


2019

## Many Happy Returns: Eradication, Re-Wilding and the Case of Lord Howe Island

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### Recommended Citation

Tiffin, Helen, Many Happy Returns: Eradication, Re-Wilding and the Case of Lord Howe Island, *Animal Studies Journal*, 8(1), 2019, viii-xxix.

Available at: <https://ro.uow.edu.au/asj/vol8/iss1/19>

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## **Abstract**

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**Keywords:** Brodifacoum, insects, Lord Howe Island, Rat Eradication Project; conservation; endangered species; biodiversity; owls; species purity

In late June and early July of 2019, over forty-two tons of grain pellets containing the toxic haemorrhagic, Brodifacoum, were thickly distributed across Lord Howe Island, a World Heritage site in the South Pacific, 550 kilometres from the Australian mainland. As well as the Park Preserve area, Lord Howe has a permanent human population of 350, an increasingly sizeable number of government staff, and up to four hundred tourists. The Rat Eradication Project (REP),<sup>1</sup> took place by helicopter carpet-bombing, saturation bait station emplacement, and hand-broadcasting of uncontained baits on properties even in the settlement area. Sponsored by both State and Federal Governments, the poisoning was strongly opposed by the Lord Howe Island First People's Association, many other residents, a few scientists, and some past (and prospective) tourists. Three court cases were mounted against the carrying out of such a risky experiment,<sup>2</sup> and in the end, proponents of the scheme were forced to apply for (and invoke) Control Orders from the State Government, threatening million-dollar fines against anyone failing to allow entry to property and private houses.

No matter how unlikely its chances of success in ridding the Island of its unwelcome but stable rat population, the Lord Howe Island Board, dominated by Government appointees and a Government appointed Administrator, forced the REP through. Billed as a necessary 'conservation measure' to protect endangered species – species who survived the initial rat impact in 1918, and have existed with the rats for a hundred years – the Project, in an era of tragically exponential plant and animal extinctions, easily garnered support from often well-intentioned individuals and conservation organisations unfamiliar with the Island and its actual rat numbers. Awarded ten million dollars to carry out an experiment beneficial to the New Zealand manufacturers of Brodifacoum and the cryptic IEAG (Island Eradication Advisory Group), the Board determined to try an eradication method never before attempted on a permanently inhabited island.<sup>3</sup> Using the gross exaggeration of there being 'a rat plague' on the Island, and the tantalising possibility of 're-wilding' a once-believed-extinct stick insect – the Lord Howe Island phasmid, (*Dryococelus australis*) – the Board has now attempted to carry this experiment through.

Throughout human history, rats (*Rattus rattus* or *Rattus norvegicus*) have accompanied humans in their movement and settlement across the world. They have – like us, with whom they have often been compared<sup>4</sup> – colonised most environments. Throughout history, too, humans have attempted – with notable lack of success – to rid themselves of these unwanted companions who compete for our foods, are associated with plagues, generate (usually irrational) atavistic terror as possible predators on ourselves and, like us again, displace and exterminate other species. We have often succeeded in controlling rats, but never in eradicating them from the areas we both – inevitably – inhabit. Since 1918, the control of rats on Lord Howe Island has proved reasonably successful. Bounties on rat tails, contained baiting, and to a lesser degree, the importation of owls as rat predators have been the methods adopted, and contained baiting remains a successful control strategy. The eradication poison procedures of June-July 2019 mark the first attempt on the Island at total rat extermination, rather than control, and at killing ‘every individual rat’ in a permanently human-populated area.

Before the crew of H.M.S. *Supply* came ashore on Lord Howe Island in 1788, no humans had disturbed the botanical, avian, reptile and insect colonisers of the island’s volcanic mountains and flatlands. Even the sailors of one ship, however, began a disastrous intrusion into this otherwise peaceful world.<sup>5</sup> Over the next two hundred and thirty years, settlement (initially sporadic), ship arrivals, and the importation of exotic plants and animals irretrievably altered the island’s original ecological composition. Settlers hunted and ate land and sea birds, shot crop pests and introduced pigs, goats and cats, many of whom would leave the settlement area to become feral. Humans (or their presence, and trade with mainland and overseas ships) were responsible for the introduction of mice, and equally inadvertently, for the arrival of rats from the S.S. *Makambo*. During the twentieth century, however, as continuing extinction of island flora and fauna became apparent, campaigns were conducted by the Islanders to halt the losses occasioned by human and rat intrusions. By then, however, a number of unique bird species, including the Lord Howe Island parrot and the white gallinule were already extinct.<sup>6</sup> Unique species and sub-species continued to exist and evolve, but by 1918 the 1788 biodiversity was already reduced and ecological complexity impoverished. With the arrival of the rats a further wave of island extinctions (mainly avian and insect) occurred (Hutton). One particular species

that did not survive the continued rat presence was a stick insect, the Lord Howe Island phasmid. Apparently extinct on Lord Howe, it was discovered in 1964 to have survived on Ball's Pyramid, a massive rock stack 23 kilometres from the main island.<sup>7</sup> Live specimens, however, were not discovered (and recovered) until 2001.

Since control methods in relation to rats have proved reasonably satisfactory – rat numbers are estimated not to have increased over the last forty years<sup>8</sup> – such a drastic measure as overall chemical bombardment to effect their eradication is risky in the extreme, and the reasons for persisting with this warrant interrogation. Rats have now been on Lord Howe for one hundred years, and in that time have reached an – albeit uneasy – accommodation with the other biota. The removal at this point of a mammalian predator – in the unlikely event that the operation is ultimately successful – is in itself questionable. But whatever the long-term benefits to the island of rat eradication, the by-kill of other bird species has been extensive. At least ten species of birds are affected – some suffering the loss of much of their population; others severely reduced. Brodifacoum, Islanders were assured by the proponents, would not unduly affect insects, at least not in terms of direct poisoning. Brodifacoum did however prove so popular that baits had to be constantly replaced because of widespread insect consumption. Whether this insect ingestion will have long term effects on these species themselves remains to be seen, but since the Lord Howe poison drop has been carried out, the Christchurch (New Zealand) newspaper, *The Press*, reported on July 5 that four iconic and endangered tuataras had died through consumption of insects contaminated with Brodifacoum.<sup>9</sup> Simultaneously, a Lord Howe Island resident reported a cockroach who had become a ‘mass of blue gloop’ – the characteristic colour of the haemorrhagic found in those consumed by the tuataras. This raises the spectre of a continuing round of insectivorous bird and reptile deaths by secondary poisoning over an indeterminate period, attesting to its persistence in the food chain. The retention of Brodifacoum in soil and groundwater is unknown, but likely to be variable across the island depending on soil type and rainfall. Brodifacoum's toxic effects (and the potential effects of its grain medium) have not been properly tested on marine biota. Lord Howe has the most southerly (lagoon) coral reef system in the world, anticipated to survive climate change bleaching impact longer than the Great Barrier Reef, thus offering a potential reservoir. As a

haemorrhagic, Brodifacoum might not be expected to affect corals directly, but corals, like many other marine organisms in a complex reef ecosystem are interdependent on overall biota. We *do* know that Brodifacoum is bioaccumulative in fish livers, and that inshore mussels and other filter feeders retain the poison for at least short periods.

The reasons for persisting with this experiment then – in spite of the dangers outlined above<sup>10</sup> – are relevant to my critique of current conservation policies in Australia. Influenced by the (former) New Zealand Government, whose increasingly zealous attacks on ‘alien introductions’ reaches at times hysterical proportions,<sup>11</sup> the Australian Government has become keen to adopt similar strategies in ridding offshore islands of ‘alien’ and/or introduced species. (New Zealand companies, with government financial input, have worked tirelessly to promote rat – and other – eradications by Brodifacoum, a product they manufacture. So lucrative has this proven, the eradication package – poison, grain base, and helicopter hire – has become one of New Zealand’s most important exports.<sup>12</sup>) Trumpeting non-analogous ‘successes’ and downplaying failures and deleterious effects has convinced Australian Government agencies to follow the New Zealand lead.

Second, notwithstanding irreversible habitat change (particularly consequent on the relentless spread of human populations), and multiple extinctions over the last 250 years, Parks and Wildlife conservation policies in Australia continue to invest heavily in the idea of returning ecological systems to their pre-colonial (before 1788) biotic ‘purity’. In essence this is not an unworthy aim, but it is an impossible and illogical one. Human overpopulation (resulting in what we euphemise as ‘habitat loss’ for other species); climate change; unstoppable global trade; oceanic pollution, not just with substances such as plastic, but so-called ‘species pollution’ consequent on international trade, are accelerating.

The possibility of the return to a pre-colonial cultural ‘purity’ – to the Australian environment’s ‘pristine’ condition – as in any post-colonial country is, regrettably, a delusion. Yet this impossible aspiration continues to underpin Parks and Wildlife conservation policies. I will return to this unshakable, if often unspoken belief in the possibilities of overall alien eradications and native rewildings later in the paper.

Third, in spite of increasing permanent population and tourist numbers on Lord Howe, and in spite of the absence of their hypothesised ‘natural’ predators<sup>13</sup> – the dream of returning the ‘exiled’ phasmids to their original island persists. A great deal of publicity surrounded the (re)discovery of the phasmid on Ball’s Pyramid, and proponents of the REP have been quick to capitalise as much as possible on the idea of re-wilding what has been termed ‘the world’s rarest Insect’.<sup>14</sup>

The preservation of biodiversity implicit in the goal of returning ecosystems to a pre-colonial state is, on the surface, a laudable one.<sup>15</sup> Species loss in Australia since 1788 has been apocalyptic, and Australia continues to have one of the highest extinction rates in the world. Human settlement expansion, land clearing, and the particular impacts of climate change are likely to accelerate these extinctions. Legislated conservation areas and the protection of biodiversity wherever possible are indeed absolute necessities.

To this point, Lord Howe Island’s reputation for conservation of endangered species and preservation of biodiversity has been a justifiably positive one. Islanders themselves have taken sensible and considered measures to protect endemic and other flora and fauna. One of the world’s most successful captive breeding programmes was the revival of the critically endangered woodhen (*Gallirallus sylvestris*) population, whose numbers had been reduced to twelve largely by human predation in the early days of settlement. (The surviving woodhens had retreated to Mt Gower, the highest point on the island, where they existed with the rats for one hundred years.) Their current ‘re-wilded’ population of over 250 is a testament to the success of this project and those engaged in it. Unfortunately, as one of the only two species to be protected from consuming baits (by capture and incarceration for an unspecified period during and after the REP), the woodhens have now had to be reinstated on the ICUN critically endangered list. Nevertheless, their earlier rescue from the brink of extinction is certainly cause for celebration.

However, it is over the *philosophy* and *management* of conservation areas, and the *methods* employed in achieving these goals, that conflict arises and the proposed REP on Lord Howe Island offers an obvious case in point. The particular method aimed at eliminating rats (and owls)



risks more than it can possibly promise, even should the action – against all odds – be successful. Two endemic bird species will be afforded protection from eating the openly distributed poison: the woodhen and the Lord Howe Island currawong. Other endemic birds, such as the golden whistler and native birds such as the ground dove are thought not to be attracted to the baits – but the grain matrix of the baits has attracted golden whistlers, silver eyes and ground doves, all of which are opportunistically omnivorous. Insectivores, too, are now at risk.

The scheme's supporters are prepared to write off at least eight bird species as (unfortunate) 'by-kill', since these are neither 'endemic' nor cherished 'natives'. But most of these birds found their own way to Lord Howe, by wind or water – through the normal channels of island colonisations – and may well, in the long term, become endemic, since evolutionary processes have no beginning or end, and are not tied to an arbitrary historical date such as 1788. Arguably, the 'action' plan is both counter-evolutionary and likely to take more species *out* of the ecosystem, radically reducing, rather than promoting, biodiversity. Should it be successful as a rat eradication strategy, its overall effect on the ecosystem – killing so many birds as well as rats in one fell swoop, and contaminating insects – risks ecological degradation, if not collapse. Lord Howe Island cannot be easily recolonised. Its vast distance from mainland Australia, New Zealand, and other potential 're-stocking' sites, militates strongly against any relatively rapid, or even long term – given the accelerating effects of climate change – biodiversity replacement.

This brings us to the idea of species *value*, since the different values accorded different species by conservation managers usually dictates their fate. Why, many environmentalists ask, are some species (even sometimes a majority) expendable in the interest of preserving (possibly a minority) of others? But the crucial categories into which species are placed are neither self-evident nor 'natural'. They have no *ontological* grounding but are instead arbitrary and contingent. As Stefan Helmreich observes:

Biologists make their way through the world with a sense of the empirical nested in frameworks of interpretation... [Thus] there is no one way in which scientists think; rather, we must attend to contexts called into relevance in various accounts. More, we

must listen to how ‘context’ itself is invoked by scientists as they explain their taxonomic enterprises. (109)

The ‘taxonomic’ to which Helmreich refers is not a *Phylogenetic* one, but one which underpins the management actions of Parks and Wildlife departments in their conservationist policing, eradications from, and rehabilitations of ‘natural’ ecosystems. And, ironically, as Helmreich also comments, these ‘taxonomies’ are organised around ‘the presence or absence of the agency of humans’ (110). Helmreich’s concern is specifically with US/Hawaiian Parks policies, but the categories he outlines are relevant – with some local variation – to conservation management in most of the settler-colonies: ‘endemic’ (or indigenous) species are those (plants or animals) restricted to a particular place and found nowhere else. ‘Native’ species are those which occur ‘naturally’ in a given area, not introduced by humans. (Human introductions of species are sometimes divided into ‘accidental’ and ‘intentional’.) Such species may in time become ‘naturalised’ or even ‘endemicised’ and not all management policies *exclude* species from the category of ‘native’ if they were introduced by humans. But what primarily distinguishes ‘native’ from ‘endemic’ is that ‘natives’ are found in other locations as well.

Most significant for my argument here, however, are Helmreich’s categories of ‘alien’ and ‘invasive’, two designations that are routinely spliced by Parks managements as ‘alien-invasive’. An ‘invasive’ species, in Helmreich’s taxonomy, is one ‘whose introduction and rapid and aggressive spread is likely to cause commercial, agricultural or environmental harm or harm to human health’ (111). But, even natives and endemics can become (perhaps under altered (ecological) circumstances) invasive, while not all ‘aliens’ are invasive – some even contributing over time to the biodiversity of the ecosystem.<sup>16</sup> Much of the time, however, and particularly in Australia, the majority of ‘aliens’ are *assumed* to be invasive, an assumption – usually unacknowledged – that is inextricably interwoven with the persistence of the 1788 historical ‘boundary’ and with ideas of nation (particularly an *island* nation) and with species ‘purity’.

Just as Helmreich cautions us always to consider the (social and national) contexts in which scientists (and their policy categorisations) operate, Head and Muir caution against unthinking acceptance of so-called scientific/management categories as if they were

transparently obvious. Analysing ‘interpretations of nativeness, invasiveness and nation in relation to Australian plants’, they note that ‘variable social processes are implicated in such conceptualisations’ and:

the concept of invasive alien – or exotic, or introduced – species, conflates two axes of variability that need to be differentiated if management solutions are to be most effective. Invasiveness refers to the *behaviour* of an organism... Alienness, or its converse, nativeness – refers to its *presumed belonging* in a certain place. (199)

Terms such as ‘alien’, ‘belonging’, ‘native’ inevitably carry human social freight, a freight not necessarily discarded when they are deployed in extra-human contexts. Australia is unique in being both continent and island – a situation unlike that of say, Europe or North America. And although no ecologist would argue that the island continent of Australia could be considered as a single biotic entity, the idea of an Australian uniqueness seems inevitably to spill into the application of the categories outlined above. Head quotes Bean’s observation that ‘there have been no research-based explicit definitions for indigenous (native) or alien (non-indigenous, exotic, introduced) plant species in Australia’. Rather, as Head argues, ‘most workers have used a time line marking the arrival of the British colonisers’ (3), noting that the arrival date (1788) has nothing to do with the inherent nature or being of the plant itself, but rather, confers ontological status on an arbitrary human historical date: ‘Did the iconic *Banksia serrata* pass into a fundamentally different state of being by being pressed, dried and transported to England? Did the seed wheat brought by the First Fleet undergo an ontological change when it was planted in Farm Cove in 1788?’ (4).

The concept of nativeness, then ‘is constituted as a temporal boundary between before and after’, a ‘boundary around humans rather than arising from the properties of the plants themselves’ (4). ‘Nativeness’ is thus a ‘theoretically weak and internally inconsistent’ concept (Chene and Hamilton 2011, 36, qtd. in Head). We lose something, Head concludes, ‘in ecological health and sustainability by ceding so much power to the temporal horizon of European colonisation’ (5). ‘Could we’, she asks, ‘imagine the future more openly if we let go of “nativeness” as a justifiable categorisation?’ (5)

The REP is primarily designed to rid the island of rats, but it will also deliberately target the owls who were introduced during the 1920s and 30s to control the rats. Should the latter not consume the grain pellets directly, most might die (an even slower and more painful death) from secondary poisoning in feeding on the dead and dying rats. Currently, the owls' diet consists predominantly of rats and mice with a very 'occasional' predation on other birds (Milledge et al. 27). If the owls are not exterminated, and in the unlikely event of the rat eradication's being successful, most of their current prey would thus disappear, and attempts to return the phasmid to Lord Howe would prove difficult, should the existing twenty to fifty pairs of owls, deprived of their main food sources – rats and mice – begin to consume the large insects.

The owls, then, have been targeted for three reasons: first, they would be likely to eat many more smaller seabirds and chicks if rats and mice are no longer available; second, if the phasmids were to be reintroduced to the island, these might begin to form part of the owl diet; and third, and most significant, they were not present in 1788.<sup>17</sup> (As an even greater sin in the eyes of Parks and Wildlife/World Heritage Management, they were introduced to the island by humans.) The owls are certainly aliens, but since the bulk of their present diet consists of *other* aliens, and invasive ones at that, the owls' presence can hardly be considered to have been significantly 'invasive'.<sup>18</sup> As Mark Davis notes:

Over the past few decades, 'non-native' species have been vilified for driving beloved 'native' species to extinction and generally polluting 'natural' environments... Such characteristics have helped to create a pervasive bias against alien species that has been embraced by the public, conservationists, land-managers and policymakers, as well as by many scientists. (153)

What many current management approaches have failed to recognise, Davis notes, is that 'natural systems of the past are changing forever thanks to drivers such as climate change, nitrogen eutrophication, increased urbanisation, and other land use changes' (153).

Consequently, 'the practical value of the native versus alien species dichotomy in conservation is

declining and even becoming counterproductive’ (153). Yet many conservationists, he notes ‘still consider the distinction a core guiding principle’ (153).

While ‘nativeness’ has had strong social roots in Australian culture, the general idea of biodiversity on a broader scale is relatively recent and can be traced back to the 1990s.<sup>19</sup> ‘Proponents of biodiversity preservation and ecological restoration commonly [use] military metaphors and exaggerated claims of impending harm to help convey the message that introduced species are enemies of man and nature’ (Davis 154). While Davis does acknowledge that ‘predators and pathogens’ introduced to islands and lakes *can* pose a very significant threat – as undoubtedly the arrival of humans and *Rattus rattus* did on Lord Howe – there is little indication that owls constitute, or have constituted, any such ‘apocalyptic’ threat. Continentally, at least, claims Davis, ‘the introduction of non-native species has almost always increased the number of species in a region’ (154).

While his caution in relation to islands like Lord Howe is well taken in the case of humans and the rat, the situation of the owls demands a much more nuanced inquiry than has so far been accorded it. Yet, while rats have certainly *not* increased biodiversity on the island, and may, it is hypothesised, come to threaten a number of small species in the future (should current controls break down), the REP itself, in eliminating the owls, causing extensive land bird by-kill, contaminating insects and fish on which sea birds depend, poses – *whether or not* it effects rat eradication – a far greater threat to island ecology and biodiversity than do the owls (and arguably, even the rats, at this late stage of their presence on the island).

Libby Robin points out that, as David Theodoropolus (2003) has observed, ‘the language of conservation science might be so overstated as to render it merely a “pseudoscience”’. ‘I am less worried’, though, Robin continues:

about ‘overstatement’ than about using language that may exclude some of the parties that want to care for the environment and its animals. Terms like *invasion biology* (Richardson 2011) and *crisis science* (Soule 1985) undermine science. They emphasise *application* over the method and carry the implication that the end might justify the means. (2)

Noting, like Davis and others, that conservation discourses in Australia are pervaded by military metaphors, Robin can rightly claim that ‘Australia has chosen to focus major conservation campaigns on eradicating feral animals and weeds rather than improving the habitat or caring for the animals the eradication programmes set out to save’ (3).

No campaign of eradication, with its exaggerated claims of actual and potential rat damage, its ‘gung-ho’ military metaphors, its nonchalance in terms of the possibilities of long-term soil and water contamination, proven insect and fish ‘biological reservoir’ effects, its casual attitude to massive native by-kill, and its contradictions and anomalies, could better exemplify Robin’s claim than the Lord Howe Island REP. ‘By treating the problem animal or plant as the enemy in a war, we lose the option of caring or having consideration for individual creatures. In fact, it is important to suppress empathy in a ruthless war, and efforts to “eradicate” undoubtedly fall into this category’ (Robin 5).

The suppression of empathy necessary for such military/‘conservation’ campaigns, grounded so often in a nostalgia for a moment before ‘alien’ human intrusion (and reminiscent of the now discarded idea of ecological ‘climax’ together with rigid applications of categorisations of flora and fauna (such as ‘native’ and ‘alien-invasive’) result in what Thom van Dooren has characterised as a practice of ‘violent-care conservation’. The vexed question of ethics and the clash of ethical approaches is thus also a focal point in the REP debate over owls, where yearning for the holistic environmental past clashes with care for animals and plants in the present.

Few residents of Lord Howe Island are *not* interested in conserving the environment and given that the one surviving ‘industry’ is tourism, most – aside from public servants – make their living from it. Almost all would be happy to make the island rat-free, but argue for continuing the current *control* method, while at the same time protecting and encouraging the claimed rat-endangered species (since these are mostly small animals and plants), in purpose-built enclosures as well as rat-proofing some ‘in situ’ areas. Another supported strategy is to continue using current bird-proof rat bait stations, but begin to implement also the specifically rat-targeted genetic and infertility control options currently being pioneered, with notable

success, in the United States and Europe. Moreover, the increasing use, in New Zealand, of the ‘Good Nature A24 traps’, with their instant killing method, protection of all other species from both entering the traps *and* dying of secondary poisoning, offer a New Zealand example, which – unlike its 1080 and Brodifacoum toxic chemical exports – is well worth emulating. These methods, especially the A24 traps and fertility controls, offer a much more humane way to rid the island of rats, and significantly, do not endanger the other bird species who will share the rats’ painful Ebola-like haemorrhagic death over a three- to six-day period.

Conflict over the *method* of rat extermination becomes a key issue, not only because of the likelihood of the project’s failing, and because of the chemical contamination of the island and its littoral zone, but because many find the poisoning method unethical in the extreme. As Mark Sagoff notes in his aptly titled ‘Animal Liberation and Environmental Ethics: Bad Marriage, Quick Divorce’, there has been an increasingly widening gulf between those who consider individual animals and their welfare as of ethical importance, and those (for example Parks and Wildlife policymakers) who see animals as significant only for their place as species in an ecosystem. The arising ethical dilemma fractures the potential of a united front in a much needed concerted action to save environments, species, animals and plants from those people who care for *none* of these things; who see the world as the exclusive province of humans and their ‘progress’ and ‘development’.

In ‘The Anguish of Wildlife Ethics’, philosopher Freya Mathews considers the history and nature of the unfortunately opposed (rather than united) camps, of the environmental/animal movements. She sees the evolution of this philosophical clash traceable in the very evolution of human societies, within which run two different ethical strands. What she terms the ‘deontic’ approach underlies contemporary environmentalism, while the ‘axial’ has ‘increasingly provided the ethical foundations of our relationships with animals’. The ‘deontic’ ethic, is, she argues, characteristic of hunter-gatherer societies, while the ‘axial’ is more ‘appropriate within the framework of civilisation – the agrarian societies that evolved into the urban-industrial formations of the modern era’:

The axial conception is based on empathy and underlies our contemporary sense of animal ethics, while ecological ethics, on the other hand, is underpinned by a deontic conception – not ethical at all in the axial sense – and mismatched, normatively speaking, with the material and metaphysical practice of modern societies. (114)

The ‘deontic’ approach, ‘less an ethic than a law’, in Mathews’ view, nevertheless still underpins most Parks and Wildlife Department policies in Australia. The latter’s methods of short-term cruelty (or sometimes even prolonged suffering) to individuals and/or species designated as ‘unwanted’ (for whatever reason) are in urgent need of more nuanced approaches.

The questioning of such ‘violent-care’ conservationist strategies is coming not just from those who regard an ethical approach to conservation as desirable, but from those who fear potential long-term environmental damage in an era of climate change and human population pressure. As Fred Pearce argues in *The New Wild: Why Invasive Species will be Nature’s Salvation*:

What conservation should really be about in the twenty-first century should not be about trying to preserve nature in aspic, still less about trying to recreate the past... Rather than fighting a losing battle to protect what we imagine to be pristine nature, we should be encouraging nature’s rebirth, often through the dynamism and invasive instincts of alien species. (5)

Pearce is clearly not referring to rats, but his point should be well taken in relation to the owls, and in relation to the prospect of re-wilding the phasmids. The ‘natural order’ of Lord Howe Island’s environment at the point of its human discovery can never be restored. But as Mathews asks:

does this mean that we cannot address the ecological disorders that have arisen as a result of our derangement of nature? By no means. We can address these disorders simply by reinstating nature as the manager of itself. We can, in other words, reassemble the ecological mosaic that civilisation has shattered rather than trying to replicate by our own actions, the roles of missing elements... With a current human population that is, from an ecological perspective, vastly excessive, we cannot renew



the whole system of balances, symmetries and reciprocities that characterised the original biospherical system. (129)

The ‘death work’ then, as Mathews terms it, that is integral to ecology, ‘may be handed back to the ecological systems themselves’ (131), and any attempts at ‘rewilding’ must be regarded with careful scepticism. Even Hogan et al., writing on the possibility of owl translocation from Lord Howe to Tasmania – and recommending against it, does note that ‘management of introduced species on islands, however, can be complex due to interactions that have developed between both introduced and native species and between introduced species themselves’ (313). For this reason, they note, ‘total removal of introduced species on islands must be approached with caution’ (313).

The rediscovery of the apparently extinct phasmid on Ball’s Pyramid, and the subsequent success of breeding programmes, especially in Victoria, brought worldwide attention and acclaim. Sir David Attenborough visited Zoos Victoria and was pictured holding a phasmid, while Dame Jane Goodall wrote a foreword to Rick Wilkinson’s detailed account in *The Return of the Phasmid*, which celebrated the insect’s rediscovery and success of the species recovery.

One of the widely advertised rationales and publicity ploys in attracting outside conservation group support for the REP was the ‘rewilding’ aspiration of returning the phasmid to its original home on Lord Howe. But while there have been notable re-wilding successes, not least that of the woodhen on Lord Howe itself, such returns – after long periods involving ecological changes to the original habitat, and imminent climate-change-driven alterations to ecosystems – such attempts need to be approached with caution. Dean Hiscox, a former Parks and Wildlife Ranger, and a member of the party which found the live phasmids on Ball’s Pyramid, cautions care:

We need to have a thorough analysis of the potential impact of the rodent eradication along with the proposals for the reintroduction of species like the Phasmid. Some impacts could be negative. Look at the goat eradication: Everyone thought goat removal

from the Island was a no-brainer. Yet in the wake of eradication, weed infestation increased rapidly. (Hiscox in Wilkinson 121)

Since their place in and effect on the original Lord Howe Island ecosystem is virtually undocumented, their reintroduction to a significantly altered – by climate change, time and the REP itself – ecological complex, is unpredictable. While it was once believed their plant diet was relatively specific, this may have been due more to deprivation on Ball’s Pyramid than to choice. In captivity phasmids have shown a proclivity for quite a number of plants, as well as being prolific breeders. Should they be successfully rewilded, their potential effect on Lord Howe vegetation as a whole, and on specific plants warrants careful consideration.

Many Lord Howe Islanders regard the prospect of their reintroduction rather less than enthusiastically. Their parents and grandparents tell of the phasmids’ invasion of walls and ceilings in local dwellings, and of returning to the home at night with one or two of the large insects attached to clothing. Phasmids would of course be of particular interest to visitors, and display cases which allow the nocturnal insects to be observed in the daytime have already been successful without having the drastic intervention of the REP. Phasmids are not insectivores, but given the potential persistence of Brodifacoum in soils and water, the long term effect on them and on the food chain as a whole remains problematic.

In terms of the Island’s biodiversity, the phasmid ‘rewilding’, if it is ever instituted, will have been accomplished at the expense of major bird losses, potential reptile poisonings, as well as insect and fish contamination, with the long-term effects of this persistence through the food chain remaining unknown. The recent deaths of the New Zealand tuataras provide a stark warning. The tuataras were not in an area that had been poisoned by Brodifacoum, but its uptake by insects had tragic consequences for the endangered reptiles.

We have learned little, it would seem, since either Rachel Carson’s *Silent Spring* and its exposure of the results of our chemical warfare on other species (and its inevitable repercussions for ourselves), or from the environmental histories of so called ‘aliens’ whether deliberately or inadvertently introduced. We still seek that return to a ‘pristine’ pre-colonial Australia; an anti-

evolutionary ‘purity’ of line now ethically unthinkable were it to be re-applied to humans. And we have not yet absorbed the notion that the impact of climate change will most certainly mix ecologies and genetic strains, and make us, in the end, grateful for almost all extra-human life that manages to survive us.

## Notes

<sup>1</sup> See <https://lhiodenteradicationproject.org/>

<sup>2</sup> Two in the Administrative Appeals Tribunal (2018; 2019) and the third in the Supreme Court of New South Wales (2019). The first Tribunal case collapsed when the APVMA poison permit was temporarily withdrawn.

<sup>3</sup> The REP on Lord Howe is the first attempt ever to eradicate rats on a permanently inhabited island, with one exception: the Scilly Island of St Agnes which has only a population of approximately 80 in summer. It is also flat, unlike Lord Howe, and has no thick cover of vegetation. But most significantly, the eradication procedure was not carried out by helicopter drop, but by bait station emplacement.

<sup>4</sup> See for instance, Jonathan Burt, *Rat*, London: Reaktion, 2006; and S.A. Barnett, *The Rat: A Study in Behaviour*, rev. ed., University of Chicago Press, 1975.

<sup>5</sup> The journal of Arthur Bowes Smyth, surgeon of the *Lady Penrhyn*, 16 May 1788, describes the bird ‘paradise’ as he saw it: ‘When I was in the woods amongst the Birds I could not help picturing to myself the Golden Age as described by Ovid’. To modern/sensibilities this seems to offer a telling counterpart to his account of *hunting* the birds:

The sport we had in Knocking down Birds was great indeed... A curious brown Bird ...[was] walking totally fearless and unconcerned in all parts around us, so that we had nothing more to do than to stand still a minute or two and knock down as many as we pleased with a short stick... The Pidgeons also were as tame as those already described and would sit upon the branches of the trees till you might go and take them off with your hand, or if the branch was high, they would at all times sit till you might knock them down with a short stick... Many *hundreds* [my italics] of the sorts mentioned above, together with many Parrots and Parroquetts, Magpies and other Birds were caught... (qtd. in Hutton 11-12)

Thomas Gilbert's observations, from the voyage of the same fleet returning to England, also attest to a pre-human Paradise and the response of the first humans to it. Apparently referring to the Woodhens, Gilbert reports, 'Several of these I knocked down, and their legs being broken, I placed them near me as I sat under a tree. The pain they suffered caused them to make a doleful cry which brought five or six dozen of the same kind to them, and by that means I was able to take nearly the whole of them' (quoted in Hutton 12). (On reflection, it would seem that the human/rat comparison is more unfair to rat than human.)

<sup>6</sup> See again, Ian Hutton, *Birds of Lord Howe Island: Past and Present* for a catalogue of extinctions and near-extinctions on the Island, post-1788 (122 ff).

<sup>7</sup> For details of the Phasmid (re)discovery and subsequent captive breeding programmes, see Rick Wilkinson, *Return of the Phasmid: Australia's Rarest Insect Fights Back from the Brink of Extinction*, Media Dynamics, 2014; and Dick Smith, *Ball's Pyramid: Climbing the World's Tallest Sea Stack*. Dick Smith Adventure, 2014.

<sup>8</sup> Private conversation with Ian Hutton, 2014.

<sup>9</sup> Skara Bohny, 'Cockroach Blue Ooze Provided Tuatara Clue', *The Press*, 6 July 2019.

<https://www.pressreader.com/new-zealand/the-press/20190706/281801400519216>

<sup>10</sup> In this paper I concentrate on the threats the REP poses to environmental/ecological health and welfare. For accounts of the potential threats posed to human health by such large-scale distribution of Brodifacoum by helicopter and open baiting, see for instance:

[https://www.researchgate.net/publication/312339960\\_Brodifacoum\\_poisoning\\_A\\_clear\\_and\\_present\\_danger\\_to\\_public\\_health\\_in\\_the\\_USA](https://www.researchgate.net/publication/312339960_Brodifacoum_poisoning_A_clear_and_present_danger_to_public_health_in_the_USA)

<sup>11</sup> For good accounts of the ways in which the New Zealand government and its commercial allies have encouraged hysteria about 'alien' species, see for instance Nicholas Holm, 'Consider the Possum: Foes, Anti-Animals, and Colonists in Paradise', *Animal Studies Journal*, vol. 4, no. 1, 2015, pp 32-56; and Annie Potts, 'Kiwis Against Possums: A Critical Analysis of Anti-Possum Rhetoric in Aotearoa New Zealand', *Society & Animals* no. 17, 2009, pp 1-20.

<sup>12</sup> See, in particular, Bill Benfield, *At War with Nature: Corporate Conservation and the Industry of Extinction*, Tross 2010, and *The Third Wave: Poisoning the Land*, Wellington, Tross 2011. For an

excellent summary of the Lord Howe REP see Bill Benfield, ‘The Lord Howe Island Rat Eradication Programme: Australians to be Guinea Pigs for a Kiwi Folly’, *The Tasmanian Times*, June 1, 2015; Aleco Vrisakis, ‘The Plan to Poison Lord Howe Island’, Address to the Lord Howe Island Board, 24 November 2015, *The Tasmanian Times*, 3 December 2015.

<sup>13</sup> Hypothesised ‘natural’ predators of the Phasmid before rat arrival are the native Boobook and the Lord Howe Island parrot – both now extinct.

<sup>14</sup> Phasmids were occasionally claimed – on the exuberance that accompanied their (re)discovery – to be the ‘world’s’ rarest insect. In fact, they were, at that time, Australia’s rarest. They are no longer so, however, having absolutely thrived in captive breeding in New South Wales, Victoria and Lord Howe Island.

<sup>15</sup> This also appears to rest on the premise of the now-discarded theory of ecological ‘climax’ states, where a particular ecology was thought to reach its *optimum* balance, or ‘climax’ and remain in that state unless disturbed by (usually outside) influences.

<sup>16</sup> Unlike Parks and Wildlife philosophy and policies in relation to ‘aliens’, many Aboriginal peoples, much more in line with evolutionary principles, adapt their beliefs to include new arrivals, an excellent example being the ‘imported’ buffalo of Northern Australia.

<sup>17</sup> Ian Wilkinson, from the Office of Environment and Heritage, New South Wales, is reported in Rick Wilkinson’s *The Return of the Phasmid*, as having said that ‘it is very likely, along with the other exotic and introduced bird species, like the mallard duck, hybrid black duck, the pigeon and blackbird, that the masked owl will be at risk from Brodifacoum baits. No action will be taken to mitigate the potential effects of poisoning any of these pest species *because they shouldn’t be on Lord Howe in the first place*’ (Rick Wilkinson 116, italics mine).

<sup>18</sup> The endemic sub-species of Currawong on Lord Howe Island frequently attacks smaller seabirds and nestlings, especially the white terns.

<sup>19</sup> See Libby Robin, ‘The Rise of the Idea of Biodiversity: Crises, Responses, and Expertise’, *Quaderni*, vol. 76, Autumn 2011, pp. 25-37.

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