments be revised to help implement the new objectives?
- What are the implications of a sustainability-driven approach to protected areas for the collaboration of public authorities, and policy integration across governmental scales and policy domains? How can the private sector contribute to the implementation of the new approach?

The answers to such questions are crucial, as they will influence the extent to which the potential of protected areas to contribute to global sustainability is harnessed.

1 It is currently fully accepted by conservationists that preventing biodiversity loss and enabling the continuation of evolutionary biological processes require nationwide conservation strategies, deploying a full range of policy instruments across all types of land ownership. Gunningham and Young (1997) provide a thorough analysis of how property rights and policy instruments may be deployed at national level to better protect biodiversity. In the New Zealand context, Craig and colleagues argue that 'the New Zealand conservation paradigm needs to be broadened to encourage collaboration of a wider range of stakeholders and land owners' (Craig et al., 2013; see also Parliamentary Commissioner for the Environment, 2002; Western, 1989). While acknowledging the necessity for countrywide interventions, including those of a voluntary nature, this article focuses on the potential for more environmentally friendly outcomes on publicly owned protected areas, considering the interlinkages between environmental quality for biodiversity health from local to global levels.

2 Live statistics can be viewed at http://www.worldometers.info/world-population to get a feel of the speed of human population increase.

3 One also needs to consider that legislative loopholes often exist, making the critical analysis of regulations important.

4 Promulgated by the 1987 report of the Brundtland Commission, or World Commission on Environment and Development.

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Christine Cheyne

Reinvigorating the Vision

conservation boards' role in 21st-century nature conservation

Introduction

Public and stakeholder involvement in nature conservation through conservation boards has been a distinctive feature of New Zealand's statutory framework for conservation, put in place in 1987. Since their inception, effective boards established for the purpose of ensuring that conservation stakeholders' voices inform conservation planning have been regarded, at least in official discourse, as a key mechanism for achieving conservation outcomes. They replaced the existing national parks boards and, like their parent body, the New Zealand Conservation Authority, were intended to focus on the entire conservation estate.

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Conservation boards have a somewhat vaguely conceived role, being more than advisory but not having full governance functions in terms of providing oversight of the Department of Conservation, which has responsibility for managing the conservation estate. The governance function/oversight/steering of an organisation, responsibility for setting direction and long-term planning – can be contrasted with the management function/operational responsibility and policy implementation.[1] Although clearly intended as a feature of the boards, which are required to recommend to the New Zealand Conservation Authority the approval of key management and strategy documents – conservation management plans and conservation management strategies – the governance function is not fully developed

Nevertheless, since their inception, effective boards have been regarded, at least in official discourse, as a key mechanism for achieving conservation outcomes, working in collaboration with the department. Recognition of the importance of the effectiveness of boards for achievement of conservation outcomes is to the fore in the 2013 review of boards, which recommended:

> A new system of annual planning and reporting should be established for the conservation boards' work programmes. … The annual report from each board would comment on how expectations have been met *and how the board has contributed to achieving conservation outcomes.* (Conservation Boards Review Panel, 2013, p.16, emphasis added)

Notwithstanding their role in the adoption of conservation management plans and strategies, their role has been, however, more of a weak advisory one. The 2013 review of boards reaffirmed that the Conservation Act 1987's provisions envisaged a role for boards in facilitating collaboration between communities and the department, and observed that the potential contribution of boards had been only partly realised (Conservation Boards Review Panel, 2013, p.2). It argued that it was timely for the original vision to be reinvigorated and for the true potential of conservation boards to be fulfilled.

A case study of consultation and decision-making in relation to the Ruahine Conservation Park change of status and land exchange proposal in 2014–15 reveals significant shortcomings in public access to information about conservation decisions, and other weaknesses in this aspect of the 'New Zealand model' of conservation management. This article discusses proposals for reinvigorating the vision of conservation boards and enhancing public and stakeholder involvement in conservation governance and management.

Incorporating stakeholders' voices in conservation planning, 1990–2015

In March 1985 the acting prime minister, Geoffrey Palmer, hosted an environment forum at Parliament attended by 150 participants, convened to contribute to the development of the fourth Labour government's environmental administration reform agenda (Young, 2004). A Working Party on Environmental Administration in New Zealand was established to continue the work of the forum. Among the principles that guided the deliberations of the working party was the following:

> Environmental administration cannot be based on rigid centralised directives. It relies on a set of broad principles; public processes whereby decisions on the use of allocation of resources are made with regard to their full value and the full implications of their use or allocation; informed, aware and responsible decision-makers at all levels; and adequate policy as well as simple economic and protective mechanisms. (Salmon, 2013, n.p.)

Prior to the review of environmental administration there was provision for a public voice in nature conservancy by national parks and scenic reserves boards. The subsequent Conservation Act 1987 created a Department of Conservation. Three years later the act was amended to replace national parks boards and scenic reserves boards with conservation boards. As noted in the 2013 review,

> The board provisions of the 1987 Act were built on the foundations of the 1952 and 1980 National Parks Acts, whereby *boards representing Māori, community and public interests, not government departments, would determine the standards that apply to the management of public protected areas.* (Conservation Boards Review Panel, 2013, p.14, emphasis added)

Section 6M of the Conservation Act 1987 sets out the main functions of boards, which are: to recommend the approval of conservation management strategies by the New Zealand Conservation Authority, and the review and amendment of those strategies; advise the Conservation Authority and the department on the implementation of conservation management strategies and conservation management plans for areas within the jurisdiction of the board; advise the Conservation Authority or the director-general of conservation on any proposed change of status or classification of any area of national or international importance, and on any other conservation matter relating to any area within the jurisdiction of the board; and to liaise with any Fish and Game council on matters within the jurisdiction of the board. Section 6N sets out the powers of boards, which include advocacy at any public forum or in any statutory planning process, including the right to appear before courts and tribunals in New Zealand and be heard on matters affecting or relating to the board's functions.

The statutory provision for conservation boards reflects a long-standing recognition of the importance of local environmental knowledge.

These powers recognise that conservation boards represent the public interest in the Department of Conservation's work, and in conservation generally. The statutory provision for conservation boards reflects a long-standing recognition of the importance of local environmental knowledge. The contemporary emphasis on boards' role in a collaborative approach to nature conservation also reflects recent shifts in thinking about public participation, and, in particular, the importance of avoiding an adversarial approach in environmental planning and decision-making and of finding durable solutions to so-called 'wicked problems', such as environmental degradation, biodiversity loss and other resource depletion, which are deep-seated and require the concerted effort of multiple social actors (Allen and Gould, 1986; Ansell and Gash, 2008; Head and Alford, 2015; Rittel and Webber, 1973). Collaborative processes have increasingly been used in freshwater planning in New

Zealand, and the 2013 review recognised that conservation boards are a key vehicle for a more collaborative approach in conservation planning. At the same time, recent research on public participation in conservation planning in New Zealand (specifically, consultation in relation to national park plans and concessions) by Valentina Dinica (2015) points out that New Zealand's preferred participatory mechanisms, such as written submissions, public hearings and public meetings, are outdated, with limited reach and poor quality of engagement.

Conservation board members are ministerially appointed following a public nominations process and advice from the Conservation Authority. Although board members are essentially political appointments (other than in the case of members appointed by iwi), the independence of boards and the Conservation Authority is recognised. An electronic fact sheet about the Conservation Authority describes its role as:

> provid[ing] for interaction between the public and the Department of Conservation and represent[ing] the long-term public interest in conservation generally, and national parks in particular. It is an independent statutory body appointed by the Minister of Conservation to advise on the Department's priorities, policies and practices at the national level. The NZCA focuses on *policy and strategic direction, not day-to-day operational detail.* (Department of Conservation, 2014, emphasis added)

The reference to the focus on policy and strategic direction indicates a governance (steering) aspect to the role of the authority, although the website states that it is not a board of directors with governance responsibilities.

In making appointments the minister seeks to ensure that there is geographic representation, that board members represent a range of conservation stakeholders (including farmers and other rural landowners, urban conservation groups and iwi/mana whenua groups),[2] and that a diversity of skills is included. Conservation boards provide for citizen participation through sectoral representation of the key constituencies of nature conservation.[3] The review of conservation boards in 2013 noted that the legislative provision for statutory conservation boards 'reflects a unique partnership between the Executive and the public'. It was recognised that board members' skill and expertise was a resource for the department: 'Strong relationships must exist between the Department's senior managers and the boards to maximise the benefit of these skills. [However], these relationships were found to be variable' (Conservation Boards Review Panel, 2013, p.1). The notion of collaboration was seen by the review as central to the role of conservation boards and the original intent of the Conservation Act 1987 was reaffirmed:

> The Conservation Act 1987 provisions relating to the boards envisaged collaboration between communities and conservation managers facilitated in part by conservation boards. The potential contribution of boards has only been realised in part and the panel believes that it is timely for the original vision to be reinvigorated and for the true potential of conservation boards to be realised (ibid., p.2).

The role of boards in the conservation management strategy process, and more generally, is constrained by their reliance on the Conservation Department.

The hybrid nature of the boards – which, as noted earlier, have a limited governance (steering) function combined with an advisory function, along with an advocacy role – appears to create confusion at times and the governance function of boards, like that of the Conservation Authority, is generally not explicitly emphasised. For example, the homepage of the Wellington Conservation Board website states: 'The Wellington Conservation Board performs a conservation advisory role, on behalf of the public, for the Wellington/Kapiti, Wairarapa and Manawatu regions.' However, the role of advice is clearly consistent with a governance function, as the role of boards is to contribute at a strategic level, as opposed to operations. This appears to be reinforced by the first code of practice for conservation boards, published in August 2015, which identifies the following roles for conservation boards:

- contributing a strategic perspective to conservation planning, policy development and decision-making as a well-informed voice of the community;
- exercising powers of recommendation and approval for statutory management planning documents;
- advising on the implementation of statutory planning documents; and
- advocating for conservation outcomes, including in public forums and through statutory planning processes. (Department of Conservation, 2015a, p.1)

The role of boards in the conservation management strategy process, and more generally, is constrained by their reliance on the Conservation Department. Boards are serviced by the department, and at times have been reliant on funding by the conservator (the manager of the conservancy or region, who is responsible for departmental staffing, including conservation board support staff) for the level of administrative support. Frequent departmental restructuring in the past decade has affected the department staff directly involved in servicing the boards. Restructuring has also had an impact on scientific and managerial staff not directly

involved in servicing the board but, for example, responsible for providing reports for board meetings. In some cases boards have met as infrequently as twice a year.[4] Throughout New Zealand, reviews of conservation management strategies (the development of so-called 'second generation' strategies to replace the first set of ten-year strategies developed under the 1987 act) has been extremely protracted, due largely to departmental restructuring and delays in developing templates. Boards also compete with other areas of departmental responsibility for funding.[5]

Board meetings are required to be open to the public and boards are subject to the provisions of the Local Government Official Information and Meetings Act 1987. However, there are growing concerns about the failure of statutory bodies to give effect to the spirit (and possibly also the letter) of open government legislation in New Zealand. Board meetings are advertised on board websites and in the local newspaper with the minimum notice required. No significant effort is made to encourage attendance by members of the public, and public forums notified in the meeting agenda are a very ineffective vehicle for public and stakeholder participation. It is difficult for the public to obtain information about board agenda items, as reports are generally not made available on the website despite the information they contain being essential for informed participation. Confirmed minutes are made available publicly and usually will be placed on the board website, but often there is a very long lag between a meeting and confirmed minutes being made available.

Board involvement in conservation planning: a case study

Having outlined some of the parameters of their role, powers, functions, and opportunities for public participation, it is helpful to see how one board has exercised its responsibilities, and to consider the implications for reinvigorating the original intent of conservation boards. For this purpose a case study was undertaken of the Wellington Conservation Board's involvement in a significant decision concerning the conservation park status of land in the Ruahine Forest Park, in the eastern Ruahine Range in Hawke's Bay, which was needed for a proposed dam. The dam was included in an application for resource consent and plan change made by the Hawke's Bay Regional Council and Hawke's Bay Regional Investment Company, and was considered by a board of inquiry. The application, the Tukituki Catchment Proposal, called in by the minister for the environment on the grounds that it was a nationally significant proposal, is briefly outlined here, with a particular focus on the component of the application which required a revocation of the conservation status of an area of forest park land to allow dam construction. Boards have a statutory responsibility to give advice to the minister on applications for revocation of protected status.

The Tukituki Catchment Proposal was selected on the grounds that it offers a 'critical case' for investigation. This term is used to describe a case that has 'strategic importance in relation to the general problem' (Flyvbjerg, 2006, p.229). The case is relevant because of the possible precedent involving revocation of conservation status (which resulted in High Court action following the director-general's decision to approve the revocation and land swap), and also because the broader water storage project is nationally significant. Document analysis was conducted using publicly available policy and planning documents, supplemented with documents sought directly from the Department of Conservation and Wellington Conservation Board. The focus here is on the process in which the board was involved in relation to the proposed change of status and exchange of conservation land, with the aim of identifying the role of the conservation board and the scope of its public engagement for the purpose of developing its strategic advice. It is not the purpose of this discussion to consider the merits of any specific planning proposal such as the Tukituki Catchment Proposal, or the proposed revocation of Ruahine Forest Park conservation status and land exchange. Nor will the focus here be on the broader Tukituki Catchment Proposal, although the very limited role the board played is worthy of analysis.

> The [Tukituki Catchment Proposal] case is relevant because of the possible precedent involving revocation of conservation status ... and also because the broader water storage project is nationally significant.

The Department of Conservation called in December 2014 for public submissions on the proposal to revoke part of the Ruahine Forest Park conservation status to enable a land exchange to be considered for the Ruataniwha water storage scheme. The scheme included construction of a 93 million cubic metre dam located in the upper Makaroro River, which has its source in the mid-eastern Ruahine Range. The purpose of the dam is to store water during periods of high flow and over winter for supplementing river flows in the Tukituki catchment during periods of low flow, to provide water for irrigation for agriculture and municipal water supply.[6] Submissions on the proposed revocation of conservation land were due on 3 March 2015. As part of the proposed scheme, the applicant, the Hawke's Bay Regional Investment Company, had applied to exchange 146 hectares of private land, containing regenerating native shrubland, intact beech forest and grassland, for 22 hectares of the Ruahine Forest Park. But for the proposed land exchange to take place, it

was necessary to revoke the conservation park status of those 22 hectares. Revoking conservation park status is an action of significant public interest, given the high level of protection. As well as the public submissions process, there was a statutory requirement to consult the relevant conservation board. Although the Tukituki Catchment Proposal application, with details of the requirement for conservation estate land, was publicly notified on 6 July 2013, and subject to the nine-month statutory timeframe, the applicant did not make the application for revocation of conservation park status until the end of 2014.

Local and national environment and conservation groups expressed concern about the revocation of conservation park status and land exchange in submissions on the proposal. Specifically, they opposed the land swap because they did not accept the claim that there was a conservation net gain and were concerned that it was not a case of swapping 'like for like'. They also opposed the proposal to revoke the conservation status of high-value conservation land, which they considered to be unlawful, the disposal by exchange going beyond the proper scope of the power in section 16A of the Conservation Act which allows for exchanges of conservation areas. There were also concerns (see, for example, the submission by Te Taiao Hawke's Bay Environmental Forum)[7] that the department's assessment that the proposed exchange would enhance conservation values could not be relied upon, as it was based mainly on information provided by the applicant.

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Section 16A of the Conservation Act requires consultation with the relevant conservation board. The parliamentary commissioner for the environment notes:

> In the Conservation Act, the exchange provision for stewardship land does not include a requirement for public consultation. In contrast, exchanges of reserve land, disposals and reclassifications all go through a public consultation process. Similarly, all significant applications for commercial use require public consultation. And the Government has recently made changes to the Crown Minerals Act to require public notification of significant access agreements for mining on conservation land. The exchange provision for stewardship land does require consultation with the local Conservation Board. This is a useful and appropriate check on swaps involving the kinds of minor changes envisioned in 1989 when the provision was added to the Conservation Act. However, in cases that are not 'minor' and there is likely to be public interest in a land swap, the public should be consulted. (Parliamentary Commissioner for the Environment, 2013, p.50)

At the Wellington Conservation Board's 28 November 2014 meeting a late item about the statutory land management regarding the Ruataniwha Dam was tabled. This meant there was no prior public notification. The minutes of the meeting record:

> Chris Lester [conservation partnerships manager in the Department of Conservation's Manawatu–Wairarapa district office] gave a brief breakdown of the proposal. The proposed Ruataniwha Dam will affect 22 hectares of conservation land. The proposal is that there is an exchange of 124 hectares of land adjacent to Smedley Station and the 22 hectares should the proposal go ahead. Chris Lester explained some of the implications of the transfer. Chris also explained that this was a briefing paper for consideration at the next meeting when a formal proposal will be tabled. The 22 hectares nominated to be relinquished falls within the boundaries of the Wellington Conservation WCB Board, and the 122 hectares nominated to be acquired falls within the East Coast/ Hawke's Bay Conservation Board.

The Wellington Conservation Board met again on 27 February 2015. Although board meetings are held in public,[8] and following the 2013 review a collaborative approach is expected to characterise board processes, Lester, who was responsible for the board's departmental support officer and had oversight of the board agenda, instructed the support officer not to release the reports accompanying the agenda. He explained in response to the request for the agenda reports:

> While the Board Reports are public documents and available from the Board Meeting on Friday 27 February, it is not normal practice to release these papers prior to their being formally received by the Board. As it happens the Board is intending to formulate a policy on the early release of Board documents and unconfirmed meeting minutes. Until I have the guidance such a policy will provide, I am reluctant to release these documents ahead of the Board meeting. (Lester, 2015)

A short while later he wrote again, saying that he had discussed the matter with the board chair and they had agreed that on this occasion the board

report could be released prior to the meeting. Subsequently, however, he advised:

> Unfortunately I am unable to release those papers as they are technically DOCs papers and any release is subject to the OIA process. If you would like me to go ahead and instigate this for you, please let me know.
>
> Further, I cannot release any minutes from the meeting until they have been confirmed. I am checking to see if I can make them available for you to read, when they are completed, but they will only be available at the office, for you to take notes from.

Subsequently, the agenda reports without the departmental briefing paper relating to the proposed revocation of conservation park status and land exchange were made publicly available prior to the meeting. The agenda itself indicates that item 4.1 was the matter of the Ruataniwha Dam land exchange, with two associated documents: a letter from the East Coast/Hawke's Bay Conservation Board with their recommendations, and a paper from David Bishop seeking advice from the Wellington Conservation Board.[9] The minutes of the 27 February meeting note:

> The Board also discussed the East Coast/Hawke's Bay Conservation Board concerns regarding the mitigation proposals and to bear those in mind when the Board visits the site on their upcoming field trip.
>
> The Board resolved to defer the decision on the Ruataniwha Land Exchange until they have visited the site on their field trip on the 28 February 2015, following which the Board would reconvene to form the recommendation.

Following the field trip the day after the board meeting, the chairperson of the board emailed the department on 3 March 2015:

> Following a recent field trip by the Wellington Conservation Board, it resolved to make the following comments on the exchange proposal. The Board recommends that the Minister takes cognisance of the Board's view that:
>
> 1. the proposed land exchange should occur on the basis of relative conservation values regardless of whether or not the Ruataniwha Water Storage Dam proceeds.
> 2. That adequate funding be provided to secure the conservation values of the Smedley Station land parcel following its acquisition by the Department of Conservation.

Concerns have been expressed in various forums … over many years about various aspects of conservation boards: in particular, their representativeness and their effectiveness …

As the Smedley Station land lies in the area covered by the East Coast/Hawke's Bay Conservation Board, that board was also invited to give feedback. The board met on 30 January but deferred discussion until after its own field trip the following day. The board's view is recorded in an appendix to the minutes of the board meeting:

> While there will be some conservation losses from the exchange, the Board considered that on balance there would be sufficient gains from the 146ha to justify the exchange. The Board noted that they would like to see relevant parts of the proposed mitigation package included in the proposed dam proposal implemented on any exchange of the land, regardless of whether the dam proceeds. … A particular issue concerning our Board (and not exclusive of other issues that could be mitigated) is the potential compromise to access to the Yeoman's Track and other walking tracks.[10]

Nine submissions were received by the 3 March deadline. Two submitters (the Wellington Conservation Board and one unnamed submitter) were in favour of the proposed revocation and exchange. Six of the seven who were opposed requested to be heard. The Department of Conservation's director, conservation partnerships was appointed as the director-general's delegate as hearing convenor. A hearing was held on 10 March. The hearing panel consisted of the conservation partnerships manager Hawke's Bay and the department's national advisor (statutory land management). A conservation board representative was invited to attend but did not (Department of Conservation, 2015c). As a result of the hearing further information was sought by the department and submitters were invited to comment further on that information (see also Department of Conservation, 2015d). The department also consulted with iwi on both the revocation and the proposed exchange (Department of Conservation, 2015b).

Following the hearing, Department of Conservation staff analysed submissions and provided a summary, along with ecological reports,[11] to the director-general, who was delegated to make the final decision (Department of Conservation, 2015c). On 5 October the director-general announced the outcome of the consultation and hearing, which was to revoke the protected status of the 22 hectares of Ruahine Forest Park to enable the exchange to take place. It was argued that the land exchange met the test of delivering an overall conservation gain for public conservation land and promoting the purposes of the Conservation Act. Subsequently, Forest

and Bird sought a judicial review of the decision.

Concerns have been expressed in various forums, including news media, over many years about various aspects of conservation boards: in particular, their representativeness and their effectiveness (see, for example, Fox, 2014). Submissions to the 2013 review reiterated concerns about representativeness:

> The NZCA reflected a common view that membership may not be fully representative of the communities the boards serve. In part, this is because boards comprise members who have a keen interest in conservation but are not necessarily reflective of their communities. In some cases, these board members are not well networked in their local communities, rather they are seen as 'experts'. However, the NZCA went on to note that it is essential boards represent the interests of their local communities and remain relevant, thereby providing a sense of local 'ownership' and solid support for conservation including recreation and tourism. Submitters noted that the quality and nature of appointments to boards had been variable and recommended more care be given to member selection to best support board functions. (Conservation Boards Review Panel, 2013, p.27)

Effectiveness has been shaped in part, as indicated above, by the nature of the support and resourcing provided by the department to boards. It is also measured by the openness of boards to input from the public and interested stakeholders. The importance of public conservation board meetings was highlighted by the 2013 review panel:

> Public conservation board meetings are an important mechanism for obtaining community input into conservation work, and can contribute to a timely resolution of local issues. This process can also be initiated by departmental staff (with the agreement of the board chair) to address local issues before they become major problems. It is essential that access to this valuable mechanism for community engagement be maintained. (ibid., p.10)

The Wellington Conservation Board's contribution to decision-making about the revocation of conservation status of land in the Ruahine Forest Park arguably fell far short of the expectations …

In his media release announcing the Ruahine decision, the director-general stated that the decision followed '*a thorough and open public process* and the careful assessment of the ecological values of both sites' (Department of Conservation, 2015d, emphasis added). It is outside the purpose and scope of this article to examine the wider consultation process, but the small number of submissions and the timing of the public consultation suggest barriers to public engagement. This is not to deny the effort of department staff to supply information to those few individuals and organisations that did make a submission. However, the preceding analysis shows that the board's consultation and public engagement in relation to the proposed change of status and land exchange, and indeed its own contribution to the decision-making process, was extremely limited.

A single case study of one conservation planning process cannot capture the full diversity of conservation boards' performance, which varies over time and place. However, it offers important insights into board performance in a very significant conservation decision. In its advice to the minister on Department of Conservation restructuring in 2013 the Conservation Authority noted:

> For conservation boards to achieve their purpose, and be useful and effective, the NZCA believes boards need to:
> - Understand and share people's connections to the national parks, other types of public conservation land, landscapes and natural features of the board's area
> - Reflect the diversity of communities and the full spectrum of interests in the public conservation lands of the board's area
> - Be perceived by the public as being 'of them' and different from the Department. (Booth, 2013)

The Wellington Conservation Board's contribution to decision-making about the revocation of conservation status of land in the Ruahine Forest Park arguably fell far short of the expectations outlined by the authority. As currently established, conservation boards are poorly placed to fulfil their purpose. In late 2014–mid-2015 the Wellington Conservation Board had nine members. One member was absent from the 27 February meeting. It appears the board had just eight members in July 2015, of whom six attended that month's meeting.[12] Board leadership was also in a state of flux. There is no public information about how many board members participated in the 28 February field trip, but often a smaller number of board members do so.[13]

This is not unusual for conservation boards nationally, but has been exacerbated by the redrawing of board boundaries in the eastern North Island. The East Coast/Hawke's Bay Conservation Board was disestablished in July 2009 and split into East Coast/Bay of Plenty and Wellington/Hawke's Bay. The board boundaries were again changed in March 2014 when the

Wellington Conservation Board was established and the East Coast/Hawke's Bay Conservation Board re-established. The eastern part of Ruahine Forest Park straddles both the Wellington and East Coast/Hawke's Bay conservancies, with the area affected by the proposed revocation under the jurisdiction of the Wellington board and the Smedley exchange block under the jurisdiction of the East Coast/Hawke's Bay board. In his report to the director-general, the hearing convenor stated:

> During the same period that submissions and objections had been invited, the Department commenced consultations with the East Coast Hawke's Bay Conservation Board and the Wellington Conservation Board, the local Conservation Board having a statutory role in respect of land exchanges. The Department also commenced consultations with Iwi groups claiming mana whenua status in the locality of the proposed revocation and land exchange. (Department of Conservation, 2015c)

It is doubtful that the Wellington Conservation Board could meet the Conservation Authority's expectations of useful and effective boards. Although the board performs a conservation advisory role on behalf of the public, the accountability of board members to the public for its response when consulted about the proposed revocation of conservation status of the Ruahine Forest Park land is very weak. Key groups and individuals from the public (including groups to which some board members are affiliated) in the area of the board's jurisdiction opposed the proposal, yet the board supported it. There is no record of board members' consideration of public or interest group views. The Wellington board's submission was just five lines in the body of an email, simply expressing the board's view that the land exchange should occur on the basis of relative conservation values, regardless of whether or not the Ruataniwha water storage dam proceeds, and requesting that adequate funding be provided to secure the conservation values of the Smedley Station land parcel following its acquisition by the Department of Conservation.[14]

The 2013 review panel highlighted the importance of relationships to the conservation boards' collaborative success, including iwi and mana whenua relationships, relationships with communities, and a new role in building community partnerships for conservation and relationships with other boards. Boards share the department's Treaty of Waitangi responsibilities, but it is unclear whether the Wellington board specifically sought advice from appropriate iwi groups; nor does it appear that the board membership included representatives of iwi groups claiming mana whenua status in the affected locality. In collaborative working there needs to be openness, transparency and trust, none of which were strong features of the Wellington Conservation Board's relationships during its consideration of the proposed Ruahine Forest Park revocation of status and land exchange.

Reinvigorating the vision

The original vision was that conservation boards 'representing Māori, community and public interests, not government departments, would determine the standards that apply to the management of public protected areas' (Conservation Boards Review Panel, 2013, p.14). As discussed earlier, the incorporation of stakeholders' perspectives reflects a normative view of the importance of participatory and collaborative approaches to environmental planning and management. Participation and collaboration take many different forms, and need to be subject to rigorous scrutiny. In particular, there are concerns that they may not be inclusive of all interests.

It is outside the scope of this article to critically review the concepts of participation and collaboration. Instead, the purpose is to review the involvement of a public conservation board in a nationally important environmental planning process and consider the implications for the achievement of the aim of the 2013 review, which was to reinvigorate that earlier vision. As such, the article is concerned with implementation of the policy of reinvigorated boards.

> Going forward, boards need to be resourced to ensure that their contribution to conservation planning as far as possible reflects established principles of collaborative processes.

The case study revealed very limited effort by the board to ensure that there was strong conservation stakeholder engagement in the process of giving strategic advice. There was a lack of openness and transparency. The effectiveness of the board was compromised by a lack of resources to perform its role, compounded by upheaval associated with departmental restructuring and changes to board boundaries. While it might be argued that a single case may be an aberration, there is no evidence that conservation boards elsewhere in the country have performed strongly in terms of promoting the desired 'powerful collaboration between communities and conservation managers' (Conservation Boards Review Panel, 2013, p.14). In the case study we see collaboration between the board and conservation managers, but not collaboration between *communities* (enabled by the board) and conservation managers.

> The 2013 review recommended three mechanisms to foster successful collaboration:
> - a new annual reporting framework, based on an annual

letter (developed in consultation with the chair of the New Zealand Conservation Authority)
- from the minister of conservation setting out expectations for the board for the year;
- accountable department directors to support the work of each board;
- a new code of practice. (ibid., p.2)

Having accountable department directors to support the work of boards is essential; however, it is doubtful that the proposed annual reporting framework will significantly enhance collaboration by conservation boards. Further research is needed to evaluate the effectiveness of each of these mechanisms.

A new code of practice for conservations boards was published in August 2015 (Department of Conservation, 2015a). This is a useful foundation, but its impact on decision-making has yet to be felt and yet to be evaluated. In outlining the responsibilities of board members, the code refers to the need for board members to be collaborative and share information relevant to the proper conduct and operation of the board. The code also highlights the need for effective engagement with community and Treaty partners: 'To exercise their role, Boards need to build strong relationships with communities, seeking information from and feeding information back to communities of interest' (p.3).

Going forward, boards need to be resourced to ensure that their contribution to conservation planning as far as possible reflects established principles of collaborative processes.[15] Departmental restructuring, conservancy/conservation region boundary changes, and infrequency of meetings in the past have significantly impaired boards' performance. The geographic scale of board areas and size of boards continue to inhibit effective representation. For some time now digital technology could, and should, have been used much more extensively and effectively to enhance the openness, transparency and public accountability of conservation boards. At the very least, unless there are reasonable and lawful grounds for public exclusion, agendas, meeting reports and unconfirmed minutes should be made publicly available electronically in a timely manner. However, engagement must be much deeper and broader than simply providing access to public conservation board meetings and information used by the board in giving advice.

There is a large body of literature on the characteristics of successful stakeholder engagement in natural resource management, and in other areas of priority-setting (for example, health care rationing). Common themes in the literature on successful factors are: use of an explicit and transparent process; timely and readily accessible information; independent advice underpinning information and analysis for stakeholders; multiple engagement techniques; inclusion of all key interests; consideration of values; and a degree of acceptability, if not consensus, surrounding the outcome of deliberation (see, for example, Innes and Booher, 2004; Larson, Measham and Williams, 2010; Sibbald et al., 2009).

Representation of Māori interests was not at all evident in the case study, but it is an area where there are some significant developments imminent, if not under way, as part of Treaty settlements. For example, the Ngāi Takoto Claims Settlement Act 2015 provides for the establishment of Te Hiku o Te Ika Conservation Board, which is to be treated as established under section 6L(1) of the Conservation Act 1987, to allow co-governance arrangements over public conservation land (with the Crown). It is expected that further such conservation boards will be created as a result of future settlements.

With the original intent of conservation boards having been reaffirmed in the 2013 review, a step change is now needed in the way boards engage the public to ensure that conservation stakeholders' voices contribute meaningfully to conservation planning. Without representative and visible boards, effective public and stakeholder engagement, and a more genuinely collaborative approach, the unique partnership between executive government and the public envisaged in the legislation boards work under will continue to be undermined. Conservation boards urgently need to play their part in reinvigorating the original vision of collaboration between communities and conservation managers.

1 Separation of governance and management functions was a core theme of public sector reforms in New Zealand and elsewhere in the 1980s, incorporating 'new public management' principles (Heinrich, 2011). The aim was to improve performance through a clearer delineation of the responsibilities of 'steering' the boat of government and 'rowing' (Denhardt and Denhardt, 2000).

2 Iwi appointments also recognise other statutory bodies such as iwi trust boards, and are increasingly influenced by Treaty of Waitangi ettlements.

3 There is also representation of key conservation constituencies on the New Zealand Conservation Authority, which has 13 members, nine of whom are appointed to represent different sectors. Two are appointed after consultation with the minister of Māori affairs, two after consultation with the minister of tourism and one after consultation with the minister of local government. The Royal Society of New Zealand, the Royal Forest and Bird Protection Society and Federated Mountain Clubs each recommend one appointee. Four members are appointed following the receipt of public nominations.

4 For example, although four meetings of the Wellington/Hawke's Bay Conservation Board were scheduled in 2013, only two meetings took place (see http://www.doc.govt.nz/about-us/statutory-and-advisory-bodies/conservation-boards/wellington/minutes/).

5 Board members are entitled to meeting and travel allowances, which are set by the minister in accordance with guidance for allowances for members of statutory boards developed by the Cabinet Office and administered by the State Services Commission (see https://www.ssc.govt.nz/sites/all/files/co(12)6-fees-framework.pdf). The level of payment is a range, with conservation board members receiving allowances at the low end of the range.

6 For further information about the Tukituki Catchment Proposal see http://www.epa.govt.nz/Resource-management/previous/Tukituki/Pages/default.aspx.

7 See http://www.doc.govt.nz/Documents/getting-involved/consultations/2014/ruahine/submissions/march-15/te-taiao-environmental-forum-submission.pdf.

8 The board website states: 'The board meets four times a year at various locations. A public forum session where members of the public can talk to the board on conservation issues is held during each meeting. The full agenda for meetings is generally available one week before the meeting date from the board support officer' (see http://www.doc.govt.nz/about-us/statutory-and-advisory-bodies/conservation-boards/wellington/).

9 Although not specified in the minutes, it appears the paper from David Bishop was the 12 February 2015 document 'Proposed exchange of part Ruahine Conservation Park for other land', which was subsequently released under the Official Information Act (M. Long, personal communication, 19 November 2015).

10 See http://www.doc.govt.nz/Documents/getting-involved/nz-conservation-authority-and-boards/conservation-boards-by-region/east-coast-hawkes-bay/2015/echbcb-minutes-meeting30-january-2015.pdf.

11 One Department of Conservation science report, 'Assessment of proposed land exchange between Ruahine Forest Park revocation land and proposed Smedley Exchange Block in relation to Ruataniwha Water Storage Scheme', dated 27 May 2015, was later made publicly available when the decision on the proposal was made. This was prepared by three department staff and an external honorary research associate (see http://www.doc.govt.nz/Documents/getting-involved/consultations/2014/ruataniwha-report.pdf).

12 Board appointments were at times delayed because of imminent departmental restructuring, in particular the controversial change from 11 conservancies to six regions in 2013.

13 Information on members' meeting and field trip attendance would normally be in a board's annual report. As at October 2015, neither the Wellington Conservation Board annual report for 2014/15 nor its 2013/14 annual report were on the board website.

14 See http://www.doc.govt.nz/Documents/getting-involved/consultations/2014/ruahine/submissions/march-15/anne-lawrence-wgtncb-submission.pdf.

15 See, for example, Land and Water Forum (2011).

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Chair in Digital Government	**Has Opening up Data Promoted Open Government in New Zealand?**	**Keitha Booth,** *Consultant on cross-government policy and programme planning*	**Tuesday 21st April, 12:30 – 1:30pm** Old Government Buildings Lecture Theatre 3 (ground floor) **RSVP**: e-government@vuw.ac.nz

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Ann Brower

South Island High Country Land Reform 1992-2015

New Zealanders have long treasured their land, with poets (Bracken, 1893) and prime ministers calling it 'God's Own Country', or Godzone for short. On his visit to New Zealand in 1897 Mark Twain wrote: 'The people are Scotch. They stopped here on their way from home to heaven – thinking they had arrived' (Twain, 1897).

As young as New Zealand is, conflicts about land and its uses have been fought about multiple values, only a few of which are tangible and locatable on a map. Land conflicts have arisen over sovereignty, cultural identity, and control of a resource located in, on or under land. Resources under contention have changed over time, from hectarage, to timber, to pasturage, to hard-rock and energy-producing minerals, to water. Recently, conflicts have started to feature a resource with new-found value in the New Zealand real estate market: beauty. In 2013 university student Daniel Kelly published a compelling 'call to arms' opinion piece describing New Zealand's landscapes as an essential part of the Kiwi national identity. He wrote: 'our rich abundance of natural beauty ... is our most celebrated asset. Fortunately it's one [prime minister] John [Key] can't sell' (Kelly, 2013).

While the prime minister cannot sell beauty, the Crown can sell land. This article describes a contemporary and continuing conflict over the reform of land ownership in the beautiful South Island high country. I attempt to make sense of the outcomes of this land reform, suggesting that the source of the conflict lies more in ideas about ownership – especially John Locke-infused ideas of political economy – than in the raw economic value of the natural resources at stake. I conclude with some Locke-inspired recommendations for land reform implementation which might avoid the current pitfalls.

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Background of South Island high country land reform

Tenure review of pastoral leases started as a way to mediate a conflict over scarce land resources, in which some wanted the land for recreation, some for its aesthetic value, some for agriculture and some for subdivision (Brower, 2008, pp.34-5). In the 1980s New Zealand became a leader in a global trend towards market liberalisation. At the time, Crown-owned land was managed for multiple uses (such as timber, grazing, mining, recreation and wildlife), causing widespread discomfort. As the then director-general of the New Zealand Forest Service put it: 'the highest attainable goal for managers [under multiple use] is a state of moderate dissatisfaction among all client groups' (Kirkland, 1989). The fourth Labour government disbanded the two multiple-use land management agencies of the day, the New Zealand Forest Service and the Department of Lands and Survey. It corporatised, then privatised, productive forest land and shifted indigenous forest

management to the new Department of Conservation.

These land reforms left out the Crown-owned pastoral leases of the South Island high country, 10% of the nation's land mass, because this land 'had an iconic value which would be more controversial politically' (Brower, 2008, p.30, quoting the commissioner of Crown lands). Indeed, many groups had much to say about the high country. By the 1980s the high country lessees themselves were advocating for the opportunity to purchase freehold title to the land they had leased, some for generations. Various Crown entities and boards of enquiry through the 1980s and 1990s pointed to the inefficiency of pastoral leases which prohibited land uses that could be more profitable than extensive pastoralism. At the same time, environmental and recreation groups were lobbying for more secure recreational access to high-elevation land and for exclusion of sheep from that land (ibid., pp.31-3).

By the end of the 1980s interest groups that paid attention to the high country were all advocating for some sort of change. That said, there were few in the population at large who were paying attention to the high country. But it was rabbits which started the high country land reforms. The Rabbit and Land Management Task Force, set up in 1987, responded to the rabbit plague of the 1980s by initiating a change of land tenure. In the late 1980s it reviewed the tenure of Mt Difficulty Station in Central Otago, with the goal of intensifying land use in the lowlands and relieving the highlands from grazing pressure. The land was split three ways: some was privatised, some retained for conservation as a protected natural area, and some remained in pastoral lease (Brower, 2008, pp.33-4). Thirty years later, oenophiles on both sides of the Tasman enjoy fine pinot noir from the Mt Difficulty and Roaring Meg labels produced on freehold land that came out of the review.

In 1991 the commissioner of Crown lands initiated a process called tenure review, in which a pastoral leaseholder could enter talks with the Crown to divide the lease land in a two-way split. The more productive land was privatised, in freehold title, while the land with conservation, recreation and landscape values shifted into the conservation estate. Tenure review proceeded *ultra vires* until Parliament passed the Crown Pastoral Land Act 1998 (ibid., pp.34-5). Almost everyone who was watching supported South Island land reform because each group stood to gain something: farmers received freehold title; conservationists saw sheep removed from hilltops and new parkland; and recreationists secured access to the backcountry for fishing, hunting and tramping.

South Island land reform on the ground

Tenure review affects 2.4 million hectares of land along the eastern slope of the main divide. This represents 10% of the nation's land mass. It is an area slightly larger than Israel and just smaller than Belgium.

One affected property, Alphaburn, is on the south shore of Lake Wānaka, on the way to the Treble Cone ski field. Until 2002 Alphaburn was 4,579 hectares of land owned by the Crown and leased for 'pastoral purposes only'. The leaseholder could run sheep and maybe deer, but the law clearly prohibited subdivision and industrial development. That prohibition on subdivision and development is precisely why the shorelines of the southern lakes – Wakatipu, Wānaka, Hāwea, Tekapo, Pūkaki – have remained so quiet during the day and so dark at night. In 2002, under tenure review, the Crown sold freehold title to 3,365 hectares of Alphaburn Station to the leaseholder for $265,500, or $79.50 per hectare. At the same time the Crown bought the leaseholder's remaining leasehold rights to run sheep on the less productive, higher altitude land with conservation and recreation values. The Crown bought the pastoral rights to 1,214 hectares for $202,500, or $166.83 per hectare. After tenure review the Crown transferred those 1,214 hectares into a conservation reserve, and the former leaseholder subdivided the new freehold land, selling off 193 hectares for $10.1 million, or 658 times the per-hectare price recently paid to the Crown.

Alphaburn is just one of 110 reformed leases along the length of the Southern Alps. Between 1992 and late 2015 the Crown sold freehold rights to 370,981 hectares of Crown-owned South Island high country land leased for pastoral sheep grazing. By law the Crown sells its rights to the land most 'capable of economic use' (Crown Pastoral Land Act 1998, section 24(a)(2)): that is, the most productive land, usually at lower elevation and often on lakeshores or along roadways. Former leaseholders paid the Crown $65.2 million for freehold title, or an average of $176 per hectare (median of $77). At the same time, the Crown bought pastoral leasehold rights to 330,854 hectares of land for conservation reserves. By law, the land to which the Crown buys rights is the land with recognised conservation and recreation values, which is usually the least productive, steeper, higher and more remote land. The Crown paid leaseholders $116.8 million for this land, or an average of $353 per hectare (median of $278).

By law the Crown sells its rights to the land most 'capable of economic use' ... that is, the most productive land, usually at lower elevation and often on lakeshores or along roadways.

Two things are of note here. First, on net, the Crown has paid high country farmers considerably more than the farmers have paid the Crown, although the resources and rights the Crown sold appear far more valuable than those it bought. This is illustrated in Table 1. Former leaseholders have received freehold title to 371,000 hectares and nearly $52 million on net in exchange

Table 1: The 12 largest Crown payouts to former pastoral leaseholders in 110 tenure reviews from 1992 to 2014

Name of lease	Area to conservation (ha)	Area to freehold (ha)	$ paid by Crown for conservation land	$ paid by lessee for freehold	Year tenure review completed	net to lessee
Dingleburn	17,722	7,016	6,192,500	615,000	2004	$5,577,500
Mesopotamia	20,728	4,973	4,742,000	142,000	2009	$4,600,000
Braemar	13,386	1753	2,718,381	81,381	2012	$2,637,000
Kyeburn	4,703	1,852	2,875,000	375,000	2009	$2,500,000
Lake Hāwea	4,855	6,470	2,200,000	$0	2011	$2,200,000
Allandale	4,421	124	1,890,000	10,000	2012	$1,880,000
Mt Cook	1,546	1,005	1,956,000	156,000	2009	$1,800,000
Mt Potts	8,670	1,022	1,820,000	130,000	2009	$1,690,000
Mt Aspiring	8,017	2,309	2,047,500	437,500	2012	$1,610,000
Lauder	3,020	1,205	4,000,000	2,560,000	2013	$1,440,000
Barrosa	4,840	968	1,610,000	180,000	2010	$1,430,000
Mt Cecil	1,265	1,188	1,410,000	$0	2011	$1,410,000

Source: these data were gleaned from successive Official Information Act requests to LINZ

Table 2: What happens to land once privatised? The 12 largest gross revenues from subdivision and on-selling of land from former Crown pastoral leases

Lease	Year tenure review completed	Gross on-selling revenue	Land area later on-sold (ha)	Price per ha paid to Crown by runholder for freehold	Average price per ha paid by new buyers
Hillend	1998	$26,200,000	2671	$126	$9,800
Queensberry Hills	1998	$15,148,000	1950	$66	$7,800
Wyuna	2004	$14,185,000	8.8	$543	$1,611,900
Closeburn	1998	$14,182,000	7.7	$215	$1,841,800
Glenariffe	2004	$12,074,000	1664	$157	$7,300
Waiorau	1998	$10,350,000	2561	$72	$4,000
Avalon	1998	$10,200,000	1351	$99	$7,600
Alphaburn	2002	$10,100,000	193	$80	$52,300
Cattle Flat (Otago)	2005	$8,480,000	1780	$132	$4,800
Shirlmar	2003	$8,350,000	3498	$2	$2,400
Waitiri	2002	$8,200,000	5.5	$91	$1,490,900
Spotts Creek	1998	$8,200,000	3108	$85	$2,600

Source: These data were gleaned from land sales records recorded in QuickMap-SalesView software. What was once 110 pastoral leases is now over 3,000 parcels of freehold. Thus, discerning which former pastoral land has on-sold for how much required examining the sales records for each of 3,000 parcels of former Crown land in the high country. Data collection ended in May 2015; no sales after May 2015 were recorded. It is worth noting that there are some sales missing from the software. As such, these data might underestimate but will not overestimate the on-selling revenues.

for giving up grazing rights to 331,000 hectares of the least productive land. In the exchange, the Crown sold, and the leaseholder bought, residual freehold rights not included in the leasehold agreement. So, all the previously prohibited land uses become possible (subject to the Resource Management Act 1991 and the relevant district plan). The Crown bought leasehold rights of grazing and occupation, which it then retired to create conservation parks or reserves.

At the outset of tenure review the Treasury set a rough guideline for comparing the value of what the Crown was selling against what it was buying. According to Treasury, the pastoral rights were worth about 72% of the freehold rights sold by the Crown to the runholders. So, when exchanging rights the Crown should be willing to pay about 72% of what the runholders would pay for freehold. Thus the ratio of per-hectare prices (price paid by the Crown for pastoral rights/price paid by runholder for freehold) should vary around a median of 0.72 (Brower, Meguire and Monks, 2010, citing Treasury documents). Empirical economics of rural land prices in New Zealand suggests that the ratio should be lower (Stillman, 2005). Yet the median ratio, thus far, is 3.4. The ratio at Alphaburn was 2.1, and it has gone as high as 940.0, at Shirlmar. Of 110 deals to date, only 19 have a ratio of less than 1.0; 11 of those anomolous 19 were negotiated before 1998.

The second thing of note is the fate of the former Crown land once freehold. As of mid-2015, almost a third of the new freeholders had subdivided and on-sold some land. 74,000 hectares – about a fifth of what the Crown sold for $65 million – has since sold for $275 million. On average, those who have on-sold land have done so at 693 times the Crown's selling price. This is illustrated in Table 2. In other words, at only 65,700% of the purchase price, the capital gains realised at Alphaburn are decidedly below the median of 69,200%.

Understanding land reform outcomes

It is often easy, if a bit trite, to explain the outcomes of land conflicts by citing larger-than-life personalities or policy style. On the face of it, South Island land reform outcomes resist both of these possible explanations. Twenty-three years after its inception the policy has outlasted many changes of government and all the dominant personalities involved.

Another logically easy, but rather unlikely, explanation is corruption, graft or electoral influence. New Zealand is regularly perceived as one of the least corrupt nations in the world, according to Transparency International surveys, rendering the first two unlikely. The third is also unlikely, given that there are only 304 leaseholding families directly affected by, or benefiting from, land reform. Land

reform outcomes appear, rather, to be a series of micro-battles which render the conservation lobby powerless to fight the macro-war over the beauty of the South Island (Brower, 2008, pp.54-9).

Olson's (1965) logic of collective action predicts that those with a vested (that is, financial) interest in resource conflicts will show superior organisation and persistence, and often defeat more numerous opponents with a non-financial interest. High country leaseholders have a strong financial incentive for land reform, and collective action creates a playing field that is tilted in their favour from the start. However, several aspects of land tenure reform render the tilt even steeper. Perhaps most powerful is the devolution of the tenure review process and its case-by-case decision-making. Land reform outcomes are decided one by one, which tends to contain the scope of debate and keep it off the national radar (Pralle, 2006, p.29). This tends to favour the status quo (Schattschneider, 1960), which remains Olson's victory of the few with the vested interest over the many with the public interest. The local, particularistic policy style of tenure review is one which also tends to privilege local needs over national goals (Pralle, 2006, pp.207–9). Though seeming personal and friendly, case-by-case decision-making in fact makes it prohibitively expensive for dispersed national conservation interest groups such as Forest and Bird, Fish and Game and the Environmental Defence Society to scrutinise and challenge each land reform proposal. Hence, many sail through unchallenged and even unnoticed.

Land reform deals are negotiated by Crown contractors, who are instructed by their public service employers to be neutral: to avoid taking sides and not advocate for the Crown's interest (Brower, 2006; Brower, Meguire and Monks, 2010). Neutrality appears to have arisen from two seemingly innocuous sources. First, in the neo-liberal public sector reforms of the 1980s there was a desire to adhere to the policy/operations split, in which public service operatives are to be entirely separate from, and untainted by, political and policy decisions (Boston et al., 1991, pp.258-9). Proponents of the split and its intellectual predecessor, the politics/administration dichotomy (Wilson, 1887), assume that a politically neutral and autonomous administrative branch of government will deliver unbiased results (Brower, 2006). Second, the contractors have the task of consulting with interested parties, not negotiating and not advocating for the Crown. Consultation involves a 'proposal not yet finally decided upon; … keeping an open mind and being ready to change and even start again' (Queenstown Lakes District Council, undated). This has been interpreted as a prohibition on stating a desired outcome for conservation and for the New Zealand public (Brower, 2006, pp.76-86).

The problem is that, as the holder of the residual ownership interest in the land it is selling, the Crown itself is an interested party. Hence, the Crown avoiding taking sides did not avoid allowing one side to dominate. When the Crown refused to take sides in its own two-party negotiation, it ceded its power from the start. It thus risked devaluing its own financial interest and selling the public short. The financial outcomes of tenure review suggest that apolitical administration has not avoided farmer dominance; indeed, it may have facilitated it.

Further, any time a government contracts out a job, it is prudent to examine the terms of the contract to discern the incentives operating on the contractor. A principal–agent problem (Niskanen, 1971) occurs when the agent ignores or subverts the principal's goals because their motivations are at odds (Laffont and Martimort, 2002; McCubbins, Noll and Weingast, 1987; Ricketts, 2002, ch.5; Waterman and Meier, 1998; Mueller, 2003). Several features of the contractual arrangements for Crown land reform negotiators suggest there might be a principal-agent problem.

1. The Crown is represented by contractors hired by Land Information New Zealand (LINZ) and employed by a property management, development and valuation firm (including, but not limited to, DTZ, Opus and Quotable Value). These contractors answer to LINZ officials.
2. Contractors are not paid on commission, but by pre-arranged contractual sums for administrative progress towards the ultimate goal (a signed land reform deal). Hence, the Crown neither rewards a contractor for striking a cheap deal, nor penalises them for an expensive deal. More tellingly, the Crown does not set a reserve price from which the contractors negotiate.
3. Until August 2006 tenure review outcomes were confidential, giving rise to asymmetric information. Only LINZ and the contractors knew who paid whom how much in a given deal.

Agency theory predicts that when agents are instructed to do X, but are financially rewarded when they do Y, they often do Y.

Agency theory predicts that when agents are instructed to do X, but are financially rewarded when they do Y, they often do Y. This is especially true in conditions of asymmetric information, when it is difficult to ascertain which of X or Y (or Z, for that matter) the agent is performing. In land reform, the ministerial principal directs the agents to: 1) complete tenure review deals; and 2) get a 'fair financial return for the Crown' (Cabinet Policy Committee, 2003, 2005). But, until August 2006, not even the minister knew if they were fulfilling the second directive. In short, land reform implementation had serious structural problems.

2007 reforms and thereafter

In 2007 an optimistic Labour-led government radically changed the rules of

Table 3: Perceived policy failures and proposed solutions

Perceived policy failures highlighted in 2006–07	Policy fixes proposed in 2007
Overly generous Crown payouts	Remove budgetary authority from officials and restore it into the minister's hand. If someone spends too much money in the future, it will be the minister, not bureaucrats, and not contractors.
Principal–agent problem in which officials ignore ministerial pleas to get a 'fair financial return for the Crown'	Enhance ministerial oversight of budgetary and conservation aspects of proposed tenure review deals. Remind officials that, in order for a deal to proceed, it must benefit the Crown.
Landscape carve-up	Institute a standard by which significant landscape values should not be compromised in any way, which all future deals must meet before they may proceed. If a station lies within five kilometres of a lake, the proposed deal must contain provisions to prevent subdivision or significant alteration of the lakeshore.
Detrimental effects on threatened native biodiversity	Institute a standard by which significant biodiversity values should not be compromised in any way, which all future deals must meet before they may proceed. This does not appear to include species, populations or ecosystems that would be impractical or unrealistic for the Department of Conservation to maintain.

Source: Brower, 2008, p.150

land reform (Cabinet Business Committee, 2007, paragraphs 22-3) in an attempt to address many of these problems (see Table 3). In July 2009 the newly-elected National-led government rescinded outright the landscape and biodiversity rule changes described in Table 3, but left intact the ministerial budgetary authority and information transparency clauses (Cabinet Policy Committee, 2009, paragraphs 15-20). If the only problems with land reform were structural, and if a National-led government in a recession were more careful with expenditures than a Labour-led government running a surplus, then we would expect land reform outcomes under National after the rule changes to be less costly to the taxpayer. But they are not. Since 2007 the Crown has trebled the median price it pays per hectare to buy leasehold rights to land shifting to conservation, while the leaseholders' median per hectare has only doubled. So fixing the problems and the election of a purportedly more cost-conscious government have resulted in the Crown losing more money, not less. This is at odds with both the lefty-greenie and the hard-nosed neo-liberal policy styles for which New Zealand is known. Redrawing lines on the land reform playing field has not changed the outcomes. There must be something else going on.

Looking deeper: the Lockean political economy driver

The image of a man and his dog battling against the odds in the empty, unforgiving, but hauntingly beautiful landscape of the Southern Alps tugs at the cultural heartstrings. Such imagery can be heartwarming. In the South Island high country it has become associated with the idea that ownership of land is established by the hard work and gritty determination of the occupier.

This idea of ownership originates in John Locke's (1694) labour theory of property. It is a colonial and nation-building idea of property, which served the interests of young nations and colonies by providing incentive to colonise and conquer, and motivating development of natural resources (Bromley, 2000, p.20). Locke's idea is plainly evident in the United States' Homestead Act (1862) and the General Mining Act (1872), which promised freehold title as a reward for making economic use of a piece of the West. It is notably absent, however, in the New Zealand Land Act 1948, which expressly prohibits the transfer of freehold (section 66). This reluctance to grant freehold title long predates the Land Act, and stems from the fragility and erosive nature of the high country soils (Page, 2009, pp.409-11). Yet it appears that land reform is progressing as if the Land Act employed Locke's ideas of ownership.

In politics, interest groups promote a world view which serves their goals, be they political or financial, publicly or privately motivated. In land reform, the farming interest has promoted a Lockean idea of ownership that does not conform to today's laws, but does conform to heartwarming and patriotic imagery, in which long-term occupation and labour are considered as good as freehold. Runholders have often implied that the land they farm is theirs: that they own it. Leasehold areas are seldom called 'pastoral leases'; runholders are quoted in the media describing leasehold land as 'their land' (Fencepost, 2006), 'their properties' (Scott, 2004), 'their pastoral lands' (Bruce, 2005), 'our properties' (Rae, 2004) and 'their high country land in perpetuity, signed by the Crown in 1948' (ODT Staff, 2006).

According to the terms of the pastoral leases, set out in the Land Act 1948 and reaffirmed in the Crown Pastoral Land Act 1998, the leaseholders do have an ownership interest in the land under lease. That interest is long in tenure (33 years, perpetually renewable) and strong in nature (compensable if revoked). But it is very narrow in the land uses it allows (only extensive pastoralism, no subdivision or industrial use). The Crown explicitly retained all freehold rights and rights to the soil, in both 1948 and 1998. In other words, the idea of work-to-own died with the 19th century. The Land Act 1948 gave license to the runholders to make economic use out of the harsh landscapes of the high country. It also gave runholders ownership rights to that use and the improvements they created. But the Land Act made a special point to retain the Crown's ownership of the land itself. In 1948 the pastoral use rights were worth more than the land itself. But times have changed. As Table 2 illustrates, the land itself is now

worth on average 693 times the value of pastoral use rights.

In tenure review, the Crown appears to be ignoring or under-valuing the economic potential of the land itself, once the pastoral constraints of the Land Act are lifted. Examining the valuation reports for all deals from 1998 to 2008 reveals that most ignored the value of the option to vary land use. But there are four cases in which Crown valuers took note of the value of subdivision and other uses (Brower, Meguire and Departe, 2012). One of the four is Alphaburn, where the Crown's valuer estimated that the option to subdivide or otherwise change land on the shore of Lake Wānaka was worth about $3 million. In negotiations, the Crown then sold those freehold rights for $267,500; the former runholder then on-sold 6% (193 hectares) for $10.1 million.

This discussion of who owns the value of the land itself brings us back to where we started: the role of beauty. The arresting beauty of the high country feeds a romanticised imagery of the Southern Man. This in turn fuels a do-it-yourself, work-to-own concept of property that is squarely at odds with the Land Act 1948 and the Crown Pastoral Land Act 1998. The pattern of prices in the land reform outcomes suggests that, regardless of the structure of the contracts and incentives operating on Crown negotiators, the harsh beauty, romantic imagery and Lockean ideas of property prevail. Herein lies the irony of the high country story. Adherence to the image of the Southern Man is transforming the landscapes that constructed the man himself. The dominance of the antiquated American model of acquiring freehold title by dint of hard work is destroying the physical, cultural and aesthetic substrate of the Southern Man. Clinging to the romance attached to the landscape is subsidising the destruction of the landscape itself.

Conclusion

One could call land conflict a 'wicked problem' (Horst, Rittel and Webber, 1973), but I would call it a problem of meaning. Land is important to many people for many reasons. Many individuals and groups assign different meanings to the same landscape, geological feature or hectare. As such, conflicts over land often relate more to identity, aesthetics, heritage or competing visions for the world than to the measurable dollar value of land itself. In such cases, it is less about dollars than about meaning.

When a conflict over land becomes about meaning, seemingly absurd financial outcomes almost make sense if all sides agree to subscribe to the same meaning. In the case of tenure review, the high country farmers succeeded in assigning a Lockean work-to-own meaning to high country land and the Crown seems to have accepted it. This mutual acceptance of a Lockean view of ownership runs counter to the text of the governing statutes and resembles hegemony (Brower, 2008, pp.19-25, 37-74).

There are several ways in which tenure review could have been implemented differently, and in a way more obviously beneficial to the New Zealand public. This article concludes with a few suggestions for how the Crown might simultaneously generate revenue, allow for land use diversification on productive land, protect conservation values, and provide universal recreation access to land with 'significant inherent values'.

Involve the courts

When policy is unclear, let the courts decide. Perhaps the simplest option, this would maintain the current mechanism of redistributing property rights, but change the administrative arrangements. Currently, the redistribution and determination of equalisation payments take place in a process of consultation between LINZ contractors and the lessee, the Department of Conservation, iwi and other interested parties. LINZ is simultaneously a negotiating party with a vested interest and the referee in charge of the process. This option would place the judiciary, rather than LINZ, in the role of referee in charge, thus relieving LINZ of the conflicting roles of representing the Crown's interest while administering the process itself. It could make use of the Environment Court for this. The role of the court would be to determine the relative value of potential and actual property rights, rather than leaving this to the negotiating powers of runholders and LINZ.

Buy and sell

The Crown could buy the entire lease. Following the purchase, the government could identify the significant inherent values worthy of protection through a consultation process similar to tenure review. As the government would be the holder of the complete bundle of property rights, identification of protected land would not be constrained by the lessee's interest. After reserving some land for the Department of Conservation, the government could sell the remaining land 'capable of economic use' at auction. This would allow a market mechanism to determine the value of potential and actual property rights, rather than a private negotiation administered by LINZ. It would also increase the likelihood of the Crown capturing potential value from the assets it is disposing of. Though the initial cash outlay for the whole property purchase would be high, Table 2 suggests that the revenues generated at auction would be higher. Administrative costs would be much lower than currently.

Create reserves and amend the Land Act

The Land Act 1948 gives ministers and the governor-general authority to create reserves on land under pastoral lease. Hence, the government could create reserves on land sections with desired values, and create access easements across the pastoral land surrounding the reserves. The Land Act does not explicitly require compensation to the lessee for creation of the reserves themselves, but posterity might require compensation for any value lost due to the easements or exclusion of sheep from the reserves. At the same time, Parliament could amend the Land Act to allow more uses on pastoral land – from viticulture to ski fields to golf courses – as desired by parliamentarians and as permitted by the Commissioner and the Resource Management Act. This option would not allow for any freeholding, and would likewise not extinguish the lease over land designated as reserves. But it would allow for protection of values, recreation access and land use diversification. The cost would be

administrative and any compensation owed to the lessee. Ideally, that compensation would be determined by a court such as the Land Valuation Tribunal.

Buy some and amend

The government could buy the lessee's interest in land deemed to be of conservation, recreation or heritage value, and thus regain 'full Crown ownership' of land going into the conservation estate. As a condition of the government purchasing the lessee's use rights, the government could amend and relax the Land Act's pastoral requirement, allowing for diversification but no subdivision. This would not allow a freehold option, but would convey many of the property rights associated with freehold, and many of the rights in the non-pastoral bundle desired by lessees.

These are just a few options, briefly presented. Each would have proponents and opponents, and costs and benefits. It is not an exhaustive list, but merely suggests that there are alternatives.

Redistribution and exchange of property rights can be tools for several ends related to land tenure and the multiple-use paradigm: clarity of tenure; neat separation of resource uses; diversification of land use; and clear conservation mandate on conservation land. This article asked how the process is going in New Zealand, in light of an abstract view of property. The results of land tenure review are clear. Redistribution of property rights is certainly changing land uses. Who profits from the changing land use is a different question entirely.

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Adrian Macey

The Paris Climate Change Agreement text and contexts

When French foreign minister Laurent Fabius brought down the gavel on the Paris Agreement on 12 December 2015, the international community reached a goal that had eluded it for six years: an updated and universal climate change agreement. It owed much to France's diplomacy over the preceding 12 months, together with efficient, firm and innovative handling of the conference itself. Fundamental to the success of the Conference of the Parties (COP21) was the commitment at all levels from President Hollande down to engage with the broadest range of parties and non-state actors. The fruits of France's engagement were nowhere more apparent than in the small island states' comment in the final plenary that this was the first time they felt they had been listened to at a COP.

Other factors contributing to the success of COP21 were the lessons that had been learned from the failures at Copenhagen in 2009, and, even more important, a much evolved international context, which the presidency shrewdly brought to bear on the negotiations.

Reactions to COP21 have ranged from jubilation – displayed by Ban Ki Moon, the French leaders and UNFCCC head Christiana Figueres on the podium – to dismay at yet another inadequate effort by the international community. But the Paris Agreement cannot be assessed independently of its contexts, both domestic and international.

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The text

The Paris Agreement and its lengthy accompanying decision can be seen as the completion of the third phase of international climate change negotiations (Macey, 2012), which finally allows for the full implementation of the United Nations Framework Convention on Climate Change (UNFCCC). The 1997 Kyoto Protocol, rather than being a stepping stone to a universal agreement, became an obstacle. 'Saving the KP' took up a huge amount of political and negotiating attention, which both interfered with and slowed progress on a broader agreement. In 2011 the Durban COP preserved the Kyoto Protocol long enough to enable a new negotiating mandate – the Durban Platform – to be agreed. A second commitment period under Kyoto was established; it will end in 2020 when the new agreement is to take effect. By 2014 it was clear that the Kyoto model of binding emissions reduction commitments and

penalties for non-compliance was a dead end. A third Kyoto commitment period beyond 2020 is thus highly unlikely.

On mitigation, the Paris Agreement can be seen as implementing article 4.1(b) of the convention. This is a fundamental provision, which introduces a binding obligation on *all* parties to reduce emissions and which the Kyoto Protocol does not fully reflect. Kyoto's distinction between developed countries with quantified commitments ('Annex I' parties in the convention) and all others continued to influence negotiations. 'CBDR' (common but differentiated responsibilities and respective capabilities), widely argued by developing countries as a binary and enduring principle, was absent from the Durban mandate. It returned to later texts, but with an important addition of 'in the light of different national circumstances', which produced just enough constructive ambiguity for everyone to be satisfied with an agreement that, in the words of the Durban mandate, was to be 'applicable to all'. That addition is retained and reiterated in the Paris Agreement.

The recognition given to pursuing efforts towards a temperature goal of 1.5° above pre-industrial levels was a major gain for poor and vulnerable countries. Whether it is achievable is another question, which will now receive more scientific attention. One outcome of COP21 is an invitation to the Intergovernmental Panel on Climate Change (IPCC) to prepare a special report on impacts of and pathways to 1.5°. Another is the elevation of adaptation and finance to be equal in rank to mitigation in the core article 2 of the agreement. This was part of the trade-off for lessening the north/south distinctions. COP21 also brought much stronger recognition than previously to social and civil society concerns, as well as to the role of non-state actors.

There are many shortcomings in the text, which have been amply highlighted by commentators. The implications of the latest science – and notably the requirement to reduce net CO_2 emissions to zero – are reflected ambiguously. The concept finally agreed is of a balance between emissions and removals in the second half of the century. Clearer versions were a step too far for some parties highly dependent on fossil fuels. Details of the all-important review and transparency provisions are yet to be agreed. On finance little progress was made beyond extending current levels to 2025.

The dominant framing of the action required of parties is still 'contributions' rather than transition pathways, which would be better aligned with the science. The latter concept is, however, found in places, notably article 4.19, which advocates 'long-term greenhouse gas emission development strategies' and refers back to article 2. The decision invites parties to submit the strategies by 2020.

At its core, the text of the Paris Agreement has delivered:

- a revised and restated long-term goal;
- a more universal core mitigation component with a corresponding compliance model of contributions, transparency and review to replace commitments and sanctions;
- an updated and expanded framework of rules, bodies and mechanisms drawing on the existing UNFCCC content as well as the previous ten years of negotiations.[1]

The context

Much of France's effort during the first week of the conference was directed outside the core negotiations. On the first day, 150 heads of state and government conveyed their expectation that there would be an agreement and a commitment to act. Then, at the end of the first week, a meeting of mayors of major cities from around the world (including Auckland) was followed by another high-level event focusing on the business sector. Both sectors demonstrated the action they were already taking on climate change, their intention to do more, and their expectations of what governments needed to do to facilitate.

Outside these three major events there was a plethora of other influences, including the presence for the first time of a central bank governor at the conference (Mike Carney of the Bank of England) and repeated appearances by Al Gore, to mention just two. The terror attacks in Paris just two weeks before the conference were also present in delegates' minds. While treated in a dignified and restrained manner by the host country during the conference, the attacks added a further reason to conclude an agreement; there is a parallel with the successful launch of World Trade Organization's Doha round of trade negotiations soon after 9/11.

Perhaps applying a lesson from previous COPs, the presidency allowed negotiators full responsibility for running their process into the ground, which they predictably did by the end of the first week. The French could not in any way be held responsible, so there was no problem in gaining legitimacy for taking over the proceedings under a new body, the Paris Committee. The presidency pointed to the high expectations of an agreement, and warned negotiators that they needed to show themselves equal to the task, with a subtext that they would not be allowed to fail again.

New Zealand at and after the COP

New Zealand was represented by the prime minister and two ministers. They were not asked to play any part in the facilitation of the negotiations, but were active in the other parts of the conference. New Zealand also gained credit for many of its ideas, including, importantly, on the legal form of the agreement. The prime minister led a session on fossil fuel subsidy reform, and trade and climate change minster Tim Groser was prominent at several events, including on trade and agriculture. At the end of the conference, New Zealand launched a declaration on carbon markets on behalf of a group of 18 countries.[2]

The text meets most of New Zealand's key needs. It provides for the use of carbon markets, recognises sinks, and gives reassurance that any accounting rules agreed will not be applied retrospectively to the first INDC (intended nationally determined contribution) period. But there are some difficulties ahead. New Zealand is unique among developed countries in envisaging most of its contribution coming from carbon markets – at least three quarters at the carbon price of $50 used in the

government's modelling (New Zealand Government, 2015a). Echoing this, the New Zealand INDC assumes 'unrestricted access to global carbon markets that enable trading and use of a wide variety of units' (New Zealand Government, 2015b). The assumption is that owing to our unique national circumstances, New Zealand can't put forward a credible figure for its 'fair share' without markets. Even with this assumption, the INDC claims that the likely cost to the economy of New Zealand's target is higher than that of other countries. Other countries use the cost of domestic reductions as the appropriate yardstick, with carbon markets potentially providing for more ambition.

Although the government has termed the INDC 'provisional', it is conditional in the ordinary meaning of the word. This carries a reputational risk: if at the time the agreement needed to be ratified there were still no carbon markets, or they were inadequate, there would be a temptation to reduce the target. New Zealand business expressed concerns about this aspect of the INDC, arguing that 'having a target that New Zealand cannot hope to meet other than via the purchase of overseas emission reduction units would not be in New Zealand's best long-term interests' (BusinessNZ, 2015).

Even with unrestricted access to markets, there is a further risk to New Zealand over the longer term. The Paris Agreement requires that each new INDC be a progression over the previous one. But because international carbon units are not permanent reductions, to the extent that markets are used in New Zealand emissions, each time there is a new target New Zealand will begin with a liability from the previous period(s). This means effectively purchasing more units to get back to square one, until such time as real domestic reductions take place. Targets could thus become increasingly costly, a factor already seen in the government's modelling of the costs for the current target (New Zealand Government, 2015a). By far the greatest proportion of the cost to households of the 2030 target is the reductions needed to get back to its 2020 starting point of 5% below 1990 levels.

A shift of the international focus over time to 'transition' rather than 'contribution' would be logical, and better aligned with the science. It would lend itself to sector-by-sector international comparisons, which could leave New Zealand less exposed by its national circumstances in agriculture and electricity.

How should New Zealand respond to COP21? The current review of the Emissions Trading Scheme won't suffice, since the terms of reference are too limited. Much more work is now needed, beginning with a re-examination of domestic mitigation potential and its costs and benefits. The modelling carried out for the INDC was limited in many respects, and it was not easy to access by stakeholders. Better public information would be a good start. It is worth noting that, after a conspicuous silence on the longer term, the government used the INDC to restate New Zealand's goal of a 50% reduction on 1990 levels by 2050. That gives some useful context for the domestic exercise.

Conclusion

The achievement of having wrested this agreement from the dysfunctional UNFCCC negotiations process and the role that traditional diplomacy played in getting there both deserve recognition. It was never a realistic hope that the result would ensure that global warming was limited to 2°, and indeed there is very little prospect that any sort of agreement based on repeated contributions would be enough. Its force is the signal that it gives to all actors, and it is a useful and updated framework.

COP21 will best be judged by the contribution it makes to both incentivising and facilitating the domestic action that the Paris Agreement requires parties to pursue. The agreement certainly falls short in clarity and ambition in places, and is still far from operational. The UNFCCC now has a challenging work programme ahead to make it so. But it is a decisive political step forward. A question to watch over the coming two to three years will be how far the new context will inspire the negotiating process to lift its game so as to produce the right text at the right time.

1 For detailed summaries and commentary on the COP21 outcome see IISB, 2015; Mabey et al., 2015; and Centre for Climate and Energy Solutions, 2015.

2 Australia, Canada, Chile, Colombia, Germany, Iceland, Indonesia, Italy, Japan, Mexico, the Netherlands, New Zealand, Panama, Papua New Guinea, South Korea, Senegal, Ukraine and the United States.

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