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Important Cows and Possum Pests

New Zealand's Biodiversity Strategy and (Bio)Political Taxonomies of Introduced Species

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Abstract

This paper examines how New Zealand's conservation discourses and strategies have, since the launch of its Biodiversity Strategy at the turn of the millennium, created and sustained a local taxonomy of species rooted in the overlapping but often clashing logics of biodiversity protection, cultural patrimony, and economic growth. This paper focuses on the taxonomy of introduced land mammals, suggesting that classificatory maneuvers pertaining to introduced species demarcate a specific space of legitimized action with regards to animals while shaping global biodiversity discourses to fit a specific local context. Following the work of Timothy Luke on environing and building on Michel Foucault's concept of biopower, this paper argues that in propagating a specific national discourse about biodiversity, species, and economic interests—rooted in what I term bio-nationalism—the Biodiversity Strategy has helped expand the scope of governance of New Zealand's human and nonhuman populations.

Keywords

New Zealand – biodiversity – biopolitics – necropolitics – invasive species – introduced species – livestock

> Biodiversity is everyone's business.
>
> HELEN CLARK, *former Prime Minister of New Zealand, Foreword to* The New Zealand Biodiversity Strategy

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It is difficult to imagine a better natural laboratory for studying anthropogenic influence on nonhuman nature than New Zealand. A chain of isolated islands in the South Pacific, first settled by humans only about 1,000 years ago (Atkinson & Cameron, 1993), with bats being its only "native" land mammals, New Zealand could well have been described—to riff off its disingenuous tourist slogan—as "100% pure" (Young, 2013). Its environmental degradation and history of introduced species spans various waves of social, political, and economic systems, and has accelerated rapidly since European settlement in the mid-nineteenth century (Atkinson & Cameron, 1993). Today, the country's environmental politics walk a fine line between the exigencies of its primary production-based economy and a long-standing commitment to the conservation and protection of native species.

As part of its Biodiversity Strategy and ongoing conservation efforts, the New Zealand government has undertaken a number of projects aimed at identifying, surveying, and culling the populations of various introduced mammals. The narrative about the adverse effects of these species is situated and circulates in a number of interrelated dialogues, including international biodiversity and conservation norms and science, domestic concerns about the biotic and cultural importance of indigenous species, and economic interests both based on and threatened by different introduced mammals.

This research traces how New Zealand's conservation interests create and sustain a local taxonomy of species, focusing on the definition of land mammals as being productive, feral, or invasive. It is then suggested that this classificatory maneuver also demarcates a space of legitimized dialogue and action with regard to introduced species and, by extension, precludes a number of alternative approaches to both biodiversity conservation and New Zealand's animals in general. Finally, it is argued that in "environing" a specific national discourse about biodiversity and species, the New Zealand government is creating a space for the governance of both human and nonhuman populations subject to a bio-nationalism rooted in the twin logics of economic growth and environmental protection.

Species, Land, and Markets: Conservation and Taxonomy in New Zealand

New Zealand is estimated to be home to approximately 20,000 indigenous terrestrial flora and fauna, including two bat species, who are the country's sole "native" mammals. In the millennium during which it has been inhabited by humans, approximately 75% of its land area has been disturbed by human

activity, and numerous nonhuman animal species (including birds, vertebrates, and amphibians) have been driven to extinction by humans (New Zealand Biodiversity Strategy [NZBS], 2000, p. 34). Currently, 39% of New Zealand territory is taken up by pasture land (classified by the Ministry of the Environment as "high-producing" and "low-producing" grassland) (New Zealand Ministry for the Environment, 2000). This space was, as of 2007, populated by approximately 9 million cows (dairy and meat cattle), 38 million sheep, and 400,000 pigs, as well as thousands of members of other species of introduced ruminants (New Zealand Ministry for Primary Industries, n.d.). Land-use-intensive primary production industries such as livestock, dairy, and commercial forestry are key drivers of New Zealand's economy, bringing in billions of dollars annually to a relatively undiversified market.[1]

Introduced species have been present in New Zealand as long as humans (themselves a nonendemic, albeit self-introduced, species[2]), but most historians of New Zealand conservation agree that it was not until the mid-twentieth century that appreciation about the detrimental environmental effects of these species began to spread throughout the scientific community and general public. Originally referred to as rodents (likely due to the focus of extermination programs on rat populations), invasive species and efforts to classify them have been central to the country's conservation efforts since these were first conceived (Thomas & Taylor, 2002).

It bears noting here that a debate rages in a number of fields regarding "native" and "alien" or "introduced" species. As Low (2002) has noted, not only have species been mobile for various reasons throughout history, but their spread has been facilitated and hastened by humans for millennia. Taking this interrelation into account, Robbins (2004) suggests that "it is not species but sociobiological networks that are invasive" (p. 140). Ergo, what constitutes nativity or foreignness is not only dependent on human agency, but is also temporally, geographically, and contextually (politically, culturally, and economically) determined, making such definitions, as Warren (2007) astutely observes, "essentially relative" (p. 430). Following van Dooren's (2011) argument that "invasive" is a "relational" term used to denote "a specific population . . . of

1 Estimates of the size of the industry vary, as do definitions of what is included in various production rubrics. The Ministry of the Environment's "Environmental Snapshot" (2010) suggests livestock, cropping, and dairy farming combine to make a $5 billion industry; Baskaran, Cullen & Colombo (2009) are far less conservative and suggest that the dairy industry alone generated $10 billion in revenues (representing 25% of total export revenue) for the year ending in March 2008.

2 I am grateful to Annie Potts for this insight.

a species that is deemed to be 'out of place' within their current ecological context," (p. 288) this paper focuses precisely on the local context in which a specific set of definitions and discourses is deployed.

The early classificatory attempts of New Zealand's Noxious Animals Act of 1956 simply listed those mammals considered "noxious." These included a number of deer, the goat, pig, possum, and a few others (Wildlife Act 1953). By the time this Act was replaced by the Wild Animal Control Act of 1977, the list of invasive species had become more contingent on a clear definition of a given animal's place vis-à-vis other animals and private ownership. The category of noxious animals was added into the new category, "wild animal," which included all deer except those "lawfully kept in captivity for the purposes of farming," goats not "held behind effective fences or otherwise constrained," and pigs "living in . . . wild state[s] and . . . not being herded or handled as . . . domestic animal[s] or kept within . . . effective fence[s] or enclosure[s] for farming purposes" (Wild Animal Control Act 1977). These ongoing shifts and demarcations would serve as a basis into which the biodiversity discourse would be woven.

Biodiversity and Strategic Taxonomies

In 1992, New Zealand became a signatory to the Convention on Biological Diversity (CBD), which came into force in 1993, and its conservation efforts began to reference biodiversity in addition to traditional claims to the protection of native species. It is within this context that, one month into the new millennium, New Zealand unveiled its national strategy for addressing biodiversity loss.

Published in February 2000, *The New Zealand Biodiversity Strategy* (NZBS) is a massive document outlining a comprehensive action plan to address diminishing biodiversity across New Zealand's land and marine flora and fauna. The report situates itself within the narrative of international biodiversity protection and eco-consciousness, speaking to New Zealand's ratification of the CBD, participation in the Organisation for Economic Co-operation and Development (OECD) Global Biodiversity Information Facility (GBIF), and commitment to international development projects "where environmental protection goes hand in hand with community development," (NZBS, pp. 115-117) thereby calling upon what Gruffudd (2011) terms "an eco-responsibility understood at the global level" (p. 221).

But biodiversity is also localized. In keeping with broader political discourses about New Zealand's distinctiveness, the country's variety of species is

framed as unique and uniquely valuable. This value, echoing the work of conservation advocates like E.O. Wilson (1994), is presented as being both intrinsic and economic. Biodiversity is linked to national pride in a "clean, green, and healthy" country, the native Maori "holistic view of the environment," cultural icons like the silver fern and kiwi, as well as the "biological wealth" and "healthy ecosystems" that undergird New Zealand's economy (NZBS, 2000, pp. 2-4).

To drive the point home, this set of values is monetized, with the authors citing a 1999 report that values New Zealand's "indigenous biodiversity" and its "direct uses," "indirect uses," and "passive values" at $230 billion (NZBS, 2000, p. 3). The NZBS's authors also stress, speaking to the international conservation community, that many species indigenous to New Zealand are endemic, making them "remarkable internationally" as "they cannot be conserved in nature elsewhere in the world" (NZBS, p. 2). This includes "internationally important" and "exceptional species" like the kakapo, the kiwi, and the weta (NZBS, p. 2). These species and many others are now threatened and some have already been made extinct by "humans and their accompanying pests" (NZBS, p. 4).

The report's authors are quick to point out, however, that New Zealand's equally unique economic circumstances necessitate a local approach to not only biodiversity protection, but to the conceptualization of biodiversity itself. This injunction bears quoting in full, as it sets the parameters for the rest of the Strategy's engagement with the idea of biodiversity and the species of which it consists. The NZBS (2000) posits that

> New Zealand's land-based primary production—farming, forestry and horticulture—is reliant on the protection and management of biological systems. These industries are also based on introduced species (for example, sheep, cattle, radiata pine, apple, and kiwifruit). Maintaining the genetic diversity of these species internationally is crucial to their ongoing resilience to environmental change and usefulness for our primary industries. (NZBS, p. 3)

This intervention consists of two important maneuvers. The first is that it reinforces the previously existing meta-division of introduced species into a small subset that is economically valuable and a broader category of putatively problematic exotics. But this division is now cast as an inherent truth emerging from biodiversity science. The second, equally important, move here is the equation of the protection of endemic species with the protection of the global genetic diversity of productive species. Two different forms of diversity are hereby mapped onto the same geographical and policy space. The implicit suggestion

is that the protection of biodiversity writ large can be both environmentally and economically beneficial and that similar strategies—indeed the same Strategy—can protect endemic species alongside economically important introduced ones.

The notion of biodiversity is localized and reframed as "New Zealand's total biodiversity," which simultaneously represents indigenous biodiversity and some aspects of introduced biodiversity (NZBS, 2000, p. 8). Within this definition, introduced species are "neither 'good' nor 'bad'," with the threats or benefits they present to ecosystems, other species, the economy, or socio-cultural categories being a priori explained as circumstantial (NZBS, p. 8).

Having set these definitions, the NZBS makes its major tactical move. While acknowledging that loss of habitat and the conversion of land area to farming, forestry, roads, and human settlement endangers native species, it identifies "invasive introduced species" as the most serious existential threat to indigenous biodiversity. Then, using the space opened by the move toward consideration of economic interests, invasives—consisting of "animal pests and weeds"—are also set up as a threat to the economically productive introduced species, which have "become an important part of . . . total biodiversity" (NZBS, 2000, p. 9).

This latter group, defined in the Strategy's "Goal Four," includes domesticated species cultivated for economic purposes, wild species like fish and game statutorily managed for human use, species introduced for pest control as biological control agents, and those species that are extinct in their country of origin (NZBS, 2000, p. 9). Despite the assertion that there are no good or bad introduced species, this subset of exotics is nonetheless referred to in the document as "important introduced species" (NZBS, p. 27). Inherent in this delineation is the supposition that the "important" species fall under a different governance category than "pests," entering into networks of protection and de facto biopolitical governance.

Biodiversity as Politics

A number of scholars have in recent years attempted to extend Michel Foucault's notion of biopolitics to nonhumans. Youatt (2008), for instance, has explicitly argued that "the 'bio' in biopower should be taken seriously as involving all of life" (p. 409). Those moving this field of inquiry in the nonhuman direction take as a basis a literal reading of Foucault's argument that biopower focuses on "the body as a machine: its optimization, the disciplining of its capabilities . . . its integration into systems of efficient and economic controls"

(Holloway et al., 2009, p. 396). As such, a specific focus on bodies of animals such as livestock as well as the "technological and administrative apparatuses that intervene almost constantly in the lives of such animals" becomes a concern for inquiry into interspecies power relations (Holloway et al., 2009, p. 398).

If we apply the biopolitical analytical framework to economically productive species, we can suggest that the private sector and the state become interested in intervening in various species' lives to ensure a good life (at least until the point when some are killed as part of market processes). In this case, that would entail health and genetic diversity assured via protection from pests and, by extension, fitness for use in the production of goods for the market, as the "important" species become "a biological problem and . . . power's problem" (Foucault, 2003, p. 245).

Given the importance of specific introduced species to New Zealand's economy, the state engages in enacting various "mechanisms of security" (Foucault, 2007, p. 353) aimed at protecting the species that underpin economic processes. This includes the policing of animal populations by keeping "important" species in their proper place (spatially and economically) and separated from invasives. This, in turn, cannot but lead to what van Dooren (2011) refers to as the de facto "production" of specific ecologies (p. 287).

The only logical corollary of the above narrative is that all other exotics are cast simultaneously as threats to biodiversity at large and to the ongoing existence of the "important" species. As such, they are deemed subject to increased scrutiny, study, public health and safety awareness, and the all-pervasive possibility of "control" (namely being fair game for hunting, poisoning, or biotechnological intervention). If it can be said that "important" introduced species fall under a biopolitical governance regime, then it would be best to look to Achille Mbembe's notion of necropolitics to conceptualize the political space to which "pests" are confined.

Mbembe (2003) builds on Foucault's notions of racism and sovereignty to argue that "sovereignty means the capacity to define who matters and who does not, who is disposable and who is not" (p. 27). Specifically, he looks at populations placed outside circuits of biopower in sites he dubs "colonies," where populations are subject to violence in a perpetual state of exception in the interest of "civilization" (Mbembe, 2003, p. 24). In this case, of course, civilization would entail economic interests as well as both cultural and scientific notions of nativity and biodiversity. Within such an analysis, pest species, having been placed into what Mbembe dubs a "relationship of enmity" (p. 16) with the rest of New Zealand's human and nonhuman populations, are subject to confinement (definitional if not necessarily spatial) to "death-worlds" (p. 40) wherein killing is the normal form of engagement.

This conflation of politics and war is not only theoretical—a conservation policy document released by Office of the Parliamentary Commission for the Environment in 2000 is titled *New Zealand Under Siege: A Review of the Management of Biosecurity Risks to the Environment* and casts invasives as a literal hostile enemy force. By creating a taxonomy that defines certain introduced species as security threats lying outside networks of biopower, the New Zealand conservation discourse provides "rational objectives [for] the very act of killing" (Mbembe, 2003, p. 23).

All this is not simply a new way of defining these animals as "vermin" by virtue of their, as described by Harriett Ritvo (1997), being "harmful to human interests" (pp. 38-39). This idea, and the concomitant call for extermination, is of course central to the project. But the list of human interests is here extended to include global and local economic and ecological dialogues. The various "pests" are cast as their own category: foreign, unproductive, and a threat to health, productivity, as well as national and international biodiversity. Indeed, as the breadth of importance of native and "important" introduced species in augmented, so is the threat posed by pests magnified.

As *New Zealand Under Siege: A Review of the Management of Biosecurity Risks to the Environment*, explains (without explicitly making the connection), while "pests" were initially simply those species that threatened agricultural productivity, they now threaten a much longer list of "indigenous biological assets" that fall under biosecurity governance. These assets contribute to everything from tourism, native species-based industries, the aesthetic values of landscapes, and, in a nod to holistic Maori worldviews, "the cultural, spiritual and other values of tangata whenua" (Office of the Parliamentary Commission for the Environment, 2000, p. 26).

Moreover, as is suggested in the next section, this is not a static category. It is both porous, allowing potential entry for other species, and subject to further taxonomic subdivision rooted in the past, present, and potential economic possibilities afforded by a given creature.

The (Bio)political Economy of Classification and Conservation Strategy

The New Zealand Department of Conservation (n.d.[a]) currently lists 25 introduced mammals as pests, including rats, possums, and feral goats. Here and throughout conservation documents and journal articles related to invasive mammals, there is a clear distinction made between "pests" and "feral" subspecies of "important" species. Although all land mammals currently existing in

the wild in New Zealand were introduced (intentionally or accidentally) by humans, there is a direct distinction made between those with and without an equivalent currently involved in economically productive activity. In another taxonomic mapping, the differences between "important" and "pest" species lie not only in their economic roles, but also in whether they are private property (and therefore fall under human spatial and population control).

According to New Zealand law, all wild and feral species are Crown property (Parkes & Murphy, 2003, p. 336). For an animal to cease to be productive, then, is for it to exit the formal sphere of exchange (itself often based on slaughter of the animal in question) and make the move from a biopolitical to a necropolitical relationship with humans. Moreover, there is an implicit suggestion here that wildness is not a standard category across those species living in the wild: feral species are simply transgressors of the divide between private and public property-control-sovereignty, while all other pests are irreconcilably wild and therefore can be nothing but threats to economic security and biodiversity.

Before delving deeper into this distinction, it bears underscoring that those invasives deemed to be the greatest risk are those that simultaneously threaten "indigenous biota" and livestock (most commonly by belonging to "mammalian vectors" of bovine tuberculosis). Parkes and Murphy (2003) explain that most invasive species "management agencies" have primarily concentrated on addressing those responsible for "affecting production values on rateable [sic] land" (p. 336) and have only since the release of the NZBS begun to take biodiversity and environmental conservation aspects of invasive control into account.

Within this context, no other animal has been more demonized and targeted for eradication than the possum.[3] Originally introduced in the mid-nineteenth century for fur farming, the creatures proved adaptive to New Zealand's environment and went feral, proving themselves to be both voracious predators for many native birds and, less expectedly, carriers of bovine TB (Landcare Research, 2008). As the possum fur industry was abandoned, so too did the possum become a "pest" and the target of a massive, multi-party extermination campaign anchored in the ecologically noxious deployment of the contentious toxin sodium monofluoroacetate (known as "1080") in areas with large possum populations (Innes & Barker, 1999).

3 Of all introduced mammal species in New Zealand, the possum receives by far the most press, in conservation messages, the popular media, and academic writing. A number of papers address various aspects of the "possum issue" and have been very helpful in crafting the arguments contained in this paper; of particular note are Potts (2009) and Gruffudd (2011).

The definitional shift from feral to invasive is obviously quite arbitrary. Feral suggests a counterposition to a licit and condoned domesticated or economically exploited species, but this depends on the profitability and success of cultivation of certain species. The vast majority of New Zealand's pest species were originally introduced for economic purposes, meaning they all passed through a "feral" stage that lasted until no member of their species was being economically exploited by humans. Central here is the public-private divide whereby "important" introduced species fall under private control (as living commodities subject to private sovereignty during life and death) while feral and invasive introduced species become primarily a public issue and therefore fall under public sovereignty.

It is the latter category that is problematized, meaning that the issue ceases to be one of introduction of species sui generis but rather the wilding of—and therefore loss of control, both spatial and economic, over—introduced species. It is highly telling that, while regulated, the importation of new mammal species into New Zealand for commercial purposes is not banned (Parkes & Murphy, 2009, p. 336).

It is also conceivable that a species may, with changing economic imperatives, move "back" through the taxonomies. Potts (2009) and Gruffudd (2011) note that in the case of the possum, an industry has sprung up that marries nationalist eco-stewardship in the form of possum killing with economic and scientific productivity in industries like fur and vivisection that would be viewed as abhorrent if they involved non-pests. As such, the necropolitical approach to pest species, while relying on a different ethics of interspecies engagement, can be profitable. Gruffudd (2011), however, raises the possibility that such profitability may lead to a species like the possum being reintroduced into formal farming, at which point, presumably, the farmed portion of the species would be dubbed "important" while the "pest" portion would become (again) a "feral" variant (p. 229).

Science, Governance, and Bio-Nationalism

Youatt (2008), writing about the relationship between nonhumans and human politics, has argued that "[t]he nation-state . . . is based around a community of humans who in turn decide what is right or good for themselves and *their* environment. Its reasoning is decidedly and openly anthropocentric" (p. 404). The New Zealand government and the various scientists and agencies engaged in enacting its conservation policies operate within a highly localized definition of the environment, playing conservation concerns against the

protection of the farming interests that are culpable for extensive environmental damage.

Escobar (1998) has defined biodiversity as a construct that "anchors a discourse that articulates a new relation between nature and society in global contexts of science, cultures, and economies" (p. 55). Building on this and writing about the New Zealand context, Ginn (2008) has argued that "ecological threats that jeopardize indigenous biodiversity become threats to the integrity of the 'imagined community' of the nation-state" (p. 336). The NZBS, growing out of New Zealand's existing conservation culture, is complicit in the creation of a distinctly national narrative regarding biodiversity (with a focus on preservation of endemic species alongside "important" introduced ones) and the threats facing it (with disproportionate blame apportioned to invasive "pests"), but also contributes to and propagates a number of norms and governance regimes affecting the production of conservation science as well as the governance of New Zealand's human and nonhuman populations.

The identification of (some) introduced species as a "serious and pressing threat" to ecosystems by the NZBS must be, first and foremost, challenged on scientific grounds. Its authors provide no explanation of the framework within which various threats were compared, nor why a complex, multi-tiered approach aimed at eradicating specific invasive mammal species is preferable to—or should not be executed concurrently with—approaches aimed at, for instance, reforestation, reduction of farm industry pollution through controls on fertilizer use or stock effluent disposal, or the expansion of federally protected parkland. This point is especially salient given the contention in the international and New Zealand scientific communities regarding what constitutes the most severe extinction threat to native species.

Gurevitch and Padilla (2004), for instance, argue that the link between invasive species and extinction is not necessarily a strong one and is not constant across analyses and cases. They write that "[e]xisting data on causes of extinctions and threats are, in many cases, anecdotal, speculative, or based upon limited field observation" (p. 470). Similarly, Davis (2003) suggests that, with exceptions, extinctions caused by introduced species are not as frequent as is normally argued. Indeed, anthropogenic loss of habitat and native cover, usually driven by agriculture, is cited as the principal driver of biodiversity depletion (see Davis, 2003; Walker, Price, Rutledge, Stephens, & Lee, 2006; Gurevitz & Padilla, 2004). This finding is corroborated by Baskaran, Cullen, and Colombo's (2009) study of the environmental impacts of the dairy industry in New Zealand. Moreover, Clout and Lowe (2000) point out that land clearing can allow—and has allowed in New Zealand—certain migratory species to "self-introduce" into new ecosystems (p. 373).

A number of conservation scientists have also argued that invasive species often act alongside other threats to native species, exacerbating existing problems like habitat loss. Taking such arguments into consideration, Gurevitz and Padilla (2004) suggest that "the resources and efforts devoted to removing exotics might be better focused on more effective means to preserve threatened species" (p. 470).

The aim here is not simply to deploy competing scientific truth claims to counter the conclusions of the authors of the NZBS, but rather to show that this debate exists, and thereby to suggest that there is a basis for questioning the assertion that "invasive pests pose the greatest single threat to [New Zealand's] remaining natural ecosystems and habitats and threatened native species" (NZBS, 2000, p. 6). The NZBS's focus on invasive species has two practical consequences. First, it delinks invasive pests from other threats to New Zealand's biodiversity, especially habitat loss. Given that the agriculture industry is a major driver of habitat loss, this move assures that it cannot, despite this fact, be viewed as the primary culprit.

Second, since pests are already set up as threats to livestock and the diversity of "important" species, this means that livestock farming and other introduced-species-dependent industries are moved from the category of threat to that of (partially) protected entities. This is clear in the ominously titled document, "Biodiversity Inventory and Monitoring: A review of national and international systems and a proposed framework for future biodiversity monitoring by the Department of Conservation," wherein proposed guidelines for baseline conservation goals include a lenient approach toward "non-invasive and tolerable exotics" (Lee, McGlone, & Wright, 2005, p. 72).

To use Luke's (1995) term, the NZBS's intervention serves to "environ" (p. 63) a specific subsection of New Zealand's ecology, thereby establishing the norms of interaction with the nonhuman environment and setting up a governance framework for this space. This includes creating a disciplinary environment rooted in specific forms and deployments of expert "eco-knowledge" (p. 58) wherein people and places are situated within the disciplinary space of its "discursive envelope" (p. 64). In this environing, however, numerous species, narratives, and debates are left outside the pale. The NZBS excludes possible scientific and political challenges to the very governance framework it seeks to institute. Moreover, by placing so much emphasis on economic growth, it superimposes the biodiversity dialogue onto a structure based on what Luke (1995) terms "resource managerialism" (p. 70).

Nowhere is this better represented than in the New Zealand Department of Conservation's new slogan: "Conservation for Prosperity." This phrasing suggests that not only is prosperity reliant on conservation, but also that

those things that lead to prosperity must be conserved. The Department of Conservation defines this branding as being rooted in the notion that "Our relationship with our environment helps define who we are as New Zealanders," which, in turn, means that national identity is linked to a biopolitical-cum-economic narrative wherein conservation "builds health and well-being" because it "keeps us in good health both physically and emotionally" at the same time as it "underpins our environment's ability to create wealth" (New Zealand Department of Conservation, n.d.[b]).

This framing is extremely salient to the debate about introduced species, as the Department of Conservation and other groups tied to the Crown, like AgResearch and Landcare Research (which are also farm-lobby-funded advocacy groups), employ the scientists who provide much of the scientific backing for and write the academic papers that shape conservation and invasive species policies. For instance, the paper "Management of Introduced Mammals in New Zealand" (Parkes & Murphy, 2003), which I have cited extensively, is co-written by Department of Conservation and Landcare scientists.

This is not to suggest this is an entirely an obfuscated or dishonest process. For instance, in his introduction to the Biosecurity Strategy for New Zealand, John Hellström (2003) is very honest in stating that the New Zealand economy is, and has historically been, reliant to a substantial extent on introduced species, and that these must be protected through biosecurity measures alongside "indigenous flora and fauna" (p. 5). As such, the official definition of biosecurity is "the exclusion, eradication or effective management of risks posed by pests and diseases to the economy, environment and human health" (p. 5). The logic that arises from such a definition, however, leads to the same conclusion: biodiversity can be protected from the same pests as productive introduced species.

Tellingly, the vision and goals of the biosecurity strategy include "protecting marine and terrestrial primary industries and facilitating exports and tourism" alongside "protecting New Zealand's indigenous biodiversity," with no hint that the two goals might not dovetail (p. 7). Central to any such approach is governance of the totality of the population, including humans, endemic species, as well as desirable and undesirable introduced ones.

The governance of introduced species, as noted earlier, is highly planned and methodical, including "internal border management" whereby pests are (ostensibly) confined to specific geographic areas, targeted eradication in geographically defined areas, as well as development of specific protected areas of high surveillance and intervention to house threatened endemic species.

"Important" species are subject to stricter regulations centered on health and surveillance. Animals who might run the risk of going feral can, under

recent legislation, be tracked with identification devices approved under the Biosecurity Act of 1993 (New Zealand Parliamentary Council Office)[4] or the National Animal Identification and Tracing Act of 2012 (New Zealand Parliamentary Council Office).[5] Such measures blur the boundary between domesticated and wild, "important" and pest, as an animal may escape the spatial cordon of biopolitical control but not its technological reach, thereby theoretically mingling with pests while being subject to different treatment and a different fate if apprehended. Furthermore, once introduced species are marked as being productive, interfering with them on a biological level becomes legitimated if that interference furthers eco-productive ends. The Crown research institute AgResearch, for instance, conducts testing on cows to reduce their "methane emissions" in a process of technocratic "greening" similar to that described by Jonathan Clark (2012) in his work on the Enviropig.

The biodiversity imperative is also mapped onto existing narratives about the threat posed by pests to native species in the deployment of a discourse of individual discipline and empowerment within conservation efforts. The new focus on biodiversity protection is based on a model of what Maniates (2001) refers to as "individualization of responsibility" (p. 33). Messages aimed at specific groups of individuals—primarily farmers—urge them to engage in biodiversity stewardship on their private property within the day-to-day operations of their businesses. For example, a public-private taskforce released a report entitled "Biodiversity on Farmland" (Wratten, 2003), which was targeted at practical farm management practices.

This document, funded by the Ministry for the Environment's Sustainable Management Fund, is aimed at the improvement of biodiversity on farmland. It defines biodiversity simply as "the variety of all living things" and frames it in terms of the value it can deliver to farmers (Wratten, 2003, p. 7). This list includes "commercial production benefits" such as clean water and healthy, nutrient-rich soil; "other economic benefits" such as increased land value and a "clean, green image" in demand in foreign markets; as well as "aesthetic," "cultural," "recreation," and "conservation" benefits (p. 8). Farmers—dubbed "ecosystem-service providers" (p. 8)—are tasked with playing a central role as value-maximizing biodiversity stewards who must also "manage pests, diseases and weeds in a sustainable way" (p. 7).

Many "pest control" initiatives aimed at biodiversity protection, including those expressly described in the NZBS, place significant emphasis on working

4 See http://www.legislation.govt.nz/act/public/1993/0095/latest/DLM314623.html, especially Part 5: Pest Management, wherein pests are equated with "unwanted organisms."

5 See http://www.legislation.co.nz/act/public/2012/0002/latest/DLM3430220.html.

with landowners. In a move that implies individual responsibility will be more effective than state regulation, the Strategy's authors suggest that "[l]andowners generally don't react positively to being told what to do on their land, therefore regulation is likely to be counterproductive and also risks losing many private 'conservators' across the country" (NZBS, 2000, p. 38). Owners of private land are cast as mini-sovereigns, in control of their territory (dubbed "production ecosystems"), and imbued with the mantle of responsible, pest-killing eco-citizenship. A 2000 Ministry for the Environment Report states that, pursuant to consultation with landowners, it was decided that there "was strong support for nurturing New Zealand's unique indigenous biodiversity, and for the view that nurturing is a function of committed and enlightened management" (New Zealand Ministry for the Environment, 2000, p. 5).

This message has been taken in by at least some in the farming community. A scan of articles on *The New Zealand Farmers Weekly* reveals a high incidence of references to pest control within the context of biodiversity conservation married to logics of private land control and the market system. One proposed project would reduce reliance on 1080 poisoning in favor of biodynamic controls while facilitating "round[ing] up the possums for harvesting." A landowner who has been involved in the project is quoted as saying that "[i]n keeping with the long-term ecological ideals and the value in possums, hunting is the way to go. It is crazy to be poisoning when we could be saving the environment and communities while creating a valuable industry" (Scott, 2010).

This is not to say, however, that there is a single, unified discourse on the matter. Different economic interests in the business of pest eradication can clash head on, as evidenced by the efforts of the ironically named Animal Health Board, an ostensibly private-public group whose sole stated aim is "managing and implementing the National Pest Management Strategy (NPMS) for bovine tuberculosis (bovine TB) in New Zealand" through its TBfree program (Animal Health Board, n.d.). The group, largely funded by dairy interests and quite openly concerned exclusively with cow (rather than some broader category of "animal") health (Animal Health Board, n.d.), directs most of its efforts at possum eradication. The group is pushing for further biocontrol and poison drops in order to preserve the "health" of native plant and animal species by specifically casting the possum as a counterpoint to a totality of "native species," and using farmers as the spokespeople for the defense of New Zealand nativism ("Making TB History," 2011).

The group has also argued that, "From a TB control perspective, even if fur trapping was subsidized, it would be far too risky for New Zealand to rely on fur trappers for critical disease management-driven pest control" (TBFree

New Zealand, n.d.). They posit that any fur industry must be subordinate to TB control goals. This argument is posed in rational economic terms: the dairy industry and money spent on possum eradication makes more money and creates more rural jobs than the fur industry and is, by extension, better for New Zealand.

A similar but more general—though no less prescriptive—narrative is aimed at the general public, who are urged to educate themselves on New Zealand's pest species and eradication and control techniques deployed against them. Gruffudd (2011) observes that in the case of the possum, there is a diffuse effort on the part of both the public and private sectors aimed at turning citizens into agents of killing through methods as varied as bounties on possum pelts and children's books. Similarly, Annie Potts (2009) has noted, active eradication of pest species is cast as a "patriotic act that helps to preserve (an imagined) New Zealand figured in ecological and economic terms" (p. 3).

The Department of Conservation's public messages regarding invasive animals set them up as threats to native species, with no mention whatsoever of the category of "important" species. These messages, illustrated with grisly images of exotics—primarily possums—killing native flora and fauna, are accompanied by a call to action for New Zealand's concerned citizenry to educate themselves on pest control methods and initiatives.

This is not a totalizing discourse, and public resources regarding biodiversity do point toward constructive individual conservation initiatives in their "own backyard or paddock" (Biodiversity New Zealand, n.d.).

What we see here is similar to what Luke (1995) has observed with the definition and implementation of the term "sustainability" in natural resource use; namely, a "vague idea" deployed "to discipline and direct many public practices . . . by establishing a register of conduct for collective morality, personal responsibility, and national purpose" (p. 65).

Throughout these campaigns, ideas about good citizenship are linked to ideas of scientifically backed ecological truth and, often, government-sanctioned productive violence. The individual is here recast as an agent of homeland biosecurity who, by engaging in anti-pest behavior, is standing up for biodiversity, economic growth, and national identity. As Luke (1995) argues, the use of specific environing tactics introduces a system of governmentality in the management of everyday life.

Conclusion

The aim of this paper has not been to suggest that introduced species in New Zealand are not a threat to local ecosystems or that certain conservation

initiatives should not be initiated. Rather, the purpose has been to examine how discourses surrounding introduced species are created and how these discourses are related to broader global and local notions of biodiversity, conservation, and national governance. I have suggested that taxonomies of introduced species are rooted in the perceived role of exotics in a given country's ecology, conservation politics, and economy. This is evident in the classification of New Zealand's introduced animals as "important," "feral," and "pests" based on their history of economic productivity and relationship to productive species.

I have also suggested that the creation of a discourse casting pests as the primary threat to both animal-based productivity and biodiversity has allowed for an environing maneuver whereby New Zealand's "total biodiversity" becomes the space within which humans engage with introduced species. Such environing not only precludes dissenting dialogue about alternate causes of biodiversity loss, but also allows for the deployment of systems of governmentality and bio-politics/necro-politics that encompass both human and nonhuman populations.

Operating within this framework, New Zealand conservation efforts, guided by the instrumental goal of pest eradication, not only overlook non-pest threats to New Zealand's biodiversity, but shift attention away from the economic bases of environmental destruction (both through farming and land clearing, and species introduction itself). Moreover, a highly nationalized and economy-centric biodiversity discourse develops into what I have termed bio-nationalism, which allows for the shifting of responsibility for conservation onto individuals, who, as good Kiwis, become authoritative and empowered agents of homeland biosecurity. In the greatest paradox engendered by this discourse and associated conservation strategies, the very farmers whose activities inherently contribute to biodiversity loss become champions of biodiversity protection.

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