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CULTIVATING BIOSECURITY:

GOVERNANCE, CITIZENSHIP AND GARDENING IN AOTEAROA NEW ZEALAND

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ABSTRACT

Biosecurity involves the selective management or control of biological movement. This thesis focuses on the intersection between plant biosecurity and gardening practices in New Zealand, a country that has developed the most extensive, integrated biosecurity regime in the world. Through plant biosecurity concerns, the way people make their everyday domestic landscapes has become materially implicated in the making of national landscapes, taking on a profound enviro-political significance. By placing New Zealand's contemporary biosecurity regime within a historical framework of very different discourses and practices related to biological immigration, these concerns are revealed to be both historically and geographically constituted.

The thesis considers how contemporary plant biosecurity is produced and organised in New Zealand, how it is enacted in situated practice, and the ways publics participate within, actively produce and challenge plant biosecurity ideals. A multi-stranded methodology is employed, utilising in-depth interviewing techniques, participant observation and textual analysis. The theoretical framework is informed by governmentality, environmentality, and environmental citizenship frameworks. The empirical research is divided into three parts. Firstly, it attends to the scientific and legislative rationalities through which pest plants are classified and categorised. Secondly, methods of public engagement and the everyday strategies of enforcement undertaken by plant biosecurity personnel are considered. Finally, the attitudes towards biosecurity of gardeners and participants involved in ecological restoration programmes are considered. I argue that contemporary biosecurity practices in New Zealand display flexibility and sensitivity towards the shifting spatio-temporalities of non-native plants. The production of environmental subjectivities through which biosecurity is enacted, are formed through the practical negotiation of personal, political and biophysical agencies.

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LIST OF ACRONYMS

ARC	Auckland Regional Council
BNZ	Biosecurity New Zealand
BOP	Bay of Plenty
BSE	Bovine Spongiform Encephalopathy
DoC	Department of Conservation
EIA	Environmental Impact Assessment
ERMA	The Environmental Risk Management Authority
FMD	Foot and Mouth Disease
HSNO	Hazardous Substances and New Organisms
IHS	Import Health Standards
IUCN	International Union for the Conservation of Nature
MAF	Ministry of Agriculture, and Forestry
Mfish	Ministry of Fisheries
MoH	Ministry of Health
NETS	National Education and Training
NPMS	National Pest Management Strategies
NPPA	National Pest Plant Accord
NZERN	New Zealand Ecological Restoration Network
NGO	Non Governmental Organisation
PPO	Pest Plant Officer
RPMS	Regional Pest Management Strategies
RMA	Resource Management Act
SPS	Sanitary and Phyto-Sanitary
UOs	Unwanted Organisms
WTO	World Trade Organisation

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LOCATING BIOSECURITY IN NEW ZEALAND: A HISTORY AND INSTITUTIONAL OVERVIEW

> We've been here for 150 years and we've turned the whole place into custard (Craig Davey, Pest Plant Officer for Horizons Regional Council, interview 2:2005).

1.1 INTRODUCTION

In 1817 my great great grandparents left Scotland via Ullapool, to make a new life for themselves in Nova Scotia (Robinson 1952). After 30 years of struggling on these inhospitable islands, their children made the decision to move again and make a home elsewhere. This time they were destined for New Zealand. In 1853 they settled amongst the first Europeans at Waipu, near the top of the North Island. The similarity between the landscape and their received memories of Scotland was a providential omen, and eased their homesickness. As the men took stock of the land, the women developed the homestead. An old mattress stuffed with hay that had made the sea voyage more comfortable was emptied at the end of the garden. The following spring, new grass growing at this spot caught their attention. The grass was strong and wiry and appeared resistant to cold and drought. It was just what was needed to provide grazing for their cattle, where the soil had been eroded following tree felling. The grass seed was distributed throughout the district, and soon 'Waipu Brown-Top' was being sold to settlers across New Zealand (Robinson 1952). The chance transportation and disposal of the grass seed was having extraordinary national implications. These links, between the domestic/mundane and the national/extraordinary, in the context of both human and non-human migration, is the subject 'matter' of this thesis.

A biosecurity threat is defined by the International Union for the Conservation of Nature (IUCN) as 'matters or activities that individually or collectively present biological risk to ecological welfare or to the well-being of humans, animals and plants' (Fascham and Trumper 2001:7). Biosecurity is frequently associated with 'biological invasion', the 'naturalisation and unintended spread of unwanted organisms in areas where they have not

previously occurred naturally' (Jay *et al.* 2003:1). Biosecurity systems including political legislation, institutional arrangements and practical enforcement have been developed by countries to protect themselves against this biological risk. Donaldson and Wood (2004) remark that 'biosecurity' was largely unheard of as a term in the UK until the 2001 Foot and Mouth Disease (FMD) outbreak, during which it evolved from reference to practices such as cleansing and disinfecting, to the surveillant control of movement and spaces. In the post 9/11 era, the term has also come to be associated with the prevention of bio-terrorism and the spread of apocalyptic human viruses (Collier *et al.* 2004). In New Zealand, however, the meaning of biosecurity is broader and its history longer. The term 'biosecurity', was coined in New Zealand from the term 'agricultural security' in the early 1990s, and New Zealand was the first country to use the term 'biosecurity' in legislation in 1993 (Parliament of New Zealand 1993).

New Zealand is frequently cited as leading the world with the most comprehensive and integrated biosecurity system (Fascham and Trumper 2001; Jay *et al.* 2003). Biosecurity in New Zealand is currently defined as the 'exclusion, eradication or effective management of risks posed by pests and diseases to the economy, environment and human health' (Biosecurity New Zealand (BNZ) 2006). The definition has changed in emphasis over the 17 years that a discernible integrated national system has been in place. The justificatory drivers for biosecurity have shifted focus from agriculture, to include concerns for native ecosystems (Williams and West 2000). The current biosecurity regime is simply one manifestation within the context of 150 years of social and legislative practices related to native and non-native species' concerns.[1] During this time what has evolved is a complex system of control responses to a dizzying array of non-native organisms, which are classified as threats in a variety of ways. New Zealand's contemporary biosecurity situation and approach is distinguished by its status as an island nation and its strong focus on border protection. It has a high proportional expenditure on biosecurity activities, inter-agency co-ordination of policy by an independent Biosecurity Council, and a high level of technologies, legislation, institutions, persons and activities that integrate to produce a particularly complex biosecurity

[1] In New Zealand, the term 'native' is used to refer to native species. All other species are assumed to be non-native/alien. 'Noxious plants' or 'pest plants' are historically specific terms to refer to non-native species that are the target of management attention. 'Weeds' are used in a conversational context when the educational programme 'Weedbusters' is being discussed. However, outside this context, the term tends to be used to refer to vegetable-patch type weeds, rather than environmental weeds. 'Invasives' may also be used. In this thesis I will use 'non-native' when I need to distinguish these from native species in the abstract, 'noxious plants' or 'pest plants' when historically relevant, and 'alien' within references to the academic debate over native/alien species.

regime. As the New Zealand geographers Jay *et al.* (2003:7) state in an overview of the regime:

> It involves different levels of government (national and regional), different biosecurity operations (surveillance, border control, and pre- and post-border control) and different biosecurity objectives (control of economically significant pests and weeds, protection of native species and ecosystems, protection of health, and the like) all working with some degree of inter-relationship.

'Biosecurity' in New Zealand is given meaning and credence through an array of specialist knowledges. These include ecology, agriculture, forestry, fishery and veterinary science, economic analysis, legal knowledges, risk analysis methodologies, and the expertise of animal behaviour specialists and dog handlers. These discursively complex and disparate stocks of knowledge are drawn on to make sense of and transform biosecurity-related ideas and values into a coherent legal and policy approach. New Zealand therefore provides a fascinating empirical arena to explore the meanings and practices, conflicts and negotiations that occur through the enactment of 'biosecurity.'

While there is a substantive literature on the science and ecology of species invasions, there has been little analysis or empirical work on its social or political elements (Jay *et al.* 2003), with the exception of Hinchliffe's (2001) innovative conceptualisation of natural indeterminacy in the Bovine Spongiform Encephalopathy (BSE) crisis in the UK. During the course of this thesis, there has been a growth of academic attention to the social, cultural and political elements of biosecurity. Notably, Donaldson and Wood (2004) analyse spatial surveillance and categorisation processes in the UK government's response to the 2001 Foot and Mouth Disease (FMD) outbreak, and Braun (2007) considers notions of sovereignty within the geopolitics of the international control of bird flu. Biosecurity cuts across a longer strand of established work in geography, anthropology and environmental studies, which has paid attention to the philosophical underpinnings of native/alien classifications (see for example Kendle and Rose 2000; Green 2002; Harper 2002; Hettinger 2001; Peretti 1998; Simberloff, 2003; Smout 2003; Warren 2007). This literature has been slow to substantiate its theoretical claims with empirical research into the actual enactment of these classifications in governance regimes and public practices.

My focus in this thesis is on plant biosecurity in New Zealand and specifically how the governance of garden plants occurs. This focus has arisen for a number of reasons. Firstly,

attention to plant biosecurity is neglected within the nascent biosecurity literature. This constructs biosecurity as a practice associated with, or of significance only to, agricultural practices, animals and moments of crisis such as disease outbreaks (Braun 2007; Donaldson and Wood 2004; Hinchliffe 2001). Plant biosecurity mobilises different actors, concerns, practices and rationalities, and significantly, different types of ecological relations. In developing a social science response to biosecurity practices, it is essential that the full spectrum of approaches and practices is considered.

Secondly, gardening is now seen to be a crucial pathway through which non-native plant species move into and around New Zealand. The domestic garden is therefore a significant site upon which contemporary biosecurity policies in New Zealand are focused. Attention to the garden and concern for native flora is an outcome of a specific set of processes and problematisations that themselves require explanation. The intersections between what are, at first glance, very different ideals and values of gardening and plant biosecurity are of considerable significance to understanding the local specificity of biosecurity practices.

Thirdly, the problematisation of gardening plants and practices centres on more everyday practices which are played out in traditionally 'private spheres.' Tensions between private gardens and the implementation of the publicly endorsed biosecurity regime raise interesting questions. Attention to the biosecurity-related governance of the garden has the potential to contribute to a growing body of literature within cultural geography and beyond. In this literature, considerable effort is devoted to garden history, gender relations (see Bhatti and Church 2000), plant agency (see Hitchings and Jones 2004), concepts of hybridity (see Franklin 2002) and the impact of cultural norms leading to social coercion (Wilson 1991) in the context of domestic gardens. This thesis therefore contributes a unique perspective by considering the *politicisation* of the garden. This new regulatory attention may herald a new era for gardens and gardening. What if the most significant event in gardening history for future gardening practices turns out to be when plants jumped the garden fence?

This thesis thus considers the contemporary enactment of plant biosecurity in New Zealand. The practices and rationalities that make up internal pest plant management will become the key focus, in which concerns over environmental pest plants, native ecosystems and gardening plants and practices are central. Governance, scientific understandings and popular values and practices are all a dynamic part of this biosecurity story. This thesis will develop a

research approach which pays attention to these overlapping knowledges, practices and spaces of significance. My approach to this issue complex is organised around the following broad research questions:

1. How is plant biosecurity in New Zealand organised and practised?
2. How is plant biosecurity communicated and enforced in situated practice?
3. In what ways and for what reasons do gardening publics participate, actively produce or challenge, plant biosecurity ideals and practices?

In order to answer these questions, in chapter two '*Constructing Theoretical Resources: the Environmental Challenge for Social Theory*' I review how the theoretical frameworks of 'biopolitical governmentality', 'environmentality' and 'ecological citizenship' can contribute to understandings of biosecurity. I argue that the concept of 'biopolitical governmentality' draws attention to the intersection of governmental apparatus, expert knowledges and subtle processes of control, which allow the extension of governance into everyday 'non-political' life. The 'environmentality' framework takes these Foucauldian understandings of governance into the environmental sphere. This extends governance to encompass the non-human, draws attention to processes of calculation in the constitution of environmental governance, and emphasises the formation of environmental subjectivities. Finally, concepts of ecological citizenship are utilised to allow for more active publics, to draw attention to the private sphere, and to emphasise the material basis of political problematisations.

In chapter three, '*Researching Plant Biosecurity in Policy, Community and Garden Spaces*' I consider the ways these theoretical literatures support particular methodologies. I additionally draw on methodological approaches championed within research on people-plant encounters. Together, these allow me to formulate a research approach which utilises adapted in-depth interviewing techniques, forms of participation observation, and textual analysis of policy documents and public communication literature.

Chapter four, '*Knowledge Practices in the Formation of Biosecurity Governance*,' is the first of three empirical chapters. I consider the ways that pest plants are legislatively classified by the biosecurity regime in two regulatory formats. I go on to consider the intersection between these governance strategies and expert knowledges of weed ecology. This chapter develops

understandings of the complexity of categorisation processes, and their association to the socio-materiality of the governed entities.

In chapter five, *'Translating the Regime: Everyday Practices of Communication and Enforcement'*, I consider the ways these regulatory frameworks are operationalised, as biosecurity personnel negotiate access to the domestic garden. Despite considerable legislative powers, social norms of courtesy and the need for public goodwill produce a tentative rather than authoritative interface between the biosecurity regime and gardening publics. I consider public education activities, which are shown to utilise a variety of discursive and embodied approaches to communicate plant biosecurity concerns. The aims of these activities range from communicating the concept of weedy species, to encouraging active bodily participation in biosecurity.

Chapter six '*Being a Biosecure New Zealand Citizen: Learning, Doing and Belonging in the 'Shared' Garden'*, draws on my research with domestic gardeners and participants in public weed control activities. I argue that biosecurity is understood through embodied interactions within the garden and wider landscapes. The enactment of broad support for biosecurity is contingent on memorial associations with particular plants, and experiential knowledge of the biophysical conditions of the garden. This chapter develops understandings of the negotiation between national and individual ecological citizenships.

In chapter seven *'Biosecurity: an Emblematic Environmental Issue?'* I review and position the thesis within social science literatures on biosecurity that emerged during the course of my research. This highlights the heterogeneous ways biosecurity is understood and practiced internationally. I consider the contributions of the thesis to wider literatures through a review of academic debates over nativist conservation. I conclude that ecological subjectivities connected to biosecurity are negotiated through 'technologies of power', 'technologies of the self' and 'ecologies of association.'

In this thesis, therefore, I focus on the detailed processes of categorisation, control, communication, enactment and negotiation, undertaken through the biosecuritisation of garden plants in New Zealand. This chapter begins the thesis by introducing New Zealand's wider historical, legislative and institutional context in which these particular practices are situated. I trace a history of shifting attitudes towards native and non-native species, from the

accidental and intentional acclimatisation of non-native plants with European settlement, to the growth of concern for 'native' nature. I detail the development of what has come to be known as a 'biosecurity regime,' from the first legal enactments to the present day. Native nature emerges as an object of concern, and the garden, gardening plants and practices, a source of threat. In the second half of the chapter, I provide an overview of the contemporary biosecurity regime, from international policy frameworks, through the pre-border and border governance arenas, to the focus of this thesis on post-border pest plant management.

1.2 An Environmental History of Biosecurity in New Zealand

This section will consider the processes underpinning the transportation of flora and fauna to New Zealand during early European settlement. I chart a shift in attention to native species and landscapes, a growth in concern over the environmental impact of non-native species, and an alignment of a New Zealand national identity with native nature. New Zealand enjoys relative ease in classifying 'native' and 'non-native' species, due to the recent occurrence of human settlement, and the solidity of New Zealand's national boundaries. The distinction is made according to those that arrived before human settlement or 'naturally', and those that arrived with and after human settlement.

This history of the acclimatisation of non-native plants in New Zealand, when juxtaposed against the contemporary biosecurity regime, makes New Zealand a particularly interesting focus for empirical investigation. Providing this history is more than simply a point of interest. Firstly, it denaturalises biosecurity as a contemporary response to non-native species issues. Secondly, it is the story of the plants themselves that are generating contemporary concern, as many garden plants currently naturalising in New Zealand are thought to have been imported during the 1920s and 30s. Thirdly, this history is drawn on as a source of explanation and justification for collective responsibility for environmental damage caused by invasive plants.

The Settlement of New Zealand by People, Plants and Animals

> In the wake of our sailors, explorers, soldiers and pioneers, they steal unnoticed, unobserved. The proverbial sun that never sets on the flag, never sets on the chickweed, groundsel, dandelion and veronicas that grow on every British garden and every British garden path (Guthrie-Smith 1999 [1921]:236).

The broad processes of the recombination of life to and from the Antipodes has been described and theorised by environmental historians and geographers (notably Clark, A. 1949, Clark, N. 2002, Clayton 2003, Crosby 1986, Dunlap 1999, Flannery 1994, Miller 1996, Star 2003). This literature is notable for its attention to the biological in explanations of the success of European settlement, and was an influential attempt to engage non-humans in accounts of 'social' change. Polynesians (Maori) settled New Zealand in the 1200s, introducing the Polynesian dog and rat, and a number of tropical plants. By the time of European contact in the late eighteenth century, large parts of the native forest had disappeared, and 34 species of endemic land birds had become extinct (Jay *et al.* 2006). The subsequent introduction of non-native plants to New Zealand is inextricably linked to every stage of European settlement, with whalers, sealers, missionaries and immigrant ships all contributing actively to the process. Clayton (2003) suggests that the first European weeds were introduced to New Zealand in 1773 by Captain James Cook within vegetable gardens in Dusky and Queen Charlotte Sounds. Darwin, who visited in 1835, enthused about the plants grown by missionaries at Waimate:

> I cannot attempt to describe all I saw; there were large gardens, with every fruit and vegetable that England produces; and many belonging to a warmer climate. I may instance asparagus, kidney beans, cucumbers, rhubarb, pears, figs, peaches, apricots, grapes, olives, gooseberries, currents, hops, gorse for fences, and English oaks; also many kinds of flowers (Darwin, 1845:403, in Bagge 2000:16).

The first organised European settlement in New Zealand occurred in 1841, and was conceived as an exemplification of the colonising theories of Edward Gibbon Wakefield held in Britain at that time (Clark 1949). European settlers arrived in New Zealand with a pre-existing set of goals for the environment as well as specific cultural methods to achieve these goals (Star 2003). The dream of transferring a cross-section of English rural life to the new country was remarkably successful:

> South island was, in its cultural rural landscape in the eighteen-nineties, very much the "Britain of the South" as visitors from the centre of empire frequently and fondly dubbed it (Clark 1949:384).

Clark (1949) cites climate as one principal factor for the relative ease of establishment of British patterns of farming.

Mack and Lonsdale (2001) identify three overlapping phases of plant and animal introductions: the accidental, the utilitarian and the aesthetic. The first intentional introductions were domestic animals with economic worth, and agriculturally valuable crop plants (Star 2003). Williams and Cameron (2003) argue that to the European eye, New Zealand lacked edible fruit and tubers, and had only two species with qualities which were relevant for utilitarian and commercial purposes. New Zealand, from the beginning of European settlement, was dependent on the earnings of its land-based industries; farmers, foresters and horticulturalists imported new species for commercial experimentation (Jay *et al.* 2006). Bagge (2000) describes advertisements for plants and seeds placed in early editions of colonial newspapers.

It is hard to unpick utilitarian needs for particular plants from the settlers' desire for aesthetic familiarity. Star (2003) refers to the settlers' emotional attachment to the flora and fauna of their youth. The white population were largely British born during this period, and wanted to reinforce and display this identity in their surroundings. This desire was, for the strongly literate population, not without a self-conscious sense of the romantic (Dunlap 1999). Commercial gardeners sent out British flowers to homesick settlers. As New Zealand lacked flora with conspicuous flowers, these were particularly powerful reminders of home, providing welcome colour to what was seen as drab native bush (Williams and Cameron 2003; Worsley 1999). 75% of the 25,000 exotic vascular plants estimated to be in New Zealand today were brought in as garden plants.

Figure 1.1: ***'Dunedin in Melville Street, January 1890'*****, in Dunn (1985:33). The wheelbarrow, bucket and spade in the foreground are the tools used to tackle the dark, foreboding bush.**

Active acclimatisation of plants and animals was a major trend in New Zealand from the 1840s. This formalised into Acclimatisation Societies in the 1860s with a network of local societies intent on stocking the country with useful and beautiful species (Dunlap 1999). These societies were seen to represent the growth and maturity of New Zealand, through the establishment of ties with the scientific elite in Europe. Acclimatisation activities and practices of collecting and recording were, therefore, intimately associated with the processes of nation building (Dunlap 1999). Not only did acclimatisation societies support Empire economically, they represented the conquest and subjection of nature, lands and peoples, and the triumph over the restraints of nature and geography. The rhetoric of conquest had a biological twist, as European species were seen to be superior to New Zealand natives, and bound to win in the Darwinian 'survival of the fittest' (Clayton 2003). This rhetoric was extended to Maori people as much as the animals and plants. Acclimatisation activities in

New Zealand formed a counter-current to the processes which ran from the outskirts of empire to the metropolitan botanical gardens, zoos and curiosity museums in Europe (Dunlap 1999). Here, new species were tested and the promising ones shipped out again, aided by the increasing development of transportation technologies. These famously included the Wardian case, a miniature greenhouse used for transporting plants on long journeys.

The extent of this project cannot be understated: agriculture, and the economy of Empire, rested on transplanted animals and plants (Dunlap 1999). Williams and Cameron (2003) highlight that New Zealand was settled in the period of British history that coincided with crucial moments in the history of gardening. This included the development of glasshouses, the creation of public gardens, and the popularity of urban gardening fuelled by the first gardening magazines. A mutually constitutive process existed, as the discovery of new lands fuelled gardening passion, and, in turn, influenced the environmental history of these countries.

A contemporary exhibition in Wellington's Te Papau museum reveals the items that different settlers brought with them when starting a new life in New Zealand. This thought-provoking display suggests what entities pioneers, individuals and families believed they needed to sustain their cultural existence in an unknown environment. What the display cannot show are those entities these people *unintentionally* brought with them. Overlapping with these intentional imports, therefore, plants found other means to arrive in New Zealand, in the ballast of ships, for example, and as contaminants in seed imports. Guthrie-Smith (1999 [1921]) argues that it was these unintentional imports, the weeds of Europe, which led to the success of European settlement (see Clark 2003).

What was it like for a plant or animal relocated to the new country at this time? Their seasonal rhythms completely disturbed, all the smells changed, the tracks that they and their ancestors repeatedly made on the landscape missing (see Jones, 2005 for an approach to animal mobility and notions of dwelling). With no environmental entanglements, with some things strangely familiar and other things just strange, does their instinctive knowledge still help them? Do they still know when to produce and open their flowers, when to start building their nests? Clark (2003) reveals that in these situations of radical displacement, new and unusual alliances are formed.

Processes of Environmental Change

The stamp of Britain on New Zealand was not just about new arrivals but also about displacement and erasure, of peoples, plants and native birds. This was an active and material process. The land was described, mapped and categorised, cleared, settled and farmed in a 'frantic rush' (Dunlap 1999). As Dunlap (1999) highlights, the first process of land development and settlement was the ubiquitous extensive felling of trees.

Figure 1.2: ***'The Manukau Harbour, Big Muddy Creek circa 1866',*** **(Dunn, 1985:xiv).**

Native birds fell to hunting, land clearing and imported predators, but also to science and amateur collectors. Crosby (1986) coined the term 'Portmanteau biota' to describe the assortment of European co-adapted species (micro and macro flora and fauna) intentionally and accidentally transported to the Antipodes, which supported the establishment of European settler-societies. Crosby attributes the success of European colonisation to be as much if not more a result of European pests and diseases, as it was a military conquest. These 'foot-soldiers' of colonisation (Guthrie-Smith 1999 [1921]), swept across New Zealand, catalysing a myriad of changes (Bright 1999, Flannery 1994).

An invasive species is defined by the International Union for the Conservation of Nature (IUCN) as an alien species which 'becomes established in natural or semi-natural ecosystems or habitat, is an agent of change, and threatens native biological diversity' (IUCN Guidelines 2001:5). The unique co-adaptation between European cultures and species allowed the plants that made it to New Zealand to respond to the transformations occurring with settlement and the establishment of agriculture. European biota had learnt to live with pressures that encouraged weedy behaviour, producing traits such as swift breeding and dispersal, the rapid colonisation of bare ground, and tolerance of human proximity (Flannery 1995). Repeated disturbance and impoverished soil was familiar territory for European plant species. New Zealand's indigenous species had evolved in relative biological isolation for millions of years, and found it impossible to compete.

Environmental change is not the only change brought about by the 'radical effects of displacement.' Clark highlights the effects of a newly encountered environment on the displaced species themselves:

> The host environment may be altered irrevocably by the presence of a new organism but so too, inevitably, is the one who runs wild transformed by the terrain in which it insinuates itself (2003:166).

The Edenic storyline of the irreversible acculturation of nature through the taint of human contact is countered by invasive species in New Zealand, which often started as domesticated and 'cultured', before becoming progressively more wild or 'natural' (Clark 2003:172). For example, refusing to act as an 'immutable mobile' (Latour 1987), gorse began to flower for longer periods and grow to a greater height in New Zealand than in its native ranges. This change, one of a 'thousand variations on the theme of its own form' (Dening, 1980: 31-2,

quoted in Clark 2003), has implications for the rate at which the plant propagates and spreads. Clark (2003:175) describes this as 'biological improvisation,' physiological divergence due to the evolutionary consequences of displacement from the organism's 'natural' habitat into a new situation free from predators and pathogens. Invasive plants are therefore both 'motile and mobile' (Hinchliffe 2001:192), and this mobility is mutually constitutive of motility. Gorse (*Ulex europaeus*) was important during the earliest stages of settlement, acting as a living fence to demarcate farm boundaries, essential to the establishment of sheep farming. The differences between gorses' behaviour in Europe and its exceptional growth in New Zealand, supported the Arcadian myth of the abundant fertility of New Zealand's soil. New Zealand is seen to have a particularly favourable climate for temperate plants, with ten years tree growth equated to twenty five years growth in other temperate regions.

It was not a simple case, however, that the relationship of gorse to its new environment allowed it to thrive out of control. In Britain, intensive husbandry and stock grazing kept gorse in check. In New Zealand, however, extensive farming practices removed this control pressure. The success of gorse is additionally linked to farming practices which were, in turn, affected by the marginality of land that made more intensive farming impossible. The spread of gorse occurred through its relationship with other entities. Its seeds travelled in mud on dirty machinery and in the tread of boots, in the digestion of finches and quails, clinging to the woolly coat of sheep, and in the currents of air and water. The success of specific invasive plants in New Zealand can therefore be partially attributed to their 'sociability': an ability to make associations with the new environment, and with objects of dispersal and transportation (Hinchliffe 2001). The transformation of New Zealand was therefore not solely a human project. The interweaving of these environmental, material and cultural causal factors undermines the construction of certain plants as 'naturally' invasive.

So, while the aim of acclimatisation practices was to change the environment, it was the assumed existence of incontestable natural entities underpinning these practices that contributed, as Hinchliffe (2001) suggests, to the ensuing environmental problems. Star (2003) argues that environmental damage provoked changing attitudes towards the practice of acclimatisation itself. The potential for transformation through displacement is, therefore, expanded beyond the environmental and biological to include the cultural. Clark reminds us that all these changes must be understood as operating within a constrained contingency. The

transported plant is therefore 'neither free to pursue any or every option, nor destined to reproduce itself in a constant and self-identical fashion' (Clark 2003:169). Instead, environment and bodies (human and non-human) are mutually conditioning and transformative.

The Growth of Environmental Concern

Clayton (2003) identifies expressions of concern towards the transformation and reconstruction of New Zealand in its colonial literature, politics and civic institutions from the late nineteenth century. This was particularly related to the problems caused by introduced weeds. Despite the typical picture of the early settler at war with the native bush, Star (2003) also understands the historical record to reveal concern for the indigenous environment. However, this was typically expressed in terms of economic worth. The rapidity of perceived negative effects that the successfully acclimatised species were having on the New Zealand environment brought the practices described above into question (Dunlap 1999). The settler society was faced with the realisation of plants as 'things' that 'strike back' (Latour 2000, in Donaldson and Wood 2004:387). The transition between understandings of imported plants as 'useful', and their informal re-categorisation due to their invasive behaviour as 'nuisance' was blurred (Bagge 2000). For example, growth in awareness and concern for the spreading infestations of gorse occurred alongside its continual use and promotion.

Dunlap (1999) also attributes a turnabout in perspectives towards introduced species to fading memories of England as home, as the first generation of New Zealand-born grew up. As introduced species lost their positive association as reminders of England, an independent national identity was increasingly claimed for New Zealand, and this was represented through symbols of native nature (Star 2003). Dunlap (1999) details their use in national symbols, nature literature and landscape painting, formal and informal outdoor education, and through national parks. Through these processes New Zealand's national border began to take on a new solidity, as the attribution of positive and negative traits across the conceptual boundary between native and introduced species began to shift. Due to these growing concerns, over the twentieth century acclimatisation societies underwent a gradual reduction in function. They disbanded, took over botanical gardens or zoos, or pursued less ambitious aims such as

stocking streams with fish. The societies eventually transformed into quasi-governmental organisations involved in the conservation of game and the management of fishing licenses, with duties of wildlife law enforcement (Dunlap 1999).

This emerging appreciation of native nature and increased concern about environmental change was also prompted by and occurred alongside developing governance approaches to invasive species. The historical development of biosecurity governance in New Zealand forms the subject of the next section.

1.3 The Development of a Legislative Response to Invasive Plants

The following discussion charts the significant developments in New Zealand's internal approach to plant biosecurity from 1836 to the 1980s. This section highlights the over-riding focus of the developing biosecurity regime on agricultural weeds. Jay *et al.* (2003) detail the political priorities, institutional divisions, allocation of funds and the agronomic scientific base of a country dependent on external trade in land-based products, which contributed to this emphasis on agricultural pests.

The Control of Thistles Act (1836) was the first legal enactment regarding the control of a plant species in New Zealand (Parliament of New Zealand, 1836). This was followed in 1859 when the provincial governments of Taranaki and Nelson passed laws compelling farmers to keep gorse (*Ulex europaeus*) hedges trimmed and banned the planting of new hedges (Worsley 1999). Bagge (2000) charts the debates that occurred in farming journals and within parliamentary minutes over the 1880s and 1890s, regarding the increasing alarm felt by farmers over the spread of invasive plants such as gorse, broom (*Cytisus scoparius*) and blackberry (*Rubus fruiticosus*) on crown land and roadsides, and the slowness of the parliamentary legislative process. While the establishment of the Department of Agriculture in 1892 provided an effective forum for expressing concern and researching national weed trends, the responsibility for further legislation lay elsewhere in the Government (Bagge 2000). Blame was also directed towards farmers themselves, and some parliamentary members called for the use of police prosecution against offenders (Bagge 2000). The

emphasis on maintaining farm boundaries, and concerns to prevent the establishment of invasive plants in less affected regions of New Zealand, re-emerge as focuses of concern throughout the twentieth century.

In 1891 a parliamentary committee was formed to consider the extent of the weed problem, and gather opinions from landowners. In 1892, the same year that the first Minister of Agriculture was inaugurated, the Noxious Weeds Bill was proposed before Parliament (Jay and Morad 2006). Controversy over enforcement on private land, the perceived utility of some weeds, responsibilities for costs of eradication, and the futility of extending the burden of control over marginal land prevented successive bills being accepted. These debates were also grappling with the broader issues of what constituted a 'weed,' and a sense of hierarchy and regionality within the definition of a weed. The Noxious Plants Act, the first national legislation regarding the control of noxious weeds, was finally passed in 1900 (Parliament of New Zealand, 1900).[2] The Act, administered by the Department of Agriculture, gave some degree of border control, and contained a three-tier definition of weeds (Clayton 2003; Worsley 1999). The first schedule contained nationally designated noxious weeds that were to be removed on sight and that were banned from purchase or sale. The second listed well-known weeds that could be reassessed as 'noxious weeds' by individual provincial weeds councils within their regions, and the third schedule listed weeds with noxious seeds (Bagge 2000).

The enforcement of the 1900 Noxious Plants Act was, however, seen to be ineffectual due to the absence of any attempt to control invasive plants on Crown land, and a lack of effective control methods. The shortage of male labour during World War One also allowed infestations to spread further. Clayton (2003) refers to the New Zealand scientist G.M Thompson, working in the 1920s, who was pessimistic about the effectiveness of any legislative action to eradicate invasive weeds, without the 'useful substitution' of something in the weed's place. He advocated closer settlement of the land and more intensive agriculture. This solution further reveals the agronomistic perspective towards noxious weeds at the time. Clayton (2003) details the debates over methods of weed control, including biological control, replacement cultivation, and the use of pesticides, that occurred from the 1920s to the 1980s.

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[2] The 1896 Orchard and Garden Pests Act focused on the prevention of plant pests, rather than pest plants (see Jay and Morad 2006).

The table below complements this discussion by detailing significant developments in New Zealand's overall approach to biosecurity, which are not central to the governance of noxious plants, and are therefore not referred to in the text. This includes the development of a border control regime, and developments in animal and health related biosecurity, from the 1900s to the present day. Significant points to draw out from this table include the fact that New Zealand has had a system of livestock quarantine in place from the early years of the twentieth century. It has also had a consolidated border inspection regime linked to plant and animal health in operation since 1956, when the Port Agricultural Service was developed in response to Swine Fever. The regime included certification, prohibition through legislation, targeted inspections and treatment facilities (Williams and West 1990).

Table 1.1: Significant Events in the Historical Development of New Zealand's Biosecurity System

Date	Biosecurity Relevant Practice, Context or Event	National Legislative or Institution development	International development
1900 – 1930s	Use of formal quarantine procedures including maximum-security quarantine facilities on off-shore islands.		
1930s – 1950s	Increasing speed and decreasing cost of air and sea travel reduces geographical isolation.	Forest Act (1949). Section 69 prohibits import of tree, seed, timber or timber products that may be injurious to any tree.	
1950s	Swine Fever Outbreak in Devonport	Wildlife Act (1953). All native and naturalised vertebrate protected, controls on the keeping of ferrets due to concerns for native birds. 1956 - Port Agriculture Service developed in response to Swine Fever. Consolidated 'Border Inspection Regime' including certification, prohibition, targeted inspections and treatment facilities. Plant and animal health. Limited points of entry to prevent incursions. High-risk imports processed through max security quarantine facilities.	International Plant Protection Convention est. in framework of Food and Agriculture Organisation (OECD member nations). Purpose to prevent spread and introduction of pests of plants and plant products, and promote methods for pest control. Applies mainly to quarantine pests in international trade.
1970s		Wild Animal Control Act (1977) – control of harmful species of non-native wild animals. All deer, feral goats, thar, chamois, feral pigs and possums now belong to the government.	1979 - International Plant Protection Convention revised.
1985-6	1985 Off-wharf examination of stored products at approved importer's premises. A proliferation of examination points and containment problems. 1986 De-regulation of fresh-fruit imports: significant increase in imports, fragmentation of trade, proliferation of inspection sites. 1987 'Detector dogs' programme for airports initiated. Reassessment of passenger risk profiles to make inspections more effective, actual number of inspections reduced. Insecticide spraying of airport cabins and cargo holds. 1989 Offshore quarantine developed to transfer risk to country of origin. Bilateral protocols formalise NZ's importation requirements – agreements signed with 6 Pacific Island nations.	1987 MAF restructure. Quarantine Services placed within 'MAF Qual.'	

1990-3	1991 Risk management principles developed as evaluation tool for import standards. 1992 MAF's risk analysis tools developed to replace earlier 'country freedom' importation strategy, where countries had to be free of specific diseases to trade with NZ. $200 instant fine system introduced due to high (25/yr) prosecution caseload.	1990 National Agricultural Security Service est., basis for present integrated system. Bringing together offshore quarantine, border protection, post-entry quarantine, disease and pest surveillance, exotic disease and pest response. Biosecurity Act (1993).	1992 GATT development – quarantine requirements seen as possible trade barrier. Convention of Biological Diversity, with article on control of environmentally damaging invasive species.
1993-4	1994 Incursions of Asian Gypsy moth egg rafts in Auckland, exotic ticks on animals and people from overseas. Reassessment of risk profiling of passengers. 1994-5 Import health standards developed and reviewed using risk analysis methodologies. 1995 Incursions of fruit fly in surveillance trap, and white fly in Auckland greenhouses.		
1995-6	Detector dogs begin work at Auckland International Airport. Incursions of fruit fly eradicated in Auckland.		WTO/GATT SPS Agreement.
1996-7	Introduction of photon-based x-ray machines raises interception rates from 54% to 94%. Incursions – Rabbit Calcivirus illegally imported and released, Painted Apple Moth found in Auckland.	Hazardous Substances and New Organism Act (1996). Environmental Risk Management Authority est. to monitor and enforce importation applications.	
1997-8	MAF develops database of Import Health Standards available on website. List of Unwanted Organisms pub., includes 866 animals, 200 plants. 30,000 on permitted 'Biosecurity Index' list.	New Minister for Biosecurity forms Biosecurity Council.	
1999		MAF's Biosecurity Authority created.	
1999-2000	Recommended shifting risk offshore to reduce need for onshore protection.	Review of future biosecurity options by MAF.	
2001		Publication of Parliamentary Commissioner for the Environment's 'New Zealand Under Siege: A Review of the Management of Biosecurity Risks to the Environment' (PCE 2001).	
2001-2		Drafting consultation and development of Draft Biosecurity Strategy.	
2003		New Biosecurity Strategy published in October.	

Adapted from Budd and Arts (2000), Williams and West (2000), Fascham and Trumper (2001).

Returning to my particular story of the governance of noxious plants, it was not until the 1950 Noxious Plants Act that 'real progress' against invasive plants was made (Parliament of New Zealand, 1978; Worsley 1999:30). The Act gave administrative responsibility to county councils, and huge government subsidies encouraged weed control by farmers. This coincided with the introduction to New Zealand of the first selective herbicides 2,4-D and 2,4,5-T (Worsley 1999). The pursuit of chemical and biological controls for agricultural weeds became an industry in itself. Worsley (1999) refers to 'the Subsidy Years', a period from the late 1960s to 1985, when the New Zealand Government offered a range of agricultural subsidies, including a 50% rebate on the purchase and use of herbicides.

In 1978 the Noxious Plants Act was again reformed (Parliament of New Zealand, 1950). This provided for the establishment of a Noxious Plants Council and district noxious plants authorities. Worsley (1999) argues that the development of independent local authorities with the sole purpose of noxious plants administration was a significant innovation. Amongst the responsibilities of the Noxious Plants Council was the overseeing of a range of subsidy issues, the review and approval of the classification of noxious plants, and the development of a training programme for noxious plant officers (Worsley 1999). The Noxious Plants Council also withdrew weed-killer 2-4-5-T from use, due to mounting concerns about its effects on people (Clayton 2003).

The late 1980s saw relevant government restructuring of the management of noxious plants. The Department of Conservation (DoC) was formed in 1987. It took over the land and wildlife management responsibilities from a variety of government agencies, including the Wildlife Service and Archaeology Section of the Department of Internal Affairs, the New Zealand Forest Service, and the Department of Lands and Survey (Napp 2007). The regional government structure as it exists today was formed through the 1989 Local Government Consultation. The regional environmental management responsibilities of various local governance bodies, including the 92 district noxious plant authorities, were assigned to 16 regional councils (Worsley 1999). This led to a shift in language from the use of 'noxious plant' to 'pest plant' to refer to serious weeds. The regional councils' inherited the ingrained focus of the noxious plant boards on agricultural pest plants. This was, however, coming under question due to pressures both within and outwith the biosecurity regime itself. This process of change is the subject of the following section.

From Agricultural to Ecological Concerns

Concern about native and alien species in New Zealand has a long history, but the direct coupling of environmental management concerns over native nature and interests in biosecurity policy is more recent. Until the late twentieth century biosecurity concerns were firmly agronomic. The National *Agricultural Security* Service was established in 1990, and was the basis for the present integrated system (Williams and West 2000). Over the 1980s and 1990s a gradual but significant switch in emphasis from agricultural to ecological concerns occurred, resetting the terms through which biosecurity was understood in New Zealand (Hajer 1995). '*Biosecurity*' was therefore coined to refer to more than agricultural security. In this section I will discuss the rise of ecological biosecurity concerns, which produced the conditions for the contemporary institutional restructuring of the biosecurity regime.

The concept of 'environmental pest plants' has brought with it a different spatial focus, new interest groups polarised in different ways, and new species of concern. Environmental pest plants are spatially defined in terms of their impacts on natural, native, or ecologically valued landscapes. This expanded definition of what constitutes a pest plant has produced a suite of 'new' weeds, of which 75% are thought to have emanated from the garden (Green 2000, in Jay et al. 2003). Environmental pest plants are therefore also spatially defined in terms of their perceived source, the garden. There are a number of ways in which this focus on the domestic garden, gardening trade and gardening practices is justified. The gardening trade is a key source of plant imports into New Zealand, and the variety of plants is extensive and shifting. The increasing subdivision of agricultural lots into lifestyle blocks has brought land-use changes from agricultural to gardened areas, as well as a higher owner density. Gardening disperses non-native plants over wide areas and into sensitive bush due to a growing preference for properties with proximity to 'natural' areas. Gardening also allows non-native plants to be grown in high enough densities for them to become naturalised. Through these different contributory factors, environmental weeds have become synonymous with 'garden escapes'. This switch in emphasis from agricultural to environmental pest plants can be attributed to a number of influences.

Bührs and Bartlett (1993) discuss the rise of environmental values in New Zealand, and the ways in which these values have been manifested, including a general greening of public

opinion, the economy and politics. This environmentalism found expression in public discourse. When combined with developments in environmental legislation on the international and national stage, a new environmental language was introduced into the political domain of biosecurity. This is apparent in the Ministry of Agriculture and Forestry's (MAF) changing mission statements in table 1.2 on page 29. As Hajer (1995) argues, the language of environmental politics is not passive but constitutive:

> discursive interaction (i.e. language in use) can create new meanings and new identities, i.e. it may alter cognitive patterns and create new cognitions and new positioning. Hence discourse fulfils a key role in the process of political change (Hajer 1995:59).

The discursive space and legitimacy given to the ideals and aims of environmentalism within the biosecurity regime started to generate its own political effects (Hajer 1995).

I have discussed how, over the course of the twentieth century, environmental appreciation within New Zealand was increasingly associated with native environments. This was connected with a cultural shift towards an understanding of native nature as the embodiment of national identity. Environmentalism in New Zealand therefore manifested a distinct nativist focus. The 'Maori renaissance' in public life of the 1960s and 1970s is also connected to a greater concern for native nature within New Zealand's political and cultural institutions, as Maori environmental values became more widely circulated, understood and appreciated.[3] These influences together fostered a nationally framed environmentalism within which concerns over environmental weeds were understood.

The formation of regional councils in 1989 was significant in the shift from agronomist biosecurity concerns (Worsley 1999). Regional councils were given an expanded mandate of environmental governance and regulation within their jurisdictions. Pest plant concerns became increasingly associated with this area of responsibility. The Biosecurity Act (1993), replacing 28 different enactments related to the exclusion, eradication or management of

[3] Prior to the 1960s Maori people use to live predominantly within a tribal structure, and work as rural labourers. Due to the increasing mechanisation of agriculture after WWII, many moved into cities in the 60s and 70s in search of work. While this led to a breakdown in tribal society and language, Maori people became a visible part of the workforce and the heart of the trade unions. This fed into the 'Maori Renaissance,' with Maori influencing trade unions, anti-Vietnam protests, art and culture, and participating in university and political life. The subsequent emergence of 'middle class' Maoris led to the infusion of Maori environmental knowledge and values into New Zealand society and culture, significantly including valuing of native plants.

pests, broadened the possible definition of what constituted a pest plant (Parliament of New Zealand, 1993). It stipulated that the calculation of the impact of an invasive species must take into account a wider range of values (Worsley 1999). Regional councils increasingly realised that the control of pest plants impacting on native flora was in their mandate. Pressure from biosecurity officers was crucial in sharpening this focus. The Resource Management Act (RMA) (1995), by codifying the regional councils' environmental governance responsibilities, reinforced this emphasis:

> Regional councils by their nature and their involvement as the major administrators of the RMA are very much concerned with environmental matters and this began to be reflected particularly in the northern regions with greater attention being given to species affecting the environment rather than agriculture (Worsley 1999:31).

The Department of Conservation (DoC) also played a strong leadership role in advocating for environmental values within biosecurity governance. This was attributed to physical evidence of environmental pest plants in nature reserves. In comparison, whilst the Parliamentary Commissioner for the Environment (PCE) was significant in pushing other environmental issues onto the political scene, it was comparatively late in contributing to the politicisation of environmental biosecurity concerns. The issue of biosecurity was raised as warranting a Parliamentary Commissioner for the Environment (PCE) investigation during a symposium in 1997. However it was not seen as a priority area in comparison to the environmental management of urban and marine systems (PCE 2001). It was not until 2000 that the PCE made a commitment to undertake an independent review of 'environmental management aspects' of biosecurity. This led to the publication of *New Zealand under Siege: A Review of the Management of Biosecurity Risks to the Environment* (PCE 2001), which was prompted by an increasing awareness of biosecurity threats to the marine environment (PCE 1999). The report was highly critical of the operational weight placed on agriculturally or economically significant pests. Despite its relatively late nature, Jay and Morad (2006) suggest that the report was instrumental in prompting a full review of biosecurity strategy.

The prior history of agricultural pest concerns has had positive repercussions for the biosecurity regime's contemporary ecological focus. The dominance of politics and the economy by farmers pushed New Zealand ahead in terms of plant biosecurity systems internationally. It produced a 'social infrastructure of knowledge and acceptance about invasive species and a culture of biosecurity awareness' (Jay and Morad 2006:299), as well as a distinct 'government science', characteristic of research from the late 1920s (Clayton

2003:316). Agriculturally-related biosecurity concerns therefore formed a platform of legislation, institutions, architectural arrangements, scientific and cultural knowledge of pest plants issues. This gave environmental pest concerns a base from which to rise. As Rabinow and Rose argue:

> the apparatus is a specific strategic response to a specific historical problem. But such an initial response to a pressing situation can gradually have a more general rationality extracted from it, and hence be turned into a technology of power applicable to other situations. The apparatus can be rationalised and the techniques turned into a generalisable technology (Rabinow and Rose 2003b:11).

To summarise, the 'problem' of invasive non-native species for New Zealand has been understood and constructed in particular ways over time, with a differing emphasis according to the context-specific argumentative situation. These different constructions continue to influence contemporary biosecurity discourses. It is possible to identify two historically differing yet increasingly overlapping or even merging 'storylines' (Hajer 1995) used to justify and explain biosecurity. A vignette of the first of these, which I term the 'agricultural and trade storyline', is provided below:

> *New Zealand is a trading nation, with export earnings traditionally based on agricultural goods. The country is dependent on imports from a variety of countries, historically England and Australia, but recently including Asian importers. Moving goods efficiently and cost effectively in and out of New Zealand and overcoming the disadvantage of great distances from world markets is increasingly important. At the same time, New Zealand's remoteness and physical detachment as an island nation has lead to an agricultural palette free of pests. This relatively pest-free status is a crucial benefit in marketing New Zealand's agricultural products. It also means that the environment is particularly susceptible to pests. There are difficulties in maintaining this advantage without imposing excess time and cost levies, and without breaching international trade obligations.*[4]

The second problem-construction related to the environmental management concerns described above, has gained purchase in institutional discourses over recent years. I will use the term 'ecological biosecurity' to refer to the biosecurity measures, arrangements and practices developed as a response to this 'storyline':

[4] See Jay *et al.* (2003:4-5) for an example of these two storylines.

New Zealand's biodiversity has evolved in isolation for 80 million years, becoming both endemic and fragile. This fragility is due to an unusual lack of native predatory mammals, including humans. Within the last 1,000 years two waves of human immigration, by Maori settlers in the tenth century, and European settlers in the nineteenth, have modified the New Zealand environment to their needs, and have brought with them new species to support their survival. Altogether this barrage of new species has led to a catastrophic loss of native habitat and species. The increase in trade and travel and the associated increased importation of species within recent years, together with the ongoing naturalisation of species, is further threatening the remnants of New Zealand's unique native nature.

A comparison of the changing mission statements of the Ministry of Agriculture and Forestry (MAF), who are central to plant biosecurity governance, displays the shifting focus and justification for biosecurity measures:

Table 1.2: Displaying MAF Biosecurity 'Mission Statements' from 1986 to 2004.

Year	MAF Biosecurity Mission Statements	Objects of concern. Aim of policies.
1986	Protect the health status of New Zealand's plants, livestock and fish resources from pests and diseases, which would impede our ability to export agricultural produce competitively.	Plants, livestock and fish resources. Exporting competitively.
1988	...to facilitate the agricultural and horticultural industry's ability to market plants, animals, fish and food products internationally through quality management systems designed to meet the requirements of clients.	Plants, animals, fish and food products. Facilitate export marketing.
1990	To develop and help sustain the land and water resources and associated industries vital to the growth of New Zealand's economy into the 21st century.	Land and water resources and associated industries. Develop and sustain economy.
1992	Maintain our competitive advantage as an export nation by keeping out unwanted pests and diseases, thus preserving New Zealand's unique environment.	Unique environment. Exporting competitively.
1995	Enhancement of New Zealand's reputation as a country largely free of plant and animal pests and diseases.	New Zealand's reputation.
1998	To contribute to the Government's agricultural and fisheries objective for enterprise development growth, and profitability, sustainability, market access and agricultural security.	Agriculture and fisheries. Growth, market access, sustainability.
2002	To protect New Zealand's unique biodiversity and facilitate exports by managing risks to plant and animal health and welfare.	Unique biodiversity, plant and animals. Protect and facilitate exports.

Adapted from Budd and Arts (2000:11)

These different storylines have reciprocal effects on the policy and practice of biosecurity. It could be suggested that the environmental rhetoric evident in the later mission statements was co-opted for PR purposes by the trade orientated Ministry of Agriculture and Forestry (MAF), rather than being adopted and absorbed as a key principle. Whichever way this discursive construction is interpreted, it has political and material effects.

This section has charted the historical development of the plant biosecurity regime in New Zealand. This significantly includes the emergence of 'ecological biosecurity' with a focus on native nature, the garden and gardening plants. This historical depth has provided an opportunity to view 'biosecurity' as an unstable and contingent response within shifting institutional and public values, a multi-faceted practice made relevant by differing 'worldviews' (Donaldson and Wood 2004).

1.4 Contemporary Biosecurity: An Overview Of New Zealand's Biosecurity Regime, 2005

This section will provide an overview of the contemporary biosecurity regime in New Zealand. I will focus on the biosecurity practices of significance to the control of garden plants. I begin by discussing contemporary institutional and legislative redevelopments, before mapping the regime across its five sites of policy intervention and control.

The Formation of the Modern Biosecurity Regime

The period from 1993 to the present day constitutes a distinguishable phase of institutional building and intensified legislation. This involved the introduction of the Biosecurity Act (1993) and the Hazardous Substances and New Organisms Act (1996), which together form the backbone of the regime (Parliament of New Zealand, 1996). The Biosecurity Act (1993) has effects across the five sites of biosecurity intervention. Described as a 'world first,' the Act is 'a law specifically to support systematic protection of... biological systems... from the harmful effects of exotic pests and diseases' (Biosecurity New Zealand 2004:8). At the pre-border and border policy sites the Act deals with the prevention of unwanted organisms that

may be *unintentionally* and accidentally introduced with imported goods. The Hazardous Substances and New Organisms Act (1996) in contrast structures the *intentional* importation of new organisms.

The newly appointed Minister of Biosecurity, Jim Sutton (also Minister for Trade and Minister for Agriculture), decreed in 1997 the formation of the Biosecurity Council to advise the Minister and to coordinate policy and its implementation. This Council was made up of members from the key government agencies with biosecurity responsibilities: the Chief Executives of the Ministry of Agriculture and Forestry (MAF), the Ministry of Fisheries (Mfish), the Ministry of Health (MoH), the Department of Conservation (DoC), the Ministry for Research, Science and Technology, the Ministry for the Environment, the Environmental Risk Management Authority (ERMA), a local government representative, and an independent chairperson. A separate Biosecurity Technical Forum provided technical and policy advice to the Minister of Biosecurity, and a Biosecurity Consultative Forum existed to provide an opportunity for stakeholder input (private sector, NGOs, science providers). Together these advised on policy-making and strategic direction. The governmental agency responsible for operationalising policy decisions was determined according to the type of incursion. With the advent of the Biosecurity Act (1993), Regional Councils had the opportunity for determining the way in which national policy directives were applied to specific pests within their regions. This framework largely formalised a division of responsibilities between central and regional government. Central government became responsible for pre-border and border biosecurity roles, and regional government became responsible for internal pest control (Jay and Morad 2006).

In November 2000 the Cabinet approved a method for the development of a Biosecurity Strategy. This was intended to extend central biosecurity functions beyond their focus on agriculture to embrace new concerns for indigenous and marine environments, to reduce system fragmentation of biosecurity responsibilities across agencies through a 'whole-of-government' approach, and to improve consistency and accountability. As Jay and Morad (2006) argue, while a legal framework existed for overall biosecurity policy, the links between key agencies and institutions remained relatively weak. The desired outcome of this process as stated in 'New Zealand's Biosecurity Programme: Current State and Future Challenges' (2002) is: 'for the tools available for the achievement of biosecurity to be

implemented in the most cost-effective means to achieve the most desired outcome for the people of New Zealand.'

After a period of drafting and stakeholder consultation, the Biosecurity Council released a Draft Biosecurity Strategy for public discussion in December 2002. The final round of consultation closed in March 2003 (MAF 2003d). The strategy review highlighted the division of interests between those with biodiversity or environmental concerns, and the traditional agricultural focus of the biosecurity regime (Jay *et al.* 2003). Within the submissions received, many reservations were expressed about MAF becoming the lead agency, as its core role is still perceived to be trade, not biosecurity. The fear was that environmental concerns would become swallowed up in agricultural concerns, and that MAF's trade interests would lead to weakened biosecurity intentions.

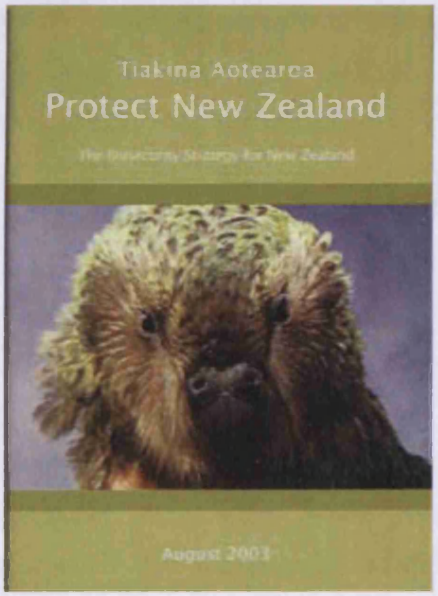


Figure 1.3: The Biosecurity Strategy for New Zealand.

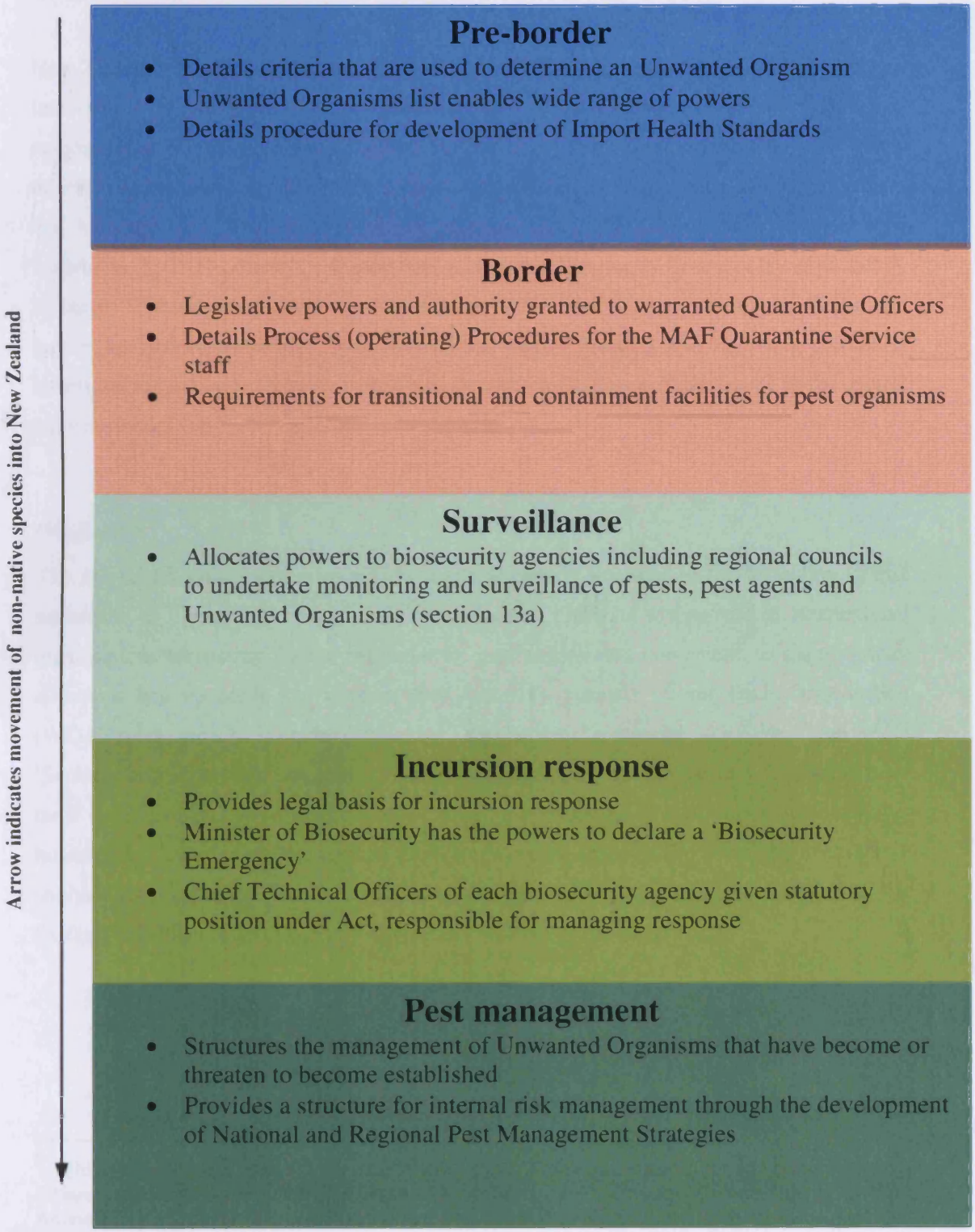
In August 2003 the Cabinet approved and adopted the Biosecurity Strategy. My empirical work in New Zealand was carried out two years after the beginning of the 'new era in biosecurity management' this was seen to herald (BNZ Nov. 2004). Key changes to the institutional structure involved making 'Biosecurity New Zealand' (BNZ), a newly formed offshoot of the Ministry of Agriculture and Forestry (MAF), the national lead agency.

'Biosecurity New Zealand' (BNZ) became responsible for overseeing the entire biosecurity system, including pre-border and border activities, surveillance, incursion responses, eradication programmes and pest management. Their expanded mandate encompassed marine biosecurity functions previously held within the Ministry of Fisheries, and particular pest portfolios from the Department of Conservation. 'Biosecurity New Zealand' (BNZ) was also newly accountable for accessing biosecurity health risks, but the management of health risks posed by rats and mosquitoes remained the domain of the Ministry of Health. While much of internal pest management was still to be physically undertaken by regional councils and DoC, negotiations for the handover of portfolios of particular pests to BNZ were taking place during the period of my empirical research (Biosecurity Council Aug 2003:17).

Biosecurity functions within MAF are now distributed between **MAF Quarantine**, responsible for quarantine, border control and inspection, **BNZ** and the **Biosecurity Strategic Unit**. BNZ has an operational policy and standard setting role. The Biosecurity Strategic Unit is a separate agency which focuses on strategic issues including the design, delivery, performance and evaluation of biosecurity services from a 'whole of government' biosecurity perspective (Paul Stokes, Biosecurity Summit, Nov. 17th 2004). Other institutional changes include the formation of the Biosecurity Chief Executive Forum, the Central/Regional Government Forum, and the Biosecurity Ministerial Advisory Committee. The Biosecurity Managers Group is a coordinating group made up of the heads of biosecurity from each regional council. The group is intended to disseminate best practice, coordinate regional council work, and present a united front to BNZ from the regional councils.

The following discussion traces the operation of the contemporary biosecurity regime across the five sites of biosecurity intervention. While the focus of this thesis is on pest management, locating it within this overall regime is important for several reasons. Firstly, this places pest management activities within politically defined 'biosecurity' practices. Secondly, each subsequent site relies on the activities of previous sites and is also a response to the failure or possibility of failure of previous sites. Thirdly, these sites are linked through shared legislation, governing bodies, and political discourses. To support this discussion, the diagram below maps the influence and effects of the Biosecurity Act (1993) across the five sites of biosecurity intervention.

Figure 1.4: The Influence of the Biosecurity Act (1993) at Five Sites of Policy Intervention.



The Operation of the Regime

New Zealand's Biosecurity Regime is constituted by five main programmes or sites of policy intervention – pre-border or pre-clearance, border, post-border surveillance, incursion response and pest management activities. BNZ is structurally divided according to a 'points of intervention' model, with Pre-clearance, Post-clearance, Compliance and Enforcement, and Incursion and Pest Management directorates (BNZ 2004). These sites are linked by legislation, by the Minister for Biosecurity, and by the Biosecurity Council (Jay *el al.* 2003). At each of these sites, however, the differing focus and the interaction of policies and governing institutions produce very specific cultures of practice. The following account is structured according to these five sites, and focuses on the place of pest plants in the overall biosecurity regime.[5]

Pre-Border

The pre-border policy and management arena is heavily involved in the formation of and adherence to international legislation. New Zealand plays an active role in international organisations legislating for the regulation of pest and disease movement, to ensure policy directions and standards that support New Zealand's interests. World Trade Organisation (WTO) rules greatly influence countries' pre-border biosecurity activities. The WTO 'Sanitary and Phyto-Sanitary (SPS) Agreement' allows for quarantine as a justifiable non-tariff trade barrier. To prevent countries utilising biosecurity as a disguised restriction on international trade, measures applied have to be based on scientific principles within risk analysis methodologies. The following table displays the biosecurity relevant aspects of the Sanitary and Phyto-Sanitary (SPS) Agreement, with article numbers:

[5] While much of this discussion could equally apply to pest animals, there are points at which differences emerge, for example through the overlapping of other pieces of legislation such as the Wild Animals Control Act (1977), and through the specificities of policies targeting vector industries, such as the nursery industry (Parliament of New Zealand, 1977).

Table 1.3: Displaying Biosecurity-Relevant Aspects of the SPS Agreement

2.2 Members shall ensure that any sanitary or phyto-sanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, is based on scientific principles and is not maintained without sufficient scientific evidence...
5.1 Members shall ensure that their sanitary or phyto-sanitary measures are based on an assessment, as appropriate to the circumstances, of the risks to human, animal or plant life or health, taking into account risk assessment techniques developed by the relevant international organisations.
5.6 Members should, when determining the appropriate level of sanitary or phyto-sanitary protection, take into account the objective of minimising negative trade effects.

(Source: Adapted from World Trade Organisation 1994)

The WTO regularly rules on biosecurity related trade disagreements between countries. For example, in 2003 the WTO ruled against Japan's quarantine measures for fireblight in apples, a 'long-running obstacle for New Zealand's horticulture exporters' (Biosecurity Council 2003:41). Participating countries are also required to notify changes in the occurrence or distribution of pests and diseases in their national environment. In the case of major disease in wildlife, Foot and Mouth Disease (FMD) for example, this will usually result in trade suspension and other management changes, as countries adjust their pre and post border controls (Biosecurity Council 2003:40). It could be argued that a strong motivation for tight biosecurity measures within New Zealand is the clearance this gives New Zealand as a 'disease-free' country to prevent other countries blocking its products.

Other multilateral environmental agreements with a focus on non-native species include the Convention on Biological Diversity, in which Article 8(h) states that:

> Each contracting party shall, as far as possible and as appropriate:
>
> (h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species (IUCN guidelines 2000).

New Zealand is working to develop stronger international agreements to notify trading partners about environmental pests, as well as international controls on ballast water. New Zealand also has bilateral agreements with a number of its import countries determining pre-border quarantine measures, such as pre-shipment quarantine arrangements for fruit fly host produce, disease testing of animals and the inspection of used vehicles from Japan

(Parliamentary Commissioner for the Environment 2001). These tend to be developed on a case-response basis.

There are two key activities within New Zealand's pre-border programmes. This involves, firstly, screening applications for the importation of new organisms under the Hazardous Substances and New Organism Act (HSNO Act) (1996), and secondly, the development and implementation of Import Health Standards (IHS) for all risk goods and pathways under the framework of the Biosecurity Act (1993).

The HSNO Act (1996) describes the methodology for the determination of a 'new organism':

Table 1.4: Displaying Definition of a 'New Organism' Under the Hazardous Substances and New Organisms Act (1996) (Section 2(1))

- Any species of organism (virus, bacterium, plant or animal of any kind) which was not legally present in New Zealand on the 29th July 1998;
- Any organism brought in or kept in containment, for example, for further study, or on display at a zoo;
- Any genetically modified organism which has not been approved for release;
- Any risk species as defined in regulations made under Section 140 of the Act;
- Any species of organism not approved for release under Section 38 of the Act;
- Any species which has been eradicated.

(source Parliament of New Zealand 1996).

The HSNO Act (1996) epitomises zero tolerance to risk. No new organism can be imported without undertaking a detailed application process with the Environmental Risk Management Authority (ERMA), an independent decision-making body operating to prescribed guidelines. Firstly, the Environmental Risk Management (ERMA) determines whether an organism is already prohibited. BNZ administers an 'Unwanted Organisms' (UOs) list under the Biosecurity Act (1993), a 'black list' of thousands of species that are not eligible for import under any circumstances.[6] 'Unwanted Organisms' are defined as: 'any organism that a Chief Technical Officer from one of the government departments with biosecurity responsibilities believes is capable or potentially capable of causing unwanted harm to any natural or physical resources or human health' (Biosecurity Council Aug 2003:61). A species may either be in New Zealand already, or be seen as a risk if it were to be imported. The HSNO

[6]The use of a 'black list' - a list of all banned species – as it operates in New Zealand, contrasts with the opposite approach, the use of a 'white list' - a list of all approved species

Act (1993) also black-lists species that are declared hazardous and banned from entry. No applications for these will be considered, and organisms listed under Schedule 2 of the HSNO Act (1996) cannot even be shipped through New Zealand. Penalties for breaching the Act include fines and imprisonment (Parliament of New Zealand 1993; 1996).

For those not already blacklisted, the application process operates at the species level. If the species is in New Zealand, subspecies, varieties, cultivars and hybrids are eligible for importation (DoC 2003b). These are listed within the 'MAF BNZ Biosecurity Index.' The scope of this list is extraordinary – it claims to contain the names of all non-native species that were in New Zealand on or before the 29th July, 1998. Applications are dealt with on a commodity basis due to the format of the Import Health Standards (IHS). This develops further the scientific classification of entities into species and sub-species, by constructing organisms as commodities, and disassembling them in this way. For example, a plant becomes fruit, cuttings, seeds, bulbs, whole plants, and cells, and each must possess individual permission for entry (BNZ 2006). The full application process involves advertising the application, receiving submissions, and holding a hearing. Section 36 of the HSNO Act (1996) lists the minimum standards that must be met for an organism to be granted permission of entry. These are also the criteria that are used to determine an 'Unwanted Organism' under the Biosecurity Act (1993):

Table 1.5: Displaying the Minimum Standards Required for Applications for Importation under the HSNO Act (1996), section 36.

The application will be declined if: a) any significant displacement of native species within its natural habitat may occur; b) any significant deterioration of natural habitats may occur; c) any significant adverse effects on genetic diversity may occur; d) the organism may cause disease, become parasitic or a vector for pathogens, hyperparasites or other disease (unless this is its purpose); e) there is a risk that it will form a self-sustaining population.

(Sources: Parliament of New Zealand 1996).

The HSNO Act (1996) therefore requires an Environmental Impact Assessment (EIA) for every application to import a new plant, assessing its potential impact on native species, natural habitats, and genetic diversity. There must be no possibility that the plant could leave the garden and become naturalised, whether or not it may cause ecological damage. Consideration (d) is an attempt to restrict the possibility that an imported plant could become

a pathway for other organisms. The ERMA process also involves consultation with all Iwi (Maori ancestral groupings), to assess the effect the new species may have on Maori values. The applicant is responsible for writing to all 30 Iwi to see if they have any objections to the importation application.

ERMA can then approve the application fully, approve it for containment only, or decline. There is no right of appeal. The full cost of the process is up to NZ$35,000 (Rennie 2005). There is effectively no benefit for a grower to pay for this process, because if an application is approved and an IHS issued, anyone can then import the plant. Benefit is not conferred on the person who initially made and sponsored the application. The cost therefore effectively encourages self-regulation: if a nursery thinks there is any chance that a plant will fail the ERMA process, they will not risk the cost. The rigidity of this process has meant that very few new plant species have received importation permission since the new system came into operation in 2000. The process has generated conflict with the gardening industry, who accuses ERMA of strangling what is regarded as a world-renowned industry. However, just before the HSNO Act (1996) was due to come in, there was a rush to import plants in order to avoid the costly process. It is estimated that 2.5-3,000 plants were imported during the period 1995-2000, and now reside in test-tubes, bottles, and packets in storage and on greenhouse shelves around New Zealand. At a rough estimate, this makes up approximately 10% of New Zealand's flora.

If an application is approved under the HSNO Act (1996), it then becomes subject to the specifications of an Import Health Standard under the Biosecurity Act (1993). All risk goods and pathways are subject to Import Health Standards (IHS), which provide explicit directions on what measures must be met before goods can be imported, and provides criteria to inspectors to assess whether the goods should be given biosecurity clearance when they arrive at New Zealand's borders (DoC 2003b). IHS certificates for plants can also specify post-border quarantine, either within MAF post-entry quarantine holding facilities or in designated greenhouses at the nursery's premises, where plants can be observed for pests and diseases. These are continually reviewed and updated, and email lists alert user groups of any changes.

Passenger and Goods Border Control

> New Zealand's borders are constantly under threat, from illegal drugs, plant pests, illegal immigrants... New Zealand Customs... are all that stand in their way (NZTV 'Border Patrol,' opening voice-over, June 2005).

MAF Quarantine carries out New Zealand border control, overseeing the five different incoming sources of people and goods: aircraft, cargo, mail, passengers and crew, and sea vessels.[7] Ships and aircraft can only enter at one of New Zealand's 24 points of entry, registered ports and airports that have approved facilities for clearance work. Here, arriving goods and passengers can be inspected by over 500 staff (DoC 2003b). On passenger planes biosecurity awareness videos are played and biosecurity information cards in seven languages are handed out. After arriving at an airport and picking up their luggage, passengers wait in turn within the passenger Biosecurity Clearance Area. MAF Quarantine Service Officers use risk profiles to select passengers for more detailed screening (PCE 2001), and passengers are required to declare any activities, including visiting a farm or camping, which may lead to an increased risk of introduction of an Unwanted Organism (Williams and West 2000). Muddy boots, tents and clothing that may harbour seeds, plant fragments or insects are checked and cleaned.

Figure 1.5: X-ray image of a suitcase containing smuggled organic material.

[7] Jay and Morad (2006) highlight that prior to the 1960s, most travel to and from New Zealand was by sea. The many weeks this entailed provided an informal period of isolation or 'quarantine,' and many unintentionally imported species would not have survived. With aeroplanes both the journey time has been reduced, and the number of passengers have increased.

X-ray machines use photon beams to pick up organic material (DoC 2003b); the National Centre for Advanced Bio-Protection Technologies conduct continual research to add to this arsenal of technologies. Detector dog teams patrol the lines of passengers; beagles, seen as the 'friendly face' of MAF Quarantine, are stationed at international airports and mail centres, and are trained to sniff for biological material (DoC 2003b).

Figure 1.6: Detector dog on patrol at Auckland Airport.

Any biosecurity transgressions such as failures to declare risk goods receive an instant fine of NZ$200. Nine thousand infringement notices were issued in 2003 (Department of Conservation 2003b).

On arrival in New Zealand goods must be approved for clearance by a Biosecurity Inspector. No goods or people may leave the designated controlled area without a MAF Quarantine Inspector's permission. IHS documentation and certification accompanies imported controlled goods for their entire journey. This paperwork will be inspected, as well as the goods themselves, as New Zealand now has 100% visual inspection of all incoming shipments. In the event of non-compliance, goods may be refused entry and returned to their point of origin, or fumigated before release. Feedback of non-compliance to the supply country through a phyto-sanitary database occurs within seven days of interception (Budd and Arts 2000). Mail is also regularly x-rayed, with 49 million items x-rayed between September 1998 and March 2003.

Despite all these measures, smuggling does occur due to the illegal permeability of the border. The following quote by the Biosecurity Minister Jim Sutton gives a colourful indication of what he sees the biosecurity regime to be up against:

> Last year 8.5 tonnes of meat and poultry products were taken off passengers. A third of that was undeclared. Two-thirds of it came from countries with foot and mouth disease. On top of that, there were 168 seizures of live animals, including dogs and live eggs. In one case, a pet rat escaped on the plane, which had to be stripped and fumigated. Some 1.8 tonnes of seed was confiscated in 4500 seizures. Nursery stock – about 12 thousand units – was confiscated in 734 seizures. Another 16 tonnes of potential fruit fly host material has been taken from passengers (PCE 2001:16).

Seeds can easily be accidentally caught in the turn-ups of trousers. Seeds placed under the collar are out of the range of a beagle's nose. A further difficulty for the enforcement of border control requirements is that persons who receive seed or plant fragments in the post cannot be prosecuted unless it can be proved that the consignment was actively solicited.

Post-border management forms the focus of this thesis. The post-border arena is divided into three response activities discussed in the following sections: surveillance, incursion response, and pest management. In these sections I provide a brief description of the site-based activities, as they form more substantial discussions in subsequent empirical chapters.

Post-Border Surveillance

BNZ's Post-Clearance Directorate is responsible for overseeing biosecurity surveillance, and for managing the development, prioritisation and implementation of surveillance to determine the presence or absence of new incursions (BNZ 2006). MAF, Mfish, MoH and DoC all undertake a wide range of surveillance activities, both to detect new species, and monitor the health and 'pest status' of plants, animals and ecosystems (Biosecurity Council 2003:47). Three main scientific laboratories across New Zealand investigate possible incursions. The National Plant Pest Reference Laboratory, for example, investigates suspected incursions of pests and diseases affecting horticulture, forestry and the natural environment. These laboratories receive approximately 1,000 calls a month to a freephone number from 'observant members of the public,' leading to several hundred investigations each month (Biosecurity Council 2003:47). While the Biosecurity Strategy states that there are about ten new species incursions each year, it does not reveal how many of these go on to require large-scale incursion responses.

Surveillance for new pest plants predominantly draws on the experiential knowledge of on-the-ground staff, such as Pest Plant Officers from regional councils and DoC field staff. This includes sightings of new plants growing wild within their regions, or appearing on the shelves of garden centres. 'Surveillance' in the context of environmental pest plants therefore applies to both newly naturalised plants in the environment, as well as 'new' plants to the gardening trade.

Incursion Response

Incursion responses are determined by BNZ's Post-Clearance Directorate. After the detection of an unwanted organism, attempts are made to identify the organism and its current distribution, and then management options are assessed. This entails either control or eradication. Contractors provide most of the field activity during a response (Biosecurity Council 2003:50). Under the Biosecurity Act (1993) the Minister of Biosecurity has powers to declare a 'Biosecurity Emergency' in the event of a major incursion. This allows full access to property and possessions, powers to seize and destroy, and powers to prevent all movement in and out of risk zones. Recommendations from the Biosecurity Strategy for improving surveillance include consistency across responsible sectors, integration between central and regional councils, and system flexibility and responsiveness to changing risk profiles. A recent high profile incursion response programme was the infamous Painted Apple Moth Eradication Campaign, in which a large residential area of Auckland was blanket sprayed with a pesticide by low-flying aircraft (see figure 1.7 below).

In relation to environmental pest plants, incursion and dispersal is obviously slow. The incursion response is correspondingly less dramatic. This does not mean that it is accorded less importance. Responding early to incursions is understood as the most effective - and particularly cost-effective – way to control pest plants. There is, however, a blurring between incursion response and pest management in the response to a new plant species in the country. The decision to move a pest from the 'incursion response' stage to 'pest management' is itself politically-charged, as it often requires the handover of the responsibility and costs for a pest from BNZ to regional councils.

Figure 1.7: Aircraft spraying pesticides in Painted Apple Moth Campaign.

Internal Pest Management

Pest management is the stage of biosecurity activity that occurs after it is determined that full-scale immediate eradication is not possible due to the extent of a pest's incursion into New Zealand. The aim of pest management may be containing the species to prevent its spread to other unaffected parts of the country, or reducing the negative impact of the pest. Eradication may still be an aim, however the difference is the envisaged timeframe. The lack of new plant imports within recent years, together with the huge numbers of non-native plants currently residing in gardens, nursery shelves and garden sheds, has placed the internal pest management arena at the forefront of plant biosecurity efforts. Pest management makes up over half of the total expenditure on biosecurity activities (Biosecurity Council 2003:52).

Within pest plant management the significant governing and enacting institutions are regional councils and DoC. Regional councils have pest management responsibilities on all public and private land within their area of jurisdiction, and the Department of Conservation is responsible for pest management on the Crown's conservation estate. The DoC estate is comprised of 8 million hectares in New Zealand as a whole. The Department of Conservation has a three-tiered structure, with two Regional Offices located in the North and one in the South Island, where internal policy formation, technical advice and research are undertaken. The DoC estate is then divided into 13 DoC Conservancies, which broadly map onto

Regional Council jurisdictions. These determine regional priorities. Finally, DoC Area Offices have field staff that undertake or supervise actual pest control activities, as well as public education within their areas. This contrasts with the centralised MAF BNZ, whose staff are all based in Wellington.

The Biosecurity Act (1993) structures the management of Unwanted Organisms that have already become, or threaten to become established. The Act provides a structure for internal risk management through the development of National and Regional Pest Management Strategies. Regional Pest Management Strategies (RPMS) are developed by regional councils to set out their responses to particular pests, and to enable them to apply for government funds to support these efforts. If the distribution of a pest overlaps several regional councils, National Pest Management Strategies (NPMS) can be developed with the support of central government agencies. The Biosecurity Strategy (2003), however, suggested that Pest Management Strategies were under-utilised both regionally and nationally. The Department of Conservation utilise a value ranking of the Crown estate to determine priorities related to pest plant control, and maintain a weed inventory, and a database of treatment approaches. BNZ's key contemporary concern in the sphere of internal pest plant management during my period of empirical fieldwork was the overseeing and legislative underpinning for the development of the National Pest Plant Accord. This is a list of all plant species banned from propagation, sale, display and promotion. The development of Regional Pest Management Strategies, and the National Pest Plant Accord, is analysed in chapter four.

A further significant realm of internal pest management is public education. Regional councils, DoC, and BNZ, as well as interest groups such as conservation NGOs, all undertake a variety of public education campaigns. These include talks to interest groups, posters and leaflets, stalls at relevant events, and television commercials. Recently, national consistency for these efforts is being sought through a national weeds awareness campaign, 'Weedbusters.' It is through these specific governance approaches and public education practices that ecological plant biosecurity comes into effect, and is 'lived' or experienced at an everyday level. The underpinning justifications for different communicative tactics form the focus of chapter five.

1.5 SUMMARY

This chapter has described an environmental history of biological immigration to New Zealand. I traced how human settlement radically altered the New Zealand landscape, and the subsequent growth of concern. This shifted from an agronomic to an ecological perspective. The gradual development of a legislative response to non-native species, the interaction between 'agricultural-trade biosecurity' and 'ecological biosecurity' was then detailed. Finally, the contemporary biosecurity regime was mapped across five sites of intervention. This highlighted the differing interaction of legislation, institutions, persons, technologies and practices at each of these sites. The discussion concluded at the site of internal pest management, the context for subsequent chapters.

The problematisation of nature has shifted from acclimatisation practices that compared the unfamiliar terrain of New Zealand to the remembered landscapes of Britain, to biosecurity practices that measure the resulting recombinant ecology against a picture of New Zealand's native ecology. The discussion has considered the construction of the 'environmental pest plant' and resulting governance attention to the garden and garden plants as their source. This has shown that environmental pest plants are not so much a 'new problem' or a newly recognised problem, as a newly problematised issue, governed in new ways (see Rose and Miller 1992). These different constructions have mutually reciprocal effects on the policy and practice of biosecurity.

Throughout the discussion in this chapter, a number of interesting questions for social scientists have arisen, which this thesis could address. For example, what were the detailed processes/debates/persons/contestations through which the Biosecurity Act (1993) or the HSNO Act (1996) were formed? What are the opinions of different policy actors towards these Acts? What are the ways in which crossing both material and conceptual boundaries cause significant shifts in identity and materiality for imported plants? How are particular plants made mobile by the intersections of people/entities? What are the effects of different biophysical sites on the classification of entities and the enactment of biosecurity? In what ways do the meanings of biosecurity shift across different sites and practices, and in different argumentative contexts? How do different cultural groups, such as Maoris, Pakehas, or Asian immigrant groups, interact with and interpret biosecurity? How are these different meanings and understandings incorporated into the regime?

This thesis could therefore be framed in a number of different ways. What I want to produce is an account framed by an analytical approach which holds onto the specific and shifting ways in which biosecurity concerns are problematised. This will pay attention to the ways in which plant biosecurity governance is understood, constituted and enacted, the roles gardening publics play within the regime, and in turn how these publics understand and interact with biosecurity problematisations. At the beginning of this chapter, I posed three research questions, to which I will now add greater detail:

1. How is ecological plant biosecurity in New Zealand, with specific reference to internal pest management activities, organised and practiced?
   - How do institutions and policies interact?
   - How are responses to specific pest plants determined?
   - How does scientific knowledge inform biosecurity policies?

2. How is ecological plant biosecurity communicated and enforced in situated practice?
   - How is it regulated and enforced on the ground?
   - How are biosecurity regulations and concepts communicated to gardening publics?
   - In what other ways are gardening publics involved in biosecurity governance?

3. In what ways and for what reasons do gardening publics participate within, actively produce or challenge plant biosecurity ideals and practices?
   - How are plant biosecurity requirements and concepts understood by gardeners?
   - In what ways are they challenged or accepted?
   - Are these requirements and concepts changing gardening practices?

To answer these questions, this thesis draws on particular theoretical literatures which form the discussion in the following chapter.

2

CONSTRUCTING THEORETICAL RESOURCES:

THE ENVIRONMENTAL CHALLENGE FOR SOCIAL THEORY

> We do not undertake analyses of works because we want to copy them or because we suspect them. We investigate the methods by which another has created his work, in order to set ourselves in motion (Paul Klee 1961:99, in Rabinow and Rose, 2003b:1).

2.1 INTRODUCTION

Over the last eighty years institutional policies and public sentiments towards native and non-native plants in New Zealand have shifted. These policies and sentiments have found expression in recent years through a consolidated biosecurity regime, representing a new domain of environmental governance. These shifts and an outline of the contemporary regime have been drawn in chapter one. At the end of the previous chapter I began to formulate a series of research concerns arising from this empirical context. In this chapter, I will use and build on these research concerns as I bring together the theoretical resources needed to approach this empirical arena.

Biosecurity as a response to global and mobile natures speaks to and draws relevancies from a range of theoretical approaches, active in the work of geographers and other social scientists concerned with the intersection between the matter and governance of life. Braun (2006:644) utilises the word 'assemblage' to refer to these global socionatures, in order to:

> stress the making of socionatures whose intricate geographies form tangled webs of different length, density and duration, and whose consequences are experienced differently in different places.

Work in this vein focuses on 'making these geographies visible and understanding the practices and processes that compose them' (Braun 2006:644). This approach could be utilised in the context of biosecurity concerns, by tracing a non-native plant as it is intentionally and unintentionally imported into New Zealand.

However, in the context of biosecurity governance as a response to global natures in New Zealand, there are crucial questions of state power, expert knowledges and the role of publics as citizens in the regime. While the approaches discussed above might allow 'political concerns [to] emerge from the details of the story itself', I instead want to *centre* these concerns within my approach to the issue complex outlined. The literatures reviewed in this chapter are therefore drawn on to allow me to go beyond a description of the 'dizzying' socio-natural complexity and dynamism of global natures, to produce a *political* account of their governance. As Braun (2006:647) asks 'is it enough to describe these networks, or to show their complexity? Or is the objective to understand the underlying processes through which particular global assemblages of nature and society are produced?' I will do this by taking the sensibility of these approaches towards socio-natural agency, natural complexity and the partial and precarious nature of these makings, into conversation with what are more frequently human-centred conceptual approaches.

In section 2.2, '*Biopolitical Governmentality,*' I examine the Foucauldian concepts of governmentality and biopolitics as approaches to consider the governance of life. This provides the resources to understand the productivity and ambivalence of power, and the nexus between government structures, expert practices of calculation and modes of disciplining. In section 2.3, '*Environmentalising Foucault: Ecopolitics, Environmental Governmentality and Environmentality,*' I consider academic approaches which have attempted to utilise and adapt Foucauldian concepts of governmentality and biopolitics to understand environmental governance. This includes a significant engagement with Agrawal's (2005a) 'environmentality' thesis. These approaches draw attention to the geography of governance, the construction of non-humans as the objects of governance, and the role of 'technologies of the self' in the constitution of environmental subjectivities. In section 2.4, '*Ecological Citizenship,*' I move away from Foucauldian based approaches, to consider the interface between citizenship and environmental governance. This allows me to explore alternative, less 'top-down' citizenship identities produced through biosecurity concerns. I draw on Dobson's (2003) ecological citizenship thesis to account for the material basis of the production of biosecurity citizenships. Finally, I conclude by drawing together these diverse contributions within the biosecurity problematic outlined in the preceding chapter, by consolidating my series of research questions as a platform to move into my empirical research.

2.2 BIOSECURITY AS BIOPOLITICAL GOVERNMENTALITY

To set myself in motion, I will first turn to academic approaches that have utilised Foucauldian concepts of '*biopolitical governmentality.*' Foucault's work, spanning a period from 1954 to his death in 1984, consists of his books and papers, lectures and courses, and interviews. Due to its occasionally impenetrable nature, its empirical association with predominately the sixteenth, seventeenth and eighteenth centuries, and its lack of clear methodological guiding resources, 'secondary theorists' particularly Rose and Miller (1992), Rabinow and Rose (2003a; 2003b), Rose (2001) and to an extent Hajer (1995), are frequently drawn on by other academics to source understandings, definitions and applications of Foucault's novel concepts. These multiple routes to an understanding of Foucault's concepts, together with the occasionally varying ways in which Foucault himself utilised the terms, has led to interpretive differences in the precise content and emphasis of these concepts. The genealogical phase of Foucault's work provides some of the key concepts and theoretical resources of relevance to an understanding of environmental policy (Foucault 1979). This includes a redevelopment of understandings of power, and the new interlinked concepts of governmentality, biopower and biopolitics. I have particularly found overlaps with 'governmentality' and 'biopolitics' between authors, and differences in the placement of meso-concepts such as disciplinary technology within broader concepts. However, Darier, following Deleuze, cautions that the theoretical concept of governmentality should not be taken as a 'truth' concept, just as Foucault himself avoided totalising metatheories. Instead this and other concepts should be regarded as a conceptual 'toolbox' (Deleuze, in Darier 1996:597). This draws attention, therefore, to the ways in which these resources can be made to work to understand biosecurity.

In the following, I review the Foucauldian concepts of governmentality, biopolitics and biopower, before considering their application to environmental politics in section 2.3. I argue that a Foucauldian approach draws attention to the intersection between governmental apparatus, expert knowledges and mechanisms for the control of populations. This provides the resources to understand how biosecurity governance is structured, how biosecurity requirements are enacted across a multiple of sites, and how pest plants as the object of control are constituted as governable.

Governmentality: Careful Control of the Population

'*Governmentality' is* a term coined by Foucault, particularly within his 1978 'College de France' lectures. It is used to describe the modern state deployment of power in the West since the sixteenth century, which supplemented dominant forms of sovereign power. This historical process consists of institutional centralisation around government agencies, the emergence of new instrumental knowledge, and the capillary diffusion of resulting power effects across the entire social body (Darier 1999). Foucault derived his ideas on governmentality through attention to specific empirical contexts including hospitals, prisons and asylums. Governmentality is described by Foucault as:

> The ensemble formed by institutions, procedures, analyses and reflections, the calculations and tactics that allow the exercise of this very specific and complex form of power, which has as its target, population, its principle form of knowledge, political economy, and as its essential technical means, apparatus of security (Foucault 1980:106).

The 'population' referred to here is human populations. I will review these concepts in this context before considering their applicability for the governance of ecological populations. However, it is important to note that the geographer Elden (2007) singularly questions the implications of this emphasis on the governance of populations over the governance of territory. He argues that many of the calculative strategies applied to governing populations are also territorial strategies. This may be crucial for successfully extending Foucauldian notions to the governance of non-human entities.

The governmentalised administrative state, the 'ensemble' referred to above, relies on two elements: specific governmental *apparatus*, and the development of a related complex of *knowledges* (savoirs). Governmental apparatus are described by Rabinow (2003, in Collier, Lakoff and Rabinow 2004:4) as 'an articulation of technologies aimed at first specifying [...] targets and then controlling (distributing and regulating) them. Its elements are 'resolutely heterogeneous', including 'discourses, institutions, architectural arrangements, philosophic, moral, and philanthropic propositions.'' Some heterogeneous elements of biosecurity governmental apparatus were described in the preceding chapter, including Regional Councils, biosecurity clearance areas of airports, and the Biosecurity Act (1993), to name a

few. However, the governmental administrative state within Foucauldian approaches is more than the institutional set-up of governance. Professional knowledges combine with the construction of institutions and disciplines (such as medicine, psychology, psychiatry, or, as shall be argued below, ecology, weed science and resource management), to allow 'experts' to act as linkages between public and private spheres. This expands control into every aspect of daily life within governmentalised states. In this conception, government is described as a domain of 'cognition, calculation, experimentation and evaluation,' placing knowledge central to governmentalised activities and the formation of the objects of government (Rose and Miller 1992:175). Ever more detailed knowledge of the 'complex and multiple materiality' of the resources of state and of the characteristics of population (Rutherford 2000:114) is obtained through governmental technologies such as statistics and other policy tools. These 'expert' knowledges represent the objects of government in forms in which they can 'enter the sphere of conscious political calculation' (Rose and Miller 1992:182). Even the social sciences, and so Foucauldian approaches themselves, are complicit within this governing complex:

> The theories of the social sciences, ... thus provide a kind of intellectual machinery for government, in the form of procedures for rendering the world thinkable, taming its intractable reality by subjecting it to the disciplined analyses of thought (Rose and Miller 1992:182, original emphasis).

The link between knowledge and power is so crucial for Foucault that he refers to a single concept '**power/knowledge**,' as knowledge or 'truth' cannot exist outside of relations of power. The modern power to punish and control is effective through the ability to classify and analyse individuals, and then to spatially distribute and separate them. This knowledge in turn exists and derives its authority from relationships of power. To be the object of knowledge is to be controlled. This highlights the significance of the expert knowledge processes through which particular pest plants come to be 'known' within biosecurity governance. The process of classifying and categorising plants is not simply an objective exercise divorced from the context of biosecurity governance concerns, to which biosecurity policies respond in an unproblematic way. In fact, these theoretical resources suggest that knowledge production about native and non-native plants is a method of governance in itself.

Rose and Miller (1992) particularly pay attention to the ways in which the problems of government are made political, and are divided from the non-political sphere. Government becomes a *problematising* activity, the process by which, for example, non-native plants

became constructed as 'environmentally damaging,' and their control sanctioned through biosecurity practices of prevention and eradication. This approach therefore draws attention away from questions over the 'power of the state', asking instead:

> what relations are established between political and other authorities; what funds, forces, persons, knowledge or legitimacy are utilised; and by means of what devices and techniques are these different tactics made operable? (Rose and Miller 1992:177).

Rose and Miller (1992) draw out analytical foci for the application of governmentality: attention to the *rationalities* of government, and significantly attention to the *technologies* of government. Political rationalities, the moralities, epistemologies and idioms of political power, become translated through *'programmes of government'*: the realm of designs made-up by political and non-political actors, papers, proposals and inquiries. These will be discussed as methodological resources in the following chapter.

The idea of **discipline** is further developed within the concept of governmentality as an important means of state control. When Foucault utilises the term 'discipline' he is specifically referring to the power to regulate and coerce the individual human body. In *Discipline and Punish* (1979), Foucault traces this control over the minute movements of the body in time and space back to the monasteries and armies, and later the prison, hospital and school. He describes how the concept expanded in the eighteenth century to become a widely used technique of the mass control of populations, producing docile bodies 'that may be subjected, used, transformed and improved' (Foucault 1979:136). The notion of discipline can be applied, for example, to the ways passengers are required to move through airport customs and perform a variety of actions designed to identify and remove illegal biological material.

The application of this modern power/knowledge is understood to have normalising effects on the population. **'Normalisation'** involves the restriction of the possibilities of individual and collective identities (Darier 1999). The 'norm' is a category developed within a system of expert knowledges such as the human sciences, used to evaluate, judge and control: the sane man, the law-abiding citizen, the heterosexual, and perhaps the native species. This not only renders those who cannot conform 'abnormal': the insane, the criminal, the homosexual and the invasive non-native species, at a fundamental level it actually brings the category (mad, bad, gay, pest) into existence. This requires 'continuous regulatory and corrective

mechanisms' with the power to 'quantify, measure, appraise and hierarchise' about the norm (Foucault 1990:144). These processes of calculation, standardisation and measurement are described by Rydin (2007) as extremely powerful in altering individual subjectivities, defining the objects of government, and making government possible.

The norm also operates to control individual behaviour without physical coercion through self-governance. The activity of governance therefore extends not only to the attempt to shape or affect the conduct of people, but also to constitute people in such ways that they can be governed (Rutherford 1999). This leads to the ideal situation in which individuals are instilled with techniques of self-monitoring and self-control. Rydin (2007) emphasises *control at a distance* as a definitional aspect of governmentality. This is described as 'steering not doing', and concerns this process of self-governance, together with the penetration of political authorities into private 'non-political' realms (Rose 1999). This occurs through complex alliances with 'experts,' techniques and non-state agents, who seek to administer, programme and shape subjects in desired directions (Rose and Miller 1992). This leads to the uncoupling of geographic distance from social and political distance (Agrawal 2005a). For biosecurity governance, the concepts of discipline and normalisation, when developed into self-governance and subjectivity formation, are suggestive of the governance of human populations who enact biosecurity requirements. This is opposed to an understanding of the standardisation and classification of non-humans as 'pest plants', as discussed above. I will discuss the significance of this emphasis on the formation of the human subject in the interface between ecology and governmentality in the section *'Environmentalising Foucault'*, below.

Governmentality can be understood as recasting government not as a set of organisations, but as a process, the 'conduct of conduct' (Rydin 2007). Foucault was therefore interested in the multiple means by which human conduct is governed, including government by the state, government by others, and government of the self (Rutherford 2000). This massive domain:

> extends from the minutiae of individual self-reflection to the depersonalised, anonymous rationalities concerned with the political regulation of states, populations and societies (Dean 1994:176-7, in Rutherford 2000:122).

Governmentality is therefore not the exclusive domain of the state. Non-state actors, professionals, academics and social movements contribute to the governmentalisation of life

by entering into complex and unstable relations with state agencies, other institutions and political forces. This is in contrast to the common conception of government as a unitary, centralised set of institutions acting in a field exterior to itself (Dean 2001). This highlights the need to look beyond state processes to understand how biosecurity is constituted and enacted in sites where governance actors are not the only, or even the central, actors.

The potential tension between institutional centralisation and the diffusion of governmentalised activity across the social body is resolved when coupled with Foucault's novel definition of **power**. The Foucauldian idea of power is conceptualised as a *field of power*, as capillary, diffused, and everywhere. This relational conception breaks with an understanding of power as possessed only by the powerful: the state, the sovereign, the multinational company, the biosecurity agency. Relations of power rarely entail total domination, and are more than simply forcing people to do something against their will. Power is never simply repressive, but always positive, constitutive and enabling. This draws attention to the radical dispersion of power into the micro-geographies of everyday life (Gandy 2006). Rose and Miller (1992) argue that 'governmentality' rather than emphasising reduction and restriction, draws attention to the *proliferation* of government apparatuses, knowledges, and means to exercise power (Rose and Miller 1992:174). This draws on Latour's conceptions of power as the outcome of successful networks or 'heterogeneous assemblages' that enrol people, procedures and artefacts, and assure stability through the material and cultural permanence these technologies of government can acquire (Novas and Rose 2000).

Foucault's novel definition of power has profound implications for understandings of contemporary public policy (Darier 1996), through the broadening of the ownership of power to all social actors. This links to a further contradiction also in tension through the two simultaneous, heterogeneous aspects of modern power: a right of sovereignty, and mechanisms of discipline (Darier 1999):

> [Power] has been characterised on the one hand by a legislation, a discourse, an organisation based on public right, whose principle of articulation is the social body and the delegative status of each citizen; and on the other, by a closely linked grid of disciplinary coercions whose purpose is in fact to assure the cohesion of this same social body (Foucault 1980:106).

As power is never merely repressive, this allows for the possibility that groups or individuals may take on identities that become the condition for subsequent, unintended actions. Rather than mere passive objects as they can seem within a structuralist framework, this allows humans some degree of freedom to accept or challenge these restrictions. This means that while relations of power can never be escaped, liberty becomes not the ideal state of the suspension of power relations, but the expression of individuality. The domestic garden is one such site of significance to biosecurity governance where expressions of individuality as a tactic of resistance may be performed. As Rose and Miller argue:

> Power is not so much a matter of imposing constraints upon citizens as of 'making up' citizens capable of bearing a kind of regulated freedom. Personal autonomy is not the antithesis of political, but a key term in its exercise, the more so because most individuals are not merely the subjects of power but play a part in its operations (1992:174).

These processes of normalisation and discipline, and tactics of resistance, constantly interact in a dynamic way.

Gandy (2006), however, argues for a need to rethink core elements behind Foucault's analysis of power, due to the declining role of the state, and the ever diminishing contrast between liberal and authoritarian forms of governmentality. In the context of biosecurity governance outlined in chapter one, however, the state remains central within a field of other actors. The use of either liberal modes of governmentality or sovereign power may vary across the different sites of biosecurity enactment. For example, different forms of power are likely to be drawn on at airport customs than are used in the domestic garden.

Considering biosecurity through the lens of governmentality can therefore be attempted without the heavy-handed sense of monstrous state suppression of individual freedom that the language of governmentality can suggest on first viewing. This is significant as the issue of biosecurity is particularly emotive terrain. The potential contradiction between state coercion through strategies of discipline and normalisation, and citizen participation in the complexes of power, is held as a productive issue that promotes a depth of consideration. By drawing attention to 'the multiple and delicate networks that connect the lives of individuals, groups and organisations to the aspirations of authorities,' Rose and Miller (1992) emphasise the connections between the desire and operations of the governmentalised state and of the individual citizen. Analytical attention is expanded beyond a simple notion of 'government',

or the set of institutions which make up the biosecurity regime traced in the preceding chapter. Instead, 'governance' incorporates processes of knowledge formation about pest plants, multiple sites and actors across which biosecurity governance is enacted, and processes of subjectivity formation around the notion of native nature, for example. A possible tension in applying governmentality to the environment was suggested. The calculation and standardisation processes significant in the formation of subjectivity for the aims of self-governance cannot unproblematically be applied to non-humans without a redefinition of the notion of subjectivity. In the following, I review concepts of biopolitics and biopower as developed by Foucault. This draws explicit attention to the novel concern of governance with different concepts of 'life,' significant to an understanding of *bio*-security.

Biopolitics and Biopower

Biopolitics and the associated concept of biopower emerged from Foucault's archaeological studies of the natural sciences. They were later reworked within his genealogical focus on governmentality and power/knowledge (Darier 1999), and in the first volume of *The History of Sexuality* (1990). Recent work in geography utilising concepts of biopolitics and biopower includes Gandy's (2006) consideration of biopolitical contestation in the urban arena, and Ingram's (2007) work on the biopolitical governance of HIV/AIDs.

Linking administrative governmental involvement with the population, and the development of the biological sciences, biopolitics describes the series of articulated, explicit governmental strategies centred on sustaining the optimisation of the 'life' of the population (Dean 2001; Foucault 2007). It is in the development of the policy state at the beginning of the seventeenth century that the political rationality to enable the formation of biopolitics emerged (Rutherford 2000). This involved the detailed management of the entire social body:

> What government has to do with is not territory but rather a complex composed of men and things. The things with which this sense of government is concerned are in fact men, but men in their relations, their links, their imbrications with those other things which are wealth, resources, means of subsistence, the territory with its specific qualities, climate, irrigation, fertility, etc; men in their relations to that other kind of things, customs, habits, ways of acting and thinking etc; lastly, men in their relations to that other kind of things, accidents, misfortunes such as famine, epidemics, death etc. (Foucault 1991:93, in Rutherford 2000:123).

Biopolitics therefore concerns the social, cultural, environmental, economic and geographic conditions under which humans live and die (Dean 2001). It includes the specific strategies and contestations 'over problematisations of collective human vitality, morbidity and mortality, over the forms of knowledge, regimes of authority, and practices of intervention that are desirable, legitimate and efficacious' (Rabinow and Rose 2003a:3). This 'vital politics' (Rose 2001) includes issues of health and hygiene, food and water supply, shelter, education, migration and, more sinisterly, race (Darier 1999). These different forms of biopower are united as strategies for the governing of life. This analytical emphasis actually *denaturalises* the governance of the conditions of life as a role of government. This highlights the unique problematisation that produced ecological biosecurity as a concern of state.

Biopower is a specific form of power that supports the biopolitical aim of the fostering of life and the care of populations. It refers to the specific attempts to intervene upon the vital characteristics of human existence, through numerous, diverse and subtle disciplinary techniques, and through the operation of the norm. Rabinow and Rose (2003a) draw out three characteristics brought together in the concept of biopower. Firstly, it entails *truth discourses* about the 'vital' character of human beings, which are taken charge of by experts authorised to speak that truth. State involvement in biological individuality crucially depends on knowledge of its population provided by the proliferation of medical and social scientific knowledges as normalising disciplines. Secondly, it involves *strategies for intervention* upon collective existence, power relations that take 'living' humans as their object. The parallel growth of the institutions of state power alongside the techniques of biopower incorporated the legal system into a continuum of apparatuses with mainly regulatory functions. Biopower therefore operates in conjunction with the blunt, prohibitive capacities of juridical power, so the law functions through the operation of the norm rather than rigid prohibition (Rutherford 2000). Finally, it involves *modes of subjectification* in which individuals work on themselves under these forms of authority in relation to these truth discourses, in the name of individual or collective life (Rabinow and Rose 2003a). Certain aspects of biological individuality, such as sexuality, are constituted so that the population as a whole is controlled to function as docile and useful bodies to support issues of national policy and economic processes, such as production. This docility is an essential element: biopower must be capable of optimising life without making it more difficult to govern (Foucault 1977). The operation of biopower occurs at every level of the social body (Rutherford 1999) leading to segregation and social hierarchies that guarantee relations of domination and hegemony (Foucault 1977). As a

geographer working with notions of biopolitics in the urban arena, Gandy (2006), however, argues that Foucauldian inspired work emphasises the discursive production of bodies over their corporeal interactions with physical spaces.

Rabinow and Rose (2003a) steer the concept of biopower away from an association with extreme murderous state imposition of death. They instead highlight that biopolitics in contemporary states revolves around strategies for the governing of life, or 'vital politics' (Rose and Miller 1992). This contrasts with Agamben's association of biopolitics with the merging of the biological and the political in the eugenic policies of Nazi Germany, which he sees as a culmination of incipient trends within twentieth century modernity (1998 [1995], in Gandy 2006). A determination to avoid importing these associations to biosecurity prior to analysis formed a strong motivation for me to turn to Foucauldian approaches to biopolitics instead.

This task of administering life adopted by political powers is constituted by two distinct, yet interlinking, poles of development that can be understood as *biopolitical governmentality.* The first, an 'anatomo-politics of the human body' is characterised by the disciplining of the human body to increase its usefulness and docility, for successful insertion into efficient systems such as the economy. The form of power this entails can be equated to the notion of disciplinary power discussed above (Rutherford 2000). The second, a 'biopolitics of the human population' involves the supervision of the biological processes of the 'species body,' mechanisms of life such as birth, morbidity, mortality, longevity, through a series of interventions and regulatory controls. These two poles are understood as conjoined through a series of 'great technologies of power,' such as sexuality, race, and more recently proposed, genomic medicine (Rabinow and Rose 2003a:2). Biopolitics therefore involves the rationalisation of the body, and rationalisation of populations, through new combinations of power and knowledge (Turner 1984, in Rutherford 2000). Gandy (2006:499) draws attention to the interplay between 'the health of the 'body politic' and the associated discourses of nationalism, militarism and colonialism.' This sheds light on the processes of the European colonisation of New Zealand described in chapter one, which were shown to manifest a distinct Darwinian biological justification, applied to both Maori peoples and indigenous biota.

Foucault's work is a historical description of a new type of state intervention into the affairs of its population that emerged in the sixteenth century. I would argue that environmental governance as a twentieth/twenty-first century function of state can be illuminated by reflection on the similarities, and differences, with this established area of state concern. Drawing these approaches into the empirical domain of biosecurity and native/alien species issues, it becomes particularly pertinent to pay close attention to Rose and Miller's (1992) call for a complex, nuanced, subtle approach to the application of biopolitical governmentality frameworks. The stuff of biosecurity, the regulation of national borders, the restrictions on importation and the strict categorisation of natural entities can easily be sensationalised in combination with the language provided by biopolitical governmentality. Academic approaches to native/alien species, for example, frequently make reference to the association of nativist policies to the Nazi regime. Rose (2001), in the context of comparing genetic counselling to eugenics, argues that rather than simply contrasting positive to negative policies, voluntary to compulsory, coercion to persuasion, we need to 'mark out the specificity' of these biopolitical practices. Equally, rather than simply contrasting Nazi nativist policies with contemporary practices of ecological nativism, we need to 'mark out the specificity' of ecological biosecurity in New Zealand as contemporary ecopolitics (Rose 2001). In what can be emotive terrain, there is the need to 'be more specific about the make-up of contemporary logics of control' (Rose 2001:9).

Rutherford (2007) highlights that a key criticism of governmentality is in its presentation as a completed project, which circulates and has effects as intended. Rydin (2007) argues that this over-emphasises the coherence and effectiveness of political projects. If deviation occurs it is cast as a failure. Rydin (2007) also contests the monolithic application of governmentality, arguing that the framework needs to allow for greater agency and conflict in the construction of objects and subjects. Analyses of governmentality are too often conducted at abstract levels. This includes a propensity to focus on political rationalities and on larger scales of analysis, such as the nation state (Rutherford 2007). Rutherford argues that geographers are well placed to add subtlety to this body of work, through attention to spatiality, scale, territory and relations. These sensitivities draw greater attention to the material realities of governmentality, or 'the messy actualities of social relations' (O'Malley et al 1997, in Rutherford 2007):

> Governmentality literature needs to be made messier – more complicated – to provide a robust analysis of the exercise, administration and application of power. By paying attention to unintended consequences, acts of resistance, processes of occlusion, and multiple locations..., I think geographers can provide a more nuanced picture of how rule circulates, and, indeed, is changed by this circulation (Rutherford 2007:305).

Foucault developed the concepts of governmentality and biopolitics through detailed attention to the particular aspects of western governance in specific historical periods. Equally, the secondary theorists I have drawn on such as Rose, Miller, Rabinow, Rutherford and Elden have reworked and developed these concepts by interrogating particular *historic and geographic contingencies*. Gandy (2006) argues that Foucauldian analyses of power relations are focused on a narrowly European frame of analysis, which fails to fully conceptualise bodily and spatial exclusion (see also Butler 1996, for a critique of Foucault's failure to attend to exclusion and social location). The contemporary post-colonial governing context of New Zealand outlined in the preceding chapter is marked by its own specificity. New Zealand can in one sense be largely aligned to the model of governance which has been used to develop Foucauldian concepts, due to the transport and replication of European liberal democracy styles. However, the postcolonial context of New Zealand and the bi-cultural nature of its governing influences are highly significant. Examples include the influence of the Maori renaissance on mainstream environmental values, and the requirement that iwi are consulted in aspects of biosecurity governance. It is also significant through the relationship of biosecurity governance to New Zealand's valued ecological assemblages. For example, biosecurity could be seen as the attempted ecological de-colonisation of New Zealand. To highlight this political-ecological specificity, I will now consider the ways in which these theoretical resources have been utilised and adapted within the empirical domain of environmental politics and governance.

2.3 Environmentalising Foucault

Rabinow and Rose (2003b:1) argue against attempts to 'discipline his [Foucault's] thought and turn it into orthodoxy.' They support approaches which work to 'open things up, not close them down; to complicate, not to simplify; not to police boundaries of an oeuvre but to

multiply lines of investigation and possibilities for thought' (Rabinow and Rose 2003b:1). Biopolitics and governmentality have been stretched and applied to a variety of arenas beyond the governance of national populations. Ingram (2007), for example, extends biopolitics to encompass geopolitical concerns for security, associated with the sexual health of other national populations. Governmentality and biopolitics, and the associated concepts of discipline, normalisation and power/knowledge, have recently been taken up and applied by a number of academics to aspects of environmental politics. These typically but not exclusively attempt to develop understandings of *environmental governmentality* and *ecopolitics*, extending the analytical resources of governmentality and biopolitics into contemporary environmental management '*logics of control*' (Rose 2001:9). Rutherford (2007) has recently provided a review of approaches that develop concepts of 'green governmentality.' A further significant contribution to this theoretical area has been made through the redevelopment of the concept of *environmentality* by Agrawal (2005a, 2005b), from a term coined by Luke (1995). Agrawal's environmentality thesis goes beyond extensionism to the active redevelopment of Foucauldian concepts through a detailed case study of community forestry in Kumaon, India. In the following section I consider the inflection of Foucauldian concepts by academics into specific empirical sites of environmental politics. Working with these approaches, and returning to the definitions of 'governmentality', 'biopolitics' and biopower' discussed above, I consider the ways in which 'ecopolitics' and 'environmental governmentality' could be characterised.

Ecopolitics and Environmental Governmentality

In '*Ecological Modernisation and Environmental Risk*' (1999), Rutherford considers the extent to which the concept of biopolitics includes a concern for the environment. Rutherford believes that Foucault's discussion of the biopolitical regulation of populations assumes a *necessary* concern with the administration of the environment through concern for the conditions of life. In the eighteenth century the supervision of the 'living interrelations' between population and environment also came to be seen as the task of state (Foucault 1988, in Rutherford 1999). New technical and normative disciplines, such as biology, agriculture and public health, provided relative control over the conditions of life. This aligns with Elden's (2007) consideration of governmentality as intrinsically associated with the governance of territory.

However, the majority of authors working within this arena emphasise contemporary environmental governance as a new area of governmental concern and responsibility. This involves an *extension* of state preoccupation beyond the 'regulatory biopolitics of the population' and the associated management of territory. It instead incorporates the control of a state's non-human subjects: the flora, fauna, air, land and water within this territory. Rutherford (1999) develops biopolitics and governmentality to understand the emergence of the environment as an object of public policy. In *'Environmentality as Green Governmentality'*, Luke (1999) argues that the time-space compression of post-modern living has brought the entire planet and all biological entities, not just human populations, under the governance of state power. Luke highlights the pervasiveness of governmental involvement in managing the environment, particularly its protection in terms of 'safety' and 'security' (Luke 1999). This is an essential manoeuvre to understand contemporary ecological biosecurity. The shift in concern from agriculture to the native ecology, outlined in the preceding chapter, stretches the traditional governmentality framework as it is no longer concerned with the maximisation of the population.

In *Environmental Governmentality: the Case of Canada's Green Plan* (1996) Darier undertakes 'a close textual analysis of the Green Plan, while applying the conceptual grid of governmentality' (Darier 1996:594). Darier (1996:596) typifies Canada's Green Plan as an example of environmental governmentality due to the centralisation of governmental environmental agencies and procedures, the emergence of new environmental knowledges, and the normalisation of environmental conduct. This results in the constitution of specific environmental subjectivities. Darier (1999) therefore sees significant potential for an environmental critique within the concept of governmentality, due to its three axes of issues of state security, techniques of control of the population, and association with new forms of knowledge. Rutherford (2007:291-2) also argues that governmentality offers 'promising analytical terrain to geographers who interrogate intersections between nature, power and society.'

The approaches discussed in different ways draw explicitly on Foucauldian language and concepts to understand developments within environmental politics. Following Rabinow and Rose's (2003a:3) definition of biopower discussed above, *'ecopower'* might therefore be characterised as involving:

- Truth discourses about 'vital' characteristics of ecological life, which are taken charge of by experts authorised to speak that truth.
- Strategies for intervention upon collective conditions of ecological life, involving power relations that take 'living' non-humans as their object.

It is the third aspect of Rabinow and Rose's (2003a) schema for biopolitics in which interesting differences emerge for ecopolitics. I have suggested above a possible tension in the application of different aspects of biopolitical governmentality to humans and non-humans. For biopolitics this involves:

- modes of subjectification in which individuals work on themselves under these forms of authority in relation to these truth discourses, in the name of individual or collective life

There is therefore a distinction drawn between the governance of humans and their ecological relationships and environmental practices, and the management of non-humans, ecological life and processes themselves. I do not believe that it is necessary to establish a definitional focus for ecopolitics in this regard, but instead hold on to the expanded potential that this dual and overlapping 'subjectification' offers. 'Ecopower' could be described as the exercise of a form of power on the varying conceptions of the 'nature' of nature as both individual entities or as collectivities (for example species, ecosystems), their apparent variability (for example as 'native' or 'non-natives'), and the ways in which these characteristics can be shaped, managed and selected in order to achieve political objectivities (for example through internal pest plant management) (from Rabinow and Rose, 2003a:2-3). Referring to the bipolar diagram of biopower, an 'anatomo-politics' of the non-human body might apply to agricultural and biotechnological practices selecting and adapting species, seeking to 'maximise its forces and integrate it into efficient systems' (Rabinow and Rose 2003a:2). Clark (2003), for example, draws on Foucault to characterise agriculture as the disciplining of life. The pole of 'ecopolitics of the species body' might be understood as environmental regulatory controls, such as Rutherford's (1999) example of Environmental Impact Assessments, or perhaps even more applicably, ecological biosecurity policies.

The most applied work drawing on and adapting governmentality to understand environmental governance through a detailed empirical case-study comes from Agrawal's (2005a, 2005b) work on 'environmentality' and community forestry in India. Rather than simply transferring and re-applying governmentality, Agrawal's approach shows how the concept itself changes in the intersection with the environmental arena.

Environmentality

Agrawal (2005a) has recently utilised the term 'environmentality' in a way likely to set its definitional boundaries, in his study of community-based forest protection in India. In '*Environmentality: Community, Intimate Government, and the Making of Environmental Subjects in Kumaon, India*' Agrawal describes environmentality as a:

> framework of understanding in which technologies of self and power are involved in the creation of new subjectivities concerned about the environment (Agrawal 2005a:166).

Agrawal traces the effects of a shift in governmental rationalities and technologies on the environmental subjectivities of forest residents. He argues that the production of environmental subjects concerned about the environment emerges through three conceptual elements: 'power/knowledges' (which he elsewhere describes as 'politics'), 'institutions' and 'identities.' These are linked within 'technologies of government.' Agrawal emphasises the relationship between experience of participation in intimate government practices, subjectivity, and pro-environmental understandings.

Whilst acknowledging the debt to Luke for the coinage of the term, Agrawal explicitly draws 'environmentality' in a new direction by emphasising shifts in environmental subjectivities brought about through participation in environmental governance. This contrasts with Luke's emphasis on regulation as a control and constraint mechanism (Agrawal 2005a:233). To envision this shift, I see Agrawal's use of the term environmentality to be a combination of '*environ*mental govern*mentality,*' but also '*environ*mental *mentality.*' This re-emphasis appeals to me as it draws the term closer to a Foucauldian concept of power that is not only constraining but also productive of subjectivities. As I have highlighted in the discussion above, Rose and Miller (1992) appealed for governmentality to be understood as a productive

force differentiating the political from the non-political and drawing conditions of life into the political realm. Following this, an understanding of environmentality must avoid the temptation to emphasise a top-down form of environmental political power. Agrawal, for example, criticises the greater attention afforded to 'technologies of power' over 'technologies of self' in analyses of subject formation within governance regimes. I do, however, want to use the term to envelop not only the production of environmental subjectivities, but also other aspects that define governmentality. This would include a consideration of environmental centralisation, the role of expert knowledges in environmental policy-making, disciplinary techniques and processes of normalisation in environmental regulation, and the constitution of environmental subjectivities. These definitional aspects support the focus of my empirical chapters, and will now form the basis of the following discussion and review.

Situating Environmental Governance: Environmental Centralisation, Government at a Distance, and Intimate Government

Rutherford (2007) argues that geography, with its attention to the specificity of space and place, is engaged in understanding how power operates differently in different places. As a discipline it is therefore 'well placed' to respond to the critiques of governmentality outlined above, by applying greater attention to the effects of the material location of different bodies. Geographers have been actively involved in working through and applying Foucault's work on space and power to a variety of different contexts (early engagements notably include Driver 1985). The ways in which governance is spatially organised or situated, the ways networks are established and flows of power occur between different constituents, experts, policy-makers, subjects and entities, is a central focus of the approaches to environmentality. This is seen by Rutherford (2007) as more attentive to the multiple sites of contemporary environmental governance. Rutherford (2000) argues that Foucault's governmentalised welfare state was made up of *'a composition of fragile and mobile relationships'* between non-state professionals, intellectuals and social movements, and state agencies (Rose and Miller 1992:192-3, in Rutherford 2000:127). Rutherford (2000) compares this to programs of environmental security, which draw on equally complex open and unstable 'politico-epistemic' configurations. Agrawal also describes a shift in the location of governance from centralised state apparatus, to a new technology of government that relies

on localities as partners in regulation (2005a:89). This challenges the theoretical separation between state and community. Agrawal therefore situates his empirical focus within environmental governance approaches that aim for decentralisation to secure greater public participation.

In his empirical case-study, Agrawal argues that the environmental governance of forestry in Kumaon, India, is made up of highly dispersed centres of environmental authority working in heterogeneous ways. He contrasts this with Rose and Miller's (1990) theoretical model through which 'government at a distance' is seen to be achieved. Drawing together Foucault's insights into 'control at a distance,' with Latour's concern for how knowledge travels through 'action at a distance,' this is a vision of singular 'centres of calculation' producing:

> constant oversight, continuous collection of information, unceasing crunching of numbers, and the imposition of intellectual dominance through expertise (Miller and Rose 1990: 9-10, in Agrawal 2005a:178).

In a history of political struggles over forest ownership in Kumaon, Agrawal (2005a:4) surveys initial attempts to bring the forest under this form of centralised control, through surveys, categorisation, planting and harvesting management, restrictions on use and fire prevention. Rather than achieving governance at a distance, this actually produced 'exceptional deviance and unparalleled illegality' through its invasive and restrictive approaches. Decentralised governance was organised through local level forest councils after 1932. Agrawal develops three interlinking concepts of spatialised governance to understand these changes: '*governmentalised localities*,' '*regulatory communities*,' and '*intimate governance*.' These concepts form the basis of the following discussion.

Agrawal (2005a:6-7) utilises the term '*governmentalised localities*' to describe sub-national units of rule. These extend state power through the emergence of tighter relationships of regulation between the state and localities. In contrast with a single colonial government department as the identifiable repository of power, through 'governmentalised localities' power and responsibility is devolved to localised bodies. This dispersal or scattering of power to multiple locations increases the number of agents involved in regulation, leading to a proliferation of 'strategies, flows and directionalities of power' (2005:90). This is very

relevant to the complex institutional geography of biosecurity described in chapter 1, as regional councils have devolved responsibilities for internal pest management.

Agrawal argues that the concept of 'governmentalised localities' and the shift to community governance did not simply lead to an extension of state power. Instead, he suggests that local decision-makers and state officials pursued new technologies of environmental governance *jointly*, and that strategies of government relied on *existing* forms of cooperation and joint action within localities. This changes the boundaries of distinction between state and community. Agrawal argues that this adaptation and refinement of the machinery of governance is less costly both politically and economically, as public support is achieved at the same time as detailed regulation is enacted by local communities themselves.

Within Agrawal's (2005a) case-study, *'regulatory communities'* develop around village level forest councils. 'Regulatory communities' emerge within governmentalised localities, regulatory spaces where social interactions around the environment occur. This occurs through the development of closer links and relationships between local decision-makers and their communities, through the granting of limited autonomy to these units. This governance format leads to a redefinition of relationships between local actors and community groups. In analysing biosecurity governance, this concept of regulatory community draws attention to the relationships between regional councils, their employees and the communities they operate within.

Community-based regulation is argued to operate 'more constantly, consistently, effectively and transformatively' at a localised level (Agrawal 2005a:93). The regulators have greater local legitimacy. Greater and more precise monitoring mechanisms are possible. Diverse strategies of enforcement developed at a local level have greater relevance. Therefore, despite this highly intensive level of monitoring and control, localised regulation is also productive of new mechanisms and alliances. In Agrawal's case-study, the variety of locally specific strategies of regulation occurred alongside codified rules created by central government. This occurred as state officials 'could not anticipate all the circumstances of use and management at the local level' (2005a:134). Agrawal (2005a:159) also highlights that the forest councils did not displace the forest department, but instead the two, through the mechanisms he describes, work in tandem, 'the capabilities of each being complimentary':

> The new governing agency for this territory is a hybrid born of members of the state and the community... The efficacy of the new regulatory regime in Kumaon thus depends on a marriage between the diversity of the forest councils and the delegated power of state officials. The councils' monitoring and sanctioning abilities and the power of state officials combine to make the new regulatory regime ... a powerful instrument for reconfiguring resource use and users' views (Agrawal 2005a:160).

Crucially Agrawal emphasises that the success of this form of decentralised rule depends on shifts in the subjectivities of those undergoing regulation.

Agrawal (2005a) utilises the term *'intimate government'* to draw together the positioning of decision-making and regulatory development in communities, with processes of self-government. Intimate government works in conjunction with government at a distance. Involvement in government becomes dispersed more widely, as actors in numerous locations of environmental decision-making operate in heterogeneous ways within the same environmental problematisation. In contrast to the operation of 'centres of calculation', practice and sociability override expertise, calculation and discipline to regulate actions, and this is supported by everyday existing flows of power. This situated aspect of governance will be discussed further under the section 'environmental subjectivities.'

A move from 'centres of calculation' to modes of intimate governance as the exclusive focus for an environmentality framework is, I would argue, too restrictive. Instead, Agrawal's (2005a) discussion prompts a greater depth of engagement and attention to the nuances of the *situated context* of environmental governance. This occurs relationally between state actors, dispersed centres of environmental regulation, legislation, governmentalised regulatory strategies, various 'experts' and human and non-human subjects. In the following section I consider the ways expert knowledges are understood to construct the objects of environmental governance.

Constructing the 'Objects' of Environmental Governance: Expert Environmental Knowledges

The previous section described the positioning of environmental governance, which in Agrawal's (2005a) formulation not only occurred between state and community, but ultimately challenged this binary distinction. Agrawal emphasises the operation of 'intimate

government' processes over the activities of centres of calculation producing expert knowledge. In his case-study, however, this occurs after the wholesale production of statistical knowledge about forests by the Forestry Department.[1] A number of other authors working with environmental governmentality draw attention to the role of expert knowledges in the classification, categorisation and standardisation of ecological life, following Rose and Miller's (1992) argument that government is intrinsically linked to expertise.

Within empirical work produced during his archaeological period, Foucault traced the development of knowledge about the natural world from the Classical Age, in which nature was categorised according to resemblance (e.g. Linnaeus), to the development of a radically new concept centred on the hidden dynamic mechanisms of life (Darier 1999). The emergence of the biological sciences as a new scientific discipline, and of biology as an object of political calculation and control, is instrumental in the development of '*biopower,*' as described above. Darier (1999) understands this to have created the initial conditions that make contemporary environmental critique possible.

Within an analysis of environmental policy, Foucault's emphasis on expert knowledges and processes of standardisation and calculation encourages contextualised attention to the link between scientific understandings and the management of the environment. The institutionalisation at a government level of new areas of scientific expertise has made environmental governance dependent on scientific expertise in both *defining* and *managing* environmental problems (Rutherford 1999). Rutherford (1999) argues that the mechanisms of ecological life became an object of explicit state calculations and strategy through expert knowledges of ecology. Luke (1999) argues that expert environmental knowledges and discourses such as ecology work well within Foucault's framework of governmentality, as they mobilise particular assumptions, codes and procedures that enforce specific understandings of the economy and society. They generate certain administrative truths, and can authorise or invalidate practices and concepts, through their ability to classify, organise and legitimate ecological reality (Luke 1999). When institutionalised at a government level, Luke argues that ecology gives governments 'all of life's biodiversity to reformat as 'endangered populations'', thus becoming objects of managerial control (1999:277). Ecology has therefore become a political resource that both constitutes the objects of government, and

[1] Agrawal's own research, which draws on statistical techniques as well as qualitative methods, is validated through his own association to a centre of calculation in the form of his supporting university.

provides the intellectual machinery essential for the practice of government. As Bäckstrand (2004:703) argues, in reference to expert and citizen debates over scientific knowledges:

> Environmental problems...are not 'out there' in a pure and unmediated form, but various techniques, procedures and practices construct these fields in such a way that they become both objects for knowledge and targets for regulation.

The forms of environmental knowledges analysed by scholars in this arena include different uses of statistics and classificatory schemas, environmental indicators and impact assessments (Rydin 2007; Rutherford 1999), scientific forestry and mapping (Agrawal 2005a and 2005b; Braun 2000; Scott 1998). This therefore overlaps with a strong vein of work in historical and cultural geography, which considers the colonial project of mapping as a method of apprehending environments. Braun (2000), for example, reveals how the process of mapping the Queen Charlotte Islands for mineral extraction erased the presence of First Nations inhabitants. Through measuring, charting and mapping practices, the Islands were remade in ways suitable for the aims of the colonial state. Rutherford (1999) considers the way in which Environmental Impact Assessments (EIAs) construct nature, but crucially also the way nature can be referred to and engaged with in political debates (Wynne 1992).

Agrawal (2005a) focuses on the use of numbers and statistics in reconfiguring 'forested environments' as domains fit for modern government in colonial India (see also Demerit 2001 for the statistical and graphic reconfiguration of US national forests; Hannah 2000, 2001 for statistics and census-taking in the governance of human populations). Processes of surveying, demarcating, consolidating, protecting, planting, managing, harvesting and marketing forests are understood as strategies by which the objects of governance are constituted and 'come into being' (Agrawal 2005a:19). These 'systematic organizational mechanisms' were founded on new representational regimes for forested environments, significantly including numerical data (Agrawal 2005a:28). In *'Seeing like a State'* Scott (1998) details the state processes of calculation, standardisation and simplification utilised in social and ecological projects designed to 'improve the human condition.' The development of Germanic scientific forestry is one such state process discussed. Scott describes how the singular aim of increasing reliable yields, seeing the forest as an economic project, excluded the forests' myriad other social and economic functions.

Agrawal (2005a) argues that statistics and numerical data are seen as precise, apolitical representations. This allows the seeming 'depoliticisation' of environmental governance, despite its inherent political nature. Agrawal emphasises, however, that the use of this form of representation within governance is contingent, not inevitable. It is not linked to an underlying material reality, but instead to the socio-political context of the time. Eventually, numbers and statistics came to stand for the forest itself, as 'statistics allowed forests to be apprehended summarily and unambiguously' (Agrawal 2005a:29). These strategies of power/knowledge therefore utilised numbers and statistics to represent forests, to enact control and to govern at a distance.

The application of expert knowledges and the classification and constitution of objects of governance within environmentality approaches are usually theorised in application to non-human 'ecological life,' rather than to humans. Agrawal argues for a contrast between the effects of classification on humans and non-humans:

> Classifications of inanimate objects such as trees and vegetation types set in motion a very different process of social world making in comparison with the classifications of human beings on which statistical counts are based. When humans are classified, the classification and the allocation regimes of which the classification is a part generates a new politics (Agrawal 2005a:63).

Agrawal is arguing that 'inanimate objects' come to be reshaped by their own representations. For example, objectives for timber production and revenue maximisation led to the selection of certain characteristics to represent forests numerically. This representation of forests as standardised entities led to the control and reduction of diversity in managed forests through a desire for uniformity. The scientific forestry techniques Scott (1998) discusses also reduced the biodiversity of the forest to the most efficient fast yielding timber, clearing out messy undergrowth and difficult to manage mixed species planting. Classification and associated statistics established commensurability and allowed deviation from statistical norms to be pinpointed and worked upon. One reality, of the 'commercial forest,' is imposed to the exclusion of other realities, for example, of an 'ecological forest community' (Agrawal 2005a). In this way, expert knowledges are 'active' in first imagining then creating a new type of forest. This, as in all of the state projects Scott (1998) describes, not only brings the object of control into the calculating gaze of the state, but it also alters the physical actuality it seeks to control. Through expert environmental knowledges, not only is the subject radically simplified, but also physically re-aligned, demonstrating the power state

projects have to alter the facts they note. However, as these representations are always imperfectly enacted, Agrawal (2005a) understands the relationship between forests and statistics as mutually constitutive.

In a further example of state simplifications of ecological reality, Scott (1998) discusses modern western monoculture farming, and the failures that arose in its application to developing world contexts (see also Murdoch and Ward, 1997, for the making of the British national farm through surveys and statistics). The radically simplified western farm, whose spatial dimensions are realigned as its species content is reduced, becomes an object of greater predictability and control. Scott links the western disdain for the West African farm to a visual preference for order and sameness, and a disregard for practical knowledge. The failure of this project is attributed to the importance of complexity that falls outside this simplifying vision. Scott's thesis emphasises the value of what he terms '*metis*' or practical knowledges formed in specific contexts through detailed, ongoing interactions or 'experimentation' with the world. Scott (1998) attributes the 'rescuing' of a number of the state failures he discusses, to the improvisation and modifications adopted by the everyday practitioners of *metis*:

> We must keep in mind the capacity of state simplifications to transform the world but also the capacity of the society to modify, subvert, block, and even overturn the categories imposed on it (Scott 1998:49).

There is not, however, a simple binary of naïve distant experts and common-sense locals, as 'metis' can be possessed by local practitioners employed within state processes.

These approaches provide valuable resources for understanding biosecurity governance. They suggest attention to the intersection between expert knowledges such as weed ecology, and biosecurity governance processes. The knowledges drawn on in determining and categorising a 'risk species' under the Environmental Risk Management Authority (ERMA) process, for example, can no longer be understood as representative of an underlying reality. However, the picture of nature as an 'inanimate object' to be represented and apprehended stands in sharp contrast to the theoretical approaches referred to at the start of this chapter concerned with the complexity and agency of socionatures. As the preceding chapter revealed in the case of plants imported to New Zealand that subsequently turned weedy, it is important to keep in mind the capacity of *nature* to 'modify subvert, block and even overturn the

categories imposed on it' (Scott 1998:49). In addition, Rydin (2007) emphasises within her research on sustainability indicators that governmental technologies such as classificatory and calculative processes need to be seen as *sites* of agency and conflict. This draws attention to public conflict and influence over the production of expert knowledges, an area which is pursued in the context of biosecurity governance in chapter 4. In the next section, I go on to consider the specific ways in which Foucauldian notions of discipline and normalisation have been applied by theorists to analyses of environmental governance.

Enacting Control: Environmental Discipline and Normalisation

The generation of expert knowledges within environmentality frameworks are applied to non-human objects of governance. In contrast, analyses of discipline and normalisation strategies are also applied to humans through the normalisation of environmentally desirable behaviour. What might prove most interesting to explore is how normalisation and disciplining of humans and non-humans becomes *linked* within environmental management practices. Biosecurity governance is one way in which these links occur, exclusionary wildlife reserves are another. Agrawal's (2005a) discussion of the development of scientific forestry encompasses the normalisation and discipline of the non-human components of the forest. However, his key focus is on the ways in which the human occupants of the forest came to accept and participate within regulatory control of the forest.

Agrawal's concept of the 'regulatory community' is offered as a new form of control. Regulatory rule:

> creates awareness and knowledge through direct participation in the various elements and stages of regulation. Those who take part in allocating resources, monitoring... and implementing sanctions are more likely to come to appreciate the fragility of the environmental resources they are trying to conserve (Agrawal 2005:163b).

'Regulatory control' is enacted through processes of resource allocation, of monitoring use, and of enforcement. Agrawal highlights that while strategies to force compliance were within the repertoire of governmental mechanisms, their actual deployment was rare. The dominant methods to ensure compliance are forms of cooperation, the achievement of group interests, and of safeguarding the future (Agrawal 2005b:125-126). These multiple means of shaping behaviour place practice and sociability over expertise in the disciplining of environmentally

beneficial behaviour. Overall, Agrawal (2005a) urges greater empirical attention to how localised regulation works, and with what effects.

Luke (1999) also considers the normalising tactics that environmental governmentality might employ. Rather than considering examples of full disciplinary control within environmental politics, in later work Luke pays attention to the subtler processes of identity construction around collective ends, such as survival or sustainability, which encourages populations to function in accord with regulatory goals. Rutherford (2007), however, highlights that the majority of work in the environmental governmentality arena pays attention to disciplinary power. Darier (1996), for example argues that Canada's Green Plan constitutes a clear attempt to discipline the population and the daily lives of individuals. It works by instilling new norms of environmental conduct through the combination of environmental education and environmental drills, such as repetition in recycling programs. This leads to the construction of environmental citizenship as the basis for a new subjectivity.

Agrawal (2003a:169) questions the structural distinction between constraint and freedom, seen to underlie much of the environmental politics literature that uses an analytic of domination/power and resistance/marginality. By opening up this dualism, it becomes possible to describe restrictive environmental regulation situated within a decision-making framework that includes community-based design. 'Subjects' can become active partners in the governmentalisation of nature. Agrawal's emphasis on the productivity of power and the subtlety of governmentalised mechanisms of control concords with the accounts of governmentality and biopolitics reviewed above.

This discussion draws attention to modes of discipline and normalisation which could be features of biosecurity governance. Governing tactics are likely to be multiple, and operate in different ways in different sites and through different bodies. This highlights the necessity for analytical attention to both biosecurity regulatory strategies and practices of public education, with sensitivity to the ways these are enacted in specific sites. In the following section I consider how practices of discipline and normalisation are understood to contribute to the construction of environmental subjectivities.

Constructing the 'Subjects' of Environmental Governance: Environmental Subjectivities

Agrawal (2005a:164) argues that the most important and unexplored question in relation to environmental regulation is of the role of environmental subject positions, their connections to changes in government, and subsequent shifts in belief: 'when and for what reason do socially-situated actors come to care for, act and think of their actions in relation to something they define as the environment?' This is corroborated by Rutherford (2007), who argues that considerably fewer scholars have paid attention to the formation of the subject over other aspects of governmentality. Latta (2007) provides one exception, by considering how particular subject positions arise within environmental politics, and how contestation over subject positions forms the basis of political conflict. As mentioned above, there is a tension between attention to non-humans as the objects of environmental governance, and to human subjectivities as the basis for cultivating regulatory adherence. While Agrawal refers to constructions of forests as the object of governance, it is his work on environmental subjectivity that is most developed and interesting.

Within a governmentality framework, subjectivities are shaped through the dual effects of '*technologies of power*,' the ways conduct and subjectivity is controlled through disciplinary techniques and normalisation, and '*technologies of the self*,' through which individuals can transform themselves and their conditions (Agrawal 2005a). Rutherford (2007) defines 'technologies of the self' as the ways people choose to become often more 'virtuous' kinds of subjects through techniques of self-improvement. Agrawal (2005a:166) criticises the secondary literature on governmentality as placing undue emphasis on the technologies of power, the coercive aspects of state, institutional or social power. He highlights conflicting conclusions of scholarship on government and subjectivity, such as Anderson's 'nation as imagined community' that emphasises the control of the imaginations of the weak by the powerful (Anderson [1983]1991), and subaltern studies, which emphasises the ability of people to resist dominant hegemonies (Scott 1985). Agrawal considers the mechanisms that could account for both possible effects. This dual commitment is revealed within an explanation of his use of the term 'subjects':

> I do not use *subjects* in opposition to either *citizens* or *objects*. One commonsense meaning of *subjects* would be to see them as actors or agents. But subjected people are also subordinated (Agrawal 2005a:165, original emphasis).

Agrawal therefore draws on the productive ambiguities inherent in the term: as citizen, as object, as actor/agent, as subjected and subordinated, and as a theme. Rutherford (2007) also explores this ambiguity. While 'technologies of the self' emphasises autonomous subjects with control over their own lives and certain desires, it also emphasises incomplete subjects who can be improved. This draws the subject into a relationship with experts through forms of pastoral power.

Agrawal utilises the term '*environmental* subjects' for those for whom:

> the environment constitutes ... a conceptual category that organises some of their thinking; it is also a domain in conscious relation to which they perform some of their actions (Agrawal 2005a:165).

This is not an all encompassing concept: environmental subjects are those that define their actions, positively or negatively, in terms of the environment. While environmental subjects will 'see the generalised need for environmental protection in some form and whose practices and words bear the mark of this acceptance', Agrawal does not demand a high level of adherence or full 'personal conversion' to the dominant environmental idiom (Agrawal 2005a:18). Within this formulation, then, not all people become or can be thought of as 'environmental subjects', and for those that do, their actions may not always lead to environmental conservation. One question that might arise from this is how often this form of environmental subjectivity is enough for the needs and concerns of the environmental regime in question? Is this enough to achieve the aims of ecological biosecurity, for example?

The success of governmentalised strategies is dependent on shifts in subjectivities. In analysing the variable ways self-formation takes place, Agrawal emphasises *participation* in different forms of governmental practices. This participation is used to explain why some people become 'environmental subjects', while others do not. This link, between changes in regulation, practices and subjectivities, is the crux of Agrawal's thesis:

> persuasive answers about variations between subject positions and the making of subjects are likely to hinge on explanations that systematically connect policy to perceptions, government to subjectivity, and institutions to identities (Agrawal 2005a:165).

The progression between participation and beliefs could be seen to work in either direction; the 'new knowledge - changes beliefs - leads to participation' is the more traditional model (see Burgess *et al.* 2000 for a critique of this). Agrawal suggests in contrast that participation in forms of environmental regulation and enforcement actually alters subjects' conceptions of their own interests. He believes that his empirical research supports the suggestion that:

> variations in the environmental identities of Kumaon residents are systematically related to their participation in environmental enforcement and that these differences stem at least to some extent from such participation (Agrawal 2005a:176).

Social and environmental practices produced under differing institutional and political circumstances are central to the construction of environmental subjectivities. In this sense, then, different institutional matrices of power can produce different environmental subjects, or 'environmentalise' subjects in different ways. This is significant in relation to Rutherford's (2007) critique of governmentality literatures which present rule as a completed project applied to a passive populace. This removes difference in both human and non-human populations, as all bodies are theorised as incorporated into a system of rule in the same ways. In contrast, Rutherford emphasises that rule is circulated through particular situated bodies and places.

By highlighting the significance of practice in constituting environmental subjectivities, attention is drawn to the practical participation of gardening publics in aspects of biosecurity governance. While Agrawal's thesis highlights public involvement in forms of biosecurity regulation, the significance of private modes of practical engagement with biosecurity is also a possible site for the formation of environmental subjectivities.

Moving Towards Alternative Subject Positions

The extension of Foucauldian concepts of governmentality and biopolitics into the environmental arena has provided valuable resources for understanding different aspects of environmental governance. Through this meeting, however, these concepts have not remained unchanged. Instability between the treatment of non-humans and humans, an emphasis on practice in the formation of subjectivities, and greater attention to the geography

of governance have been highlighted. The emphasis Agrawal (2005a) places on 'technologies of the self' in the constitution of environmental subjectivities is a particularly significant intervention.

In the following section I augment these resources with an alternative body of literature, which shares concerns of how to understand relationships between states and publics in matters of environmental concern:

> Citizenship emerges out of relationships between citizens and with institutions – including government – over time and in a variety of social, economic and political spaces (MacGregor, Pardoe, Dobson and Bell 2005:1).

Despite this common focus on citizens and governing institutions, these approaches differ particularly through their treatment of lay publics. The approaches to governmentality, biopolitics and environmentality I have drawn on attempt to emphasise the positivity of power. They nevertheless convey a sense of state-dominant relationships with lay publics, and the genesis of problematisations within expert knowledges and concerns. This discursive language is perhaps uncomfortable for environmental theorists, who are often driven by personal environmental commitments. This could be one reason why biopolitical governmentality has had a limited uptake in the environmental arena, in comparison to work on health, for example. While citizenship approaches contain conceptions of both active and passive roles for publics, as a whole it allows a re-centring or empowerment of citizens within wider political formations. It provides resources to examine, from a different angle, conceptions of power in state-citizen relationships, and offers an alternative perspective on subject positions. This is relevant to both academic discourses and political contexts. Gandy (2006), for example, refers to the repeated differentiation between citizens and subjects in colonial contexts. While citizens have the right to directly participate in political formations, subjects have a relegated status at the margins of society. This highlights the politicisation of these terms. The different discursive positioning of 'citizens' also influences the direction of academic focus, which is frequently more 'bottom-up' rather than 'top-down' as in governmentality frameworks. This can prevent governmentality approaches fully attending to the ways in which rule is a contested engagement: 'governing is always becoming, necessarily uneven, often contested, and sometimes exercised outside the state' (Rutherford 2007:292).

Citizenship in one manifestation has a Foucauldian link. The development of 'biological citizenship' by Rose (2007) is a possible starting point for thinking through the resources citizenship may provide in understanding biosecurity governance. Rose and Miller (1992) also argue that governmentality contains conceptions of state and citizen responsibility. Rather than draw substantially from Rose's biological citizenship thesis, however, I want to draw on conceptions of *ecological citizenship* for a number of reasons.

Firstly, ecological citizenship's explicit normative import provides a counterbalance to Foucauldian language of subjects and discipline, which when taken into the environmental arena can produce its own negative normative values. This instrumental focus of ecological citizenship is discussed further below. Secondly, Dobson's (2003) account of ecological citizenship draws attention to an *ecological material geography* of political relations that I regard as vital for understanding ecological biosecurity. While Foucault provides an account of the politics within objects and architectural arrangements, this is infrequently applied to 'natural' entities and interactions. Agrawal's (2005a) environmentality thesis also proposes a geography of political associations between governance and localities, but this remains unconnected to biophysicality or ecology. In contrast, Dobson's (2003) account foregrounds biophysical relationality in the generation of politics, centres the private sphere as a relevant site of politics, and explicitly considers the connections between ecological issues and the geography of politics. This approach can also be adapted to consider the material basis of subject positions. Thirdly, the previous chapter raised the significance of national identity and citizenship formulations in relationships to native nature, and subsequently for ecological biosecurity. Turning to the ecological citizenship literature is therefore motivated by the utilisation of these discourses in empirical, political contexts.

Citizenship as a concept has been taken up by theorists of environmental governance, notably Dobson (2003; 2005a; 2005b), Bell (2003; 2005), Dobson and Bell (2006) Valencia Saiz (2005), and Hayward (2006). Bell (2005) highlights that the different intersections between citizenship and the environment have included the most widely used 'environmental citizenship,' 'ecological citizenship' (utilised by van Steenbergen 1994, Smith 1998 and Dobson 2003) 'sustainability citizenship' (Barry 2003) and 'green citizenship' (Dean 2001). Dobson's collection of books, papers and seminar series represents 'the most sustained attempt to examine citizenship from an ecological point of view' (Valencia Saiz 2005:174). Dobson's ecological citizenship thesis provides useful resources and realignments for

developing a citizenship-informed approach to ecological plant biosecurity. In particular, this includes redeveloping the political space of ecological citizenship, highlighting the material nature of responsibilities and virtues, and emphasising practice. In the following discussion I structure my consideration of the intersection between citizenship and environmental concerns through attention to Dobson's (2003) canonical account. I draw on critiques and alternative positions where needed to construct a theoretical approach relevant to ecological biosecurity.

2.4 Debating Ecological Citizenship

Conventional accounts of citizenship in the social science literature provides the background to the approaches reviewed within this section. Citizenship is defined by Dobson and Bell (2005:1) as 'dynamic and political, entailing a bundle of rights, responsibilities and practices that define membership in a political community.' Citizenship is described as having a conceptual 'architecture' (Dobson 2003:209) containing three elements: citizenship as rights-claiming and responsibility-exercising; the public sphere as the traditional site of citizenship activity; and the nation-state as the political container of citizenship (Delanty, 1997:294 in Valencia Saiz 2005:169). From an initial glance, this bundle of rights, responsibilities, participation and identity appears to map closely onto the meanings and practices of biosecurity. Citizenship is seen to encompass a political side which relates to 'the individual's position vis-à-vis an over-arching political body;' and a social-cultural side pertaining to 'questions about who is accepted as a worthy, valuable and responsible member of an everyday community of living and working' (Painter and Philo 1995: 115-117). Beyond this 'conceptual architecture,' citizenship is a debated concept, with different models and approaches. Dobson (2003) refers to liberal, republican, feminist, cosmopolitan and post-cosmopolitan accounts of citizenship.

Concepts of citizenship have been made to work in a variety of different arenas of social and political analysis. The intersection between ecology and citizenship in the domain of environmental politics has produced a growth of recent scholarship (Dobson 2003; Dobson and Valencia Saiz 2005; Dobson and Bell 2006). Despite the breadth of varied contributions, Latta (2007:230) argues that ecological citizenship is 'treated either as an object of normative

theorising, related to the ideal shape of ecologically-orientated political community, or as an instrument in the cultivation of "green" political subjects.' I will address this concern in the following section.

Dobson (2003) argues that conventional notions of citizenship are challenged by the nature of contemporary environmental problems. The key debate is over how far citizenship needs to be modified to be relevant and useful to an understanding of environmental citizenship. Traditional approaches to citizenship diverge from the co-ordinates of environmental concerns in the way it emphasises the role of the public sphere for the enactment of politically relevant behaviour, on political membership as spatially bounded by the nation state, on citizenship as temporally focused on the present, and on the over-riding focus on rights (in a liberal conception). These factors are clearly in tension with the required responses to environmental problems, and have led different academics to argue for the necessity of varying modifications to traditional accounts of citizenship.

It is important to emphasise that there is no unanimous consensus over what ecological or environmental citizenship can or should mean, and so these concepts must be regarded as 'under construction' (Valencia Saiz 2005:170). Latta (2007a), for example, highlights the different models of ecological citizenship, including liberal versions (Bell 2005; Eckersley 1996; Hailwood 2005), and deliberative or discursive democratic models (Barry 1999). Dobson (2003) draws a definitional distinction between what he terms 'environmental citizenship' and 'ecological citizenship,' a distinction that does not remain unchallenged. 'Environmental citizenship' is a term Dobson utilises to subsume the context of environmental rights, strongly practised, for example, through the environmental justice movement in the US: 'environmental citizenship ... refers to the attempts to extend the discourse and practice of rights-claiming into the environmental context' (Dobson 2003:89). While Dobson's understanding of 'environmental citizenship' is contained within a liberal citizenship, ecological citizenship, on the other hand, can be neither discursively nor politically contained within these forms' (Dobson 2003:83) 'Ecological citizenship' is used to refer to the unique concept Dobson redevelops in association with the empirical conditions of environmental sustainability. Ecological citizenship:

> deals in the currency of non-contractual responsibilities, it inhabits the private as well as the public sphere, it refers to the source rather than the nature of responsibility to determine what counts as citizenship virtues, it works with the language of virtue, and it is explicitly non-territorial (Dobson 2003:89).

For ecological citizenship, therefore, the emphasis of the 'architecture' of citizenship alters. So while the issue of rights and responsibilities remains a defining feature, Dobson (2003) emphasises responsibilities or obligations, and argues that these are non-contractual, asymmetrical and non-reciprocal. Defining the nature of political space remains crucial, yet it is extended beyond the public sphere to encompass both trans-national and private spaces. The question of citizenly virtues remains central, as justice is argued to be key to ecological citizenship. These features make ecological citizenship the most relevant citizenship construct to ecological biosecurity.

What becomes immediately apparent, however, particularly through the juxtaposition of this concept of ecological citizenship with Foucauldian approaches to governance and the environment, is the explicit normative import of Dobson's ecological citizenship. In the following section I address this conflict, by exploring the critiques and alternative approach to ecological citizenship provided by Latta (2007:231), who in contrast pays attention to how the 'politics of citizenship becomes ecological through its articulation with numerous different...understandings of the environment.' Latta draws attention to the entwining of the politics of citizenship and the politics of nature, in an empirical account of debates over different ecological citizenship identities in conflict over hydroelectric development in Chile.

Debating Ecological Citizenship's Normative Import

Dobson (2003) argues that the key motivation for utilising citizenship concepts in the environmental arena is the search for a more sustainable society. Dobson therefore sees ecological citizenship as a contribution to the *promotion* of sustainability (Bell 2003). 'As well as being of intellectual interest, ecological citizenship should also be regarded as a practical tool' (Dobson 2005a:10). This emphasis is also evident in much of his collaborative work. For example, Dobson and Valencia Saiz (2005) outline the practical importance of citizenship in achieving sustainable objectives through the role of civil society in

environmental governance. Dobson and Bell's (2006) edited book *'Environmental Citizenship'* draws together a wide range of perspectives on how environmental citizenship can contribute to sustainability. Ecological citizenship is therefore discussed as an approach to environmental governance that should be advocated, rather than simply a theoretical framework.

This instrumental or normative framing of ecological citizenship is critiqued from within scholarship on citizenship and the environment. Latta (2007b:241) argues that 'scholarship on the ecological dimension of citizenship risks limiting its analytical potential if it fails to move beyond the confines of a normative, prescriptive or instrumental project directed at the cultivation of "greener" citizens.' This limits the identification of alternative narratives and practices of citizenship. Latta (2007a) instead considers the way citizenships and the environment become intertwined in relations of power. Latta (2007a:378) argues that 'rather than seeking the "right fit" between citizenship and nature, this approach is more likely to embrace the proliferation of a wide plurality of ecological citizenships, corresponding to the active politicisation of the human-nature and the human-human relationships that coalesce in various socio-ecological orders'. Latta (2007a) utilises the term 'ecologies of citizenship' to refer to these multiple ecological citizenships revealed through scholarly engagement. In this sense, ecological citizenship is produced, not just by academics setting the definitional boundaries of the term, but by governance actors, publics and other interested parties. Bell (2005), for example, considers concepts of 'environmental citizenship' produced by *Environment Canada.* The normative aspect of ecological citizenship is therefore a feature of its use within environmental politics itself.

This draws attention to the ways ecological citizenship concepts are utilised by the biosecurity regime. From the discussion in the preceding chapter, it is clear that concepts of ecological citizenship in New Zealand have shifted over time. I also highlighted the alternative justifications for contemporary biosecurity within 'agricultural-trade' and 'environmental management' formulations, which may produce different ecological citizenship positionings. Finally, I questioned how publics produced or contested ecological biosecurity ideals, which may involve other citizenships or identities outside dominant formations. Together, this supports Latta's move towards theorising the production and enactment of multiple ecological citizenships.

Latta (2007b) draws heavily on Foucauldian notions of discourse, normalisation, and the production of subject positions. He argues that citizenship in Chile is constituted through systematic disciplinary technologies that enact normalised citizenship. Latta (2007b:231) therefore approaches citizenship from 'a critical stance':

> I prefer to think of citizenship as a highly contested space, where dominant modes of political being are constantly destabilised by emergent citizens in the process of "becoming political" through challenges to the prevailing order...

This quote highlights the conflict Latta presents between 'dominant' (constructed as 'state produced') and 'insurgent' ecological citizenships. His approach draws from scholarship related to environmental justice movements and is informed by subaltern studies, and therefore lies closer to Dobson's (2003) 'environmental citizenship' definition. These influences drive Latta's positioning of alternative ecological citizenships *outside* dominant constructs. This codifies a distinction between the state and society that was brought into question through environmentality approaches, and essentialises environmental politics. This works against the opportunity citizenship theory provides to produce a 'flatter' approach to state/citizen relations. Gilbert and Phillips (2003) produce an alternative account of multiple ecological citizenships, in a consideration of debates over urban environmental and spatial governance. They argue that 'performative' or everyday, in-the-making citizenships, offer a mode of articulating alternative aspirations for governance. Latta's (2007) intervention is significant, however, in highlighting the contested and co-constructed nature of both citizenships *and* natures. He pays attention to the specific discourses or narratives through which nature is articulated within dominant and insurgent citizenship regimes.

The aspirational, normative aspect of ecological citizenship that forms the basis of Latta's critique seems a very contrary impulse to the Foucauldian analysis that I discuss above. I would argue, however, that certain approaches to environmentality, and even Latta's ecological citizenship framework, could also be seen as normative in its implicit distrust or negativity towards attempts to govern environments. To return to Luke's (1995:74) language as an example:

> Being an "environmentalist" quickly becomes a power expression of the eco-knowledge formations of environmentality in which the geopowers of the global ecosystem can be mobilized through the disciplinary codes of green operational planning.

The normative edge of Dobson's (2003) ecological citizenship framework therefore provides a useful counterbalance to these approaches. This is essential to avoid importing assumptions regarding the politics of biosecurity practice prior to empirical engagement. However, by highlighting that ecological citizenship constitutes a site of power relations, space is opened within this theoretical approach for multiple, alternative and conflicting ecological citizenships. This introduces a dynamic element to ecological citizenship. Latta (2007a:385) writes: 'ecological citizenship does not precede a politics of nature... but instead is an emergent property.' Citizenship is therefore understood as continuously *in formation*. Gilbert and Philips (2003:319) take this further by emphasising that this emergent citizenship has effects: 'citizenship is not only a set of formal rights and practices... rather, it is a continual process of creation and transformation of both society and nature.'

Ecological citizenship can therefore be approached as an ideal concept, a practical instrument, an existing practice to be understood *and* a theoretical tool. I am not debating what makes up an ideal type ecological citizenship complex to be applied and encouraged in environmental campaigns. Instead, I wish to utilise ecological citizenship as a framework to analyse the effects of biosecurity on the politics of both citizenship and nature. I am also interested in how conceptions of ecological citizenship are utilised, negotiated and reworked through biosecurity relevant practices. The tension this produces is highlighted by Dobson when he argues that:

> as well as being historical and internally malleable, political concepts are political. This is as much as to say that definitions cannot stand outside the relationships of power they intend to describe. They stand in a complex relationship to this power: neither simply reflecting it nor uncomplicatedly calling it into question (Dobson 2005b:9, original emphasis).

Taken alongside the Foucauldian framework outlined above, this intersection prompts a range of questions: is the biosecurity regime *promoting* notions of citizenship, or are publics acting in ways that they or academics define as 'citizenly'? Is biosecurity emerging as a new area of citizen rights and responsibilities through practical engagements, or is it being actively constituted as such? The overlaps and possible tensions between governmentality, environmentality and ecological citizenship frameworks are further discussed below. Firstly, however, I work through the significance of Dobson's (2003) concept of 'ecological citizenship' for an understanding of ecological biosecurity. I draw on aspects of Latta's

(2007) productive intervention which, I argue, allows a particular synergy between citizenship and governmentality approaches.

Material Politics and the Ecological Footprint

Dobson (2003) draws attention to where his conception of ecological citizenship aligns or departs from the existing theoretical citizenship traditions. However, he derives his co-ordinates for ecological citizenship not from aspects 'definitionally associated' with theorised conceptions of citizenship, but by paying attention to the *empirical* conditions under which ecological citizenship is generated. In this sense, ecological citizenship is *produced* through non-ideal environmental conditions. Dobson therefore provides an understanding of the way in which the materiality of everyday interactions with biophysical entities generates politics. This political materiality is described and understood through the metaphor of the 'ecological footprint'. This represents the ecological impact of an individual's everyday life:

> the space of ecological citizenship is created by the metabolistic relationship between individual human beings (and collections of them) and their non-human natural environment as they go about producing and reproducing their daily lives (Dobson 2005a:9).

The ecological footprint metaphor encompasses the spatiality, obligations and nature of relationships that Dobson argues is generated by ecological citizenship. Political relationships are formulated through 'antecedent actions and relationships' particularly the ecological citizen's capacity to cause impacts 'at a distance' (Dobson 2005a:4). This questions whether concepts of the ecological good are imposed by the state 'from above', as they appear in Foucauldian analysis. It posits instead that environmental problematisations can be produced and understood in material contexts through practical interactions.

This is a very different account of the emergence of the political than that provided by governmentality and environmentality formulations discussed above. Politics is generated not simply through problematisations and knowledge constructions, but through conditions of interaction between peoples and environments. This expands Agrawal's (2005a) dual emphasis on 'technologies of power' and 'technologies of the self' in the constitution of ecological subjectivities. It suggests that biophysical relationality (as peoples re/produce their

lives through material-ecological interactions), is critical to a fuller understanding of the production of ecological subjectivities. This is a crucial manoeuvre for a holistic understanding of biosecurity politics. The previous chapter suggested, for example, that environmental changes in New Zealand brought about through the effects of introduced species (an outcome of complex interactions between the material, cultural and social) was one factor prompting a change in attitudes and a new politics towards native/non-native species.

Ecological citizenship is constituted by the way material ecological interactions are interpreted through conceptions of the 'ecological common good', leading to the production of politics. Dobson's (2003) account is constructed specifically around his link between ecological citizenship and the objective of environmental sustainability. However, he states that the search for the ecological 'common good' can take many forms. Bell (2005) provides the resources for a separation between ecological citizenship and this emphasis on sustainability. Bell (2005:185) argues that a liberal environmental citizenship must constitute the environment only as 'a provider of basic needs' and 'a subject about which there is reasonable disagreement'. This liberal commitment to 'reasonable disagreement' over the ecological good life has two significant effects. Firstly, it does not require the environment to be conceived of in any particular way. Secondly, different 'just and sustainable environments' can be chosen, as there will always be 'reasonable disagreement' about what the ecological good life entails. Through Bell's (2005) intervention the focus of ecological citizenship can be enlarged to consider differing conceptions of the ecological 'common good,' broadening who and what activities can be considered relevant to ecological citizenship. This is significant for the application of ecological citizenship to biosecurity concerns in two ways. Firstly, it allows biosecurity concerns to be encompassed as a current conception of the ecological good in New Zealand. Secondly, it takes account of the history of native/alien species concerns, and shifts in justification for biosecurity, as outlined in the previous chapter.

Constituting the environment as 'a provider of basic needs' in Bell's (2005:187) formulation, however, excludes many practices related to ecological plant biosecurity. It also represents a specific environmental conceptualisation in itself, rather than the neutral perspective that Bell is perhaps aiming for. Adopting a Foucauldian concept of differing 'problematisations' of the environment, which I will refer to as the 'ecological common good,' expands this

conceptualisation. The intersection between biosecurity and citizenship is associated with a different form of the ecological common good, as well as different 'empirical conditions' of historical-material interactions.

Gilbert and Philips (2003) draw on concepts of performative citizenship to emphasise the distinction between citizenship in theory and everyday practices of citizenship. They argue for:

> a necessary acknowledgement of the complexity and contingency of environmental citizenship...to reiterate that it is at the local level that ideas and realities of natures are defined and created (Gilbert and Philips 2003:319).

This is the logical next step from Dobson's (2003) emphasis on the material basis of citizenship. If ecological citizenship is formed through material practices, it must therefore be under a continual *process* of construction and constitution. In the context of rights, Gilbert and Philips (2003:314) argue that: 'performative citizenship is the practice of expressing and recognising our rights and others' rights through the processes of questioning, affirming, negotiating, and enacting them'. This can be extended to performances of citizenship in relation to identity and responsibility.

This section has utilised Dobson's (2003) emphasis on the material constitution of ecological citizenship, but I have taken this in an unexpected direction to produce relevancies for ecological biosecurity. Through Bell's (2005) liberal environmental citizenship formulation I have separated Dobson's concerns with sustainability, arguing that other conceptions of the ecological common good may underpin ecological citizenships. I have added the concept of biophysical relationality in the production of environmental politics and citizenships to Agrawal's (2005a) emphasis on 'technologies of the self' with 'technologies of power' in governmentality approaches. Finally, I have drawn on Gilbert and Philips (2003) to reinforce the continual evolving nature of ecological citizenship in practice. In the following section, I consider the ways Dobson's emphasis on the material production of environmental politics produces particular spatialities of ecological citizenship relevant for an understanding of ecological biosecurity.

Spatial Boundaries, Material Practices: Membership and Obligation

Ecological citizenship is generated through material practices that lead to specific spatio-temporalities of political obligation. This produces two interesting inflections in the way ecological citizenship is defined spatially, which challenge both the nature of the political community and the definition of political practices. The first is the association between traditional accounts of citizenship and the nation state, or the *macro-political space of citizenship.*

Beyond the Nation State?

The nature of the political space in which citizenship relations take place is one of the most disputed aspects of citizenship. Dobson (2003) argues that ecological citizenship exhibits non-territoriality, due to the global nature of both environmental problems and contemporary political community and campaigning strategies. Incorporating non-territoriality in an account of ecological citizenship is essential to properly represent citizenship interests in the trans-national nature of environmental problems. Valencia Saiz (2005) also argues that globalisation has eroded the traditional role of the nation state as a factor unifying political community and shaping citizenship. The definition of a political community therefore moves beyond a conception of political representation restricted to the nation state. Valencia Saiz (2005:169) refers to ecological citizenship as 'post-national' citizenship. This non-territoriality is the crucial way ecological citizenship departs from the major citizenship traditions, and has a number of critical implications. The first is how should we define citizenship-based membership? Dobson (2003:30) argues that rather than being 'given' by way of membership to a 'common humanity' or territory, political space is 'produced' by 'the activities of individuals and groups with the capacity to spread and impose themselves'. Political space is therefore a product of human-non-human relational activity, constituted by material practices.

Valencia Saiz (2005) argues that due to this non-territoriality, ecological citizenship borrows from the cosmopolitan tradition, adapting elements of both citizenship and cosmopolitanism. In contrast, Dobson (2003) argues that ecological citizenship departs from the cosmopolitan account in critical ways. While cosmopolitanism attends to the trans-national element of environmental problems, Dobson (2003) believes it does not adequately deal with the local

and regionally experienced nature of these problems. Gilbert and Philips (2003:319) hold onto to this multiple spatiality of environmental citizenship, arguing that 'environmental rights and practices are not confined by the nation-state, but are simultaneously beyond it (global), part of it, and within it (local).' Dobson also argues that the basis of cosmopolitan obligations through membership of a 'common humanity' fails to encompass the asymmetrical nature of both responsibility and experience of environmental problems.

In contrast, Bell (2005:180) argues that the most theoretically interesting way of conceptualising an environmental citizen is as a 'citizen of an environment,' or of multiple environments. Bell (2005:182) asks:

> What does it mean to be a *citizen of an environment* – a citizen of Planet Earth or a citizen of an environment defined by particular political (or other) boundaries? (original emphasis).

Working from the usage of environmental citizenship by *Environment Canada*, Bell (2005:181) suggests that 'individuals are not only citizens of one global environment... but also citizens of more local environments'. By holding onto a form of territorialisation in defining ecological citizenship membership, what emerges is more a 'citizen of a biota,' comparable to Leopold's (1949, in Bell 2005) conception of a 'land community.' This places the emphasis on citizens as embodied individuals living in a specific physical environment. This does not depart as significantly as it may seem from Dobson's account. Dobson draws attention to the fact that despite environmental issues being 'non-territorial' in cause and effect, they are 'manifest at a local and regional level' (Dobson 2005b:10). I have also highlighted the way I believe Dobson's account to emphasise embodied material interactions as the source of ecological citizenship. What Bell's (2005) intervention does provide, however, is the suggestion that *identity* associations, made and formed through interactions with particular biophysical locales and through imaginative associations with wider environments (e.g. national environments), may have significance for the playing out of ecological citizenship in practice. Latta (2007b) also highlights that ecological citizenship can be a lens through which questions of identity can be considered.

Into the Private Realm

The second significant spatial construct drawn into question through ecological citizenship is the private sphere, the *micro-political space of citizenship*. Dobson's (2000: 59-60; see also

Gilbert and Philips 2003) argument that 'it is the admission of citizenship activity to the private realm that is perhaps ecological citizenship's most distinctive contribution' is of particular significant in relation to biosecurity attention to the domestic garden. This is attributed to feminist conceptions of citizenship, which have challenged the de-politicised and excluded status of the private sphere and private virtues from citizenship conceptions:

> Environmental citizenships endorse changes in consumption, disposal and character that are usually considered part of the private realm, but that are also publicly pursued, accountable, and have repercussions beyond the private. In this way, environmental citizenships endorse feminist assertions that 'the personal is political' (Gilbert and Philips 2003:318-9).

The private realm is a legitimate site of ecological citizenship activity both through its implication in generating widely dispersed environmental effects, and because the relationships associated with it 'are similar in content to those of ecological citizenship' (Dobson 2003:139), being unconditional and non-reciprocal. The 'private' therefore includes:

> the physical space within which people's lives are produced and reproduced (such as apartments, houses and mobile homes) or the realm of relationships usually regarded as 'private' (such as between friends and family) (Dobson 2005a:10).

In this way, ecological citizenship is taken from the idealised public sphere, to the ordinary, everyday and mundane: 'Ecological citizenship...is all about everyday living' (Dobson 2005a:10, original emphasis).

Bell (2005) challenges what he sees as the restriction of ecological citizenship to the private realm, arguing that campaigning, for example, should be considered an ecological citizenship action. Dobson is, however, working from the opposite direction. While these actions are more readily understood as citizenship actions, the extension of citizenly behaviour to the private sphere is radical and provocative enough for it to need to be centred within an account of ecological citizenship: 'The ecological challenge is to regard both of these as acts of citizenship' (Dobson 2005b:8).

Within governmentality approaches the private realm becomes connected to state practices through normalisation processes leading to self-governance, and through the role of experts connecting 'private' realms to state aspirations. Within Agrawal's (2005a) environmentality thesis 'intimate government' describes the enactment of regulation at the local level.

Ecological citizenship adds two things to these understandings of the politicisation of the private. Firstly, in its normative sense, it provides a tactic through which private behaviour can be politicised through discourses of citizenship duty. Secondly and more significantly, Dobson's (2003) thesis suggests that the political is not simply 'extended' into the private sphere, but that the nature of ecological interactions occurring through the reproduction of life in the private sphere '*makes*' the political.

While Dobson's focus on metabolic interactions can be seen to be more closely aligned with agronomic biosecurity, his centring of the private sphere points towards the political effects of other ecological interactions within non-public spaces. This allows gardening practices to be legitimately drawn into this frame of analysis. Through ecological biosecurity concerns, the space of ecological citizenship is formed through non-metabolistic, but, I shall argue, equally significant material relationships between humans and the non-human constituents of the domestic garden and wider New Zealand landscapes. In the following section I consider how these relationships are made political through the centring of responsibilities within an ecological citizenship formulation.

The metaphor of the 'ecological footprint' provides an account of the spatial and temporal effects of the ecological exchanges under scrutiny. I have discussed how this questions both the nation state and the public realm as suitable containers for ecological citizenship. The emphasis on the private realm does not produce a restricted spatio-temporality. The relationships within the private realm produce connections that are radically dispersed temporally and spatially. This embeds the private sphere beyond the nation state. For example, Dobson (2003) highlights that the possessor of an overlarge ecological footprint has the capacity to have an effect 'at a distance' in time and space on those with less than a fair share of ecological resources. In the context of ecological biosecurity concerns, this draws attention to the actual and perceived spatio-temporal effects of gardening plants and practices, and how these effects are comprehended by the biosecurity regime and gardening publics. In the following section I move on to consider a further aspect of the architecture of citizenship brought into question through the interface with environmental concerns: citizenship rights and responsibilities.

Rights, Responsibilities and Citizenly Behaviour

The language of rights is a key trope within citizenship discourses (Dobson 2003). These rights usually include political, civic, social or human rights, and are conferred according to membership of a citizenship regime. 'Environmental citizenship' is derived from a liberal citizenship rights-based discourse, defining and claiming rights against the state. Dobson (2003), however, argues that the rights-based discourse is not exhaustive of conceptions of ecological citizenship. This is supported by other theorists: 'There is more to citizenship than rights' (Delanty 1997:286, in Valencia Saiz 2005:10-11). The emphasis Dobson (2003) places on responsibility or, as he redevelops it, obligations, is seen to align with a republican conception of citizenship. This emphasis on responsibility also has a strong history within green political theory, and is essential for a synthesis between ecological citizenship and biosecurity. Dobson argues (2003) that these obligations are underpinned by the primary virtue of *justice*. Citizenly obligations are therefore distinguished from moral responsibilities as the association to justice makes them political. The issue of justice arises through historical material inequalities.

The obligations of ecological citizenship, when loosened from a concept of the ecological footprint, are essentially the obligations not to negatively impact the ecological common good. As Dobson points out, it is impossible not to have an impact at all, as we are exchanging with our environment by virtue of living. What is crucial, then, is the extent to which this is in line with current expectations of how to achieve the ecological good. The specific obligations this generates are therefore 'radically indeterminate' (Dobson 2005a:6). For example, in Herbert Guthrie-Smith's *Tutira*, the New Zealand environmental history classic first published in 1921, the settler-farmer and chronicler of weeds ponders a grove of wild fruit trees in New Zealand. He suggests that a traveller, in an act of 'good citizenship,' planted the plum stones after his lunch. This historical concept of improving the 'new' country through the introduction of plants and animals has been discussed in the previous chapter. With ecological plant biosecurity what it means to positively affect the ecology of the country has undergone almost a complete reversal, but the idea of this relationship as a citizenship responsibility remains. This draws attention to how obligations are determined in empirical contexts and to whom or what they are owed. This is not pre-determined, but emerges through practice.

Hayward (2006) argues that the emphasis on non-reciprocal obligations makes ecological citizenship an exclusive category. For this reason, Bell (2005) promotes the language of 'good' or 'excellent' environmental citizen to distinguish those who go beyond their 'cost-proviso' duty, defined as what can be done 'without too much cost to ourselves.' While Bell interprets this as what is physically or economically achievable, this concept of duty-limiting costs could be explored more widely. Dobson (2006), however, counters these critiques by arguing that ecological citizenship is not a 'status' or 'privilege' with a particular 'eligibility.' To be an ecological citizen is to owe obligations due to unsustainable living. Dobson (2006) therefore places an emphasis on 'citizenship as practice' over 'citizenship as status.' I would argue that Dobson's (2006) movement away from a positive sense of citizenship status is likely to conflict with the normative use of the concept by governments or environmental campaigners. In chapter five, for example, I pay attention to the ways in which citizenship is utilised discursively in biosecurity public communication campaigns in New Zealand. This draws greater attention to the issue of citizenship identity.

Dobson's (2003) ecological citizenship thesis has centred everyday material practices within the private realm as the site for the generation of citizenship obligations. This has been essential in constructing the resources to understand ecological biosecurity. It has highlighted the importance of the private garden in the performance of ecological citizenship, and the significance of material interactions in the production of politics. However, the previous chapter raised questions about how the biosecurity regime promotes biosecurity ideals, and how publics participate in biosecurity. In the following section, therefore, I draw on academic accounts of environmental citizenship that consider the interaction between citizens and institutions in environmental contexts. Bell (2005:9) argues for a need to consider 'the nature, role and limits of institutions, the scope of the political and the place of voluntary citizen action or "self-regulation" in a liberal society.' This draws attention to the place of Dobson's (2003) ecological citizen performing self-regulation in the context of citizen-institution relationships and active citizenship participation outside the private sphere.

Institutions and Citizens: Promoting and Participating in Environmental Citizenship

Bell (2005) argues that the state plays a key role in allocating duties and mediating between citizens as duty-bearers and as rights-holders. This highlights the necessity of developing institutional arrangements and political processes that promote environmental justice. If those institutions are in place, environmental citizens have a duty to comply with them. Bell (2003) argues that Dobson's (2003) picture of citizenship responsibilities encompasses only a 'negative duty': a responsibility not to violate another's fair share of ecological space. Bell argues that this is too narrow as it fails to encompass the 'positive duty' of, for example, furthering 'just arrangements not yet established.' As this positive duty is often mediated by institutions, this translates as a duty to obey just environmental laws and to pay taxes to ecologically 'just institutions' that stop other people violating the 'ecological good' (Bell 2003).

However, Bell (2003) highlights that an ecological 'law-justice' gap can emerge due to an institutional inability to enforce certain laws, an institutional reluctance to promote laws that would be unpopular, and the possibility that the required laws would violate other important liberal rights. While this gap could be addressed through authoritarian environmental governance, Dobson's (2003) ecological citizenship of non-coerced political duties is another response. Bell (2003) argues that this formation of ecological citizenship fails to address the 'law-justice gap,' as voluntary self-regulation does nothing to change political frameworks or wider public opinions. The ecological citizen might be concerned about changing institutional policies or holding institutions to account, through engagement in different forms of community action. This goes beyond Latta's (2007a:381) characterisation of ecological citizenship in terms of 'citizenship as self-restraint.' By redistributing the responsibilities and sites of governance, mutual responsibilities between government and citizens are emphasised. Within this active formulation of ecological citizenship, the role for institutions is to promote environmental citizenship through policies, programmes and partnerships. The role for citizens is to think and act in citizenly ways, individually and collectively, through 'voluntary self-regulation,' *and* through active participation in environmental politics. This adds significantly to the environmentality literature as it removes

the assumption that states or institutions are driving the governance concern, and imposing this on passive publics.

Bell's (2003) suggestion that ecological citizenship must take on a positive as well as a negative obligation draws attention to active citizenships. While 'politics as participation' emanates from a civic republicanism citizenship, ecological citizenship shifts the terms of what constitutes participation to include private actions and activities, as I have discussed. In the intersection with environmental concerns the justification for political participation at a local level ('think global, *act* local') comes from a basic need. Achieving the common ecological good cannot occur without citizen participation, due to the impact of everyday living on the environment. This provides a different account of participation to that utilised by Agrawal's environmentality thesis. Participation or practice in the environmentality formulation is driven by the state and used as a way of constituting the interests or subjectivity of individuals. In contrast, through ecological citizenship, participation produces a 'citizen-centred' politics and subject positioning. Ecological citizenship therefore moves a concept of state-citizen relations from the singular imposition of government legislation, beyond voluntary self-regulation, to an emphasis on forms of active participation within environmental governance.

However, a further difference between environmentality and ecological citizenship formations has now emerged. Citizenship is related to a politics of attitude change, which is seen to contrast to the more superficial politics of behavioural change. Dobson and Valencia Saiz (2005) argue that citizenship-like approaches to environmental governance produce shifts in attitudes at a deeper level than those achieved by regulatory-induced behavioural changes. In contrast, Agrawal's (2005a) environmentality thesis suggests that behavioural change when based within practical involvement in politics can lead to attitude changes and a shift in subject positions. This tension could be interesting to consider through empirical engagement with biosecurity practices in New Zealand.

This begins to address the question of how ecological citizenship is promoted, or how and why people come to act as 'ecological citizens.' The politicising of the private has particular implications in this regard. This is a realm where adherence to regulations cannot be made visible, or are thought to be beyond the scope of political interference. While Bell (2005) argues that states can bring private actions into the public domain without simple monitoring

(for example, kerbside recycling makes a private act public), it is in this context that the utility of citizenship-based political approaches are central. There is the hint that certain institutional formulations are required in Dobson and Valencia Saiz's (2005:162) argument that 'engaged citizens do not emerge fully-formed from the social womb. Citizenship requires government action, in the sense of policies to create the conditions for citizenship and the spaces in which it can be exercised.' Bell (2005) also understands environmental citizenship to expand policy strategies beyond the regulatory or economic. It is in this context that Dobson's ecological citizenship formulation is seen as too demanding, requiring a person to act for the ecological good even if they act alone (Bell 2005). Bell suggests that it is more reasonable to place individual action in a framework where *everyone* is required or 'coerced' to change their behaviour. Drawing on Mill (2001), he argues that there are two forms of coercion, legal force, and 'the moral coercion of public opinion' (Mill 2001:14, in Bell 2003:12). This informal social pressure can range from the exhortation to 'do your duty,' to 'social threats and punishments such as sarcasm, mockery, humiliation' (Bell 2003:13). This aligns closely with Agrawal's (2005a) understandings of the enactment of regulation at community scales. Moral coercion can also operate privately through people 'practising what they preach' and thus influencing the behaviour of close friends, associates and neighbours. Bell (2003:14) argues that:

> 'moral coercion' takes the monitoring and enforcement duties of justice out of the hands of the state and puts it into the hands of our associates. We do not need a police state for effective moral coercion.

Forms of moral coercion, however, can also be utilised by states within public communication campaigns and education strategies. For example, Hayward's (2006:446) vision of citizenship 'can be construed as a condition of practical virtue attainable by degrees, through processes of education and deliberative association.' This goes beyond a sole emphasis on moral coercion, as Hayward (2006) argues that the normative force of justice within a political context ultimately warrants the use of legal coercion for its enforcement. Discussion of what constitutes legitimate power should, therefore, be included within discussions of citizenship.

This discussion of ecological citizenship has produced a number of significant resources that contribute to a better understanding of ecological biosecurity. This includes questions over the role of the nation state in defining ecological citizenship, the politicisation of the private

sphere, the emphasis on responsibilities, the significance of moral coercion, and an emphasis on participation. Alternative ecological subject positions have been suggested through the possibility of active ecological citizenships. In the following section, I will consider these resources concurrently with renewed attention to governmentality and environmentality, by working through the similarities, conflicts and incompatibilities of these varied approaches. In this way I produce an analytical strategy to frame my research approach to ecological biosecurity.

2.5 Governmentality, Environmentality and Ecological Citizenship: An Analytical Strategy

I have drawn on the concepts of 'biopolitical governmentality,' 'environmentality' and 'ecological citizenship' as each brings particular resources to construct an approach to understand biosecurity governance. In the following discussion, I will consider the overlaps between these approaches, and what tensions may need to be resolved.

The approaches share a concern with the governance, management or conscious influence over 'life.' The 'vital' object under consideration shifts from human populations and their relationships with other life processes, to the direct management of ecological life itself. Governance occurs at the scale of populations, but also at the level of the individual and their daily choices. Biopolitical governmentality and approaches to environmentality pay greater attention to the role of expert knowledges and practices, and particularly the role of standardisation, classification and categorisation in constituting 'life' in governable forms. Ecological citizenship approaches, in contrast, centre the actions and choices of the individual. They share a perspective in which governance is made up of a multiplicity of relationships between the state, citizens, institutions and experts. The nature of these relationships is significant in influencing the governance objective. I have drawn on environmentality approaches to enable attention specifically to the governance of ecological or environmental objects, processes and relationships. I turned to ideas of ecological citizenship in order to pay greater attention to the individual and their material associations to biophysical contexts. Each framework extends outside traditional spaces and relationships of politics, to encompass minute and mundane aspects of life. They operate in conjunction with

a host of other processes, where 'sovereign' forms of power are inappropriate for a variety of reasons. While formal top-down regulatory methods were not excluded from these theoretical approaches, they considered how governance extends beyond legislative control. This makes them suitable to match the nature of the environmental problematic.

These approaches consider in different ways the governance of the private sphere, and the life processes and relationships that take place there. Biopolitical governmentality highlights the role of experts acting as linkages between the public and private, expanding control within the governmentalised state. Agrawal's (2005a) environmentality thesis emphasises the significance of existing relationships of power within the local community. Ecological citizenship pays attention to personal political responsibility that is seen to emanate from the metabolic re/production of private life. Through ecological citizenship formulations, individuals are encouraged to or understood to act in the common good rather than in self-interest. In the environmentality analysis the common good is made to seem like self-interest, whereas in the biopolitical governmentality perspective the 'common good' becomes the norm against which behaviour and identity is judged and corrected. The individual in biopolitical and environmental governmentality approaches is embedded in their local community or in 'normalised' society. For the ecological citizen the political community is indeterminate, with the empirical nature of the ecological good in question generating the embedding mechanisms. For issues of environmental sustainability, this runs beyond the nation state, connecting the individual through their potential for negative effects to other times and spaces. For other environmental concerns, I have suggested, concepts of the nation state and territorialised citizenship identity may become more significant.

This combined literature draws attention to the ways in which relationships, within governance frameworks and everyday interactions, are spatialised in significant ways. These approaches are therefore concerned with the geography of governance in specific ways that are of particular relevance for understanding biosecurity. Within ecological citizenship approaches this includes questions over the territorialisation of membership and identity, and the politicisation of 'private' spaces, actions and relationships. Within an environmentality framework, Agrawal's (2005a) concepts of 'governmentalised localities' and 'regulatory communities' attempt to redefine the spatiality of governance. Both of these approaches therefore work beyond attention to the nation state and national governance as the traditional site of both analysis and political significance.

Each approach politicises and draws theoretical relevance from practice or participation. Ecological citizenship draws attention to the way in which private practices have negative ecological consequences, impacting beyond the private sphere itself. Practices therefore produce politics, and define the nature of citizenship obligations. Within an environmentality framework, practice is seen as a potential explanation for shifts in subjectivity, leading to concern for the environmental good. Within biopolitical governmentality frameworks controlling bodily interactions and movements through techniques of discipline and through the control of spaces is a method of governance in itself. Practice therefore becomes a potential tool within governance approaches.

Points of tension between these frameworks revolve around the construction of the individual and the sense of individual conscious choice in regulating their own behaviour. Despite Rose and Miller's light-handed approach to governmentality and biopolitics, there is still a sense of control and manipulation within the very language itself. While Agrawal's (2005a) use of the term 'subjects' encompasses 'citizens', this in itself raises the question: can environmental citizens 'be made'? A further conflict between these approaches is also evident in their understandings of the direction of the growth of concern – as a 'concern of state' emanating from experts and those in political power, or a more general social concern produced in a 'flatter' way. MacGregor *et al.* (2005:9), for example, surmise 'environmentality' as:

> a process through which citizens come to internalise *the government's environmental agenda* (i.e., changing their 'attitudes') so that they police themselves with minimal intervention by the state (emphasis added).

Ecological citizenship concepts, in contrast, allow for *citizen-led* environmental behaviour and concerns, beyond the adoption of government rhetoric. This appeals to me as I am uncomfortable with the idea that the state has values that it imposes on its subjects, who then take up these concerns as their own.

As a response to these compatibilities and differences, there are a number of ways ecological citizenship and governmentality could be drawn together. Firstly, citizenship could be subsumed as a 'programme' or 'mode' of governance, within an overarching governmentality perspective. Through this approach, citizenship is understood to be promoted by governance institutions to enrol private citizens and extend governance into the private sphere. This relies

on the discursive construction of particular types of activity as 'citizenly' by governance institutions. Alternative ecological citizenships are produced through ongoing processes of resistance and normalisation. This broadly aligns with Latta's (2007) use of ecological citizenship. There are a number of problems in adopting this approach, not least in the way in which ecological citizenship operates beyond the state's own singular motivations, as I have discussed above.

A second way in which ecological citizenship could be subsumed is as a 'technology of the self' within an environmentality framework, involved in the *co-creation* of environmental subjectivities with governmental 'technologies of power'. Ecological citizenship approaches show that self-governance does not necessarily have to be understood as 'subjectification.'

Thirdly, these frameworks could provide different, yet compatible resources. Ecological citizenship would be utilised, for example, to derive the political space of relevance, to determine and describe the nature of responsibilities, and to draw analytical attention to the individual citizen. Environmentality in turn provides the resources to understand how governance in these areas is undertaken through the production of truth discourses and strategies for intervention. Conceptions of ecological citizenship could be drawn on to alter the discursive balance of governmentality language, and to offer alternative challenging constructions of subject positions through the agency of publics as ecological citizens. This would enlarge Rose and Miller's (1992) rejection of heavy-handed approaches to biopolitical governmentality, and Agrawal's re-emphasis on 'technologies of the self.' I will allow the benefits of these combinative approaches to emerge as the frameworks are relationalised, contextualised and performed through the practice of plant biosecurity in New Zealand.

Returning to the Research Questions

At the end of chapter one I began to formulate a series of research questions arising from the empirical context of biosecurity in New Zealand. Through the resources provided by this literature review, I can now refine these broad areas of research attention. These changes are significantly related to a fuller conceptualisation of the *role of publics* in the regime, greater

attention to the *spatiality of governance*, and a more symmetrical theorisation of the *significance of expert knowledges* within biosecurity governance. My research questions have therefore been reworked in the following ways:

1. How is contemporary plant biosecurity, with specific reference to internal pest plant control, ecological protection and the impact of garden plants, organised in New Zealand?
    - How are governance regimes organised and situated?
    - How have unwanted plants as objects of governance come to be defined legislatively?
    - How are they categorised and classified legislatively?
    - What are the roles and impacts of expert knowledges?

The changes to this research question reflect, firstly, the emphasis within the literatures reviewed on the *spatiality* of governance. The way in which governance is spatially organised, situated and dispersed has significance for how governance occurs, for example, through interactions between national, regional and local regulatory spaces. Secondly, I have utilised the term 'governance regimes' to emphasise that biosecurity governance is made up of more than simply the interaction between 'institutions' and 'policies' (question 1, p.54), or the institutional 'set-up' of government. Instead, its elements are 'resolutely heterogeneous' (Collier *et. al.* 2004:4), encompassing an ensemble of apparatus and knowledges, or *rationalities* and *technologies*: institutions, technologies, persons, policies, professional knowledges, procedures, practices, multiple sites and actors. Thirdly, rather than taking the reality of 'pest plants' for granted, I want to pay attention to how the concept is in itself brought into existence. The way pest plants are constituted as objects of governance is fundamental for how they can enter the sphere of governance, through particular legislative practices. By drawing explicit attention to processes of classification and categorisation, biosecurity emerges not simply as a 'response to pest plants' (question 1, p.54), but as the active constitution of pest plants. This reframing additionally acknowledges that the act of specifying the targets of governance is significant in their control. These processes of constitution are not simply objective and divorced from the governing context, but can be understood as a method of governing itself. This links to the final shift in wording within this research question, which responds to the reformulation of expert knowledges within the literatures reviewed. Rather than conceptualising scientific knowledges as 'informing'

biosecurity policies (question 1, p.54), this broadening of attention to the 'roles and impacts' of expert knowledges allows for more complex alliances between political authorities and experts, acknowledging that government is intrinsically linked to expertise. This might also include the possible effects of biosecurity governance on expert knowledges themselves, such as through the institutionalisation of scientific expertise.

2. How is contemporary plant biosecurity enacted in situated practice?
    - How are control regimes regulated and enforced?
    - What are the roles of publics in plant biosecurity practices?
    - In what ways are gardening publics encouraged, enforced, or educated to adopt plant biosecurity ideals?

The shift within this second research question from the framing of contemporary plant biosecurity as something which is 'communicated and enforced' (question 2, p.54) to a practice that is 'enacted', is intended to respond to the multiple means through which governance has been shown to operate. This extends beyond an understanding of biosecurity regulations as simply 'communicated' to incorporate, for example, the possibility for self-governance and subjectivity formation to be part of the governing process.

3. In what ways and for what reasons do gardening publics participate within, actively produce or challenge plant biosecurity ideals and practices?
    - What are the understandings and practices of publics who choose to play an active role in biosecurity outside the garden?
    - What are the impacts of plant biosecurity within the domestic garden?
    - In what ways could the domestic garden be seen as constitutive of biosecurity politics?
    - How do plant biosecurity requirements interact with other processes of association within the domestic garden?
    - How are these 'conflicts' understood and negotiated by the domestic gardener?

This research question has been expanded to allow research attention to the effects of biosecurity participation on subjectivities. This includes participation outside the domestic garden and beyond private gardening practices. Rather than biosecurity being conceptualised as a practice imposed by the state on publics, this encapsulates the possibility of connections

between the desires of individuals and the aspirations of government. By utilising a broader concept of the 'impacts' of plant biosecurity, its possible effects have been enlarged beyond a dualistic relationship between the gardener and the biosecurity regime. This might encompass, for example, the significance of other interactions or associations in the space of the private garden. Rather than a unidirectional concept of biosecurity impacting on gardens or gardening practices, however, this research question also asks about the effects of the garden itself on biosecurity politics. This attention to the garden's constitutive effects considers how the nature of the garden, for example as a private space or a space of relations, defines what biosecurity can be. This responds to the significance placed within the literatures reviewed on the effect of particular material locations on the production, operation and circulation of power. This conceptualises the garden and the relationships and entities that define it as a significant site of politics, not simple a blank space on which government is written. To avoid over-emphasising the effectiveness and coherence of biosecurity, by asking a question about 'conflicts' the possibilities for unintended consequences or acts of resistance are also incorporated.

In the following chapter I develop this analytical strategy into a research methodology through which to approach the empirical arena of plant biosecurity in New Zealand.

3

RESEARCHING PLANT BIOSECURITY IN POLICY, COMMUNITY AND GARDEN SPACES

> Social science methodologies and forms of knowing will be characterized as much by openness, reflexivity and recursivity as by categorization, conclusion and closure (Davies and Dwyer 2007:258).

3.1 INTRODUCTION

This thesis draws on the resources provided by governmentality, environmentality and ecological citizenship frameworks to consider the institutional enactment, public communication and lived experiences of plant biosecurity in New Zealand. In this chapter I consider the methodological resources provided or implied by a commitment to these theoretical approaches. I augment this work by drawing on methodological discussions provided by literature which attends to people-plant encounters. I then describe the strategy I adopted to address my research questions, and provide a map of the empirical research I undertook. While the substantive focus of this thesis is on plant biosecurity, the ontological focus is on memories, attitudes, understandings, identity, practices, decision-making, power, and knowledges. Attempts to access these ontological properties drives my adoption of specific methodological approaches. The following section considers the methodological implications of adopting the theoretical framework outlined.

3.2 UNDERSTANDING THE POLITICAL SPACES OF BIOSECURITY

Kendall and Wickham argue that 'governmentality does not supply tools for qualitative research: rather, it produces a certain kind of attitude or sensitivity' (2004:143, in Seale *et al.* 2004). While Hajer (1995) undertakes a sustained attempt to develop methodological tools from Foucault's concepts, I have utilised Foucauldian approaches more as a descriptive language or 'spirit of enquiry' to draw empirical attention towards a particular line of analysis (Kendall and Wickham 2004:143). In his genealogical phase, Foucault added the analysis of social practices (non-discursive practices) to his previously developed understanding of knowledge (discursive practices) as contextualised. Asserting the 'primacy of the practical over the theoretical' (Rutherford 1999:40), this approach treats knowledge production as social practice, requiring epistemic practices to be understood within their broader practical context. Rose and Miller (1992:175) analyse modes of government through attention to '*political rationalities*,' which they describe as:

> the changing discursive fields within which the exercise of power is conceptualised, the moral justifications for particular ways of exercising power by diverse authorities, notions of appropriate forms, objects and limits of politics, and conceptions of the appropriate distribution of such tasks.

'Political rationalities' have a moral and ontological form (conception of the nature of objects governed), and are articulated in a way that 'renders reality thinkable in such a way that it is amenable to political deliberations' (Rose and Miller 1992:179). Political rationalities are translated by political and 'non-political' actors into '*programmes of government*': reports, white papers and proposals, for example. Critically, however, this is investigated through attention to the interdependencies of political rationalities with 'governmental technologies':

> the complex of mundane programmes, calculations, techniques, apparatuses, documents and procedures through which authorities seek to embody and give effect to governmental ambitions (Rose and Miller 1992:175).

'*Technologies of government*' are the strategies, techniques and procedures that deploy the programmes of government, the 'inscription devices' through which reality is made stable, mobile, comparable and combinable (Rose and Miller 1992:185). This draws on Latour's conception of power as stabilised within lasting networks to the extent that the permanent forms of these technologies is established: as x-ray machines, architectural arrangements in

airports, techniques for recording the location of invasive plants. These technologies of government become 'resources in the local composition of forces' (Rose and Miller 1992:184). Despite the apparently linear progression of governance from the ideal to the real through the schema of 'political rationalities,' 'programmes of government' and 'technologies of government', Rose and Miller (1992:177) emphasis the 'the vast assemblage of persons, theories, projects, experiments and techniques' that make governance possible. This draws attention to the diverse stocks of knowledge, strategies, techniques and procedures through which programmes of biosecurity become operable (Hajer 1995). This approach to political discourse therefore moves away from an emphasis on systems of thought, to systems of action that give effect to government. This pays attention to 'tactics and apparatus, tools and devices' rather than attempting to penetrate below what is said or written to reveal 'hidden depths' (Rabinow and Rose 2003b:10).

This emphasis on discursive and non-discursive practice has particular implications for constructing a research approach. Firstly, it implies a balance between research methodologies that pay attention to *what people do* and *what people say*. Secondly, it draws attention to the *influence of non-humans*, including technologies, artefacts, materials, plants and other bio-physical entities, within governance regimes. This implies a move away from a sole emphasis on qualitative methodologies that centre human speech and interpretation, such as interviewing techniques. It centres methodologies that pay attention to the materiality of the research context and the reciprocal influences of humans and non-humans on or in that situational context. This might include participant observation and particular forms of textual analysis that treat the text as an object in context, rather than a representation of rationality. Where interviews are utilised, the situated context of the interview becomes significant, and discussion would need to encompass attention to practices as well as more traditional discursive self-reflection.

Rose and Miller (1992) utilise a particular vocabulary to describe the practices of governance without overly ascribing unity or functionality. They refer to the 'mobile mechanisms', the 'shifting alliances' (1992:174), and the 'humble and mundane mechanisms' of governance (1992:183). This moves away from a reified approach to analysing governance. This avoids what Kendall and Wickham (2004:148) later refer to as the heavy-handed, superficial appropriation of Foucault to apply power to 'every situation.' Agrawal (2005a) also challenges methodological approaches that draw simply on those resources or discourses

produced by governing institutions as they represent themselves in the world. While Scott's approach to analysing state environmental governance projects could be criticised for a simplification of the power of government, he also argues 'We must never assume that local practice conforms with state theory' (Scott 1998:49). This directs attention to the actual enactment of governance, and to self rather than state generated representations and performances. It also implies a symmetrical and flattened approach to research which avoids a priore assumptions and research distinctions between 'political' and 'non-political' actors and practices. This has implications for the way 'different' groups of research participants are interviewed, and the ways research participants are recruited.

Agrawal (2005a) draws attention to the geography of governance, at the scale of regions, localities, everyday local practices and individual experiences of governance. This attempts to access the embodied practices of regulation to understand how environmental politics is 'lived' by those subject to it, centring people within an understanding of state practices:

> A shift...toward villagers' involvement in practices of socio-ecological regulation helps to uncover how conceptual units of analysis such as politics, institutions, and subjectivities – clearly different concepts in the abstract – are combined in the lives and experiences of Kumaon's villagers (Agrawal 2005b:180).

Dobson's (2003) approach to ecological citizenship discussed in the preceding chapter takes this shift to the everyday level of governance further, drawing analytical attention to the private realm and private practices. This justifies the garden and gardening practices as relevant methodological sites of investigation. Methodological resources that pay analytical attention to everyday practices of public involvement in governance include participant observation and in-depth interviewing with relevant publics.

In the previous chapter I argued that Dobson's (2003) approach to ecological citizenship draws attention to the material or biophysical context of the generation of politics through human-non-human interactions. In order to flesh this out, and add to what is substantially a material-semiotic approach to talk and texts of government, I will now turn to methodological literatures which grapple with lively natures.

3.3 Locating People-Plant Encounters

This thesis is concerned with the relationships, practices and meanings that constitute people-plant encounters in the domestic garden and connected spaces, set in the context of contemporary plant biosecurity concerns. To determine a methodological approach to these spaces, relationships and activities, I have drawn on a body of work concerned with the ways people engage with botanical encounters (see Davies and Dwyer 2007:261, for a review of methods of carrying out research while 'being within nature'). These combined approaches, as Head and Muir (2006:510) highlight, are linked to 'dwelling' theories, which emphasise the 'intimate, rich, intense, making of the world' (Ingold 2000; see Whatmore and Hinchliffe 2003). As Cloke and Jones (2001) explicate, however, traditional approaches to dwelling can draw attention away from non-human agencies. The approaches I have drawn on are therefore also influenced by commitments to relational agencies emerging from science and technology studies. This section will argue that questions about nature's materiality and agency are as much about the way methods are operationalised as they are about incorporating attention to nature within theory.

Davies and Dwyer (2007) highlight that social science engagements with nature have moved from traditional deconstructivist positions embedded in a narrative of disenchantment, to the enchantment of being in nature through embodied, multi-sensual interactions (see Degen *et al.*, submitted). This has led to the adoption of a range of mobile methodologies to access the practices and technologies of engaging with nature in the field (Davies and Dwyer 2007). This includes ethnographies and interviews in outdoor spaces (Hitchings and Jones, 2004), following scientists and species through habitats (Ellis and Waterton 2005; Hinchliffe *et al.* 2005; Waterton 2003), or simply walking and talking (Anderson 2004; Hitchings and Jones, 2004; Wylie, 2005; all in Davies and Dwyer 2007). These approaches shift attention from what people say about nature, to 'how they engage with plants, animals and insects in particular kinds of ecological spaces and practices' (Whatmore and Hinchliffe 2003:8).

This body of work provides greater depth to the arguments for focusing empirically on the domestic garden, which Hitchings and Jones (2004:3) describe as a place 'saturated with developing relationships between people and plants'. They argue that specific physical contexts are relevant in the construction of ethical positions, and advocate attention to 'how certain commitments are constituted through the encounters staged in different physical

places' (Hitchings and Jones 2004:3). This draws attention to the specific context of the methodological encounter staged, which becomes implicated in the co-constitution of research results. Head and Muir (2006) argue that:

> the garden is not coincidental... It should not be understood as a separate field site where we can view the expression of pre-constituted attitudes and practices. Rather it is a place – like any other – of active making and re-making, of both humans and non-humans (Head and Muir 2006: 522).

This informs my research attention to the ways understandings of biosecurity are produced through specific interactions, or 'active making and re-making,' enacted within the domestic garden.

A key aim of Hitchings and Jones' (2004) work is the desire to find methodological ways to access the rich enactment of 'mundane' or everyday plant-human interactions, rather than the 'deeper social meanings' often offered by gardeners in social research contexts (see May 1997). This moves away from previous approaches within cultural geography which paid attention to the 'meanings' of nature at the scale of landscapes, ignoring the specific relationships people forge within landscapes. In contrast, Hitchings and Jones (2004) are concerned with the particularities of botanical encounters, and the ways plants make a physical difference to the nature and experience of people-plant interactions. Plants are not 'passive components' within human understandings and desires. The biological properties of plants affect the way they can be approached analytically and interacted with physically. This highlights the importance of specific ways questions about plants are posed and spoken about in interviews. My research considers the impact of everyday, ongoing, practical interactions between plants and people on 'deeper social meanings' about plants. Chapter six, for example, draws attention to the ways in which plants' 'immediacy as individual life forms' challenges their positioning within 'larger, and sometimes unwieldy, categories of nature, environment or landscape' drawn on in plant biosecurity governance (Hitchings and Jones 2004:16).

Whatmore and Hinchliffe (2003:1) refer to the 'uncanny intimacies' between humans and non-humans that become erased from analytical accounts, and ask how their presence can be made to register in these accounts. Hitchings and Jones (2004) argue that participant observation methods allow plant agency to be revealed in the way embodied interactions with plants take place. While their attention is to the more 'observational' style of this approach,

Degen *et al.* (submitted) emphasise participant observation as a method of *experiencing* the embodied activities themselves. This allows the deeply physical and emotional investments these practices involve to be accessed (Degen *et al.* submitted). Referring to research conducted in a variety of green spaces in England, Degen *et al.* (submitted:3-4) draw attention to 'passionate involvements,' what they term 'ontologies of association,' which make up relationships and exchanges in green spaces. They also advocate participant observation as a methodological approach to reveal 'the embodied and emotional expressions embedded in the activities involved in the making of green spaces' (Degen *et al.* submitted:14). These engagements and attachments are seen to outstrip their discursive expression, instead emerging and indeed fostered through practices. Following Wiley (2002, in Degen *et al.* submitted) these interactions are understood to be relational processes, as practice intertwines the body, environment and emotional attachments. They argue that this draws attention away from an emphasis on the spoken word, to 'the body in action.'

This emphasis on accessing the specificity of 'personal relations to the non-human botanical' also leads Hitchings and Jones to promote *mobile* ethnographic methods (2004:7; see also Anderson 2004; Urry 1999; Wiley 2002). While 'talking about gardens is difficult,' an interview approach combined with experiencing the garden through walking in it, allows 'a sensitive approach to the interplay of thoughts and surroundings' (Hitchings and Jones 2004:9; see also Lorimer 2005). In this way, plants can act as prompts, and different types of conversations are enabled.

Whatmore and Hinchliffe (2003) argue that a reliance on traditional social science methods such as interviewing and structured surveys entrenches an emphasis on what people say rather than what they do. This produces a politics of knowledge that draws attention away from embodied, vernacular ecological knowledge. Attention to the effect of traditional methodologies on the position of non-humans in the research outcome is further supported by Whatmore (2006: 606-607), who perceives an:

> urgent need to supplement the familiar repertoire of humanist methods that rely on generating talk and text with experimental practices that amplify other sensory, bodily and affective registers and extend the company and modality of what constitutes a research subject.

Here I would like to emphasise the word 'supplement,' to justify utilising participant observation and in-context in-depth interviewing techniques alongside and indeed

immediately with 'familiar' methods of attention to text and talk. The contrast between the methodological recommendations of people-plant encounters, and of material-semiotic attention to talk and texts is lessened if texts are approached as performative 'objects' in their own context (see Hinchliffe *et. al* 2005).

These theoretical approaches lead to a particular set of qualitative methodologies and a particular approach to the interpretation and analysis of the research material generated. In-depth interviewing, participant observation and textual analysis have been promoted, in combination with embodied, mobile interviewing techniques. A symmetrical approach to research participants and attention to the situated context of the text, interview or interaction in question is emphasised. I have responded to these methodological suggestions by developing a multi-stranded methodology which takes the concerns and commitments described above into different empirical sites of biosecurity relevance. Ellis and Waterton (2005:675) argue that ethnographic attention to multiple locations provides 'a view of the connections and disconnections between different places and modes of engagement' (see also Marcus 1995 for a discussion of multisited ethnographic approaches). This research strategy is described in detail below.

3.4 Research Description and Empirical Mapping

It is difficult to identify a distinct period of field research for this thesis. The distance required a delimited time in the place of New Zealand. This was strengthened, however, by the documentary analysis of public communication literature, policy documents and other resources, accessed and analysed for my master's thesis and as an ongoing process. The following account describes and maps the empirical research I undertook in New Zealand between June 1st 2005 and December 10th 2005. This fieldwork period entailed a steep learning curve. I had to discover who or what were the key 'players' in gathering and pursuing relevant contacts, the contemporary institutional concerns and significant practices, and how these were spoken about. In addition to the following approaches described, during the course of the fieldwork I kept a research diary of this learning curve. This included a chronology of the research, future ideas and threads, and my impressions, concerns, and evolving perceptions. In the following five sections I present my approach to the five key

areas of this research: documentary analysis, institutional interviews and work shadowing, participant observation at garden shows, gardener interviews and finally interviews and participant observation with weed activists.

Documentary Analysis: Texts as Facts, Discourses and Agents

This part of the research involved analysing policy documents, written legislation, management procedures, consultation documents, internet resources and other forms of textual resources produced between 1990 and 2007. These were identified and obtained via web-based research, through connecting documentary references, and through references and recommendations from institutional research participants. I utilised these resources in three key ways (see Prior 2004 for a discussion of different ways of conceptualising documents in social science research). Firstly, these resources provided factual information. They provided a structuring historical and contextual background to build an overview and chronology of the regime, including details of biosecurity practices, legislation, and relevant scientific frameworks. This knowledge base allowed me to identify key people, institutions, practices and policy-making processes of significance for further in-depth research. The foundation of knowledge I obtained provided a context for my institutional interviews, and allowed me to utilise the interviews in a more in-depth way to focus on discursive understandings.

Secondly, my research approach conceptualises texts as forms of active communication produced by actors with an intention to represent themselves in a specific way (Burgess 1990). This includes persuading or influencing the public, other policy actors, or the outcome of policy. 'Texts' are discursive documents that reveal something about the ways things are understood and constructed, representing objects, events, and interests in particular ways (Delaney 2001). For documents produced by biosecurity agencies, this suggests attention to the ways in which governance is represented and conveyed. I undertook a review of Regional Pest Management Strategy (RPMS) documents, and the Regional Pest Management Strategy (RPMS) consultation documents, which provided information on public/stakeholder concerns and official institutional responses. It became as important to pay attention to silences, to who are what is left out, as much as to what was included. I also paid attention to more direct ways in which the biosecurity agencies represented themselves, or attempted to influence publics. This included viewing web-based materials and taking notes, collecting and

analysing leaflets, brochures, posters and other communication literature. During the course of fieldwork I collected newspaper articles about biosecurity, and subscribed to gardening magazines which had regular features placed by biosecurity agencies.

Thirdly, texts such as documents, posters and leaflets are entities in their own right, which generate effects and have agency (Prior 2004; see for ecological examples Ellis and Waterton 2005; Hinchliffe *et. al* 2005). I therefore paid attention within my interviews to the ways texts are spoken about and interacted with practically and discursively. These texts are objects that circulate within a wider social and political context of both production and consumption. I considered the production of texts through questions about public communication literature in institutional interviews. I considered consumption or 'reading' cultures, by questioning how these materials were interpreted and acted on. I also undertook participant observation of gardeners interacting with different forms of representations at weed awareness stalls at garden shows. This approach places texts within their physical context when utilised as objects of display (see Ball and Smith 1992; Rose, G. 2001).

Drawing on texts as factual, discursive and active objects contributed to my research attention to both the enactment and communication of plant biosecurity, and the ways this is interpreted by gardening publics. In the following section I discuss the interview and observational methodologies I undertook to directly address my research concern with the institutional practices of plant biosecurity.

Institutional Actors: Interviewing, Observing, Interacting

This aspect of my research is concerned with the perceptions, knowledges, views and understandings of biosecurity practitioners, weed scientists and other people related to the biosecurity regime. The interactive context of the qualitative interview therefore provides one meaningful way to generate data on these ontological properties (Mason 2002). Qualitative interviewing is a method also referred to as in-depth, semi-structured or loosely structured forms of interviewing (Mason 2002; see also May 1993; McCracken 1988). Mason also refers to 'creative interviewing' to emphasise the situational creativity of the qualitative interview in opposition to the structured survey interview, which follows a pre-given script. The qualitative interview produces depth, nuance, complexity and roundness, rather than a

broader, shallower representation of data. The qualitative interview is interpreted as a co-production of meanings and understandings, rather than simply a reporting of facts (Mason 2002).

Mason (2002) highlights the core features that define qualitative interviews. Firstly, they involve the interactional exchange of dialogue. Secondly, they embody a relatively informal style, or 'conservations with a purpose' (Burgess 1984:102). Thirdly, they adopt a thematic, topic-centred or narrative approach, with a set of starting points for discussion, utilised within a fluid and flexible structure. Finally, they understand knowledge as both situated and contextual. This requires the interviewer to ensure that the relevant contexts are brought into focus, so that situated knowledge can be produced of relevance to the research focus.

Identifying research participants first emerged from the institutional structure of biosecurity in New Zealand, described in chapter one. As a starting point, I identified relevant figures from 'Biosecurity New Zealand' (BNZ), regional councils, and the Department of Conservation (DoC) to be of crucial significance. This later expanded to include institutional commentators, including Landcare Research scientists, retired weed scientists, and academic commentators and campaigners. This required moving between Auckland, Tauranga, Hamilton, Napier, Wanganui and Wellington in the North Island, and Nelson and Christchurch in the South Island. The map on the following page locates these institutional interviews.

I approached a variety of regional councils to gain insight into regional variations in attitudes and practices of biosecurity in New Zealand. Those attended to emerged for a number of reasons. Firstly, I wanted a geographic spread to encompass ecological, climatic and population variations across New Zealand. Secondly, particular regional councils are understood as greater or lesser players in terms of biosecurity policies and practices. I approached regional councils and particular employees understood internally as 'leaders.'

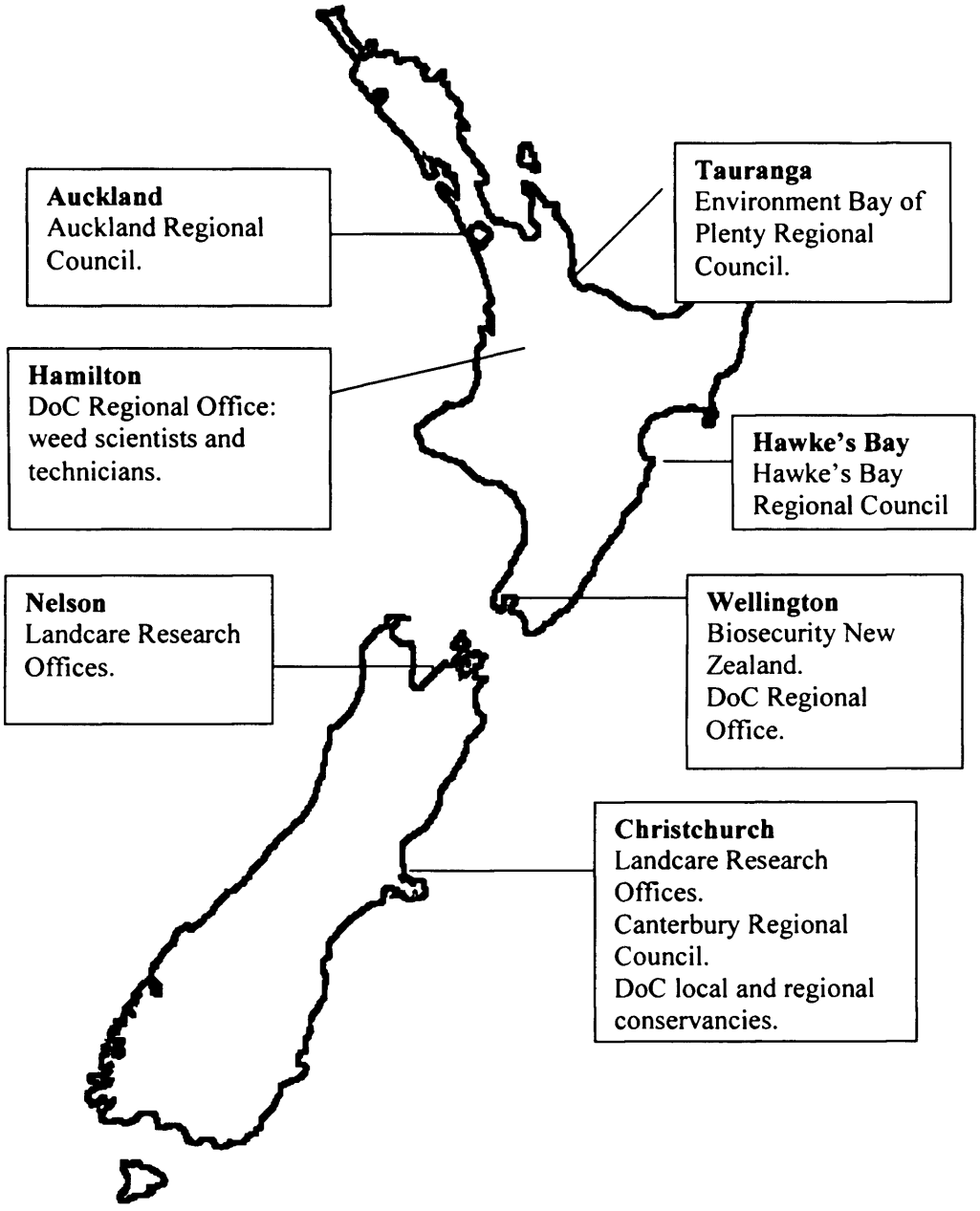


Figure 3.1: Map Locating Institutional Interviews in New Zealand

These 'local' biosecurity practitioners have greater roles within, and therefore important perspectives towards, the national framework. For example, Jack Craw, the Biosecurity Manager for Auckland Regional Council is crucially responsible for driving forward national standards, and Carolyn Lewis a Pest Plant Officer (PPO) for Waikato Regional Council is also National Weedbusters Coordinator, and now also chairperson for the Biosecurity Institute. Due to their significance in the enactment of institutional biosecurity in New Zealand, and due to their insights and eloquence, these and other institutional actors play a significant role in narrating themes in the subsequent empirical chapters. I balanced this with attention to those regional councils for whom environmental pest plants were a newly emerging focus within a traditional emphasis on agricultural pest plants. Thirdly, I focused on regional councils who were involved in running public communication stalls at garden shows during my period of fieldwork, enabling me to combine interviews with more active involvement in the stall. Fourthly, I received active invitations from biosecurity personnel from particular regional councils. Within the number of options this selection criteria presented, the actual regional councils researched emerged for somewhat pragmatic reasons: I had a contact, friend or family member I could stay with.

My institutional interviewees were actively solicited through internet sources, through existing contacts or through attending the Biosecurity Institute National Education and Training (NETS) Conference held in Christchurch on July 25th-27th, discussed below. This recruitment approach avoided the inevitable bias which occurs as people unconsciously recommend others who they believe will corroborate their own positions. Equally, by obtaining research participants in practice and through recommendations, I avoided an understanding of biosecurity based through its idealised representation within sources of communication such as the internet, in which Biosecurity New Zealand (BNZ), for example, appears to have a stronger internal influence than in practice.

The following table presents information related to these institutional interviews, including the interviewee's name, organisational affiliation, whether the interview was taped, if a repeat interview was undertaken, and if the interviewee participated in the research in another format.

Table 3.1: Institutional Research Participants

	Name of Research Participant	Organisation and Position	Location	Repeat	Taped	Other Research Contribution
MAF Biosecurity New Zealand						
1	Melanie Newfield	MAF BNZ weed scientist (formally DoC)	Wellington	Yes	No	Informal conversation at conference
2	Amber Brill	Wellington Reserves Manager (formerly Weedbusters Co-ordinator)	Wellington	No	No	No
3	Suzanne Main	MAF NPPA	Wellington	No	No	No
4	Gerard clover	MAF nurserystock	Wellington	No	No	No
National and Regional Level Figures						
5	Carolyn Lewis	Waikato Pest Plant Officer (PPO), Weedbusters Coordinator, Biosecurity Institute Chairperson	Hamilton	Yes	Yes	Work shadow; garden interview; conference presentation; additional informal conversations; resource provision
6	Jack Craw	Auckland Biosecurity Manager	Auckland	Yes	Yes	Attended presentation to nurserymen's conference; resource provision
Regional Councils/Pest Plant Officers						
7	Sara Brill	Pest Plant Officer	Tauranga	Yes	Yes	Interview as gardener and QEII landholder; work shadow; resource provision
8	Wayne Cowan	Pest Plant Officer	Wellington	No	No	
9	Craig Davey	Pest Plant Officer	Wanganui	Yes	Yes	Garden show stall/work shadow
10	Robin Packe; plant biosecurity team. Dean Roughton, Robin Packe.	Plant Biosecurity team leader; Pest Plant officers	Hawke's Bay	No/Group interview	No	Resource provision
11	John Mather; Walter Stahel, Sara Brill, others	Bay of Plenty regional council	Tauranga	No/Group interview	Yes	Resource provision

12	Mike Harre	Auckland Regional Council Pest Plant Community Relations Officer	Auckland	No	No	Attended conference presentation; informal discussions at conference
13	Rob McCaw	Environment Canterbury Regional Council, Central Area biosecurity team leader.	Christchurch	Yes – over course of garden show	No	No
DoC Regional Officers or field staff						
14	Di Carter	Christchurch DoC officer	Christchurch	No	Yes	Resource provision
15	Helen Braithwaite	DoC weeds officer, Christchurch	Christchurch	Yes – over course of garden show	No	No
16	Daniel	Christchurch City Council Botanist	Christchurch	Yes – over course of garden show	No	No
DoC or Landcare Research Weed Scientist						
17	Susan Timmins	DoC Social Scientist	Wellington	Yes	Yes	Informal conversation at conference
18	Ian Popay	DoC technical weed scientist	Hamilton	Yes	Yes	Informal discussions at conference; resource provision
19	Phil Dawson	DoC technical weed officer	Hamilton	Yes	Yes	Informal discussions at conference; resource provision
20	Peter Williams	Landcare plant pest scientist	Nelson	No	Yes	Resource provision
21	Colin Meurk	Christchurch Landcare	Christchurch	No	Yes	Resource provision
Other						
22	Christina Chau	Chinese Conservation	Auckland	No	Yes	No
23	Jennifer Hartley	Retired Landcare Weed Scientist	Hawke's Bay	No	No	No

The *number of institutional interviews* emerged as a balance between undertaking detailed in-depth work and making general conclusions, the timeframe of research, and the number of relevant people within the regime. The number and depth of the interviews, combined with the significance of my interviewees to different aspects of biosecurity policy-making and enactment in New Zealand, gives me confidence in the credibility of this research. For example, representatives of 6 out of 16 regional councils participated in the research. I interviewed both biosecurity managers about policy management issues, and pest plant officers about 'hands-on' public interface work. If the opportunity arose, I undertook group interviews with the regional council's Pest Plant Team: this was possible for both the Bay of Plenty and Hawke's Bay Regional Councils (see Burgess 1999; Crang 2002, for a review of group interview methodologies).

The context of the interview influences the situational knowledge produced. This includes, amongst other factors, the setting for the interview, the use of recording devices, and my own positionality as a researcher. I conducted interviews in a variety of locations, including the interviewee's office, but also cafes and bars, in biosecurity vehicles and on location in nature reserves (see Elwood and Martin 2000 for a consideration of how the physical location of interviews affects discussion). The following discussion reflects on the influence of these differing interactional contexts.

Recording and anonymity: I recorded the majority of institutional interviews using a digital recorder, whilst making notes of relevant non-verbal aspects of the interaction situation. I asked permission to record at the start of the interview when describing the research and my intentions for research outputs. I did not offer anonymity, but emphasised the interviewee's privilege not to answer, to withdraw their answer or to request that their answer be used anonymously. This 'context anonymity' was requested on one occasion. Some interviews arose following informal conversations, in situations I deemed inappropriate to stop the flow of discussion to retrieve my digital recorder. On reflection, this was more a result of my own awkwardness than anything conferred from recording itself. In only one institutional interview did I receive a strong sense that my interviewee was talking 'on the record,' producing institutionally-circumscribed responses. This did not invalidate the interview; it instead offered an insight into this more controlled institutional context.

Interview questions and schedule: I used the interview to derive both factual data on the intricacies of policy or technicalities of practice, as well as the interviewee's interpretations and opinions (Searle 1998; Smith 2001). I was more interested in how they deliberate, rather than obtaining the 'right' answer. While interviews were targeted to my research questions, they also provided deeper contextual understanding of biosecurity practice in New Zealand, refining my research process and supporting my understanding. Informal conversations were also used to derive contextual information. My approach to each interview differed according to the positionality of the participant. Institutional participants whose careers had progressed through different biosecurity positions offered a range of perspectives. While I began by using detailed interview schedules, as my experience grew I worked to a brief list of topics. This retained openness to issues I had not considered prior to the interview context (Mason 2002). Appendix 1 shows an example of an interview schedule for one semi-structured institutional interview. My level of understanding and experience grew during the research, and my institutional interviews correspondingly developed from the exploratory to the specific. I led discussion towards meanings, justifications or the 'philosophy' of biosecurity particularly in repeat interview opportunities, or where I encountered particular reflexive and articulate interviewees.

Positionality: I actively conveyed my natural enthusiasm and interest in biosecurity issues. I negotiated a balance between 'knowledgeable' and 'ignorant but keen.' I choose to appear ignorant of aspects of biosecurity on occasion to access the specific ways it is talked about in the interview setting. In others I exhibited my grasp of biosecurity to push the discussion to greater depth and sophistication, or to generate acceptance. This occurred in a shifting, context specific process. As much as my own positionality influenced the interviews' content and character, interviewees were far from passive respondents, and on occasion I was aware of the balance of power shifting to the interviewee themselves. This is not surprising, as I was interviewing dominant policy actors who had the strength of character and persuasion to influence and direct national policy. However, by reflecting on this within my research analysis it added rather than detracted from the richness of data generated, within the spectrum of different interactional contexts.

After an initial period of research in Wellington focused on Biosecurity New Zealand (BNZ), my institutional interviews and work shadowing, gardener interviews, and garden show participation overlapped, rather than forming discrete phrases of the fieldwork. This was a

result of my movements around New Zealand, and a distinct commitment to avoid privileging particular sites or aspects of the research. It allowed my evolving understanding of the specificities of different biosecurity sites to feed into my research approach to others. This was particularly significant in repeat interviews with institutional actors, in which I could ask questions relevant to gardeners. My interviews and participation with weed activists, however, took place during the final months of fieldwork, as it emerged as a focus through the fieldwork process itself.

Work shadowing

Participant observation is usually utilised within an ethnographic approach, and involves spending long periods of time observing and interacting with a particular social group (May 1997). Through this engagement, the researcher is able to explore practices, knowledge and meaning structures, including discursive structures as well as simple language use beyond linguistic reasoning. Participant observation techniques can also be used to engender empathy, to access the research community, to learn about the ways things are spoken about, and to support other research methods such as in-depth interviews. This gives a picture of key actors, relationships, tensions and affinities within the community itself. I utilised participant observation for institutionally-based research in a number of ways.

Firstly, I took opportunities to interact in informal settings as much as possible, over meals, drinks, staying with institutional participants on several occasions, socialising at the end of work days, during conferences and after garden show days.[1] Secondly, I was able to informally 'work shadow' four Pest Plant Officers (PPOs): Sara Brill for a morning in Tauranga, Carolyn Lewis to a meeting regarding a public education event in Hamilton, Wayne Cowan to a Nature Reserve in Wellington, and Craig Davey over the course of a three day garden show in Wanganui. All of the PPOs I spent time with were urban or peri-urban based. They were to be found knocking on the door of a suburban house, asking to talk to the owner about their privet tree, rather than talking to a farmer about his gorse 'problem.' I was frequently taken on a drive or walk through their 'patch' to be shown infestations and examples of garden dumping, or pest plants of particular concern. This gave me the opportunity to see their everyday work pattern, ask context relevant questions, and gain an

[1] Watching 'Wallace and Gromit: the Curse of the Were-Rabbit' with a chortling biosecurity practitioner was one of the more surreal informal interactive opportunities.

understanding of the physicality of the practice of biosecurity. Thirdly, from 27-30 July 2005, I attended the NETS Biosecurity Institute conference in Christchurch. This occurred early on in my fieldwork period, and was a vital opportunity to present myself and my research to a wide number of biosecurity personnel both formally through a paper presentation, and informally through a variety of social opportunities. Through this participation, I was immersed in the institutional culture of biosecurity in New Zealand. The conference provided me with an overview of contemporary concerns, literal information about the operation of the regime, and an understanding of contemporary discursive strategies. I was also able to generate contacts for subsequent interviews. In addition to the NETS conference, I attended a presentation given by Jack Craw to the Nursery and Garden Industry Association, in which he discussed and defended developments in the National Pest Plant Accord (see chapter four).

The interviews and work observation that contributed to this aspect of the research allowed me to access the detailed processes through which pest plants are constituted, categorised and controlled by the biosecurity regime. This material is presented in chapter four. In addition, I was able to begin to address my research interests in how biosecurity is enacted in situated practice, and how publics are encouraged or educated to adopt biosecurity ideals. This research question was also explored through participant observation of weed awareness stalls at garden shows, discussed in the following section.

'Weed Awareness' Stalls at Garden Shows

The 'weed awareness' stall at garden shows is a site where biosecurity and gardening ideals and practices explicitly co-habit, and where biosecurity personnel are involved in direct interface with gardening publics. This interface includes both visual and material tactics of persuasion and display, and face-to-face conversations (see Rose, G. 2001 for a discussion of visual methodologies). Paying attention to the weed-awareness stall enabled me to witness the way the biosecurity regime represented itself, and the ways gardeners in a specific context interacted with this representation.

I attended three garden shows in Christchurch, Wanganui and Hamilton where weed awareness stalls were organised by a committee including the regional council, the local DoC conservancy, and other stakeholder groups. These were shows to which I had been actively invited by a member of the organising committee. This was important due to the high level of involvement the research entailed for the institutional participants. I also attended three garden shows, in Hamilton (other), Blenheim and Auckland, where there was no official institutional plant biosecurity presence, to see if pest plant concerns were represented in any format. The following table presents information regarding this research:

Table 3.2: Research Conducted at Garden Shows

Garden Show and Location	**Length of research involvement**	**Description of research**
Hamilton Agricultural Field-day	1 day	Informal interview with staff on stall; informal conversation with visitors to stall; analysis of stall display.
Wanganui 'Bloomin' Artz' Garden Festival	3 days	Participated in erecting stall; informal and formal interview with staff on stall; informal conversation with visitors to stall; interviews with stall visitors; analysis of stall display; participant observation of stall (staff and visitors).
Christchurch 'Gardenz' Garden Show	3 days	Participated in erecting stall; formal and informal interview with staff on stall; informal conversation with visitors to stall; interviews with stall visitors; analysis of stall display; participant observation of stall (staff and visitors).

To provide a detailed example of this aspect of my research approach, for the Wanganui Garden Art Festival I arrived two days earlier and was involved in the full process of setting up the stall. This gave me the opportunity to spend time work shadowing and interviewing the Horizon's Regional Council Pest Plant Officer Craig Davey. With this depth of participation, I was able to witness the evolution of the stall display. This included discussions with Craig of his aims for the stall, what and how to display the different elements, and what Craig liked and disliked about the different visual and textual media he had to choose from. Over the course of the garden show I was able to pay analytical attention to:

- The visual presentation of the stall as a whole;
- The use of textual and visual media including posters and leaflets;
- The use of other entities in the display, such as plants and props;
- The way in which the public moved around and interacted with the stand as a whole, and particular aspects of the stand;
- The interaction between garden show attendees and the garden stall personnel;
- Conversations and reflections during the show with both gardener attendees and biosecurity personnel. These sometimes developed into full interviews and included both taped and untaped conversations;
- The opportunity to develop contacts for further interviews.

At the Wanganui Bloomin' Artz' Garden Show I also walked around the site as a human 'guide' for the Weedbuster mascot 'Woody Weed,' paying attention to how children and adults interacted with him. My involvement was therefore both more participatory, in helping to set up the stall, and more observation based, in watching how people moved through it (see Fetterman 1998, May 1997 for discussions of the spectrum of 'participant observation' approaches, from the more participatory to the more observational). I was careful to provide physical 'pack-horse' help but not to influence the arrangement of the items on the stall itself. I recorded these research encounters through photographs, through notes in a fieldwork diary both during and after the shows, through taped interviews and informal conversations where relevant, and also by physically collecting examples of leaflets. While on the stall I was required to wear my name on an 'exhibitor's badge' with the Regional Council's header. I always had to be aware of the need to introduce myself as a PhD student researching the gardening publics' attitudes to biosecurity. This will have affected my interactions with gardeners, but I believe the forthright way in which people expressed their views on pest plants, after I had identified my research interests, revealed an acceptance that I was positioned outside the regime.

This aspect of the research allowed me to attend in detail to the ways gardening publics are encouraged to adopt biosecurity ideals at one particular site of interaction. This research is presented in chapter four. In addition, through interactions with gardeners I began to access the different ways they reproduce, adopt or challenge biosecurity ideals. In the following section I describe the methodologies used to directly address this research concern, through different methods of in-depth or creative interviewing with enthusiastic domestic gardeners.

Gardeners: Creative Interviewing Whilst Sitting and Walking

My participation in the garden shows was one way in which I was able to have formal and informal conversations with gardeners. A more significant way I accessed the accounts of gardeners, however, was through creative or adapted forms of qualitative interviewing undertaken within the domestic garden. Creative forms of qualitative interviewing are appropriate methodological approaches to explore the lived experiences, motivations, choices and beliefs of gardeners acting within the context of plant biosecurity concerns in New Zealand. The following table displays information about the numbers, location, type of garden, and other specifics of the interviews I conducted with gardeners. I then go on to discuss the process of interviewing domestic gardeners using this adapted technique.

Table 3.3: Table Displaying Information Regarding Interviews with Domestic Gardeners

Location	Number of interviews	Interview Context	Type of Gardens	Other Research Contribution
Auckland	6, including 1 mother and daughter.	In domestic garden	All urban domestic gardens	1 'weed activist'
Tauranga	1	In domestic garden	Garden in rural setting bordering pastureland and privately owned native bush restoration areas.	Pest Plant Officer
Hamilton	1	In domestic garden	Urban garden, exclusively native	Pest Plant Officer
Hastings	7, including 1 group interview of 8 participants	6 in domestic garden; group interview at gardening group meeting room	1 mixed garden bordering native bush; remaining mixed	1 committee member of 'Guthrie-Smith' trust
Christchurch	6	5 in domestic garden, 2 at Gardenz Garden Show (1 follow up from show)	2 'bush' gardens, exclusively native; 1 native/non-native segregated; remaining mixed	3 also 'weed activists'
Wanganui	2	At Wanganui Bloomin' Artz Garden Show		Participant observation at stall

In summary, I undertook twenty-three gardener interviews, equating to thirty individuals. Seven of these individuals also formed part of other aspects of the research, as pest plant officers, or as community weed campaigners. Of these thirty individuals, all but one were women. This may have been influenced from an unconscious consideration of my personal safety, as I was entering the homes of interview respondents some of whom I was meeting for the first time. This also emerged due to the nature of my sampling technique, as gardening groups in New Zealand tend to be made up of retired women. This also reflects the make-up of committed gardening as a pastime.

Identifying research participants occurred in a variety of ways. In Auckland I arranged to attend the monthly meeting of the North Shore gardening group. I introduced myself and my research intentions, and invited the members to approach me after the meeting if they were interested in being interviewed. Attending the gardening group meeting itself provided an opportunity to gain an insight into the ways in which gardening is enjoyed and talked about in group settings. In Hastings I contacted the Keiranga Gardening Group secretary, who organised a meeting with some of the group members. I utilised this opportunity to undertake a group interview, and went on to interview one of the members in their garden. In Christchurch I gained contacts for interviews through the garden show. I also contacted one participant through a popular gardening website, who also went on to recommend a friend who I interviewed. I gained contacts for interviews informally through recommendations from family, and on one occasion from a biosecurity officer. In Tauranga and Hamilton, I also interviewed pest plant officers as gardeners in their gardens. In addition, I took the opportunity in institutional interviews to ask in an informal way about their own gardens and what they choose to grow. This formed a part of four institutional interviews.

The number of interviews undertaken emerged within the timeframe of research, particularly as this overlapped with other aspects of research. Following the timeframe of institutional interviews, conferences and garden shows tended to drive the amount of time I spent in one place. This was out of synch with my preference for gardening interviews, as it took longer to generate contacts through the methods described above. However, I believe that the depth of these interviews, often lasting over the course of an afternoon, together with the number undertaken, allows me to talk with some confidence about the themes and issues that emerged. Unlike Head and Muir (2006), I did not attempt to gain a representative sample, or a diverse range of different 'types' of gardeners. Instead, I directly solicited 'enthusiastic'

gardeners who had 'a desire to grow plants actively chosen,' (or as one respondent called them, 'real gardeners'). I felt these interviewees could provide a depth of engagement and a consideration of the issues my research was concerned with. 'Enthusiastic' gardeners do not form a representation of people with access to gardens in New Zealand, or necessary own the gardens from which weeds are more likely to emanate. That is informally thought to be absentee landowners, and owners who do not keep up their gardens (Susan Timmins interview 1:2005). However, these groups can largely be controlled through legislative means, such as removing plants from shelves, and enforcing removal from gardens. Instead, I focused on enthusiastic gardeners as I felt they are more likely to be personally affected by biosecurity attention to the domestic garden, to be able to reflect on it, to provide justifications for gardening choices or actions, and possibly contest biosecurity requirements in active ways.

Recording and anonymity: I used a digital recorder, and again also noted down body language, situational issues, thoughts and reflections during the interview. On one occasion I sensed that the interviewee was less at ease when I started recording, affecting the flow of the interview. Overall the use of the digital recorder worked very well. I put this down to its unusual visual appearance, as without the turning wheels of a traditional recorder, it is easy to forget that it is working. While I have retained the names of people in public office, I have adopted pseudonyms throughout this thesis for respondents in non-public office to retain their privacy. While I offered anonymity at the start of the interviews whilst explaining my intentions for the research and use of research material, I found that this caused confusion and jovial nervousness. Respondents made jokey remarks such as: *'I thought you were just going to ask me about my garden!'* (Carol, Hastings gardener, interview 2005). Following these initial responses, I adapted my introduction, simply stating that I would change their name in any research outputs.

Interview questions and schedule: The interviews were designed to access the gardeners' personal experiences and attitudes associated with gardening in the context of plant biosecurity concerns in the New Zealand. I devised an interview schedule of segmented theme-focused open-ended questions, balancing abstract and situated questions, which I adapted to each interview. This interview schedule is presented in appendix 2. As my experience grew, the interview schedule remained in my bag. This allowed me to concentrate fully on the interviewee, and present a responsive and interested demeanour. This negotiated

a balance between flexibility in this research encounter, and directing the interviewee to issues relevant to my research. I was initially inexperienced about the appropriate linguistic conventions to differentiate between 'weeds', 'pest plants', 'invasive plants', 'noxious plants', 'plant biosecurity' or 'pest management.' The use of open questioning strategies therefore allowed interviewees to express themselves using their own language. I began with a standardised introduction to interview, focused around descriptive questions asking for the story or narrative of their garden, ready to pick up specific threads. This eased the interviewee into the conversational situation of the interview, and allowed me to register my interest and enthusiasm through verbal and non-verbal cues. My precise way of phrasing questions was adapted across interviews as my experience of interviewing and of biosecurity and gardening grew, and in reaction to the specific conversational context of the interview situation itself. While these gardeners were very interested in talking about plants and past gardens, I had more difficulty in drawing discussion onto biosecurity-related concerns. I learnt that this could more naturally be achieved by following up comments about weeds or pests in the garden itself, and this forms part of my discussion in chapter six.

Positionality: I presented myself as enthusiastic and semi-knowledgeable about gardening through references to specific plants or aspects of the garden as I entered my interviewee's home. Being a young British female with family connections to New Zealand was conducive to the interview situation, prompting my mainly older female interviewees to reminisce about their first gardens. I traded discussion about my own garden, and about current garden trends, famous gardens and garden shows in Britain. Once my positioning as less knowledgeable about biosecurity was unsuccessful, when an interviewee directly asked why I did not know the answers myself.

Interview context and resources: The interviews lasted between 1.5 and 4 hours, with an average of 2.15 hours. This included recorded interviews in the kitchen or sitting room, and wandering around the participant's garden. In addition conversations spilled over into cars travelling to the interviewee's house, and over a cup of tea before and after the interview 'proper.' The interview at the kitchen table or sitting room blended questions with other activities. These included looking through booklets with photos of banned plants, at old photos of their garden, and at weedbuster articles in newspapers. These activities were also prompted by my research participants. For example, in two interviews participants got out photographic diaries of their garden. In a further four, participants found newspaper articles

or leaflets regarding biosecurity, a book about weeds and a book about native plants. These activities can be understood both as methodological prompts in themselves, but they also show something about the material existence of both plant biosecurity and gardening memories.

Interviews are a resource for assessing how respondents understand and construct their social worlds within context of interview. Interviews therefore construct a reflexive person. While I am interested in this, I was also keen to access the lived experiences of gardening in the context of biosecurity concerns. In addition, different aspects of identity are revealed in different contexts. As Mason questions '[I]f the interview is intended to generate situated knowledge, how can you ensure that the appropriate context is brought into play?' (Mason 2002:67). Walking around the garden and asking questions prompted by the garden allowed for the intervention of plants as material things, and they became a springboard for a different type of discussion (see Lorimer 2005). This produced valuable context-relevant reflections as plants asserted themselves and demanded attention. Encountering plants in practice, interviewees acted as gardeners: stopping to remark about particular plants, bending down to pull up weeds, and on one occasion cutting flowers for me. This informal context was more comfortable for both me and the interviewee. Mobile interviewing presents certain practical difficulties. It produced a more disjointed flow to the conversation, which was difficult to transcribe. As well as juggling a digital recorder, I also took photographs for descriptive purposes and as an interview resource. By using the process to ask about preferences and advice for the photographs, the interview was moved in particular directions.

In the context of the garden and the mobile interview, discussions moved easily from the reflexive, to the specifics of particular plants and gardening practices. I was able to prompt discussions on viewing the garden if, for example, I could see that there was a high proportion of native plants, or if the planting scheme separated native from non-native plants. The act of taking the interview into the garden was also associated with my interest in examining memory as materially located and embedded in plants. Walking through the garden triggered memories and experiences associated with particular plants, but placed these within the more 'mundane' bio-physical context of garden, and the material considerations of plant growth and death.

Through these interviewing techniques, I was able to address my research interests in the ways gardening publics interpret, reproduce or contest biosecurity ideals, the impacts of biosecurity in the domestic garden, and the influence of other associations within the garden on these concerns. This material is presented in chapter six. A number of these interviewees were also more actively involved in biosecurity politics outside the private garden, through campaigning, community weed control and native restoration projects. In the following section I describe the research methodologies undertaken to access these practices, through participant observation and interviewing techniques.

'Community Weed Activists': Energetic Encounters

My analytical attention to individual and community weed control, ecological restoration or campaigning work emerged as a focus during the fieldwork itself. It was concentrated in the later half of my time in New Zealand. It overlapped with other research strategies as I took the opportunity to interview participants more directly during shared activities, as well as organising formal interviews if relevant. I obtained contacts in two ways. Firstly, I received a list of both groups and individuals from Carolyn Lewis of Weedbusters, and from Mike Harre, the Community Relations Officer of Auckland Regional Council plant pest team. Secondly, I generated contacts at the Biosecurity Institute Conference, and at garden shows. The following table presents information about the different groups I researched, and the methodologies and strategies adopted.

Table 3.4: Research Conducted with Community Native Restoration/Weed Removal Groups and Projects

Project/ person	Location	Description	Research methodology	Length of involvement	Other Research Contribution
Motuihe Island	Auckland	Ecological restoration of an island, weed control large part of activities	PO; informal conversations; 2 longer informal interviews	1 day	No
Travis Wetland	Christ-church	Community managed wetland, different groups involved in weed control and re-vegetation.	PO; 2 longer informal interviews; AGM attendance	1 day	No
Summit Road	Christ-church	Community group undertaking native restoration and weed control.	PO; informal conversations; informal interview before/after in car	1 day	No
NZERN; Addington Bush Society	Christ-church	National information sharing network for ecological restoration projects; community group involved in native restoration on different areas of public and covenanted land.	Informal conversations during Gardenz; in-depth interview; walk and talk tour of Addington Bush	Over 3 days	Garden type interview
Governor's Bay Restoration Society; QEII restoration project	Christ-church	Community group involved in campaigning and research activities; covenanted native bush restoration project on private land.	Informal conversation at conference; in-depth interview; walk and talk interview	1 day	Garden interview
QEII restoration project	Tauranga	Covenanted native bush restoration project on private land.	In-depth interview, walk and talk interview.	1 day	Garden interview; work shadow as PPO; 2 in-depth interviews as PPO
Individual weed campaigner	Auckland	Campaigns for certain non-native plants to be declared pests	In-depth interview; walk and talk interview.	½ day	Garden interview
Maori Pa	Christ-church	Ecological restoration and weed control	Attended workshop of talks during conference; informal conversation.	½ day	No

In contrast to participant observation at garden shows and conferences, in this context the research methodology was enacted towards the 'participatory' end of the spectrum, as I was fully involved in pulling up weeds, cutting stems, applying poison, or digging holes for native saplings (Fetterman 1998; May 1993). This was vital in gaining a sense of the physicality of the work, which requires considerable exertion. Whatmore and Hinchliffe (2003) advocate participation to access the practical aspects of vernacular ecological knowledge that is produced through doing. Degen *et al.* (submitted:14) suggest that participant observation in this context is an essential tool to acknowledge and understand 'the embodied and emotional expressions embedded in the activities involved in making urban green spaces.' Undertaking embodied physical work in green spaces also allowed me to experience the active material qualities of the plants themselves, including the distinct sensory qualities of the native plants, and the sense of smothering-ness received from close proximity to some enormous pest plant infestations.

Through in-depth interviews, mobile interviews and participatory interactions with community weed removal and restoration groups, I was able to consider the meanings and practices of publics who play an active role in plant biosecurity in the public sphere. By following some of these participants back to their gardens, I was also able to consider connections between these more public and private embodied engagements with nature in the context of biosecurity concerns. This material is discussed in chapter six.

Summary

In total, fifty-three group and individual interviews were conducted. Twenty-three were institutional actors, thirty with domestic gardeners, with seven overlaps between these categories. Ten interviews were undertaken with individuals engaged in ecological restoration or campaigning. I 'work-shadowed' three pest plant officers. I attended three garden shows for a total of seven days, undertaking interviews with weed awareness stall holders, gardeners, and an analysis of the stall itself through participant observation and textual and visual analysis. I undertook participant observation with three community ecological restoration groups. This was supported by textual analysis of a variety of sources, including policy documents, Regional Pest Management Strategies (RPMS) and consultation documents, public communication literature and displays.

3.5 Research Analysis

The analysis of these materials was not a discreet phase of the research process. I reflexively analysed interview and other data as an ongoing process in New Zealand, and in a more structured and intensive fashion on my return to the United Kingdom. This continued and overlapped with my writing process, as I returned to original interviews and field notes until the final processes of drafting the thesis. Themes therefore emerged for this analysis during the research process itself, informing the data gathering process.

I either fully transcribed or partially transcribed different institutional interviews according to their utility. After listening back to each interview and reviewing my supporting notes, I choose to fully transcribe those interviews which provided discursive relevance or reflection, and partially transcribe those interviews that provided contextual or factual information. For those that were not fully transcribed and coded, I instead listened to the interview, and made a running series of notes about the content and any significant issues that arose.

In contrast, I fully transcribed and coded all gardener interviews. The coding process was undertaken by adding line numbers to the transcribed interviews, and assigning both pre-existing and emergent codes to the discussion. I paid attention to the codes and interpretation I brought to the interview, visible within the themes of my question schedule (see appendix 2), and those that emerged from the interview situation itself. I drew together key categories, and looked across interviews to see where these arose or were contradicted. I then recorded the line numbers and interview codes under code themes. Cognitive mapping provided a way to draw these interview themes together with those identified within my fieldwork diary notes, observation notes, textual analysis resources and photos. I then selected quotes which successfully represented or articulated these emerging themes to utilise in my empirical chapters. In the following chapters I have attempted to draw on as many of my informants in order to be as inclusive as possible. Where I have inevitably privileged particular individuals, this is due to the unique significance of their position within the regime, their depth of historical involvement, as well as their capacity for critical insight and fluency of expression (see Rabinow 1977). For example, in chapter five I draw extensively on Carolyn Lewis in a discussion of the public education campaign Weedbusters, as she is the co-creator and National Co-ordinate of this campaign. She therefore offers insights and understandings of the background, intentions and operation of the campaign, unavailable to others.

3.6 CONCLUSION

The theoretical frameworks of governmentality, environmentality and ecological citizenship, and the literature concerned with people-plant encounters, have in different ways been shown to draw methodological attention to both discursive and non-discursive practice. This implies a balance between research methodologies that pay attention to what people do and what people say. In response to this I combined context relevant in-depth interviews, textual analysis and participant observation techniques in my methodological approach. This encompassed attention to embodied practices as well as more traditional discursive self-reflection. This enabled me to move analytical attention from the production of biosecurity policy to the enactment of biosecurity governance, and from expressed public opinions about biosecurity to the negotiation of biosecurity ideals within everyday gardening practices. Attention to non-humans (technologies, artefacts, materials, plants and other bio-physical entities) within these frameworks necessitated consideration of the materiality of the research context and the reciprocal influences of non-humans in gardens, nature reserves and garden shows.

This research approach was developed to enable both wide-ranging attention to the institutional enactment, public communication and lived experiences of plant biosecurity, and to achieve a depth of engagement and a dense account of practices. The material generated is presented in three empirical chapters that now follow. **Chapter four** draws on in-depth interviews with biosecurity policy actors and weed scientists, and textual analysis of policy documents, to discuss the development of a national and a regional regulatory framework for pest plants. **Chapter five** draws on interviews and work shadowing with pest plant officers, and participant observation of weed awareness stalls at garden shows, to consider the interface between gardening publics and the biosecurity regime. This extends from the negotiation of institutional access to the domestic garden, to the public communication and enforcement of plant biosecurity. **Chapter six** draws on creative interviews with both domestic gardeners and participants in community weed control programmes, to consider the impacts of plant biosecurity discourses and requirements on the attitudes and practices of these publics.

4

KNOWLEDGE PRACTICES IN THE FORMATION OF GOVERNANCE

> We do not live in a governed world so much as a world traversed by the 'will to govern', fuelled by the constant registration of 'failure', the discrepancy between ambition and outcome, and the constant injunction to do better next time (Rose and Miller 1992:191).

4.1 INTRODUCTION

This chapter pays attention to the way the biosecurity regime structures its response to invasive plants in New Zealand. This reveals how political rationalities, biophysical properties of non-humans, public understandings, the independent agency of pieces of legislation and scientific expertise, amongst other things, come to define the formulation and practice of internal plant biosecurity governance. I discuss the influence of the Biosecurity Act (1993), introduced in chapter one, on the realm of internal pest plant management. I then consider two regulatory instruments, Regional Pest Management Strategies (RPMS) and the National Pest Plant Accord (the Accord), utilised to organise a political response to pest plants. This involves the creation of the category 'pest plant', and the progressive complexity this attains. While I focus on regulatory instruments and scientific rationalities, the vitality of the governing context continues to creep into this account, in the conflict and negotiation between biosecurity practitioners, gardeners, nursery owners, plants and other biophysical influences.

4.2 The Biosecurity Act (1993) and Internal Pest Plant Management

The Biosecurity Act (1993) has had a defining role in the historical development and character of internal legislative frameworks targeting pest plants. It provides the formal grounds on which biosecurity agencies construct and relate to 'pest plants.' The Biosecurity Act (1993) introduced the term 'biosecurity' into legislation for the first time (Jay and Morad 2006). A 'world first', the Biosecurity Act (1993) is 'a law specifically to support systematic protection of... biological systems... from the harmful effects of exotic pests and diseases' (Biosecurity New Zealand 2004:8). With effects across all five sites of biosecurity intervention, the Biosecurity Act (1993) is the crucial piece of legislation with applicability to internal pest plant management, as it legislates for Pest Management Strategies, and confers powers to operating authorities.

The historical circumstances of the drafting and development of the Act have significantly influenced the way it structures internal pest management. The contingent set of circumstances which led its development has produced cultures of practice separate from initial intentions for the Act, but driven by adhering to what it stipulates. Crucially, the Act was written by the Ministry of Agriculture and Forestry (MAF) with Foot and Mouth Disease (FMD) in mind. Jack Craw, the Biosecurity Manager for Auckland Regional Council, describes the way the use of the Act was envisaged:

> They wanted all the power, but flexibility, so they could declare restricted zones, have any sort of power, take any kind of action, kick down doors, declare quarantines on sites, etc etc. (interview 1:2005).

The 'power and flexibility' that Craw describes here is potentially formidable, and would appear to equate to a form of 'sovereign' power. In this chapter, however, I argue that what emerges in practice is actually far more complex, differentiated and collaborative. I understand this to equate to governmentality, but with defining features that draw on citizenship and environmentality formulations.

The 'flexibility' of the Act comes through the open way it defines a pest, as an organism specified as a pest in a Pest Management Strategy. This has allowed the Act to be transferable

beyond its initial disease-focused remit, to encompass ecological weeds. I asked Jack Craw whether the authors of the Act imagined or intended it to be used for pest plants:

> No, it was written for Foot and Mouth, and only MAF had powers. We [Regional Council] were the eyes and ears. The ... select committee were happy with the broad focus, but MAF wanted a disease focus. But by happy coincidence what we got... is immensely flexible to define a pest (interview 1:2005).

This disrupts the direction of Rose and Miller's (1992) schema, where political governance develops from the abstract to the material through 'political rationalities' to 'programmes of government' to technologies of government', in two ways. Firstly, it highlights that political rationalities and connected political technologies are closely influenced by the material context of their concerns. This begins to substantiate my re-adapted use of political materiality within Dobson's (2003) concept of 'ecological citizenship,' outlined in chapter two. Secondly, the translation of this technology into alternative political materialities has significant effects. This raises questions about the effects of legislation derived from this particular empirical context, when applied to a very different situation of relational interactions between people and plants.

The first draft of the Act gave power only to MAF, who were not able to delegate to other authorities. It was acknowledged that this was unworkable, and the first set of amendments, made within a year, extended powers to regional governments.

Through the power and flexibility embodied in the Act, together with the extension of powers to regional councils, the governance of pest plants has taken on an open format:

> It's not prescriptive legislation, it's empowering, it doesn't prescribe methods it says you can utilise any methods you like. On a national and regional level you can write your own menus: what is a pest, how it is to be managed, who pays and how. It's fantastically powerful (Jack Craw interview 1:2005).

The Act has taken on a powerful position in itself, partially independent of the actors who created it, yet still relationally associated through the process of drafting amendments.

The 'power and flexibility' written into the Act allows intervention at any stage of an incursion. This contrasts with approaches in countries such as the UK, where the need for separate legislation for individual species prevents responsive action over new invasive

plants. In contrast, the Act generates a particular spatio-temporality of political action within the domain of plant biosecurity concerns:

> If we have a new problem I can take up to $100,000 of action without any strategy, I can take it tomorrow. It gives holding time for a plant giving time to get a strategy amendment, which can take 6 weeks, but if you have to consult, it can take 3 months, if it's going to cost some-one (Jack Craw interview 1:2005).

In addition, amendments to the Act allowed for 'partial reviews' for changes to pest strategies (Phil Dawson, Department of Conservation Weed Technical Officer, interview 1:2005). I was particularly struck by how unusual it is for a piece of environmental legislation to operate to a political timeframe that could match an environmental one. For health legislation, however, it is not uncommon, as there needs to be the power and flexibility to act in the event of an epidemic. And this was what the Act was written for, not for a human epidemic, but an epidemic in cattle. This connection between the timeframe of political action and the timeframe of entities themselves suggests something about the way the spatio-temporalities of non-humans have a role in driving political responses.

The Biosecurity Act (1993) represents a significant 'representational innovation' for biosecurity governance (Agrawal 2005a:30). It assigns considerable power to operating authorities and embodies flexibility in both defining and categorising a pest. It details the criteria, including consultation and costing processes, on which decision-making is built. In the following sections, I consider the detailed processes through which environmental pest plants come to be produced and categorised legislatively. This involves a consideration of the justification and organisation of regional government, and the economic, political and scientific rationalities drawn on in the development of Regional Pest Management Strategies (RPMS).

4.3 Regional Councils and Regional Pest Management Strategies

The Regional Council Structure

The regional government structure as it exists today was formed through the 1989 Local Government Consultation. The regional environmental management responsibilities of various local governance bodies, including the internal pest management responsibilities of the 92 District Noxious Plant Authorities, were combined into 16 regional councils. While pest management is just one of their regional environmental governance functions, it is significant. The Environment Bay of Plenty (BOP) Regional Council estimates, for example, that approximately 10% of their overall budget is spent on animal and plant pest control.

The Local Government Consultation advised that wherever possible, local environmental government boundaries should follow *natural* boundaries. The boundary lines between regional councils often follow the tops of hills, which if above the bush line can act as a natural barrier for weed spread. The map on the following page displays the boundaries of the 16 regional councils in New Zealand. These regional units broadly align to regional climate and human habitation patterns, producing a distinct regional manifestation of plant invasions. As Carolyn Lewis, a Pest Plant Officer from Waikato Regional Council and National Weedbusters Coordinator explains, this spatio-temporal geography of invasion gives regional councils an opportunity to learn from each other:

> We watch Northland to see what's going to be a problem here ten years later. Northland's the first place of human settlement in New Zealand, so after the lag phase, things are coming out there first. So Northland's the worst, Auckland's pretty bad, then here [Waikato], then Wellington's not so bad, then you get the frost starting to knock things on the head. So because New Zealand's climate is so varied, we go from tropical to sub-alpine, every region has got its own problems (interview 1:2005).

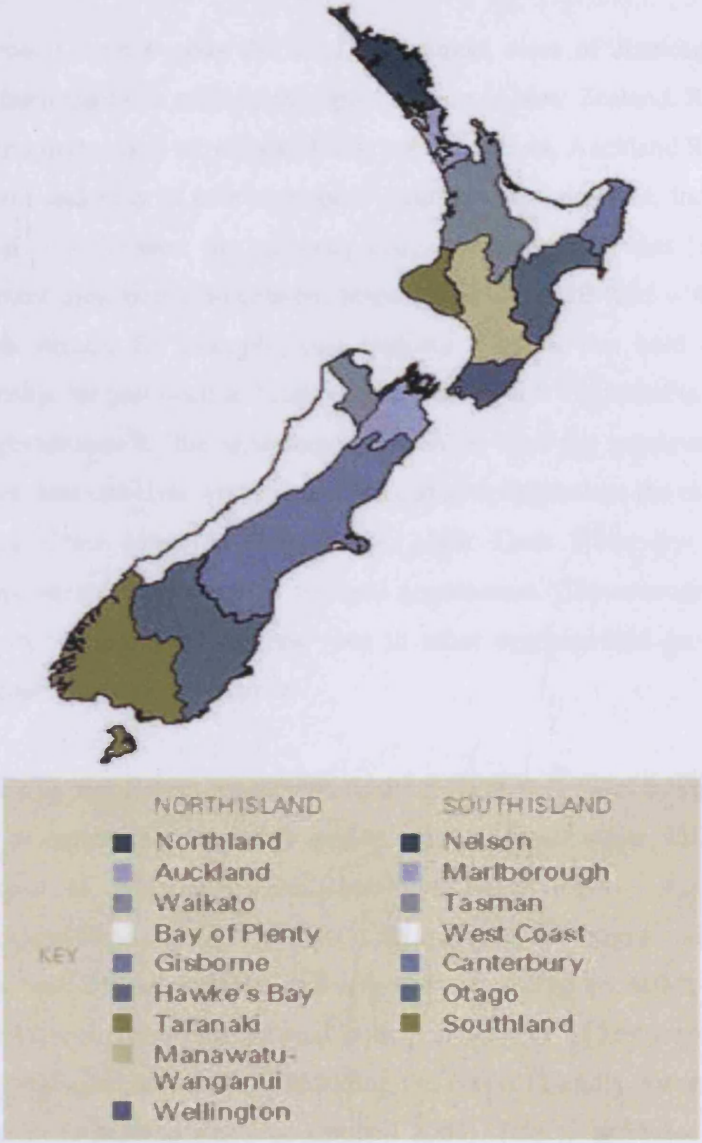


Figure 4.1: Map Displaying Location of Regional Councils in New Zealand (National Pest Plant Accord Steering Group 2005d).

This gives greater ecological relevance to the internal political organisation of pest plant management. While Agrawal's (2005a) concept of 'governmentalised localities' utilises a theoretical geography of governance, this regional government format extends that. Governance is spatialised in a way derived from material ecological geographies. While this has been relationally influenced by human habitation patterns, it is not a purely human consequence.

The regional council areas overlay the local government areas of district or city councils, which together form the basis of political representation in New Zealand. Regional councils may also own land in the form of parks and reserves themselves. Auckland Regional Council, for example, owns and runs 38,000 hectares of land as nature reserves, including off-shore islands. Regional councils have the authority under the Biosecurity Act (1993) to enforce landowners to meet their pest management responsibilities on *all* land within their area of jurisdiction. This means, for example, that regional councils can hold city and district councils accountable for pest plant infestations on council land. The benefits of this system of environmental governance is 'the separation of the doers from the regulators' removing the conflict of interest that can arise when authorities can give themselves the consent to do what they want (Jack Craw interview 1:2005). As Jack Craw (interview 1:2005) argues 'biosecurity demonstrates that we need regional government.' Governance is therefore not simply applied to 'subjects' or 'citizens,' but to other agencies and government bodies, leading to the 'governance of governance'.

Regional councils have different reputations in the field of pest plant management, and can have a greater or lesser role as policy leaders on a national stage. This contrasts with Agrawal's picture of governmentalised localities which rarely interact horizontally (2005a:91). Auckland Regional Council (ARC), for example, has been a policy-driving force, and is organised, well-funded, political and very persuasive. The council is well represented on national committees and drives national policy. A number of key resources and policy initiatives have originated out of ARC, including the Forest Friendly Awards, and the *Plant Me Instead* booklet (Auckland Regional Council 2005). This is attributed to the council's size, funding, and the charisma of particular characters, significantly the Biosecurity Manager Jack Craw. It may also be related to the greater prevalence of pest plants in Auckland, due to the region's warmer climate, lack of winter frosts, large urban population, early settlement history and air and seaports, amongst other factors (Jack Craw interview 1:2005; Robin Packe, Hawke's Bay Regional Council Plant Biosecurity Manager, interview 2005). As much as Auckland is 'looked to' as a policy driver, then, it is also 'looked to' as a weed hotspot, due to its weed-favourable climate. 'It might be a problem in Auckland, but it isn't here', was a frequently repeated mantra. Waikato Regional Council and the Environment Bay of Plenty (BOP) Regional Council are also understood to be well organised and responsive to pest plant issues. In contrast, certain regional councils have a reputation as 'old school' in terms of

pest management, linked to their persisting focus on established widespread weeds such as blackberry and gorse. To re-cap, this thesis draws on research undertaken with Auckland, the Environment Bay of Plenty, Hawke's Bay, Waikato, Horizons (Wanganui), and Christchurch Regional Councils.

Regional Pest Management Strategies: Classification and Control

Internal pest management is organised and legated through the preparation of Pest Management Strategies, following a formal methodology written into the Biosecurity Act (1993). Regional Pest Management Strategies (RPMSs) are developed by regional councils 'to provide a strategic and statutory framework for efficient and effective management of plant and animal pests' (ARC 2002a:9). RPMSs detail the species/sub-species that will be targeted for pest management, and the precise control intentions and methodology for each. Regional councils have no statutory obligation to undertake pest management, or develop Pest Management Strategies. In practice, 13 out of 16 councils work to a Regional Pest Management Strategy (RPMS) of some kind. The Regional Pest Management Strategy (RPMS) is a 5-year document, and using Auckland Regional Council (ARC) as an example, the first was operational from 1996-2001, the second from 2002-2007, and the third is currently being consulted and will come into effect in 2008.

RPMSs greatly expand the realm of calculation and visibility within pest plant management. As Donaldson and Wood (2004) argue, surveillant biosecurity is about the establishment of categories, and in order to be eligible for inclusion in the RPMS, a plant must first be categorised as a pest. This is the first process of categorisation: *defining the distinction between a benign plant and a pest plant.* It must be demonstrated that the plant is capable of causing 'a serious adverse and unintended effect' in the region on one or more of the following:

Table 4.1: 'Criteria for Inclusion,' from the Biosecurity Act 1993; section 72 (c), (Parliament of New Zealand 1993).

i. economic wellbeing; or ii. the viability of threatened species of organisms, the survival and distribution of indigenous plants or animals, or the sustainability of natural and developed ecosystems, ecological processes, and biological diversity; or iii. soil resources or water quality; or iv. human health or the recreational value of the natural environment; or v. the relationship of Maori and their culture and traditions with their ancestral lands, waters, sites, waahi tapu, and taonga.

These criteria reveal the breadth of ways non-native species are considered to adversely impact New Zealand, reflecting an underlying shift from an agricultural to an ecological focus for biosecurity justification (Williams and West 2000). As these criteria demonstrate, scientific understandings are drawn together with a range of other values. This contrasts with the emphasis in environmentality frameworks, apparent in both Agrawal (2005a) and Scott (1998) work for example, on purely economic criteria and scientific conceptions in the categorisation of forests. As there is a formal codified methodology for determining a pest within the legislation itself, rather than this being the preserve of science, the Biosecurity Act (1993) displays both transparency and flexibility. This incorporates a 'knowing of indeterminacy' (Hinchliffe 2001) into the heart of the biosecurity legislative system.

With the advent of the Biosecurity Act (1993) and this expanded criteria, the numbers and types of weeds that regional councils were confronted with greatly increased. Complexity therefore emerges due to the proliferation of sites and species, threats and threatened, prompted by this expanded understanding of risk and harm. To take an example, gorse qualifies as a pest, the first stage of the RPMS categorisation process, due to its economic impact on agriculture and forestry, its ecological impacts, and its impact on recreation, for example through overgrowing walking tracks. The material significance of this only emerges, however, through the second step in the categorisation process: *the placement of pest plants within a hierarchy of control categories.*

The categorisation process is detailed and multi-tiered. A process for screening nominated pests, based on the criteria above, was developed by the Biosecurity Managers Group for use by regional councils. This model considers the adverse effects of a pest, the biological characteristics of a pest, and the distribution of a pest. Based on this assessment, plants are

classified according to proposed management approaches. The table below presents this full control hierarchy, and details the control requirements related to each designation:

Table 4.2: Regional Pest Management Strategy Control Hierarchy

CATEGORY	SCREENING ASSESSMENT	CONTROL REQUIREMENTS
Total Control	Major effects, low incidence, where eradication is deemed realistic.	Full control and removal mandatory. RC funds and carries out all work. Aim – eradication from region or defined areas in region, over 5 to 10 yrs. Banned from sale, propagation, distribution and display.
Containment (Removal) – or 'Progressive Control' (BOP)	Moderate/major effects, with widespread distribution, so that eradication is deemed unrealistic.	Landowners/occupiers required to carry out control work on own property to completely remove pest plants whenever they appear, throughout region/or in designated parts. Aim: to minimise their impact. Eradication may be possible.
Containment (Boundary Control)	Moderate/major effects, with widespread distribution, so that eradication is deemed unrealistic.	Landowners/occupiers required to carry out control work to a specified distance from their property boundaries, in rural parts of region. Aim: to reduce impacts on neighbouring properties
Surveillance	Moderate/major effects, too widespread to warrant control, so that publicity and limited control in site-led programmes deemed appropriate.	Pest plants banned from sale, propagation, distribution and display within region. People encouraged to remove from their properties whenever they appear, though not a legal requirement. Research to be undertaken into effects and biological control.
National Pest Plant Accord	Detailed screening process operates outside of Regional Council responsibilities, described in detail below.	Pest plants banned from sale, propagation, distribution and display throughout New Zealand. Same status as above.
Community Initiatives Programme	Pest plants nominated by community groups or groups of landowners who wish to carry out their own collaborative control work. Typically widespread pest plants that failed the Cost Benefit Analysis, but have a high public profile.	RC provides advice and information, as well as regulatory back-up for a listed number of these.
Research Organism	Plants which are the subject of RC funded research during the life of the RPMS, to more clearly determine impacts, effective control, management regimes, and to undertake consultation.	Under Regional Council surveillance and research.

Source: adapted from ARC (2002a:27-29)

Under their current RPMS (2002-2007), Auckland Regional Council (ARC) has a total of 133 plants listed within their RPMS, divided between the above categories. This includes 25 Total Control Pest Plants, 13 Containment Pest Plants, and 82 Surveillance Pest Plants. In contrast, the Environment Bay of Plenty (BOP) RPMS lists 52 plants, with 10 in the Total Control category (John Mather, BOP Plant Biosecurity Manager, interview 2005). All pest plants in RPMS are banned from sale, propagation, display and distribution in their regions. For plants placed in the highest category full control and removal is mandatory, with the work funded and carried out by regional councils themselves. African feather grass (*Pennisetum macrourum*), and Old Man's Beard (*Clematis vitalba*), a smothering vine imported as an ornamental plant from Britain, are examples of Total Control pest plants within the Auckland region. At the lower end of the control hierarchy are 'Surveillance' pest plants, which landowners are 'encouraged' to remove from their properties, although this is not a legal requirement (ARC 2002a:27-29).

The control designation ascribed to pest plants leads to the varying permeability of boundaries in the New Zealand landscape. Donaldson and Wood (2004) suggest that the most successful types of boundaries are those that are reinforced but differently permeable, allowing different speeds of movement and different entities to move in variable ways. Through rationalising their approach by constructing differentially permeable boundaries, relevant to a pest plants' placement within this hierarchy, regional councils can respond to greater numbers of pests. It is important to note that in the case of domestic gardeners only the top two categories in the control hierarchy require actual removal of plants from the garden. This means that some plants will be banned from propagation and exchange, be unavailable in garden centres, yet be legally tolerated within the garden itself.

The problems posed by pest plants include the ramifications of political claims about what control can be achieved. John Mather emphasised the care that needs to be taken in placing pest plants in the most applicable category (Environment BOP Plant Biosecurity Manager, interview 2005). For example, stipulating a high level of control for a plant that later emerges is far more widespread than initially thought, generates an unachievable workload. This can lead to a perceived failure by the regional council if eradication is not subsequently achieved. There is also the possibility that a pest plant confers benefits. Understandings of the pest plant's extent in the region, as well as knowledge of how it spreads and vectors of spread, thus become essential information tools. So, while an understanding of the RPMS hierarchy

could focus on the high level of control that exists over plants, it is crucial to emphasise that a large part of the system allows for the managed absence of control:

> John Mather: If it came to our attention, if we found out through scientific evidence that there were more benefits than drawbacks to a pest plant, then it would not be a pest plant that we would enforce control of.
>
> Kezia: Is there an argument for 'let nature be'?
>
> John Mather: Yes, I think probably there is. Quite often doing nothing and leaving it to nature is an option.
>
> Kezia: But there seems to be so much control?
>
> John Mather: Yes, but when we put plants in the strategy and decide which category to put them in, how much intervention we will undertake, it's all about best knowledge, and public input also (interview 2005).

The control hierarchy also details who is responsible for carrying out control work. In the first instance, primary responsibility resides with the landowner. The regional council undertakes pest control work where there are deemed to be regional benefits from doing so. This includes land with High Conservation Value, where technical expertise is required, or where significant adverse environmental impacts may occur (ARC 2002a:21). The Environment Bay of Plenty (BOP) Regional Council justifies undertaking eradication work in certain circumstances, through the more thorough and effective eradication that occurs when professionals undertake control work (John Mather interview 2005). This higher level of service delivery is seen as essential for certain high risk, low incidence pest plants.

This placing of responsibility on the landowner differs from the high level of responsibility adopted by biosecurity agencies in the past. Peter Williams, a Crown Research scientist working for Landcare Research in Nelson, describes what he understands as a 'gradient of responsibility' that moves from the state to the individual, according again to how widespread the threat already is:

> Only the state can protect you as an individual from a threat at the border. So it must have primary responsibility for doing that. But take the other extreme. The common cold. The common cold is so widespread that only you can protect yourself. The state can protect you from bird flu, hopefully, but it can't protect you from the common cold... With AIDS, you can take some measures to protect yourself, and the state can take others, it's a mishmash. Well weeds are the same. Who is responsible and who should pay, changes in the same way along that gradient that it does for human diseases (interview 2005).

The use of health discourses by practitioners to explicate plant biosecurity mirrors the extensive application of governmentality within health research. The emphasis Peter Williams places on state and personal responsibility is spatialised in ways that resonates with Dobson's (2003) account of the ecological citizen's responsibility within the private sphere. This highlights the complexity of state and citizen responsibility, but also its spatial geography.

In the following section I detail the particular rationalities which contribute to the classification of pest plants into the different categories within the RPMS control hierarchy. This includes the use of Cost-Benefit Analysis, the Infestation-Curve Model, and the association of these rationalities to 'weed-led' and 'site-led' approaches. This develops my discussion of the spatio-temporality of plant biosecurity control measures.

Rationalities of Weed Control (1): Cost Benefit Analysis (CBA)

Regional councils and their predecessors Noxious Plant Boards formerly had 'unlimited money' to spend on pests such as gorse. Jack Craw, Biosecurity Manager for Auckland Regional Council, described the shift from this situation:

> The legislation, the 1993 Biosecurity Act changed that... it said you have to justify how you're spending the money, you have to say who the beneficiaries are, etc. Go for things you think you can exterminate quickly... So the real switch really dates from that (interview 1:2005).

The Biosecurity Act (1993) has therefore been instrumental in altering the focus of attention from existing infestations, to newly established naturalisations. Under section 72(1) (a) and (b) of the Biosecurity Act (1993), regional councils are required to assess the cost-benefit (CBA) of having a RPMS in relation to each organism within that strategy. This considers whether the costs of action outweigh the costs of inaction, and whether the net benefits of regional intervention exceed the net benefits of an individual's intervention. This is seen to allocate limited resources in the most effective manner 'because the price of you doing one thing precludes you doing something else' (Peter Williams interview 2005).

The CBA process is understood to have many problems, particularly in regards to the issue of deriving economic environmental values. As Carolyn Lewis, a Pest Plant Officer from Waikato Regional Council and the National Weedbusters Coordinator explains:

> When it's about agriculture, it's easier, although we even have trouble working out how much weeds cost the country per year in herbicides. Now it's more difficult as it's about values, it doesn't take into account loss of recreation, damage to taonga. So councils are required to do CBA but it's very fuzzy science (interview 2:2005).

Mike Harre, the plant biosecurity Public Liaison Officer for Auckland Regional Council, argued that while a CBA is required, it is still based on 'a lot of estimates and assumptions' (interview 1:2005). Or, as Phil Dawson, a DoC Weed Technical Officer puts it: 'they've got to have a CBA, but it might be crap' (interview 2:2005). The difficulty of quantifying the costs of environmental pests is explicitly acknowledged within Auckland Regional Council's RPMS (2002-2007), and CBAs are only carried out for Total Control and Containment Environmental Pest Plants. Whereas costs of *action* are quantified and converted to Net Present Value, the environmental values this is compared to are left unquantified. A judgement is made by the Council that the cost per hectare to protect the listed environmental values is acceptable. This is seen as sufficient to meet the requirements of section 72(1) (a) of the Biosecurity Act (1993). It could be argued that by keeping the environmental values unquantified, the process retains flexibility to shifting human values. This allows biosecurity policy to respond to the inherent indeterminacy of biosecurity issues outlined in chapter one. It also, however, highlights some of the difficulties of undertaking ecological biosecurity in a framework influenced by prior commitments and concerns driven by agricultural biosecurity.

Rationalities of Weed Control (2): The Infestation Curve Model

The CBA process has become entwined with a policy tool utilised to associate the costs of control to stages of plant naturalisation: the Infestation-Curve Model. Peter Williams, a weed scientist working for Landcare Research in Nelson, drew the attention of the biosecurity establishment to newly naturalising weeds as a more economical focus for weed control activities, by effectively overlaying the CBA process onto the Infestation-Curve Model. Within this rational framework:

> The history of successful control programmes, economic analyses and scientific studies, shows that the greatest return for expenditure of money and effort comes from controlling weeds at the *early phases of invasion* (Williams 1997:22, emphasis added).

The Infestation-Curve Model diagrammatically represents the increase in the population of a plant over time, through different stages of naturalisation. 'Many pests and diseases tend to follow a well defined, very simplified "S" shaped pattern' (Williams 1997:15), with a lag phase as the plant establishes and begins to expand, followed by a rapid explosion as it finds suitable habitats, and then a levelling off as these habitats are saturated. A reproduction of the 'Infestation-Curve Model' utilised within the Environment Waikato Regional Council's RPMS is presented below:

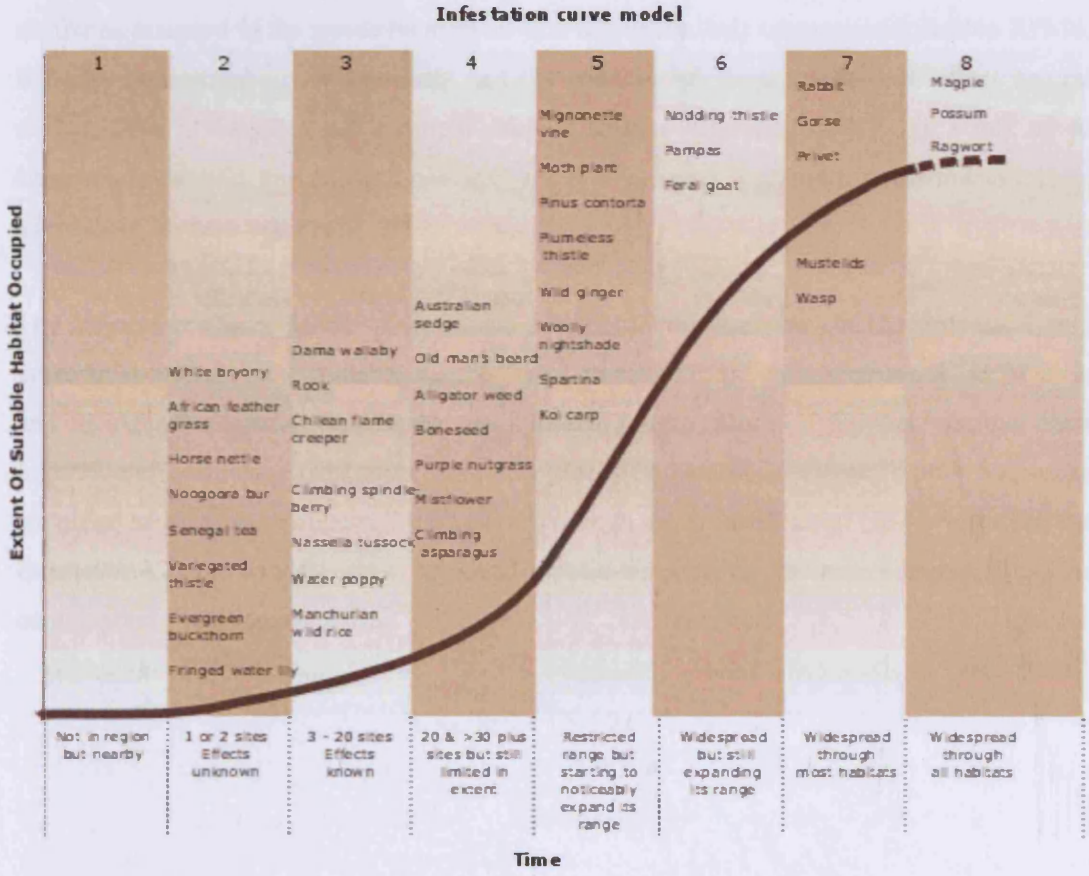


Figure 4.2: A Diagram of the Infestation Curve Model, within Environment Waikato Regional Council's RPMS (Environment Waikato Regional Council 2002:14).

In early stages of naturalisation, a plant will be occupying few of its available ecological niches. At this stage eradication efforts are easier, cheaper, and more likely to result in the successful removal of the plant overall.

Gorse is an example of a plant at the opposite end of the Infestation-Curve Model. Over the time that it has been in New Zealand, it has reached most if not all of its available ecological niches. Horizons Regional Council RPMS (2001b:80) states that gorse plants 'are found frequently throughout the Region... in nearly every expected habitat, estimated 278,000 hectares infested with gorse.' At this point in the Infestation-Curve Model it is more costly to undertake weed control work. The outcomes are less significant, as complete eradication is unlikely. The concept of 'benefit' within the CBA is therefore not only assessed as the extent to which a weed impacts on the values listed in figure 4.2 above. It also includes the extent to which the weed's prevalence can be reduced, or its spread prevented. It is not simply identity attributes assigned to the weeds themselves that determine their categorisation within RPMS, but also understandings of the costs and the capacity of human actions to effect natural change. This is therefore not a simple story of science informing policy, but a mix up of economic, scientific, and political concepts and requirements, together with the indeterminate agencies of humans and plants.

The Infestation-Curve Model gives plants a status in the decision-making process. Using gorse as an example, the sociable-materiality of gorse led to the failure of control techniques and its extensive spread, despite the best biosecurity-like efforts of farmers, noxious plant officers and politicians over more than 150 years (Bagge 2000). Gorse is now frequently classified as a 'boundary control' pest plant. Through the rationalities of CBA overlaying the Infestation-Curve Model, this achieved spatio-temporality is now determining the contemporary political response.

Rationalities of Weed Control (3): Weed-led and Site-led Approaches

The Infestation-Curve Model is used to justify a policy distinction between 'weed-led' (originally 'species-led') and 'site-led' control approaches. This key concept was introduced by Peter Williams, and has been adopted by the Department of Conservation (DoC) and regional councils. The distinction between weed-led and site-led approaches generates a complexity of categorisation, boundary maintenance and hierarchy construction, with differing spatialities and physicalities.

The approach draws on the Infestation-Curve Model and CBA, taking into account the extent of the pest plant, the cost to control it, and its potential for damage. The majority of regional council pest plant control activities are organised according to a 'weed-led' approach (ARCa 2002). A weed-led strategy ascribes a level of control to low incident, high-threat species that applies across the region, regardless of the site were the weed is growing:

> Species-led [now referred to as 'weed-led'] says that we are going to control this weed wherever it is, the value of the site is immaterial, we're controlling it because we believe and we've got rational systematic research which says that the impact on the conservation estate would be huge, so we're going to try and kill it, no matter (Peter Williams interview 2005).

Within this approach it is the categorisation of the weed that becomes the crucial determining distinction, within the hierarchy of pest plant control designations. For those determined as a high threat, such as pest plants in the 'Total Control' category, the scale of spatialised boundary maintenance is increased to the national or regional border. This homogenises internal space for these weeds, removing the significance and physicality of boundaries between nature reserves, forestry land, agricultural land and urban gardens. For a weed-led approach, it is therefore the *plant* that is 'subject to categorisations that defines specific actions and restrictions,' rather than the space (Donaldson and Wood 2004:384).

However, as these are low prevalence pest plants, this produces a spatial focus for control work at points where new weeds emerge. When coupled with contemporary concern over environmental pests emanating from the domestic garden, this spatial focus has moved from historic attention to rural production areas, to places in and near human habitation:

> It's more an urban focus, or peri-urban. That's where there's more activity. Yeah, half native, half introduced, sometimes called wasteland, sometimes other values, wetland. All the messed up bits and not quite so messed up, the edges (Peter Williams, interview 2005).

The weed-led approach draws attention to low conservation value, marginal, 'feral' or 'remnant' spaces in urban and peri-urban areas, where weeds are not obviously displacing other plant species, and are adding colour and botanical exuberance (Hinchliffe and Whatmore 2006). This does not, however, represent a conservation focus on the recombinant ecology of the 'urban brown' rather than 'wider green.' The target for protection is still wider natural landscapes:

> Peter Williams drew attention to the need to focus on plants in the urban area, to keep them under control *before they reach the reserves* (Robin Packe, Plant Biosecurity Team Leader, Hawke's Bay Regional Council, interview 2005, emphasis added).

It instead represents a cleaning up of urban nature as the source of infestations. This spatial-temporal focus on the points of emergence of pest plants generates new political concerns and new actors mobilised in different ways.

As a species' numbers start to rise along the Infestation-Curve Model (with a corresponding increase in cost and decrease in likelihood of full eradication), the imperative for a weed-led strategy drops, but the imperative for a site-led strategy grows. This is when a suite of weeds, including those designated in low threat categories, are all controlled on high-value sites. These site-led places might include, for example, particular reserve areas with highly rated environmental values:

> So once a weed becomes so widespread, like gorse, you only control it in places where the values of the place you want to protect are being impacted on (Peter Williams interview 2005).

For a site-led approach, it is the site that is categorised as 'high value,' the internal categorical differentiation between pest plants (table 4.2) becomes less important, while the initial binary between 'pest plant' and 'benign plant' is critical. The physical boundaries of the nature reserve become vital, as pest plants are tolerated on one side of the boundary and not on the other. This produces a spatialised heterogeneous landscape of inclusions and exclusions, a greater complexity in the type of boundary, and a smaller scale of divisions. This equates to Donaldson and Wood's (2004:373) description of the evolving practices of

biosecurity in the UK as 'producing a highly spatialised form of control, reliant on the creation and maintenance of tightly categorised territories.' The Department of Conservation utilise a site-led approach, and have developed a ranking of the value of its estate, creating a hierarchy of habitats and sites. As weed control work is undertaken on these high-value sites, they become 'physically aligned' to this categorical schema, revealing the power of these categories to transform the 'facts' they note (Scott 1998).

This discussion of the political rationalities involved in constructing a detailed and differentiated response to pest plants has focused entirely on expert knowledges and categorisation processes. This has disrupted a simple schema of categorisation received from environmentality literatures, by emphasising the *spatio-temporal sensitivity and flexibility* of the categorisation process. This *gives non-humans a status* in the decision making process. In the following section, I will discuss a further way that the understanding of categorisation as an expert, rigid process is altered through this intersection with plant biosecurity practices in New Zealand. This occurs through the impact of public knowledges and opinions, developing a discussion of citizen participation in the public realm.

The RPMS Review Process

Regional councils are close to their voter base, as they are comprised of elected representatives and funded through ratepayer taxes. The final inclusion of a plant within a RPMS and its placement within the control hierarchy is therefore dependent on negotiations. This occurs through the informal diffuse pressure of 'public opinion', felt and interpreted in a myriad of ways, but crucially also through a formalised review process.

RPMSs are reviewed every five years. Regional councils follow the same broad process, which takes between one and a half to two years. This process is stipulated in sections 72 and 77 of the Biosecurity Act (1993) (Environment BOP 2003). This thorough review process provides checks against the 'personal crusades' of elected representatives with other interests (Phil Dawson, DoC weed technical officer, interview 2005). The timeframe of review balances the need for tangible results to be achieved during each strategy cycle, with temporal responsiveness to newly emerging pest plants. Reassessing legislated pest control

regionally every five years through this review process is remarkable, particularly in comparison to the UK model (Jack Craw interview 2:2005).

The review process firstly involves the release of a discussion document for public submissions, which details the regional council's approach to pest management. In the example of Auckland Regional Council, the discussion document outlines the Council's pest management achievements during the previous strategy, and advances proposals regarding the future strategy.

The document goes out to other biosecurity agencies with pest control interests, such as Biosecurity New Zealand and DoC, as well as 'the public.' I asked John Mather, the Environment BOP Regional Council Plant Biosecurity Manager, who of 'the public' received the discussion document at the last review:

> I'm not sure. 500 discussion documents went out, to other government departments, research, forestry, people in garden clubs, nurseries. You want to make sure you consult in a wide range of community, so you don't get people come along afterwards and say "We totally disagree!" Oh, also Iwi representatives (interview 2005).

The release of the discussion document may be supported by structured public consultation, involving public workshops. Submissions are then received, which may challenge the inclusion or omission of particular species, or their placement in particular hierarchical control categories. In the last Environment BOP review process, a DoC representative made approximately 40 nominations for the inclusion of plants they wanted more proactive control over. This compares with no submissions received from public gardening groups at this review (John Mather interview 2005). John Mather reasons that this is because the RPMS mostly contained 'old' plants that have already naturalised, and are therefore no longer the most popular garden plants. This dominance of expert groups and biosecurity agencies reveals that the review process is as much a power struggle between the different interests of other governing bodies, as it is a forum for 'public' input.

All the submissions received are collated, and a *'Submissions Received'* document is produced (Environment BOP 2002b). Next, the proposed RPMS is developed and formally notified by the regional council under the Biosecurity Act (1993). After a final schedule of public hearings and submissions, the regional council deliberate, and decisions are finalised

and notified. Many public nominations received during the review process do not make it onto RPMSs; Jack Craw referred to the first Whangarei Regional Council RPMS review, which rejected 30 animals nominated by the public. This included one nomination for the native and (usually) much-loved symbolic Pukeko. This process broadly aligns the public with Bell's (2005) 'liberal environmental citizen,' with procedural rights to participate in decision-making about the environment. However, the review process is also undertaken to reduce contestation and gain legitimacy for the RPMS, and so can be seen as a governmental mechanism to achieve control.

Through this process the control categories assigned to pest plants are further destabilised. Movement between categories becomes possible, not just through scientific understandings of the stages of plant invasion, or internal policy judgements of related costs, but by exposing the weighing of these considerations to public debate. The proximity and required responsiveness of regional councils to their voter base is used to explain why gorse, for example, is still on most RPMS lists: 'because of the political situation in the countryside there is still pressure to control widespread weeds' (Peter Williams, interview 2005). This is despite the 'common sense' of those working in the plant biosecurity establishment. Phil Dawson, a weed technical officer working for DoC, exemplifies this opinion, which was reiterated across my institutional interviews:

> It's not a common sense action. It's a plant they [landowners] can kill, do it themselves and be responsible for it themselves. So why should the rest of the region subsidise it?[1] Shouldn't it be spent on things which are not yet a problem? (interview 2:2005).

This suggests that the control of gorse and other widespread plants is seen as a private citizen duty by some within the biosecurity establishment. This conflict over citizen and state responsibilities is related to questions of visibility, spatiality, and temporality. For gorse, its widespread distribution has led to its low level control designation through the rationalities of expert knowledges. However, even this allocation of resources is questioned by institutional actors. This widespread distribution also leads to its greater public visibility. It elicits the attention of the public more than the recently escaped, low prevalence, high control pest

[1] The costs referred to here in the case of gorse are not incurred through direct control work, but through the costs of monitoring, surveillance, the provision of information and advice, and the regulatory costs of enforcing the Strategy rules (Auckland Regional Council 2002a).

plant. It seems the more obvious candidate for attention in the public eye, yet it is ostensibly ignored by regional councils. This has ramifications for public perceptions of the dedication and effectiveness of the regional council's approach to plant pests overall (Mike Harre, interview 2005). Woolly nightshade is another example of a pest plant that would 'fail' its CBA in Auckland, yet is still controlled due to public pressure. Auckland Regional Council has estimated the costs of *not* controlling woolly nightshade at $24 million, while controlling it is estimated to cost $34 million. The compromise reached, controlling it only in response to received complaints, is costed at only $1 million over 20 years (Mike Harre, interview 2005). Conversely, it can be difficult to persuade the public that plants not visibly acting as pests should be controlled or banned from sale. This can cause a disjuncture between 'when things become a problem in the eyes of the public or the eyes of the scientific establishment' (Ian Popay, weed ecologist for DoC, interview 2:2005). It would be a mistake, however, to trace this conflict too rigidly. As Carolyn Lewis highlights, the CBA rationality can dictate low levels of control responses that are also difficult for biosecurity personnel to understand:

> Everyone has to be aware of our limited resources and what we want to achieve. But if you've spent 10 years of your life battling this particular species and then someone comes along and says we can't tackle that species anymore because it's not giving value for money, we're just going to let it go and ignore it, then you just feel like you've wasted 10 years of your life (Carolyn Lewis interview 2:2005).

One response has been the creation of a category within the RPMS hierarchy called the 'Community Initiative Pest Plant' (ARC 2002a). This allows the inclusion of plants on the RPMS that community care groups wish to take responsibility for controlling in their local area. Following the agreement of 75% of occupants of the area, a pest plant can be assigned the equivalent status of Total Control Pest Plants. This begins to challenge the assumption that biosecurity is an expert practice imposed in a top-down manner on publics with differing values. The inclusion of other values in this way does not represent an attempt to produce a singular decision in an effort to reduce uncertainty (Hinchliffe 2001), but instead allows for the possibilities of these values materialising in different ways in different places.

The geography of knowledge produced by the RPMS review process leads to the inclusion and exclusion of certain voices from the policy debate, such as an emphasis on the opinions of expert groups over individual members of the public. The eventual hegemony of the RPMS process is that regional councils have the final say. There is no requirement for them

to adhere to submissions, but they must respond and justify their response to each submission. The review process could be seen as a process of making the public 'allies' through the rhetoric of public involvement in decision-making. It is also significant that it has been made easier for publics to enact greater control than ask for a reduction in control. The process has, however, had a real effect on the categorisation of pest plants. Gorse, for example, has a higher placing in some RPMS control hierarchies, and is controlled in pockets of community-led removal programmes. The stipulation for public consultation has not necessarily produced 'better policy decisions' (Hinchliffe 2001), but it has made changes to the authoritative voice. As Hinchliffe (2001) argues, it is closure, not exclusion that is undemocratic, and the stipulation of the regular review process is one way that this closure is prevented. This also begins to draw more active citizen-like formations into governmentality frameworks.

Regional Cross-Border Weed Issues

I have considered the regionality of biosecurity governance in New Zealand through the regional council format, and argued that this spatiality is ecologically relevant to the manifestation of pest plant issues. In addition, within each regional council area control responses to pest plants are differentiated through the RPMS hierarchy, producing even greater spatial heterogeneity and sensitivity. However, this regional governance format produces difficulties for political aspects of pest plant issues that take a national manifestation. Regional variations in the RPMS hierarchy can result in plants being banned from sale in one region, but not in neighbouring regions. For national chains of nurseries, plants sent between branches could be inadvertently sold in regions where they are banned (Carolyn Lewis interview 1:2005).

Under the Biosecurity Act (1993), regions have a responsibility to look across their boundaries when planning their plant biosecurity strategies. This does not frequently happen in practice, as Carolyn Lewis explains:

> We have a situation in Waikato where we are still controlling Old Man's Beard and woolly nightshade, but Auckland's virtually given up on it. So you see it marching down the motorways when we're doing what we can here to try and control it (interview 1:2005).

The difficulties that can flow from utilising a regional governance approach in tackling pest plant control have contributed to the development of a complementary national governance instrument. In the following section, I review the historical development, scope and implementation issues associated with the National Pest Plant Accord (the Accord). This discussion contributes in a number of ways to an evolving analysis of internal plant biosecurity governance in New Zealand. Firstly, it reveals a further layer of complexity in the governance and categorisation process, the geography of this process, and its association to the spatio-temporality of biological invasions. This has significance for a critique of a Foucauldian analysis of expert categorisation processes, when removed from a consideration of the geography of their governing context. Secondly, shifts between voluntary and mandatory approaches in the historical manifestation of the National Pest Plant Accord (the Accord), bear insights for discussions of governmentality, and particularly an understanding of 'moral coercion' within the normalisation process. Thirdly, the Accord is seen to produce 'a different type of pest' (Jack Craw interview 1:2005) from those on RPMS. This political categorisation therefore discursively influences the construction of the objects of control.

4.4 THE NATIONAL PEST PLANT ACCORD

The National Pest Plant Accord (referred to as 'the Accord') is a list of pest plant species that are banned from the nursery trade. This includes their propagation, distribution, promotion and sale within the whole of New Zealand. While the National Pest Plant Accord (the Accord) is focused on nurseries and garden centres, it encompasses other relevant retail outlets such as pet shops and aquariums. In the latest review process, it was recommended that 'casual' markets such as car boot and church sales are included (National Pest Plant Accord 2004).

The National Pest Plant Accord (the Accord) is available through a thick ring-bound flick-book, and on the Biosecurity New Zealand and the Weedbuster website. The page of the 2005 Accord for the pest plant Japanese honeysuckle (*Lonicera japonica*) is displayed below.

Figure 4.3: Picture of the Pest Plant *Lonicera japonica* within the National Pest Plant Accord 2005 (National Pest Plant Accord Steering Group 2005d:72).

Lonicera japonica · Japanese honeysuckle

Vine

DESCRIPTION · This plant is a vigorous evergreen (semi-evergreen in cold districts) climber. Young stems are purple and hairy. As the plant ages the stems become woody. Stems are long and tough and twine clockwise. Leaves (3-12 x 2-6 cm) sit in opposite pairs on the stems. Upper surfaces of leaves are shiny dark-green (occasionally yellowish) and lighter-green on the underside. Pairs of two-lipped sweetly scented tubular white flowers (2-5 cm long) that age to yellow are produced from September to May. Flowers are followed by egg-shaped glossy black berries (5-7 mm in diameter).

IMPACT · The vine climbs over and smothers most plants from the ground to the medium canopy. It can cause canopy collapse and subsequent invasion of grasses or ground vines. It also provides support for faster-growing weedy vines (for example, morning glory and mothplant). Most spread is by the movement of stem fragments, such as the dumping of garden rubbish, rather than by seed.

WHAT TO DO · Contact your regional council to determine the status of this species and responsibility for control and/or advice on control.

Lonicera japonica · Japanese honeysuckle

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This material presence is significant, as Phil Dawson, a DoC weed technician argues:

> It would seem that with initiatives of this type, once something finally is in print the idea finally starts to cement in people's minds. There's something tangible to see and the education begins (interview 2:2005).

While the contemporary manifestation of the Accord is as a regulatory instrument, this reference to its educative function signals the multiple ways in which it is utilised and imagined. The aims of the Accord are two-fold. Firstly, a key vector for the spread of pest plants is cut out. The Accord allows enforced control of 'new infestations' – sales in nurseries – by authorised persons. Jack Craw (interview 1:2005) describes the Accord as run on compliance: 'if they don't comply, the plants are confiscated, if they re-offend, they go to court. There has been no court action to date.' Auckland Regional Council has 12 field staff that spend 25-30% of their time undertaking shop inspections (Jack Craw interview 1:2005).

Secondly, the Accord operates as an educational message, a clear signal to the gardening public that these plants are 'naughty' (Jack Craw, interview 1:2005). Whilst the Accord does not prohibit the listed plants being grown in the domestic garden (referring only to mechanisms of movement and exchange), it is intended that the filter down effects of the plant being declared 'environmentally damaging' will reduce the plant's desirability in the eyes of the public (Mike Harre, ARC Plant Biosecurity Community Liaison Officer, interview 2005). As Carolyn Lewis explained, the Accord operates as a deterrent for the domestic gardener, rather than a legislative tool that would be used in practice:

> Technically if some-one was selling it from their garage you could enforce it. But if it was a little old lady taking canes to all her mates, you couldn't, even though technically it's illegal. Public relations-wise it would be a disaster so you wouldn't even touch it...What you would do is explain to people that by selling it and spreading it on it's actually just as bad as doing it with a cannabis plant. And that tends to get the attention of the little old ladies (interview 1:2005).

This distinction between the legislative power of the Accord and its use in practice reveals the diffuse impact of the public on the practice of biosecurity governance through social norms of the appropriate use of power. By comparing Accord plants to other illegal plants such as cannabis that is strongly connected to concerns over health and morality, the role of legislation within the construction of social norms is emphasised. This suggests that social norms and legislative practices are co-constitutive. This is discussed in greater detail in chapter five. In the following section, I review the history of the Accord, which highlights the significance of moral coercion within the practice of government.

From Regional to National and Voluntary to Mandatory: the History of the Accord

The build-up to the National Pest Plant Accord (the Accord) is a history of developing approaches from *voluntary to mandatory*. Although always a national strategy, in earlier conceptions there was an element of differentiation according to climatic zones, and a regional legislative format through which plants were banned (Suzanne Main interview 2005). This is also therefore a history of development towards a fully *national-level strategy*. This history is bound up with the switch in attention from existing widespread pest plant infestations, to earlier stages in the naturalisation process, particularly the 'conveyor belt' that

operates between the nursery and the garden (Peter Williams, Landcare weed scientist, interview 2005).

The impetus behind the Accord is attributed to the experiential knowledge of Noxious Plant Officers working in the early 1990s, and particularly Jack Craw, then a Noxious Plant Officer for Northland Regional Council. These officers highlighted that the nursery industry was promoting and selling the same plants they were removing from the landscape. At the first voicing of the need for a 'nationally banned from sale' list, the nursery industry, represented by the National Garden Industry Association (NGIA), demanded that a voluntary approach be tried instead (Jack Craw, interview 1:2005).

The voluntary 'Forest Friendly Award' was devised, and subsequently launched in September 1993. The Forest Friendly Award was differentiated and divided along three climatic zones, the northern, central and southern regions of New Zealand. These zones also equated to DoC conservancies, watershed boundaries, and grouped regional council boundaries. The Award list was sent to all garden plant merchants. Retailers indicated a desire to sign-up, and were inspected by trained volunteers from a high profile national conservation NGO, 'Forest and Bird' (Phil Dawson interview 2:2005). This voluntary participation in the governance process within the public sphere exemplifies Agrawal's (2005a) discussions of regulatory participation. It also aligns with Bell's (2005) understandings of 'good' environmental citizens. Those retailers that complied received a plaque promoting their 'Forest Friendly' credentials, with publicity organised through local newspapers and other local media. The Award operated through the supposition that gardeners would act as good ecological citizens through consumption choices, by giving their custom to 'Forest Friendly' garden centres (Bell 2005).

Approximately a third of plant merchants signed-up. Compliance was particularly low with large nursery and retail chains. Jack Craw (interview 1:2005) attributes this to what became a mantra for the issue: 'all in or none in.' As Bell (2003:14) argues, it can sometimes be too demanding to expect people, including businesses, to change their behaviour if others are not. The beneficial publicity for a garden centres' 'Forest Friendly' credentials was not seen to balance the negative effects of losing customers to others that provided popular 'black-listed' plants, such as lantana *(Viburnum lantana),* an attractive, but invasive, herbaceous plant. Phil Dawson attributes the stalling of the Award to the difficulties of engendering public support

and understanding, at a time when the idea of environmentally damaging garden plants was new to the public. They struggled to see, as he puts it, 'the link from ornamental plant to monumental problem' (Phil Dawson, interview 2:2005). After a failed series of attempts to convince the big players to join the scheme, the decision was made to pursue legislative means.

What does this failure of a voluntary approach tell us about concepts of governmentality and citizenship? It suggests that the power of 'moral coercion' is crucially linked to the prevailing climate of social attitudes. It also highlights the problem of over-relying on the public to behave as good ecological citizens, if this is divorced from government responsibilities of developing effective legislation. Social attitudes within which moral coercion operates may therefore be co-constituted by related legislation and regulatory processes. The significance of a legislative underpinning of social values, and particularly the necessity of regulation in contentious arenas to drive the normalisation' process is discussed in chapter five.

The next manifestation, the 'National Surveillance List', received its legal status through the mutual agreement of regional councils to include the plants in their respective Regional Pest Management Strategies (RPMS), which were being developed for the first time (National Pest Plant Accord 2001). Concerns were raised that some of the proposed plants might not become pests in every region, and so fail the RPMS review process. While all of the 13 RPMS strategies produced at this time adopted the National Surveillance List, Otago Regional Council removed some plants from their RPMS, arguing that the region's ground frosts would prevent these pest plants naturalising (Suzanne Main interview 2005). The National Surveillance List of approximately 100 species came into force in 1997. This included a phasing in period to allow nursery stock to be depleted and replaced with alternatives, to avoid financially penalising nurseries (Phil Dawson interview 2:2005; Jack Craw interview 1:2005). The lack of objections to the list was attributed to this and other management aspects of the implementation process. Despite this success, the legislative underpinning of the list within RPMSs presented difficulties. The continuous 5-year cycle of RPMS reviews made coordination over a single national list difficult, as each regional council operated to different time periods. The nursery industry also called for greater national consistency for both the list and its implementation, to avoid confusion for large retailers with multiple branches nationally, or for plant merchants sending plants out to customers in different regions.

A National Pest Plant Strategy was proposed. However, there were disagreements about who should take the initiative forward. No biosecurity agency wanted responsibility if public sentiment went against the list (Phil Dawson interview 2:2005). After rejecting an appeal from the regional councils to take on the Strategy, DoC suggested that the plants could be made Unwanted Organisms under the Biosecurity Act (1993) (see chapter one). Negotiations between the regional councils and MAF were managed through the Biosecurity Managers Council. What resulted is described by Jack Craw as 'the deal from Heaven' (interview 1:2005). While MAF was willing to extend legislative powers to the list by declaring the plants Unwanted Organisms, they were unwilling to be involved in surveillance and enforcement. This role was absorbed by the existing expertise of the regional councils. The National Pest Plant Accord (the Accord) effectively became a subset of the Unwanted Organisms Register of relevance to plant species in commercial trade (National Pest Plant Accord Steering Group 2005b). This arrangement means that even though the Accord is a national list that is produced, reviewed and legislated at the national scale, it is undertaken and enacted at the regional scale. These complex arrangements concord with an understanding of the proliferation of apparatus and means to govern within a governmentality approach. However, the Accord's geography of governance is materially associated and thus co-constituted by the complex geography of pest plant invasions. This in turn is connected to micro-climatic variations across New Zealand. This argument is explicated further through criticisms of the list discussed below.

Producing a Different Type of Pest

The first National Pest Plant Accord (the Accord) came into effect on 1 October 2001. The Accord produces pest plants that can be distinguished in three ways from RPMS pest plants. Firstly, the Biosecurity Act (1993) allows BNZ as national coordinator to immediately declare an organism a pest, without the need to consult as is required within RPMS (Suzanne Main interview 2005). Accord pest plants are therefore more *removed from public debate.* This encapsulates the key advantage of the Accord for regional councils. They can avoid the expensive and time-consuming process of analysing and consulting about individual species against the criteria in section 72 and 77 of the Biosecurity Act (1993), as there is no requirement that the plants be included on a RPMS (National Pest Plant Accord 2001:2). Regional councils also avoid responsibility for the designation of popular or commercially

valuable plants that may generate complaints from ratepayers. As Accord species do not require a CBA, this arrangement also avoids the difficulties of assigning economic value to the environmental damage caused by ecological weeds, as discussed above. Secondly, as Unwanted Organisms, Accord plants are banned nationwide, rather than only in certain regions depending on their RPMS status (National Pest Plant Accord 2001).[2] These pest plants are therefore *nationally significant.* The Accord is seen to be more attractive to the nursery industry, as it spatialises the 'all in' mantra, bringing national consistency in enforcement (Jack Craw interview 1:2005). Thirdly, by making pest plants Unwanted Organisms their regulatory status becomes definitive. Regional councils have additional powers under section 100 of the Biosecurity Act (1993) to control Unwanted Organisms (Suzanne Main interview 2005). Accord plants are therefore *authoritative.* In comparison, RPMS rely for their legislative authority on a section of the Biosecurity Act (1993) that is untested legislation.

Jack Craw describes the classificatory distinction between pest plants in New Zealand which is produced through the existence of two regulatory mechanisms:

> There are two types of pests. A pest in a pest management strategy, but with this you have to notify, consult, it can take a year and half, it's expensive, long-winded, you need a CBA, etc. But MAF can instantly declare an Unwanted Organism, with all the status of a pest, they can do whatever they like with it, but without the hassle... MAF had a strategy that took only as long as it took to declare it (interview 1:2005).

When Jack Craw refers to different 'types' of pests, this classification is an *explicitly* political classification as much as it is a 'natural' biological one. The political work involved in constructing a pest is not hidden. A particular spatiality of regulation is suggested through the removal of this classification process from public debate, with consequences for a citizenship perspective. This also suggests that while the geography of plant invasions has very specific regional manifestations, this does not naturally imply a comparable political geography of response. A national response has political efficacy. This is also crucially tied to a political temporality, the quicker response, which is required as Accord plants are newly emerging concerns. These temporal and spatial aspects of the Accord, and the influence of the public on this spatio-temporality, can be considered in more detail through a discussion of debates arising through the Accord review process.

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[2] The difference between the Accord and the Unwanted Organism List is that the latter is much longer. It includes plants that are banned from entry, which have not yet entered New Zealand, and plants classified as Unwanted Organisms that are geographically limited and being dealt with by individual regional councils.

The Accord Review Process

The Accord has a stipulated review procedure, but in comparison to the RPMS, this is explicitly an expert affair. This suggests that governance concerns over the Accord are not so much about obtaining public legitimacy, but about producing a robust response to invasive plant threats. This was apparent within institutional discourses that arose through my in-depth interviews. Whilst RPMSs were discussed in concert with concerns about engagement with the public, the Accord was measured in terms of its effectiveness as a tool to respond to the particular nature of invasive plants.

The Accord requires temporal responsiveness to changing horticultural fashions and newly arising threats. The Accord is reviewed every five years, which is seen to maintain relevance to these shifting horticultural trends (Suzanne Main interview 2005). The review considers both new inclusions for and removals from the list. This process began in 2004, and was in progress during my research in New Zealand. The review process is systematic and structured. Two working groups are involved. Firstly, the **'Technical Advisory Group'** (TAG) is responsible for providing 'objective, technically sound' scientific expertise in re-drafting the list (National Pest Plant Accord Technical Advisory Group 2005a). The 'Technical Advisory Group' (TAG) members, comprising botanists and taxonomists, are selected from nominations from regional councils, DoC, and Crown Research Institutes (National Pest Plant Accord Technical Advisory Group 2005a). TAG generates and assesses plant candidates, and accepts submissions from the different biosecurity agencies and a 'consultative list' of invited expertise. Secondly, the **'Steering Group'** is made up of representatives of Accord signatories, which include biosecurity agencies (Regional Councils, MAF, Doc), but also a member of the National Garden Industry Association (NGIA). The Steering Group is responsible for decisions on political, social and economic matters including final inclusions on the list, the implementation period, cost-sharing, and guidance on successful national execution (National Pest Plant Accord Steering Group 2005b). For both of these groups, members' expertise is clearly validated by their associations to recognised institutions. This expertise is, however, rendered 'universal and impartial' by the requirement that they act 'independently' of these institutions. This expertise has a spatialised association to the national scale.

Criteria for Inclusion

The primary criteria for inclusion of a plant on the list are:

> a) The pest plant is an environmental, agricultural or human health risk; and
> b) The pest plant has potential for sale, propagation or distribution; and
> c) The inclusion of the pest plant in the accord will aid in preventing the spread or introduction of that pest plant (NPPA 2001:3-2).

These criteria are not limited to ecological factors, but encompass risks to agriculture and human health. In comparison to the definition of a pest in RPMS, the Accord criteria no longer include references to Maori values. Criteria 'b' is the requirement that the plant is either in trade, or would be in trade if it were not to be included. Criteria 'c' contains an implicit reference to the place of the plant on the Infestation Curve Model. If it has reached its full environmental extent, there is no perceived political benefit in banning it. However, the position of the Accord as both a *regulatory instrument* and a *public education mechanism* has resulted in debate within the Accord review process over the rigidity of criteria b and c. The following discussion traces the detailed processes and debates that occurred through attempts to enact and understand these criteria.

Paul Champion, an aquatic weed ecologist, and Peter Williams, a terrestrial weed ecologist, developed the risk assessment process to establish the 'environmental, agricultural or human health risk' ('criteria a' above) of nominated pest plants (National Pest Plant Accord Steering Group 2004). This was adapted from an Australian model designed to assess applications to import plants (Ian Popay, DoC weed ecologist, interview 2:2005). The risk assessment process requires 'scientific evidence' that the plant is a problem in New Zealand or in countries with a similar climate, introducing an international dimension to the understanding of this risk. The first meeting of TAG for this review cycle in August 2005 discussed which of the nominated plant species are a problem, have naturalised, established, or are controlled in New Zealand (Ian Popay interview 2:2005). From these discussions, each member was assigned a number of plant nominations to put through the risk assessment process (National Pest Plant Accord Technical Advisory Group 2005a). Despite the austerity of scientific rigour this process produces, in practice other considerations have also affected the negotiated place of a plant on the Accord list.

Once a list of relevant pest plants was generated through this process, the Steering Group became the site of negotiations over the final inclusions on the Accord. As with the RPMS, the initial criteria produce large numbers of pest plant 'candidates,' and so further processes of selection are undertaken to generate the final list of Accord plants. The detailed criteria are not explicit as in the process of assigning pest plants to the RPMS control hierarchy. Instead, it emerges in the debates and discussions which occurred during the review process, accessed through the minutes of the meetings, and through the reflections of participants, accessed through in-depth interviewing.

A central debate related to the applicability of Accord to different stages of pest plant incursion into New Zealand. The Accord is not intended to be a mechanism for preventing new species entering New Zealand, which is the role of the Environmental Risk Management Authority (ERMA) process, described in chapter one. In practice, however, the specificity of individual cases is considered on their own merit. Jack Craw (interview 1:2005), for example, referred to a high-threat aquarium plant that is not currently in the country, but is highly likely to be imported if it were not on the list due to its popularity. Some Steering Group members argued that this preventative aspect of the list should take greater precedence over the inclusion of the well-known, established pest plants (Melanie Newfield, BNZ weed scientist, interview 2005). Whether or not widespread pest plants are sold and disseminated, it is argued, their presence in the environment is so extensive that they have formed self-supporting populations. However, the 'illegal status' the Accord assigns these widespread plants is seen by others on the Steering Group as essential in what are termed 'ongoing management issues,' including maintaining political integrity, promoting public understanding, and obtaining funding for control or research programmes (National Pest Plant Accord Steering Group 2005b; Jack Craw interview 2:2005). Moving plants on and off the Accord list reduces its public credibility and undermines public confidence in institutional expertise. It also becomes difficult for the public to keep up with changing institutional opinion over the legality of plants (Carolyn Lewis, interview 1:2005). Therefore, while the Accord can be seen as a political mechanism that has attempted to remove the influence of public opinion from one arena of internal pest management by side-stepping the need for public consultation, it is still influenced by a consideration of public values.

The Steering Group was also responsible for managing the timing of announcements regarding the Accord list, described as an exercise in 'stage-management' by Jack Craw.

While compliance monitoring is focused on the merchandisers, it is the growers who need to remove the plant from their catalogues. The timing of the public announcements for the list therefore needs to be carefully handled. If plants were 'de-popularised' too quickly, growers and merchandisers could have valuable stock left on their hands. The financial penalties this would induce could adversely affect relationships between the nursery industry and the biosecurity establishment. For this reason, all negotiations with the nursery industry were conducted in confidence. This, however, engendered accusations of a lack of transparency and distrust in procedures for choosing plants from those not involved in the process (Melanie Newfield, BNZ weed scientist, interview 2005).

The National Pest Plant Accord 2006 was adopted and launched in October. In the following, I discuss criticisms of the Accord, and responses to these criticisms, from within both institutional and public discourses. These revolve around the complex national and regional territorialisations performed by the Accord.

Criticisms of the Accord: National/Regional Tensions and Territorialisations

In his account of Germanic scientific forestry, Scott (1998) describes regional level power struggles to resist national standardisation. This is reflected in the debate over the Accord as an example of national-level standardisation, measurement and uniformity, in tension with the regional or local specificity of climate and plant invasion. Criticism of the Accord arises from understandings of regional variation in New Zealand's climate and ecosystems. Opponents of the Accord argue that the plants listed do not have the potential to be weedy in the whole of New Zealand:

> If you made it an Unwanted Organism, it was unwanted everywhere, and that was hard for people to understand. Didn't matter where you sold it. That's a high hurdle for people to get over (Ian Popay interview 2:2005).

I encountered this argument from both gardeners and those in the nursery industry. It is not, however, limited to voices outside the biosecurity regime, as evident from the removal by Otago Regional Council of a number of National Surveillance Plants from the recommended list in their RPMS. Carolyn Lewis explained this institutional perspective:

> So someone down south would look at Auckland's list and say "We would certainly not support *that* on a national list, it's not a problem down here" (interview 1:2005).

When I asked about this criticism in interviews with weed ecologists and national level institutional players, there were two main responses. Firstly, the specificity of micro-climates and climate unpredictability is utilised as a justification for this national blanket policy. The following quotes exemplify this position:

> New Zealand is a huge microclimate, so if it grows in Northland, it'll almost certainly grow in Nelson and Banks Peninsular. People use climate models very often, but things grow outside where those climate models predict in New Zealand (Ian Popay interview 2:2005).

> Canterbury is usually cool in winter, but on Banks peninsular it's coastal, so it gets less frosts, it can have almost tropical things growing. Nelson in Marlborough is the same... You have alpine plants growing down in Southland on the coast, and salt loving plants growing in Central Otago... So to ask science to predict where things will grow in New Zealand is almost asking too much of anyone (Phil Dawson interview 2:2005).

The regional variability of sensitivity to pest plants that climate variation produces therefore becomes a justification for a national response. Despite this, it is acknowledged that there are plants that will never be weedy in certain regions. This, however, is dealt with through the second key justification for a national approach, which refers to issues of implementation, national consistency and nationally derived benefits from regional environments. According to Jack Craw, for inclusion in the Accord it must be 'in the national interest' to remove a pest plant from sale:

> A plant doesn't have to be weedy in the whole of New Zealand for it to be on the list, it's just saying that it's a national issue. It might be affecting all alpine areas. Now we don't have alpine areas in our section, but it is in our benefit to adhere to national accords which protect alpine areas (Jack Craw interview 1:2005).

By removing from sale a pest plant with the capability of affecting nationally precious ecosystems, its transportation between neighbouring regions is prevented. In the following section, I consider this national political geography amongst other issues through a comparative discussion of RPMS and the Accord.

The Accord and RPMS: A Dual Categorisation Regulatory Approach

The National Pest Plant Accord (the Accord) and Regional Pest Management Strategies (RPMS) work together to gain the full benefits of the 'power and flexibility' of the Biosecurity Act (1993), and to allow a relevant governance response to the distributed nature of biological invasion. At a simple level, they are both lists of plant species categorised as a threat to New Zealand in particular ways. However, a number of crucial and significant differences have emerged. The detailed review process for RPMSs considers scientific and economic rationalities, as well as public perspectives. This produces a differentiated control response to pest plants based on the spatio-temporality of plant invasion. This is also differentiated and enacted at the regional level. However, this creates difficulties for effective biosecurity responses in certain circumstances. The combined workings of the Accord and RPMS allow a play between regional and national scales of governance, which is associated in particular ways with the geographies of natural entities, the pattern of biological invasion, and the bio-physical context of New Zealand. The workings of these two legislative approaches produce a balance between national legislative powers, and regional level expertise and accountability. This reveals instances where national standardisation is seen as the more desirable approach, and those where regionality of governance is appropriate. Ironically, as discussed above, these moments of national standardisation can be justified by different regional variations. While Agrawal (2005a) discussed the political drivers that lead to a geography of governance within his environmentality thesis, these examples reveal this to be additionally connected to the biophysical geography of the governing context itself.

RPMSs and the Accord are both affected by debates over the temporality of biosecurity governance intervention, understood through the Infestation Curve Model, and the 'conveyor belt' of plants from the nursery to the garden. This extends and adds detail to an understanding of biosecurity as enacted across the five sites of biosecurity intervention, detailed in chapter one. Despite being referred to as the 'naturalisation' process, this discussion has revealed that this is not simply seen as a 'natural' process, but is intimately tied up with human activities of trade and exchange. This can be seen in the reference to pest plants on sale in nurseries as 'new infestations.' As the final stage within this process is fully naturalised plants filling all their available niches and so impacting on national landscapes, this could be provocatively described as a 'nationalisation' process.

The two regulatory approaches reveal different levels of responsiveness to public opinion, and different ways this is formalised through their production and review. The RPMS requires public consultation, and is additionally affected by the impact of public opinion due to the regional council's ratepayer funding base. The Accord process is in contrast removed from public debate, which is seen to produce a more authoritative response to pest plants at very early stages of 'naturalisation.' As the Accord is primarily focused on pest plants in the gardening trade, these are desirable garden plants, which would perhaps generate more public contestation. This removal from public debate does not, however, remove the influence of the public from the Accord's development. This discussion has also therefore revealed that the association of governance practices to the social context of public opinions and attitudes is crucial. While legislation is seen as a social driver or norm setter, then, voluntary policy initiatives can fail by being out of sync with public opinion. A surprise, perhaps, is the way this public influence has been perceived as driving governance practices from the more voluntary to the mandatory.

The discussion of these governance approaches has highlighted the significance of particular scientific rationalities and expert opinion in both developing these practices, and enacting them. In the following, I detail the structure of weed-related scientific research in New Zealand, and consider the specificities of undertaking this research in a relational context with both particular governing needs, and particular biophysical agencies.

4.5 The Place of Science in Pest Management

The ways 'native' and 'alien' plants are 'rendered thinkable' underpins ecological biosecurity policies, and is a key way plant science and ecology differentiate and collectivise nature. These entities are brought into being and constituted as governable by ecological expert knowledges themselves, which define and individuate their 'characteristics, laws and processes' (Rose and Miller 1992:182). Through these expert knowledges, 'native' plants and ecosystems, and 'alien' and 'invasive' plants become 'calculable entities with a solidity and density that appears all their own' (Rose and Miller 1992:186). These entities can then become governed and managed, evaluated and programmed for particular ends. However, as the preceding discussion has revealed, this calculation process is never stable or complete.

The categorical distinction and associated value hierarchy between native and introduced plants is ingrained within New Zealand's scientific establishment, as Peter Williams discussed:

> Professional botanists and students, when we were out doing our inventories and if we came across an introduced plant we would say "what's the name of that?" "Oh, *Scungous introductous.*" That value system was ingrained very early on (Peter Williams, interview 2005).

This initially contributed to a lack of scientific attention to the naturalisation of introduced plants. Peter Williams, who began studying weeds himself in the 1970s, witnessed the transformation of scientific attention to their environmental impact. This has shifted from the stage at which there was almost a complete absence of any studies of introduced species in the wild, to the contemporary situation in which 'lots of young people can make a career out of it' (Peter Williams, interview 2005). The numbers of scientists working in the weed science area is growing, with both Massey and Lincoln University now employing a lecturer in weed science. There are, however, still limited numbers of people coming through, with the Accord TAG group made up for the most part with 'old duffers like me' (Ian Popay, DoC weed ecologist, interview 2:2005).

The practice of weed science in New Zealand is closely aligned to the needs of plant biosecurity governance. All of my interviewees questioned agreed that policy predated scientific research sequentially in New Zealand:

> Certainly... research is driven by policy. It goes back to 1836... They didn't need a scientist to say what to do, they knew that if they had thistles they couldn't sell grass. So in that sense the legislation and policy has pre-dated research into the impacts. And that has continued to apply throughout agriculture and biodiversity (Peter Williams, interview 2005).

This reveals that in as much as 'government depends on these sciences for its language so the... sciences thrive on the problems of government' (Rose and Miller 1992:182-3). However, the need for scientific research to underpin biosecurity governance has grown, apparent, for example, in the requirements of the World Trade Organisation's Sanitary and Phyto-Sanitary Agreement, discussed in chapter one. In the following discussion I consider how these links between science and policy are enacted, and how the sciences of plant biosecurity are influenced in turn by the agencies of biological entities. This discussion highlights the difficulties of undertaking weed research in a way that is useful for political governance, and the strategies to overcome these difficulties.

The Difficulties of Weed Research: Experiential Scientific Expertise

Ian Popay highlighted the two-fold, interconnecting difficulties of undertaking research into the impact of weeds in New Zealand. Firstly, the problem of isolating the impacts of weeds from other potential perturbations, and secondly, the huge expenses this would incur (interview 1, 2005). Peter Williams also discussed these problems:

> In terms of their impacts, it's hard to know, it's expensive, and it's not obvious what kinds of impacts they're having. The problem is knowing cause and effect: you can introduce a rat and witness the result... [H]ow can you separate the effects of the weeds themselves, from the effect of modifying the environment which created the conditions for their establishment in the first place? (interview 2005).

Rather than preventing research from occurring, these conditions have led to a particular approach to generating the knowledge required for biosecurity governance. This includes a reliance on the experiential expertise and understandings of weed scientists and 'on the ground' biosecurity practitioners:

> DoC has got the research which shows that weeds are the greatest threat to the threatened plant species...That data is derived from the opinions and observations of DoC field staff being asked "What do you think is threatening your XYZ?" (Peter Williams, interview 2005).

These 'opinions and observations' are validated through the association of these experts and practitioners with 'centres of calculation' such as DoC and the Crown Research Institutes. This use of experiential expertise directly extends to the formation of specific policy instruments, such as the development of the National Pest Plant Accord. When discussing the Accord, Peter Williams again emphasised the costs that would be involved in undertaking weed research projects. He argues that the Accord is 'entirely hearsay, it's just the opinions of experts, no research goes into it. It would cost millions to investigate the potential impacts of those 200 on New Zealand biodiversity. Many millions' (interview 2005). This has contributed to a very limited number of research projects related to the impacts of weeds in New Zealand, which is seen to affect the knowledge base of plant biosecurity governance: 'There's a huge number of species which we haven't really looked at closely at all, we haven't had the time ...we're only just getting to know what's here, and where things are, and where they're being controlled' (Peter Williams interview 2005). This quote reveals that the knowledge required is both about weeds and their geographic location in New Zealand, but also about the geography of biosecurity control practices.

The difficulties and the experiential basis of weed research do not diminish the centrality of scientific expertise within plant biosecurity policy-making. Scientific understandings and the opinions of scientific experts have significant impacts on biosecurity policy frameworks and practices, providing the 'intellectual machinery' of biosecurity governance (Rose and Miller 1992:182). This is demonstrated through, for example, the influence of the Infestation Curve Model on the categorisation of pest plants in RPMSs, the development of risk assessments on the production of the National Pest Plant Accord, and through the influence of the 'core-periphery' model on the theory of actual weed control work.

In some significant instances scientific knowledge regarding pest plants has advanced through unpredictable means. Chapter one discussed the efforts made during the twentieth century to control large infestations of gorse in the New Zealand landscape. Areas of gorse that were continuously left, due to their marginality or the neglect of an absentee landowner, perhaps, have in some instances shown patterns of native forest regeneration. This has produced understandings of gorse as a 'nursery plant' for native bush. This is now being approached through a more traditional research trajectory. For example, during my research in New Zealand the DoC weed ecologist Ian Popay was undertaking research comparing the composition of native plants that have grown through gorse with compositions produced

through other sheltering plants (interview 1:2005). Informal, 'plant-centred' routes for knowledge production still contribute to scientific understandings. Walter Stahel, a Pest Plant Officer for the Environment Bay of Plenty Regional Council, told me he was 'keeping an eye on' an area of woolly nightshade the council could not afford to clear, for similar patterns of native bush regeneration (interview 2005).

4.6 CONCLUSIONS

In this chapter I have discussed the way the plant biosecurity regime organises its interface with plants through detailed categorisation practices. The Biosecurity Act (1993) stipulates the criteria for this process, which includes scientific and economic rationalities, and public consultation. The Act requires that the process is detailed and justified within RPMS. This suggests that these governance practices are as much about governing regional councils, changing 'blind habit into calculated freedom to choose' (Rose and Miller 1992:187), as they are about the governance of either publics or plants. Throughout this the significance of publics in a variety of ways has been raised.

In chapter two I discussed the ways in which the representation of objects of governance in the form of statistics is seen to support government by transforming complex phenomena into information. As Rose and Miller (1992:182) argue, 'Governing a sphere requires that it can be represented... in a form in which it can enter the sphere of conscious political calculation.' This representational requirement is affected by the difficulties of undertaking weed research. These difficulties have produced a reliance on experiential expert understandings, and this in turn has given plants agency in knowledge development.

The difficulties of weed research and related adaptive strategies, as well as the interplay between the Accord and RPMSs, results from governance issues directly arising from the specificities of interactions between plants, places and people. This demonstrates the indeterminate ways in which the impulse to control is caught up with the socio-materiality of entities it is seeking to control. In the following chapter, I move on to consider the greater complexity which occurs through efforts to *enact* these categorisations, through everyday strategies of communication and enforcement.

5

TRANSLATING THE REGIME: EVERYDAY PRACTICES OF COMMUNICATION AND ENFORCEMENT

> Government is intrinsically linked to the activities of expertise, whose role is not one of weaving an all-pervasive web of 'social control', but one of enacting assorted attempts at the calculated administration of diverse aspects of conduct through countless, often competing, local tactics of education, persuasion, inducement, management, incitement, motivation and encouragement (Rose and Miller 1992:175).

5.1 INTRODUCTION

The previous chapter described the way policy frameworks, scientific knowledges, public opinions and biophysical agency lead to the legislative categorisation of plants. Two overlapping policy frameworks, the National Pest Plant Accord (the Accord) and Regional Pest Management Strategies (RPMS) were considered. In this chapter I turn my attention to 'local tactics of education, persuasion, inducement, management, incitement, motivation and encouragement' as biosecurity personnel bring these legislative mechanisms into contact with gardening publics. This emphasises the instability and uncertainty that accompanies these classificatory processes as they are made tangible and have material effects. The first part of this chapter considers the work practices of Pest Plant Officers (PPO) as they enact the RPMS and the Accord. This presents the Pest Plant Officer (PPO) as a crucial 'node' translating legislation and responding to the domestic gardener in flexible and reflexive ways. The second part of this chapter then considers the aims and methods behind public education for plant biosecurity. These two practices, regulatory enforcement and public communication, operate in conjunction to attempt to produce a biosecurity aware and compliant population, as the following quote describes:

> What you're trying to do with the newspapers is knock off a few people who are already willing to read about it. Then with your shows you're knocking off some people. Then with Weedbuster groups you're knocking off others, and it gets smaller and smaller, and more labour intensive as you go up. Finally at the top you've got a few people that you may have to serve a legal notice on (Carolyn Lewis, Pest Plant Officer for Waikato Regional Council and Weedbusters National Co-ordinator, interview 1:2005).

As Carolyn Lewis explained this, she drew a pyramid on the sheet of paper in front of her. The different levels of this 'population pyramid' form the subject of this chapter.

5.2 Pest Plant Officers and Everyday Governance Interactions

Pest Plant Officers (PPO) are on-the-ground enforcement officers, the public face of regional councils. They are the key point of interface between domestic gardeners and the biosecurity regime. Each PPO is tasked with enforcing the Regional Pest Management Strategy (RPMS) in their area of domain. To achieve this, their work revolves around identifying infestations of pest plants, liaising with landowners to organise control and removal of pest plants, and public education activities. PPOs are state actors who provide a link between the environ-political objectives of the biosecurity regime, and the minutiae of daily existence (Rose and Miller 1992). While they have a disciplining function, they also function as experts who provide direction, allowing the private domain of the garden to be brought under governance (Rose and Miller 1992). This blurs Rose and Miller's (1992) distinction between 'discipline' as a function of state actors and 'direction' as a function of non-state experts.

In the Environment BOP, the staff tasked to 'advise and enforce' the RPMS involve one coordinator and seven PPOs. The flexibility built into the Biosecurity Act (1993) allows regional councils to use their own systems for dividing PPO's workloads. This may be according to geographic regions or by sectors, for example nurseries and garden centres, or agricultural properties. In the Environment BOP Regional Council, one staff member devotes 90% of their time purely to visiting landowners, encouraging them to carry on with control programs (Environment BOP pest plant team, group interview 2005). In contrast, Walter Stahel, also a PPO for the Environment BOP Regional Council, spends his time visiting nurseries, garden centres and pet shops, ensuring that those plants banned from sale are not on the shelves, and also looking out for the next problem plant. PPOs also have a level of personal choice over which pest plants they focus on. Sara Brill, a PPO working for the Environment BOP Regional Council, told me 'although we have to advise and enforce the strategy, individual officers make decisions on how to achieve that' (Sara Brill, interview

1:2005). She did not think this was necessarily positive, and mentioned a colleague who chooses not to focus on wild ginger (*Hedychium gardnerianum*) as they thought it was not a 'visible' pest plant.

As Agrawal (2005a:91-2) argues, it is the regional level decision-makers who define the 'depth and nature' of regulation. The current emphasis within regional councils is on collaborative approaches to regulation. Designating areas of jurisdiction to each PPO enables them to foster 'working relationships' with the nurseries or properties that they visit. Building flexibility into their work focus allows PPOs to respond to the concerns of their 'clients.' For example, whilst Sara Brill defines her job as dictated by the legislative underpinning of the RPMS, she is willing to address the particular concerns of the gardener 'That's not to say that I won't give advice to Joe Bloggs with X in his garden, that's not on a list, but he's worried about' (Sara Brill, PPO for the Environment Bay of Plenty Regional Council, interview 1:2005). The opportunity to foster these relationships is seen as essential to successfully undertake the job, in what are often difficult circumstances. Carolyn Lewis, a PPO for Waikato Regional Council, described the reaction she sometimes elicits from homeowners: '"What are you doing in my garden, who are you?" so you have to walk carefully, make sure people understand the issues' (Carolyn Lewis interview 1:2005). Sara Brill also referred to the difficulties encountered by being seen as a regional council employee. Landowners occasionally assumed that the PPO were 'snooping around' properties, looking for things to charge them with. There is also the 'Plant Police' label to put up with. For these reasons, Wayne Cowan, the Biosecurity Manager for Wellington Regional Council, looks for certain characteristics when hiring for the job:

> You needed a particular type of person to do it, you need people skills.... you need to be a certain sort of person to say things in a certain sort of way to get people on board (Wayne Cowan, interview 2005).

The PPOs route into the domestic garden follows a specified procedure, from firstly identifying infestations, to inspecting gardens, and finally encouraging compliance or undertaking removal work. In the following sections I detail this process, and emphasise that despite the considerable powers of access available to PPOs through the Biosecurity Act (1993), the actual process by which they enter the garden happens in a tentative manner.

Surveillance: Identifying Infestations

There are a number of ways in which pest plant infestations are identified by PPOs. Firstly, infestations might have been previously identified and be part of a routine monitoring programme or a targeted control programme. Robin Packe, the Pest Plant Team Manager for Hawke's Bay Regional Council, described how they used to annually visit known infestations, mapped and recorded on the regional council's databases (interview 2005). These were the more established pest plants that previously occupied a large percentage of regional council's focus, such as gorse (*Ulex europaeus*) and blackberry (*Rubus fruticosus*). However, as the focus changed to newly naturalising pest plants, as described in the previous chapter, this method of identifying infestations has consequentially become less significant.

Secondly, PPOs may also 'scout' for new infestations, as Robin Packe described: 'We won't do special trips, but if we're on a way to a job, we'll take a route and do a specific area' (interview 2005). Robin Packe described working as a pair, one person driving with the other person spotting pest plants peeping over the walls or fences of properties. Susan Timmins, a DoC weed scientist, refers to this as the 'drive-by technique.'

Figure 5.1: The Horizons Regional Council Pest Plant Team vehicle, branded with the 'Weedbusters' logo.

Driving around with PPOs, it was not long before my eyes became sharpened to spotting pest plant infestations. Carolyn Lewis, a PPO for Waikato Regional Council, believed she could differentiate a pest plant infestation within surrounding bush from a low-flying aircraft, due to the particular aesthetic qualities of each:

> I can pick out from a small plane, with textures and colours, New Zealand plants have a particular look about them. And often that's how we pick up on things, people will say "I don't know what this is but it doesn't look right." You can see it's not looking how it should look. They don't know what it is, but they know it isn't right (Carolyn Lewis, interview 1:2005).

She occasionally rues these 'weed goggles' that PPOs come to acquire:

> I do wonder if it's like The Matrix and you'd be better off not knowing you're living in weeds...You need an awareness to see it. Most people are weed-blind... But you always wonder if it were better if you didn't know. Like I can't go on holiday and enjoy myself now if there are weed areas (Carolyn Lewis, interview 1:2005).

Finally, infestations may be identified through specific requests for help from landowners themselves, or through sightings and reports by members of the public. Sara Brill, PPO for Environment Bay of Plenty Regional Council, estimated that she receives an average of between 2-4 calls a day related to sightings by members of the public. This includes complaints from neighbours reporting pest plants on surrounding properties. Some PPOs I spoke to felt that they were occasionally used in this way within long-running feuds. Unless a neighbourly complaint is about a Total Control pest plant, the PPOs make sure that the complainant's property is clear of the pest before acting on the sighting. They are also careful not to divulge who the complainant is: 'We try not to get drawn into feuds' (Robin Packe, Hawke's Bay Regional Council plant biosecurity group interview, 2005). Public concerns are also significant in driving regional councils' focus, and PPO's workloads. In Hawke's Bay Regional Council, for example, privet *(Ligustrum sinense)* was receiving attention as a Total Control pest plant, due to public concerns about its effect on asthma. In an attempt to limit the workload this particular plant was creating, PPOs were supposed to pursue its removal from gardens only in response to a specific complaint.

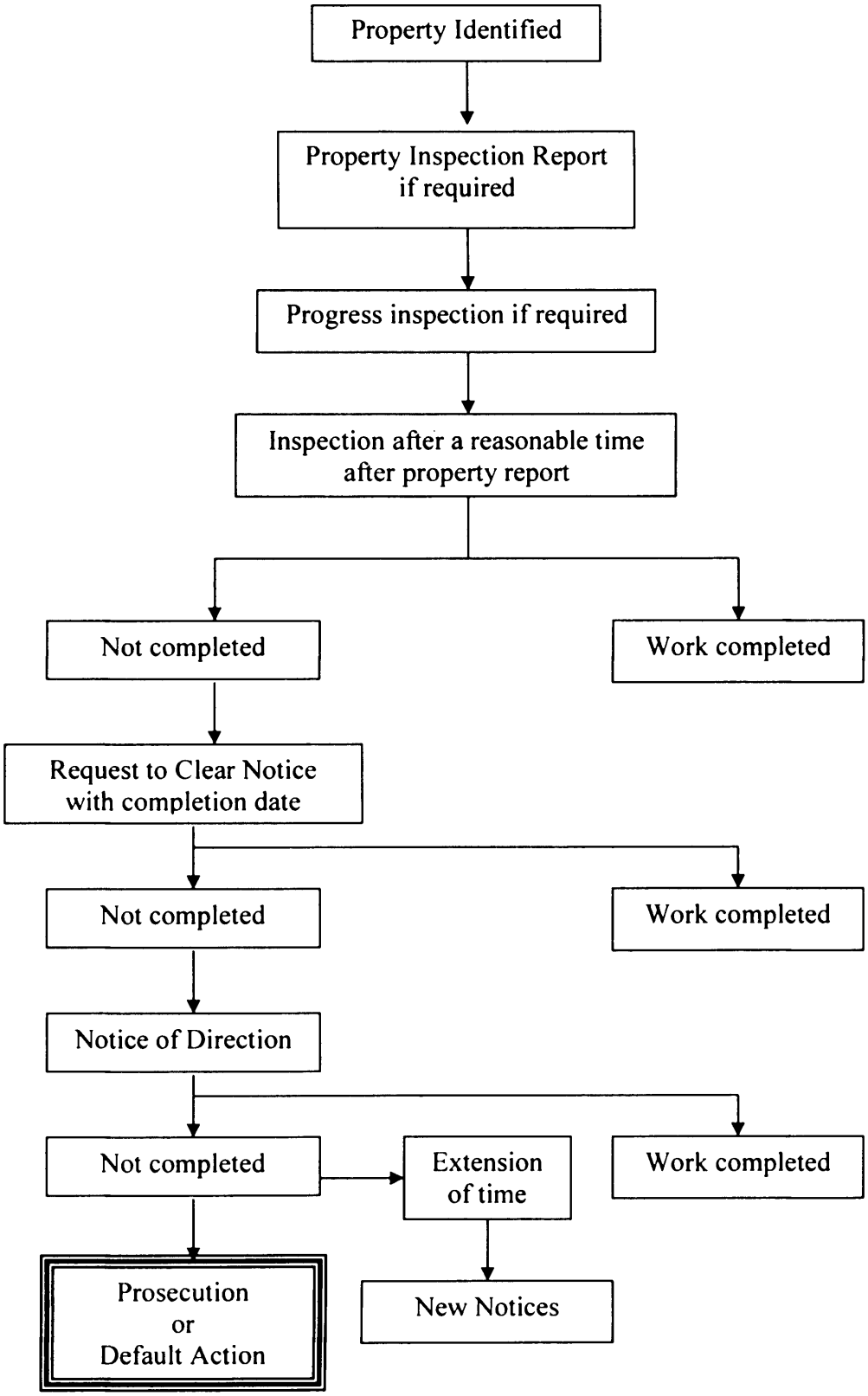
Chapter two highlighted tensions between the contrasting subject positionings afforded the public in governmentality and citizenship frameworks. These glimpses of 'the public' suggest that they are far from passive, utilising biosecurity for their own ends. The position of the

public as 'subjected' is destabilised, as they are shown to be responsible for driving state actors workloads and everyday activities. This provocatively echoes Foucauldian understandings of 'discipline' as controlling the movement of the human body. In the following section, I develop this argument, showing how the interface between the PPO, the gardener and the garden adds complexity to notions of power within a governmentality framework.

Inspections: the Garden and the Gardener

Once an infestation of a Total Control pest plant has been identified, a specified 'flow of events' stipulates the way PPOs approach property owners. This develops from verbal requests and encouragement, to the issuing of notices, to the undertaking of work with cost recoverment in the final instance. Horizons Regional Council, for example, provides each of their PPOs with a '*Standard Operating Procedures*' handbook, containing the flow diagram of the inspection and compliance process, displayed on the following page.

Figure 5.2: Flow diagram of the PPO inspection and compliance process, (Horizons Regional Council, 2003:6).



These detailed procedures highlight the control that is exercised over the process of biosecurity governance itself. The first step for the PPO involves inspecting the property, and so meeting the landowner. The Biosecurity Act (1993) confers significant powers of inspection on Authorised persons, that they may, at any reasonable time, enter any place for the purpose of:

> Confirming the presence, former presence or absence of any pest, pest agent or unwanted organism; or managing or eradicating any pest, pest agent or unwanted organism (Parliament of New Zealand 1993, section 109).

The exception to this is a Maori dwelling house, a Marae or a building associated with a Marae, for which consent of the occupier or a warrant issued under section 110 of the Biosecurity Act is required (Horizons Regional Council 2001:2). In this instance, the cultural rights of particular New Zealand citizens outweigh the biosecurity regime's right of access to private space. Despite these considerable powers which, as argued in the previous chapter, could be seen to equate to a form of sovereign power, in practice regional councils take a more co-operative approach in their relationships with landowners. This is exemplified in the following quote taken from the Horizons Regional Council '*Standard Operating Procedures*' handbook:

> The people you are visiting for the first time are your customers and should be treated with respect and courtesy, with the emphasis on fostering co-operation for a common goal (Horizons Regional Council 2003:5).

This emphasis on a 'common goal' alludes to a form of citizenship responsibility associated with biosecurity ideals. In order to foster co-operation, inspections rarely take place without the PPO's firstly approaching the owner, notifying them of their intention to make an inspection. Notification can be by telephone, in writing, or by letter-drop. Due to social norms of 'courtesy,' and the need to maintain public goodwill, the practice of entering the domestic garden therefore happens in a tentative manner.

I accompanied Sara Brill on a visit to a garden in Tauranga, which had been identified as containing woolly nightshade *(Solanum mauritianum)*. In order to carry out this inspection, the boot of the regional council truck Sara Brill was driving was filled with the paraphernalia required for property inspections. The following table lists this equipment, which includes objects for rendering biosecurity control visible, as well as objects to enact control and removal:

Table 5.1: Equipment required by Pest Plant officers for undertaking property inspections (Horizons Regional Council 2003:31)

Equipment Required for Property Inspections	
Plant Pest Warrant card	Writing materials
Business card	Binoculars
Diary	Camera
Valuation NZ index of the property	Grubber
Plant Pest Management Strategy	Slasher
Operation Plan	Pruners
Property Plan	First Aid Kit
Aerial Photos	GPS unit
Plant pest identification pamphlets	Knapsack sprayer and herbicide
Maps of the area	Prills
NZ Agrichemical Manual	

PPOs are required to keep diary entries of all inspections, and may also take samples, exhibits, photos and grid references of infestations (Horizons Regional Council 2003:10). This detailed monitoring is necessary in the event of contested removal work. This level of visibility and surveillant knowledge production is therefore not just about making the objects of governance 'knowable' in order to enact control (Rose and Miller 1992). Instead, it is as much about biosecurity personnel and regional councils protecting themselves legally. The 'right of access' to private space emerges as a precarious and unstable right of biosecurity governance.

After knocking on the door, introducing herself, and showing her warrant card to prove she was an 'authorised person,' Sara Brill received permission to inspect and verify the woolly nightshade *(Solanum mauritianum)* infestation. We spotted the infestation in the back garden, growing through a pile of wood above head height, dotted with rusty nails.

I have described the detailed process that has controlled and monitored Sara Brill as a PPO, as she moved from the regional council offices, to a face-to-face encounter with a pest plant in the private space of the domestic garden. I will now consider the processes by which the removal of pest plants is enacted.

Compliance and Removal

Removal work also follows a specific procedure. In the Environment BOP, pest plant teams or contractors work systematically 'road to road, property to property' either undertaking eradication work themselves in the case of Total Control plants, or encouraging the landlord to undertake work themselves in the case of Progressive Control plants (Environment Bay of Plenty Pest Plant Team, group interview 2005). In this case, Sara Brill received permission from the garden owner to treat the woolly nightshade *(Solanum mauritianum)* infestation immediately. She sawed through the stem at the base of the plant, and applied a translocated herbicide from a hand-held bottle to the plant stump. Permission is always sought before using chemicals on a property.

At Environment Bay of Plenty, if the work is not completed on the initial visit in this way, a Property Inspection Report is filled out. This identifies the pest plants to be removed, the steps required to achieve this, and stipulates a required 'completion date.' This is as much an effort in making visible the control procedures, as it is about undertaking control. This required visibility heightens as the process becomes more intrusive. For example, failure to comply at each stage initiates 'notices': a Request to Clear notice, and then a Notice of Direction, which must be delivered by an authorised person with a witness. At this point a human witness is required, rather than the non-human entities that have witnessed the process up to this point. Repeated failure to comply can lead to prosecution (under section 162 of the Biosecurity Act), or to the work being carried out by the regional council (under section 128) and charged to the property owner. If the charge is not paid, it becomes a charge on the property title, recouped when the property is sold (Horizons Regional Council, 2001b). At the point of 'failure to comply,' what was previously a citizenship responsibility to enact plant biosecurity ideals, shifts to a state responsibility to enforce the public good. Wellington Regional Council takes a more direct approach. After a pest plant sighting is confirmed through inspection, an 'assumed consent' form is issued. This signals that removal will be carried out by the regional council after two weeks if the property owner has not contacted the PPO to say otherwise (Wayne Cowan, Plant Biosecurity Manager, Wellington Regional Council, interview 2005). Work may be charged to the landowners, depending on the status of the pest plant of concern. The enactment of biosecurity therefore varies regionally, and not just due to differences in pest plant impacts or varying institutional and public concerns, as discussed in the previous chapter. Governmentalised localities also produce regional

variations through these different understandings of the appropriate use of power (Agrawal 2005a).

Inspections of nurseries and other outlets for plants banned from sale, propagation and distribution follow the same format of property inspection outlined above. If a plant pest is found, it is taken away and destroyed with the owner's agreement. If a pest plant is suspected, a sample is taken for identification. If the owner refuses to co-operate, a 'Notice of Direction' is served. This rarely happens in practice, as Robin Packe, the Plant Biosecurity Manager from Hawke's Bay Regional Council explained:

> The biggest problem isn't the garden centres. They're usually helpful. It's the little old ladies that dig up something from their garden, split it and stick it in a pot. And what can we do about that? We don't know every church sale that happens! (interview 2005).

While the previous chapter discussed the difficulties of knowing and governing pest plants due to their inherent indeterminacy, this discussion is beginning to signal that the aligned task of governing publics is just as complex. It also suggests that particular gardening publics that engage in informal exchange practices present particular control difficulties. This is related to the (in)visibility of informal practices of plant exchange, and their association to spaces traditionally separated from the governing state. These difficulties are compounded when public and institutional methods of valuing plants conflict.

Pest Plant or Prized Plant?

The pest plants within domestic gardens may be more traditional weeds, such as woolly nightshade *(Solanum mauritianum)*, but also garden plants regarded as desirable. Sara Brill expressed surprise over some plants that are grown in an ornamental fashion by domestic gardeners. She described what happened when, following a complaint, she knocked on a householder's door to inspect a privet tree *(Ligustrum spp.)*, a Total Control pest plant in the Environment Bay of Plenty:

> And she said: "Yes the privet is at the end of the garden," and I saw this hose coming up from the ground near it and I ask her about it: "There's a hose at the base of the privet!" And she says: "Yes I put it there when I planted it." You know she bought it from a garden centre and planted it maybe five years ago! (Sara Brill, interview 1:2005)

The requirement to remove a prized plant classified as a pest, or having a plant become a pest within the garden, can cause the domestic gardener distress. Sara Brill understands her role as a PPO to encompass not only protecting New Zealand's biodiversity, but also protecting people:

> People need to be protected, they bought a plant, and now it's a weed, and they have problem getting rid of it. I know someone who bought a plant, a snow poppy, and now its gone everywhere in their garden, took huge amount of effort to get rid of it (interview 1:2005).

'Weediness' forms a 'transitional zone' between eco-political concern for national ecology, and the personal concerns of the domestic gardener (Rose 2001). The discursive and material links generated as plants act as weeds in the domestic garden are discussed in the following chapter. For those ornamental plants that do not act as weeds in the domestic garden, it can, however, be difficult to establish and maintain their identity as pests. Sara Brill described her reaction to the conflict in values that can arise in this context:

> Yes, why does it matter? If all we want is bushy green privets, then bushy green privet is fine. I spoke to a guy yesterday who had a privet in his garden and he said. "I like trees, why should I cut my tree down? Why should I remove it, it's a lovely big tree." And I can see his point. But it's on our list, and the birds will spread it, and it will end up in our bush areas (interview 1:2005).

This emphasises the normalised power of the RPMS ('but it's on our list'), which has become a justificatory concept in itself. However, prized ornamental plants make up only a percentage of those targeted by the biosecurity regime, as Carolyn Lewis explained:

> 300 are a problem, and out of those probably a good 70 are the old fashioned stuff, and people are resistant to that, through familiarisation, they're so used to it being there, they find it a hard concept that they should get rid of them (interview 1:2005).

This familiarisation that older garden plants achieve as 'staples' of the garden presented particular problems if they are classified in pest plant categorises that require removal. As the domestic gardener is only required to remove Total Control and Accord pest plants, this approximated 70 is further reduced to fewer contentious plants. However, there are occasions when plant biosecurity rules can have a greater physical impact on the domestic garden, which Hitchings and Jones (2004:3) remind us is 'saturated with developing relationships between people and plants.' Sara Brill confided:

> Sometimes I get to a garden and just think where do I begin? Then it's best just to select a few plants to concentrate on, they're not going to rip their whole garden up and start again (Sara Brill, interview, 2005).

Sara Brill finds enforcing the removal of these prized pest plants particularly hard with older people, who do not perceive them as a problem. I was told by another PPO that they had allowed a privet *(Ligustrum spp.)* to remain where it had been planted over a beloved family dog. Here perhaps the liberal 'cost proviso' of ecological citizenship has come to work: where the personal cost of enacting the ecological good is seen as too great (Bell 2005). For Carolyn Lewis, this also supports the shift in focus to newly identified pest plants, which are not only less established physically, but also culturally:

> Newer plants haven't really established, ... they're not so fashionable, so people aren't going to argue about them so much, so if you get them early before they're in New Zealand psyche as such [laughs], then you've got a better chance of getting rid of them (interview 1:2005).

'Regulation' or Co-operation?

The conflict that can arise when a home-owner is required to remove a prized pest plant is approached in specific ways. The use of a formal letter is particularly stressed by regional councils if the PPO is dealing with an 'uncooperative or aggressive occupier' (Horizons Regional Council 2003:34). When a visit is made, two authorized people attend. In his years working as a PPO Wayne Cowan, now Plant Biosecurity Manager for Wellington Regional Council, was threatened with a gun twice, and called the police out once. He carried out the removal work while the property owner was in jail. The reasons for arrest were related to aggressive behaviour rather than a failure to comply with biosecurity regulations. However, this reveals the passions that can be provoked through the intervention of biosecurity-related responsibilities into perceived rights within private spaces, and the difficulties of making these responsibilities and rights cohere. Dobson's (2003) ecological citizenship thesis is one response to the difficulties of engendering positive environmental behaviour in the private sphere, where regulatory enforcement is inappropriate, ineffectual, or conflicts with other citizen rights or social norms. As a result of these difficulties, Auckland Regional Council's RPMS (2002a) explicitly lays out the scenarios in which 'regulation' (which in the New

Zealand context is used to refer to regulatory enforcement) can be used. These are to protect landowners who are carrying out their commitments under the RPMS from neighbours who are not (biosecurity is about protecting people as much as biodiversity), to implement the Accord (reiterating its authoritative status), and to restrict the movement of pests onto pest-free islands in the Hauraki Gulf. Sara Brill described the role of regulatory powers to maintain certain values in instances where people fail in their responsibilities to conform to particular norms:

> Like the law system, if people don't take responsibility for being good people, we need to put it in the judicial system. Putting steps in to maintain these values. Do the public see it [growing banned pest plants] like the judicial system? Some people do, some don't. People think it's not as bad as when you vandalise things, or steal things (interview 1:2005).

In the justification for implementing plant biosecurity, comparative metaphors shift from health and disease related metaphors, which help define the problem of biosecurity, to law and morality metaphors that are related to ways of changing social behaviour.

Enforcement through regulation is, however, seen to be a small part of regional councils' approach to pest management. Auckland Regional Council's RPMS states that 'ever since legislation was first passed regarding pest management in New Zealand, regulation has failed to contribute significantly to the reduction of pest plants' (2002:22). The Environment Bay of Plenty Regional Council has placed a collaborative approach at the heart of their self-representation, as John Mather, the Plant Biosecurity Manager explained: 'Our working statement is "Working with our communities for a better environment." So it's about working with people rather than against them' (Environment BOP Plant Biosecurity Team, group interview 2005). A voluntary, collaborative approach forms the basis of regional council's approach to homeowners in the case of required removals of pest plants. Peter Williams detailed the likely scenario:

> It's still largely voluntary. They say "Look, madam, did you know that in your front garden you have X, did you know that it is noxious? I think it would be much better if you pulled it out." 99% of the time people say "Oh, have I?! Crikey! Right, I'll get it out tomorrow" (interview 2005).

Other incentives to act before a regulatory enforcement approach is adopted include shifting the balance of costs for control work. For the removal of specific Total Control plants, either full costs or 50% costs are covered by regional councils. However, if landowners contest

work, or delay in responding with permission to undertake work, they lose the offer of cost-covered work.

Therefore, while governmental mechanisms to force compliance are within the repertoire available to the PPOs, their actual deployment is rare. Despite this foregrounding of a collaborative, co-operative approach, the status conferred by legislation is seen as an essential underpinning to enable public acceptance of plant biosecurity ideals. This supports Agrawal's argument that 'regulation is not just about restraining a group of people who might break the rules... regulation is the source of awareness and recognition and the context in which practices unfold' (2005a:22-23). Carolyn Lewis described the way in which legislation was seen to interact with public education efforts:

> You can have this situation where you are trying to lead people to this point, or you can actually stand here, put the legislation in place and say this is the norm. This is the legislation you have to comply with, and then try and speed them all up until they get to that point (interview 2, 2005).

The previous chapter discussed the way RPMSs are reactive to public values, while the Accord operates in an authoritative way, with the intention that it will drive public values. Despite the role of legislation as a driver for social values, the attainment of public support is seen to be the essential basis for the success of plant biosecurity:

> At the end of the day, you can legislate until the cows come home, but until you get that public support, the legislation can help that, but until you get the public support, you might as well forget it (Carolyn Lewis, interview 1:2005).

A publication produced by Susan Timmins, a DoC plant scientist, in collaboration with Kate Blood, an Australian biosecurity public communications expert, argues that the use of education to produce public support and commitment is a superior approach to the use of regulation alone:

> We can involve the public in our battle against weeds by education and/or regulation. Education is preferable to regulation because it achieves commitment rather than just compliance (Timmins and Blood 2003).

This aligns with Dobson's (2003) understanding of educative citizenship approaches contributing to longer lasting attitude change, rather than more shallow behavioural change. Pest plant control programs in different ways and to different extents are always going to

impact on people (Mike Harre, Auckland Regional Council Plant Biosecurity Community Liaisons Officer, conference speech 2005). A level of public support is needed simply for biosecurity personnel to carry out their activities and for political processes to gain the public support to back these biosecurity practices. Carolyn Lewis, however, goes further in what she believes public awareness and support can achieve:

> I believe that we can stem the tide, but until we get 100% community support behind us we can't do it. So we are kind of on a holding pattern, keep things moving along, improving things, preventing it getting any worse.... But the only way we can, I won't say get back to what we've lost, but protect what we've got, is through public support (interview 1:2005).

Sara Brill echoed this sentiment, arguing that if the conscious decision was made by enough people to prioritise pest plants, New Zealand could ultimately become a weed-free country:

> If we all decided to get rid of everything, all the weeds, ... if enough people wanted it, it would happen. Like they can do it on islands, they can do it here. But enough people don't want it... I can't push other people to want it, we have to say as a community. It takes a lot (interview 2:2005).

Achieving this point of public desire for a weed-free New Zealand is interpreted in different ways by different regional councils. While some take a passive approach to public opinion, seeing themselves as representing their constituents, others 'see themselves as a leader, and will decide if something is a problem, they'll do advertising and try and get people on side' (Carolyn Lewis, interview 2:2005). This engendering of public opinion and support is undertaken through a variety of different types of public education activities. In the following section, I discuss the ways public education is understood and approached by the biosecurity regime.

5.3 PUBLIC EDUCATION FORMATS AND PROGRAMMES

> Power is not so much a matter of imposing constraints upon citizens as of 'making up' citizens capable of bearing a kind of regulated freedom (Rose and Miller 1992:174).

Regional councils and DoC conservancies utilise a variety of different approaches to public education. While I will discuss more formally organised activities, it is important to highlight the less formal awareness-raising work that occurs as an ongoing activity for PPOs and DoC conservancy staff. Sara Brill highlighted the overlapping nature of regulation, eradication and education activities, by referring to targeted boneseed (*Chrysanthemoides monilifera*) removal work she had undertaken:

> Even though it was focused on a weed, there was awareness-raising because people would say "Boneseed, I didn't know we had boneseed, what's that?" And I'd say, "Didn't you? Oh well, have a brochure." And I'd give them a brochure all about it. So it's always awareness-raising. Every-time you come in contact with the public, and I come into contact a lot, some awareness-raising happens (interview 2:2005).

Formal public education operate as stand alone events, activities or publications, as campaigns focused on specific plants, or in combination with a series of events. These have included annual schemes such as Auckland Regional Council's annual 'The Big Clean Up,' and Horizon Regional Council's 'Old Man's Beard' campaign run in 2005. This campaign focused on the widespread, smothering plant *Clematis vitalba*, depicted in the photo on the following page.

It encouraged people to phone the hotline 0800-WEEDBUSTERS at any sighting. The campaign organisers hoped that by focusing on a weed high in public concern they would raise their profile and reputation as being tough on weeds, and generate public support and concern for plant biosecurity issues. This campaign therefore operated outside of the formal classificatory rationalities of RPMS, which ascribe low institutional attention to widespread plants, as discussed in the preceding chapter. It also suggests an institutional tactic of utilising the emotive agency of pest plants in producing public responses.

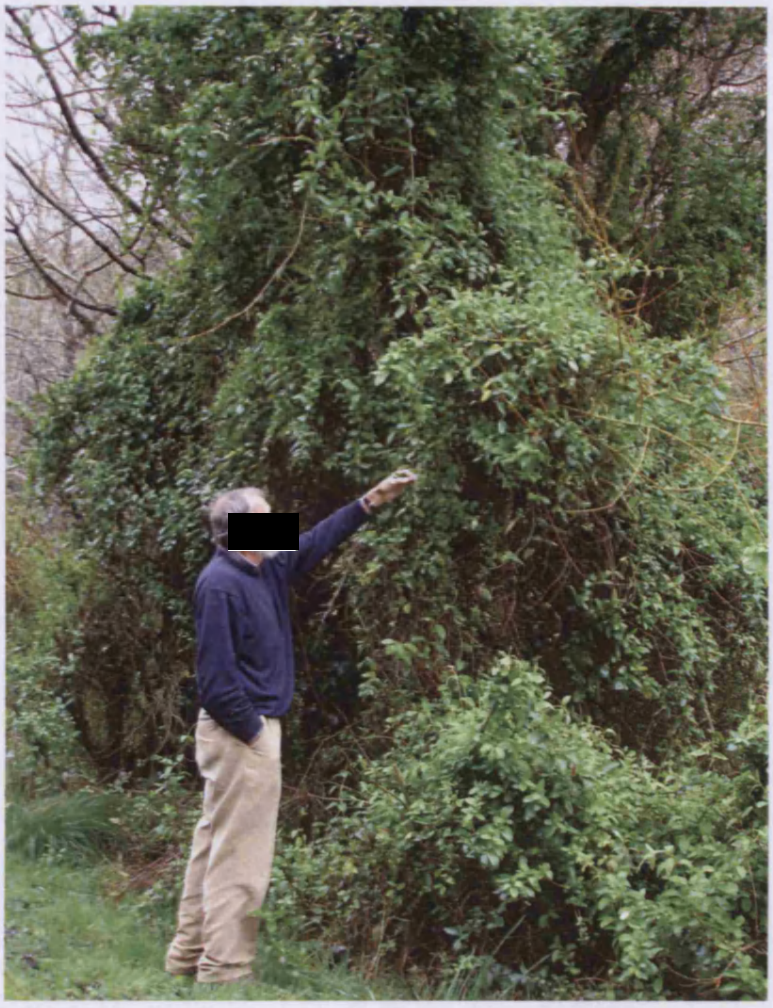


Figure 5.3: 'Old Man's Beard' (*Clematis vitalba*) smothers a native tree.

Particular education campaigns become cemented in public consciousness. For example, in the late 1980s David Bellamy fronted a campaign focused on the removal of 'Old Man's Beard' (*Clematis vitalba*). This included a television advert where he proclaimed in his gruff English accent through his huge tangled beard: 'Old Man's Beard must go!' This is frequently impersonated, nearly two decades after the campaign ran (Helen Braithwaite, DoC weeds officer, interview 2005). In addition to these larger scale campaigns, PPOs regularly visit garden clubs, schools and other community groups to give talks about pest plant issues, and run 'weed awareness stalls' at garden shows and other events.

Weedbusters: Co-ordinating a National Weed Awareness Campaign

A significant way in which these activities are currently being organised is through the public weed awareness agency 'Weedbusters.' This is an umbrella campaign, co-ordinating and unifying regional public communication campaigns to achieve national frontage. The need for a national campaign to promote weed awareness was identified in the late 1990s by a key group of institutional actors, including Susan Timmins and Amber Bill of DoC, and Carolyn Lewis a PPO working for Waikato Regional Council. Despite the immediate enthusiasm for a national program, both the regional councils and the Biosecurity Institute were reticent to co-ordinate it themselves (Department of Conservation, 2004a). But the idea had set seed. In 2001 a working group made up of DoC staff successful bid for $300,000 of DoC funding to establish a weed awareness programme to run from 2002 to 2004, and a National Weeds Public Awareness Co-ordinator was appointed to initiate the campaign in 2002 (Department of Conservation 2004a). The publication '*Weed Awareness in New Zealand*,' written by Susan Timmins and Kate Blood (2003), highlighted the necessity of a 'weed aware' public to achieve regulatory goals and support mechanisms such as the Accord. National co-ordination was seen as necessary to co-ordinate resources, to give unity to public communication messages, to energise staff, and to promote inter-agency co-operation.

The 'Weedbusters' campaign was officially launched in October 2003. The format for the campaign was adopted in its entirety from the Australian Weedbusters model, due to the ease and cost saving that was achieved. Weedbusters is 'an interagency weed awareness and education programme designed to protect New Zealand against the spread of invasive weeds' (Department of Conservation 2004a). Its aims are to: increase the number of people participating in weed issues; build a population aware of the threat of weeds; reduce the number of plant species becoming established as weeds throughout New Zealand; help all agencies involved in weeds work share resources (Department of Conservation 2004a). The Weedbuster 'vision' statement is: 'New Zealanders are aware of and taking action to reduce the impact of weeds on the environment, economy and human health' (Department of Conservation 2004). The campaign therefore outlines the 'obligations' and 'virtues' of ecological citizenship associated with plant biosecurity. This is a bounded, territorialised citizenship community, with membership defined as 'New Zealanders.' The Weedbusters Strategic Direction report emphasises the need for permanent attitude and behavioural

changes. The ecological 'greater good' achieved through plant biosecurity benefits both human and non-human collectives:

> The key task of Weedbusters is to change attitudes and behaviours permanently for the greater good of individuals, their communities and ultimately the wider New Zealand environment (Department of Conservation 2004:4).

Susan Timmins (interview 2:2005), however, speculated that Weedbusters' key task is actually more about drawing agencies together, co-ordinating outputs, branding and encouraging a shared focus, than it is about getting the wider public involved.

The Weedbusters framework operates through a 'Weedbusters Management Committee', responsible for strategic direction, a 'National Co-ordinator,' and regional Weedbuster teams (Department of Conservation 2004). This institutional framework is designed to achieve both national consistency and a local level focus for actions. The management committee includes representatives from biosecurity agencies and key stakeholder groups, including Federated Farmers and the Nursery and Garden Industry. In each region one person from the regional council and one from DoC are expected to form the Weedbuster 'team.' This has occurred in all but two regional councils, and all but four DoC constituencies. The regional Weedbuster teams are expected to undertake awareness raising events, and to encourage the formation of local initiative projects.

These different public education formats produce a written and visual paraphernalia of leaflets, booklets and posters. These are physical resources that influence the visibility and presence of the biosecurity agencies in the public sphere. Mechanisms of enrolment are materialised in booklets, posters, t-shirts and, as shall be discussed, native plants, as much as they are codified in the legislative lists described in chapter four (Latour 1987, in Rose and Miller 1992). These one-off, annual and ongoing efforts, some branded Weedbusters, others not, draw on different resources and communication techniques, as well as different discursive justifications for plant biosecurity. These educative approaches are related to a variety of underlying aims for public education. These develop from communicating the concept that weeds are an environmental problem, to encouraging active participation in weed removal.

5.4 WEEDS ARE A PROBLEM. WHICH WEEDS ARE A PROBLEM?

The first task of public education for internal plant biosecurity is producing public acceptance that some plants are 'bad':

> It's really important to get the message across that weeds are a problem, not the specific species so that they can get to the point where they can identify for themselves, but, you know, what *are* weed species (Carolyn Lewis, interview 1:2005, original speech emphasis).

The concept that plants are harmful is the platform on which more detailed public education is built. Carolyn Lewis described the difficulties of conveying this concept:

> everyone thinks that if you dump weeds they just rot down, so trying to convince someone that plants are harmful is actually quite a big ask, because its such a slow thing, its not going to happen over night. They're not going to suddenly take over the world (interview 1:2005).

The temporalities of pest plants therefore produce a barrier to understanding their potential negative environmental impact. The need for a campaign such as Weedbusters included the difficulty of generating public concern about weeds, particularly in competition with other conservation and biosecurity issues. This was seen to essentially boil down to the fact that 'weeds are not sexy' (Carolyn Lewis interview 1:2005):

> We pulled weeds aside as a separate campaign, because in virtually every other campaign, weeds always get the shortest straw. If you lump it in with animals, everything goes to animals... If you want publicity for animals, you get it free of charge. If you want publicity for weeds, you virtually have to pay for it (interview 1:2005).

'Weedbusters' was designed to work through what Amber Bill, the first National Weedbusters Co-ordinator, terms 'icon awareness,' with the whole 'story' of weed concern captured within the term 'Weedbusters' and its visual portrayal in a logo and mascot:

> We needed a symbol that would mark it out, that if you saw that symbol you would know that everything I talked about after that was going to be about weeds. You know it's invasive weeds, you know it's a big issue (Amber Bill, interview 2005).

The key stories are 'weeds are a threat to our way of life in New Zealand,' and 'everyone has a responsibility for weeds' (Amber Brill, interview 2005). This defines the depository of

obligations as well as the holder of responsibilities (Dobson 2003). Woody Weed, the Weedbuster mascot, is the key visual icon who embodies these stories. Woody exists as a visual image on branding, he appears at events as a full-size mascot, and he even features in a new children's book written collaboratively by Carolyn Lewis and Ian Popay.

Woody Weed has not, however, gone down well with all his target groups. Some biosecurity personnel suggested that children find the huge mascot terrifying. At the Wanganui Blooming Artz Show, I encountered young children unsure or actively scared of Woody. This led to Woody interacting more frequently with adults. There were, however, some children who had no such qualms:

Figure 5.4: Some children love Woody Weed! Wanganui Bloomin' Artz Festival, 2005.

Woody Weed represents an attempt to give plants the charisma of animals in conservation (see Lorimer 2006), by animating or 'ani-morphising' plants. This is a highly visual and embodied way to overcome the difficulties plants' temporalities pose for their public understanding as an environmental threat. Other discursive tactics used to raise concern for weeds attempt to associate biosecurity with other security issues, including war, terrorism, immigration and even extra-terrestrials.

The Emotive Language of Public Communication

'Weedbuster' or 'weed awareness' stalls at community fairs and garden shows are run in collaboration with the different biosecurity agencies. At the Wanganui Bloomin' Artz garden show in 2005, a stall run by the PPO Craig Davey utilised a war and terrorist theme, drawn together by the banner 'Garden Terrorists: Join the War Against Weeds.'

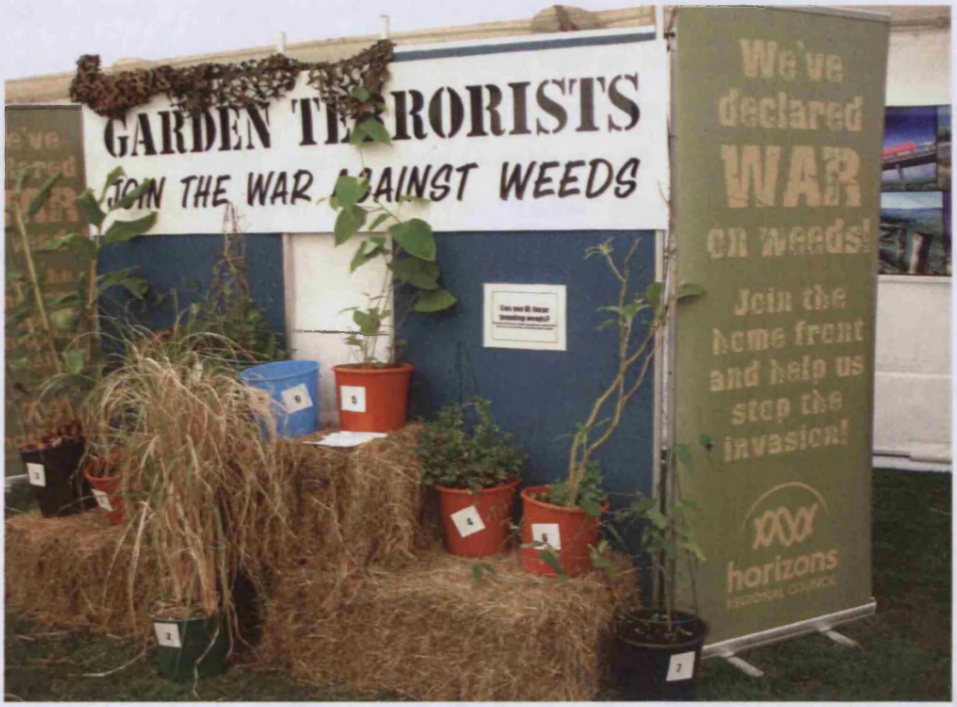


Figure 5.5: The War and terrorism theme at the weed awareness stall, Wanganui Bloomin Artz Festival, 2005.

A camouflage net was draped over the top of the display walls, with a flashing light adding to the atmosphere. Craig toyed with the idea of wearing camouflage paint, but decided to stick with camouflage trousers and a Weedbuster t-shirt. Carolyn Lewis described a time when she had nearly used the same banner at a garden show:

> I was at a show after September 11th, and I got out the banner and thought, "Oh, I'll use this one." And I looked at it and thought, "No I can't!" (interview 1: 2005).

I asked Carolyn Lewis about the use of this type of emotive language and metaphoric association to war and terrorism at public events such as garden shows and in pest plant public education campaigns overall:

> Um, we use 'alien invaders' and get away with it, which you couldn't use in America, because 'alien' means 'illegal immigrant.' You couldn't use the words 'illegal immigrant' here. But it's really tempting, it's a good idea as it gets across the idea of things moving where they shouldn't move (interview 1: 2005).

The opening voice-over in the popular television documentary 'Border Patrol' draws on these discursive associations, stating that: 'New Zealand's borders are constantly under threat, from illegal drugs, plant pests, illegal immigrants... New Zealand customs... are all that stand in their way' (Border Patrol, transcribed 27/06/2005). The use of military, alien and invader metaphors, and other strongly suggestive language such as 'horrible' and 'nasty,' represented a 'shock tactic' (Craig Davey interview 1:2005), and could be seen as an attempt to make the mundane world of weeds 'strange' (see Donaldson and Wood 2004). Carolyn Lewis acknowledged that this type of language was 'loaded' and had to be used with care. The 'immigrant' metaphors are also drawn on by people opposing biosecurity measures, as she explained:

> You've also got the people in the pro-exotic movement which really use that as a rallying cry. This guy says about agapanthus: "They're a really hard working immigrant, if people had worked that hard to try and fit into New Zealand, we'd give them a medal, not tried to kill them." So yeah, it's the emotive side of things (Carolyn Lewis interview 1:2005).

The socially sensitive nature of some of the more emotive language has recently been cemented in association with particular political values, after its adoption by the far right New Zealand First leader Winston Peters. For this reason, Carolyn Lewis suggested, it was increasingly being avoided in biosecurity publicity campaigns. This reveals the reflexivity of institutional actors.

These discursive tactics extend beyond descriptive language, to negative connotations within common names utilised for pest plants. Wellington Regional Council, for example, refer to climbing asparagus (*Asparagus verticillatus*) as 'snake grass', in an effort to make it sound less attractive. Country associations in common plant names are also utilised to emphasise the outsider status of pest plants, such as Mexican daisy (*Erigeron karvinskianus*), Argentinean pampas grass (*Cortaderia selloana*) and Chinese privet *(Ligustrum sinense).* These names were highlighted boldly on the posters adorning the display walls of the Wanganui weed awareness stall. I was told 'If there's a choice over different common names we'll always use a country name to make the point that it doesn't belong here' (Susan

Timmins interview 1:2005). This is again a bounded or territorialised ecological citizenship identity, explicitly associated with the nation state (Bell 2005). In this context, 'ecological citizenship' works as a method of exclusion. This also suggests that citizen identity is extended to plants. These associations have found their way into public discourse. Visitors to the pest plant stalls extensively utilised country names within common plant names. At the Gardenz stall in Christchurch, a visitor described how she had sent a weed to Massey to be identified, and proudly told us that it was one of the world's worst weeds 'Indian something or-other' (Gardenz visitor 4, 2005). A visitor to the Wanganui stall discussed the posters identifying banned and controlled pest plants with a friend. Pointing to Chilean rhubarb *(Gunnera tinctoria)* and Chilean flame creeper *(Tropaeolum speciosum)*, she remarked to her friend 'Oh, Chile has a lot to answer for' (Wanganui visitor 7, 2005).

Beyond the exclusionary tactics described above, an inclusive sense of ecological citizenship is also directly evoked in the public education campaigns, as Jack Craw, the biosecurity manager for Auckland Regional Council, described:

> In Northland we had signs put up saying not 'Get Rid of Your Wild Ginger' because no-one wants to hear that from a bureaucrat... so we had big signs up saying 'Destroy Wild Ginger Before it Destroys *Our* Forests' [speech emphasis]. So you were doing a patriotic thing by destroying it (interview 1:2005).

This type of public communication message discursively draws on New Zealand's 'clean, green' image, as the Biosecurity New Zealand website extols: 'Pride in our environment,... and deep affection for our native plants,... have become intrinsic features of the New Zealand cultural identity.' It goes on to urge New Zealanders to: 'Be vigilant and protect those things which quintessentially define us as a nation – which make our country unique and special in the world' (Biosecurity New Zealand, 2006). The following photo depicts a banner utilised at the Gardenz weed awareness show, which proclaims: 'Together we can stop the spread of weed.'

Figure 5.6: 'Together we can stop the spread of weeds': A selection of posters at the Gardenz weed awareness stall.

The aim of these public education tactics is, as described, to generate acceptance of the concept of weed species, and concern over their environmental impact. Carolyn Lewis believes that this level of public awareness has been achieved in her area of jurisdiction:

> You could go up to any door in Hamilton and knock on it and start talking about invasive plants and they would know what you're talking about, they would know as a concept that some plants are bad, and get into bush areas. So they may not know the species, ...but you're not having to start from square one, you've moved them along that understanding just a little bit. Enough to make it a bit easier to get your message across (interview 1:2005).

I have considered the tactics utilised to communicate the concept of weedy species, and to produce a level of public concern for weeds. These tactics included 'animating' weeds through the Woody Weed character. This was perhaps too successful, as Woody frightened his target audience. Discursive tactics revolved around the association of weeds to other 'invasive entities', including human immigrants and extra-terrestrials, and other security

issues, including war and terrorism. Ecological citizenship identity associated with particular plant citizens and a territorialisation of national space was used to frame insiders and outsiders, and to link citizenship identity to ecological responsibility. This effort to communicate weed issues and concern is the essential basis on which more detailed public education messages are built. I will now move on to consider the next step on from this, the communication of the banned plants themselves.

Communicating Pest Plant Lists

The second, overlapping aim of weed-related public education is a step from understanding and accepting 'weeds are a problem,' to knowing '*which* weeds are a problem.' This involves communicating the specific plants in RPMSs and the Accord. The ability to identify and distinguish between native plants and pest plants is seen to be a difficult task for the public:

> Knowing *which* are bad is important, but not that easy. Being able to tell the difference between a hungi-hungi and a privet tree takes some skill, it's not that easy, between native and weeds, it's not that obvious to non-trained botanists. Botanists are used to looking at the tiny differences (Sara Brill, interview 1:2005, original speech emphasis).

This communication of banned plants is undertaken in a myriad of ways. Columns are contributed to local community newspapers; for example, '*Weedwatch*' appears fortnightly in Bay of Plenty community papers, profiling a different weed each time. Information on pest plant lists is sent to target groups; for example in 1998, Auckland Regional Council sent a mail-out to all gardening groups in their region, providing information on plants to be banned. These are also sometimes included within the householder's billing rates mail-out (Mike Harre, interview 1:2005).

The Weedbuster website, www.Weedbuster.org.nz, which receives an average of 66,000 hits a month, has a 'weed search' function for weed identification, control methods and information on banned lists (Weedbusters 2006). Other materials produced directly by Weedbusters include the booklet *'Weedbusting: A guide to recognising and controlling invasive weeds,'* a 16 page colour-illustrated A5 booklet with information on weeds, weedy characteristics and control methods. These visual and discursive resources are also supported

by public education events based around the verbal communication of banned plants. These frequently involve more embodied activities. For example, in June 2005 Sara Brill organised a 'walk and gawk' event in Tauranga, a guided walk highlighting weeds in the local area.

A key aim of the weed awareness stall at garden shows continues to be the communication of pest plants on banned lists, and promoting their correct identification. While the provision of information on plant biosecurity issues had been undertaken at agricultural fairs in the past, the use of stalls at garden shows specifically started in the early 1990s following the introduction of the Accord list. The 2005 Wanganui stall focused on this aspect of public communication, with potted pest plants displayed on hay-bales outside the stall, and posters with colour pictures and descriptions describing those pest plants, their legal status, problems and control methods, displayed within the stall.

Figure 5.7: A visitor to the Wanganui weed awareness stall attempting to identify a potted weed.

The stall had a 'weed quiz' asking for the names of the pest plants displayed. This was intended to encourage people to enter the stall, look at photos of pest plants and read the posters for information on the plant names (Craig Davey, PPO for Horizons Regional Council, interview 2005). The contrast between the display of these pest plants as prized specimens in the style and context of a garden show, underneath banners 'declaring war' on weeds, produced an intriguing and challenging contradiction. The materiality of the pest plants in this context presents particular difficulties, however, as one PPO from Hawke's Bay Regional Council joked: 'although they are hard to keep alive. That's a sure way of killing a weed. Put it in a pot' (Dean Roughton, interview 2005). The combination of different visual and material (re)presentations promoting pest plant identification at the Wanganui stall prompted visitors to remark in surprise at some plants, confirm their own knowledge and experience of others, and compare stories with their companions: 'What's this plant? Is it illegal? (Wanganui stall visitor 8, 2005), 'Is it an obnoxious weed? [sic]' (Wanganui stall visitor 5, 2005). One visitor to the Wanganui stall pointed to a potted purple loosestrife (*Lythrum salicaria*), asking in surprise 'Is that one a noxious weed?' After listening to information from Craig Davey about the weed, its extent, the problems it can cause and how to remove it, she remarked 'Well, it's a pretty plant! If you don't own it, it looks good' (Wanganui stall visitor 3, 2005). At the Hamilton Agricultural Show weed awareness stall, a live display format utilising pest plants was also adopted.

Figure 5.8: Pest plants in an attractive display at the Hamilton Agricultural Show

On one side of the path entering the stall, pest plants were arranged as a 'show garden.' On the other, native plants were displayed in a similar fashion, emulating a small garden. This directly and materially associates pest plants with the domestic garden, rather than the wider countryside. The domestic garden was centred as the source of weeds. This format also highlighted the attractiveness and suitability of native plant alternatives for the domestic garden setting.

These diverse attempts to communicate the pest plants banned through the legislative formats described in the preceding chapter, complicates a distinction between experts and non-experts. For plant biosecurity aims to be achieved, gardening publics are required to attain a level of knowledge usually reserved for ecologists and botanists. This brings into question the rigid subject positions for both experts and subjects offered within governmentality frameworks. A further challenge occurs through the expressed motivations of biosecurity personnel for being involved in face-to-face public education events.

Communicating a 'Non-Purism': What's Not on the List

The aim for public communication interactions between plant biosecurity personnel and gardening publics is not simply the transferral of positive information on what is banned and how it should be controlled. It is also about what is not banned, in a sense communicating a *non-purism*. Biosecurity personnel described their motivations for involvement in garden shows as the opportunity to explain their own justifications for pest plant control work, as well as communicating the underlying philosophy of the agencies they represent. This centrally concerned the concept that not all non-native plants are to be banned (Mike Harre, Auckland Regional Council public liaison officer, pest plant team, interview 2005). This (mis)conception was evident in the comments I heard at the garden shows. One gardener remarked: 'It gets to the point where everything that's exotic gets declared bad' (Wanganui stall visitor 7, 2005). Another told Craig Davey: 'Life would be very boring if we just grew endemic plants' (Wanganui stall visitor 11, 2005). This point of contention is used to focus on communicating why *these* plants are banned, describing the specificity of each case face-to-face (Craig Davey, interview 2005). Mike Harre, however, suggested that the public are willing to listen to this message only in regards to plants they do want to be banned.

This issue of 'native purism' was clearly a concern for biosecurity personnel. Wayne Cowan, the Plant Biosecurity Manager for Wellington Regional Council, for example, was very keen to explain that he did not have a purist attitude towards native species. He stressed that a non-native species became banned only if it was causing environmental damage. Carolyn Lewis also emphasised the environmental justification behind every pest plant controlled or banned through plant biosecurity policies:

> There is *always* an underlying environmental issue. That's what people don't understand, they call us plant Nazis, think we just don't like these plants. That's not the case (interview 1:2005, original speech emphasis).

This non-purist stance can for some, however be more tactical than actual:

> Because a lot of people think DoC is for natives and nothing else, and for a lot of [DoC] people that would be the ideal, but that's not what most people would accept, it would be too far out for them (Carolyn Lewis interview 1:2005).

This discussion reveals the pragmatism and reasonableness of biosecurity personnel, and their desire to represent themselves in this way. While this suggests that the association between national identity and plants is less significant than 'objective' scientific understandings of environmental damage, it is significant that native plants cannot be classified as pests regardless of their behaviour (Wayne Cowan, interview 2005). It is also undermined by the suggestion in the quote above that for some biosecurity agencies, this non-purism is a tactic to gain public support.

I have discussed plant biosecurity public education in terms of communicating understanding and knowledge. This utilises not only discursive and visual materials, but also more embodied tactics. This knowledge and understanding is not, however, sufficient to enact plant biosecurity ideals, and fails to fully describe the role of the public in plant biosecurity activities. There is also a real need for private behavioural changes, bringing a shift in focus from *communication* to *effects*.

5.5 CHANGING PRIVATE BEHAVIOUR

There is the familiar adage that people are both 'the problem and part of the solution' (Mike Harre conference speech 2005). Correcting the specific behaviours that make people part of the problem is a central part of public education efforts (Timmins and Blood 2003). For publics to adopt the required behavioural changes, to become more compliant, and for these changes to be enduring, 'people need to trust that there is a reason why they're being asked to do this, not just that they have to' (Carolyn Lewis interview 1:2005). This emphasis on behavioural change is therefore supported by the communication of the concept that 'weeds are a problem', described above. Carolyn Lewis highlighted, however, why this passive or discursive acceptance of weed concepts was not enough:

> You can have a 'No Drag-Net Fishing' sticker on a car that's bloody polluting. So people will talk it, but will they actually walk it and change their behaviour? ... So that's where Weedbusters comes in, it's trying to actually get people to change their behaviours and get involved (interview 1:2005).

This focus on behavioural change is therefore a central aspect of the Weedbuster campaign:

> Weedbusters... you want to change behaviours as well as make people aware. You don't want to just tell people what's the problem, you want them to change the way they do things (Carolyn Lewis interview 1:2005).

The four main behavioural activities targeted by Weedbusters that contribute to spreading weeds are: growing weeds, distributing weeds intentionally, distributing weeds unintentionally, and the inappropriate disposal of garden waste (Department of Conservation 2004). Sara Brill organised a public event in Tauranga in 2005, focused on this fourth behavioural activity, the appropriate disposal of pest plants as garden waste.

Figure 5.9: An example of garden dumping in the foreground of the photo, suggests the source of the smothering vines in the native bush in the distance.

This behavioural issue is connected with the difficulty of generating passive acceptance of weeds as environmentally damaging. This has been compounded by public education drives related to composting green waste, which produce the impression that weeds benignly 'rot down' (Susan Timmins, interview 1:2005). During promotional events at garden centres, members of the public were given vouchers entitling them to free waste disposal of specific pest plants within the Environment Bay of Plenty Regional Council's RPMS. Sara Brill commented afterwards 'One person said it was an incentive to get rid of 'Wandering Jew' (*Tradescantia fluminensis*). They wouldn't have done it if they didn't have the event, the deadline' (interview 1:2005). While removing this plant would have had only a limited physical effect on weed prevalence, the long-lasting function of the event was educative, encompassing public awareness and involvement:

> There's probably just as much 'Wandering Jew' growing in another area by now! It's terrible isn't it! But it will! But that's o.k, little by little, people will get to know what is good to grow and what's not. They get on and do it, then visit their neighbours and tell them, so little by little (Sara Brill interview 1:2005).

This reveals that public education activities attempt to make growing banned plants appear 'anti-social', therefore forming the 'subjective conditions under which contractual notions of mutual relations between citizen and society could work' (Rose and Miller 1992:180). Carolyn Lewis discussed the ways this moral coercion operates:

> Banana passion fruit is another one, because every one remembers it from childhood, and everyone likes eating the fruit... But that seed has been set in their mind that it is something they shouldn't have, and all it will take is one neighbour or one friend to come to the garden and say "Oh god look at that!" They'll be shamed! So that peer pressure is an important thing as well (interview 1:2005).

Peer pressure, or moral coercion, is a key aspect of the governmentality, environmentality and ecological citizenship frameworks, as discussed in chapter two. For governmentality approaches, the operation of the norm labels deviant behaviour, against which people correct their own and other's behaviours. Within Agrawal's (2005a) environmentality thesis, 'intimate government' describes the way regulation at an everyday level utilises existing social networks and relationships to control and coerce behaviour. Within an ecological citizenship framework, Bell (2003:13) discusses the importance of moral coercion and the use of 'social threats and punishments such as sarcasm, mockery, humiliation.' In the context of plant biosecurity, the banana passionfruit (*Passiflora tarminiana*) and the gardener 'shamed' by their friend, both the wider context of moral norms *and* close social networks are significant.

5.6 Understanding How Weeds Spread

I have discussed the knowledge that a biosecurity-aware public needs, and described how required private behavioural changes are encouraged. This appears to map on to the familiar picture of knowledge leading to behavioural change (critiqued by Burgess *et al.* 2000). However, this is not the final stage of public education aims:

> So there's awareness, there's behaviour change, and then there's one step further. That's getting people to the point where they can actually think "this is a weedy *characteristic*," not "this is a weed species". So they might not even know what the plant is, but they can guess that it might be a problem. So that's an even bigger ask (Carolyn Lewis interview 1:2005).

Understanding the concept of 'weedy characteristics,' identifying plant behavioural features that define them as potentially weedy, would allow the public to make interventions *before* the political processes to officially classify and list a plant in the ways described in chapter four are undertaken:

> That's the ultimate stage you want to get to. People saying: "I don't know if this plant is on a list, but look at the way it's behaving." And that is the ultimate of what you want to achieve (Carolyn Lewis interview 2:2005).

> By the time a weed is on a PMS [pest management strategy], it's too late in the lag phase to do anything about it. It's only early on that you can catch it (Helen Braithwaite interview 2005).

Despite the legislative and practical changes made to institutional biosecurity practices due to the shift in attention to earlier naturalising weeds, the public is needed to enable this policy temporality to be successful. The emphasis on preventative and early responses to weed establishment is seen to require 'proactive rather than reactive' public awareness (Timmins and Blood 2003:6), and an alignment with institutional concerns for weed risk. Carolyn Lewis attempts to communicate the idea of 'weedy characteristics' to gardeners through the comparison between a plants' behaviour in their garden and in the bush: 'I always say to garden groups, "If it's like that in your garden, think what it's going to do in the bush"' (interview 1:2005).

This imaginative link between the garden and the bush is seen to be difficult for some gardeners to make. Wayne Cowan, the Plant Biosecurity Manager for Wellington Regional

Council, discussed the difficulties people have associating their own gardening behaviour to the generation of weeds:

> Gardeners can't make the leap between seeing damage in the landscape and understanding their own practice as environmentally damaging. They say "but it's controlled in *my* garden" (interview 2005, original speech emphasis).

The concept of weedy characteristics can, however, construct some plants as 'inherently bad.' This operates to dissolve what Susan Timmins, a DoC weed scientist, sees as the crucial association between human behaviour and the creation of weeds:

> People are unable to make the link between their behaviour and the spread of weeds. Human behaviour creates weeds, but people believe that weeds are inherently bad, they don't realise that they make them that way through their behaviour (interview 1, 2005).

Gardens are therefore constructed as sites in the *production* of weeds, as widely grown non-native plants can achieve a density of numbers that allows them to form self-sustaining populations in the wider countryside. The 'garden as laboratory' extends beyond the more traditional positioning of the garden as a reservoir for weeds, exemplified in the following quote:

> Weeds are spread by wind and birds, so will land in people's gardens, if people don't know what they are, they will become a harbour to spread weeds. Urban areas are the worse place for weeds, all weeds originate from gardens (Sara Brill, interview 2, 2005).

Carolyn Lewis discussed the ways human behaviour is crucially linked to generating weeds:

> Because we've brought them here, we've moved them and spread them around, we're allowing them this loci of invasion. Rather than them coming here from one point and slowly spreading, we've already mixed them, it's much easier for them (interview 1, 2005).

The garden then becomes a place that requires continual observation and control. The significance of the laboratory/reservoir garden is the requirement this places on the gardening public to act as the 'eyes and ears' of the biosecurity regime, watching for these plants turning pest (Susan Timmins, interview 1, 2005). This draws the public into a surveillant role, usually reserved for experts within governmentality frameworks. This is a further way in which the public are required to participate in biosecurity in the private realm. In the

following section, I go on to discuss the needs and justifications for more active bodily participation in public spaces.

5.7 Active Participation in Public Spaces

An emphasis on an active rather than passive public is a key tenet of the Weedbuster approach:

> Agencies can fight it to their hearts content, but without public support and *active* public support, they're fighting a losing battle. So that's what Weedbusters is trying to do, get that support (Carolyn Lewis interview 1:2005, original speech emphasis).

'Active' public support is understood as both individuals making private behavioural changes as discussed, but crucially also participating in public weed control activities through 'Weedbuster groups.'[1] Weedbusters therefore promotes both contractual responsibilities not to transmit pest plants, but also non-contractual responsibilities to participate in weed control activities. The concept of Weedbuster groups developed from the successful 'landcare', 'beachcare', and other active environmental community groups, which have arisen as a phenomenon in New Zealand within the last ten years (Mike Harre interview 2005). In Auckland, 20,000 hectares are looked after by community groups, who focus on both animal and plant pests. These include those plants that have fallen outside institutional focus, categorised under the Community Initiative pest plant category of RPMS, as discussed in the preceding chapter. Groups must be registered through the Weedbuster website, which provides information on forthcoming activities, contacts and press releases. Weedbuster groups receive a 'Weedbuster toolkit.' This includes publicity material such as posters and 'Weedbusters at Work' signs to put by the roadside where work is taking place, practical tools including a booklet on control methods, and sachets of mustang© herbicide. Groups can bid for further funds through conservancies, area offices, or regional councils. This funding covers costs such as tools, herbicides, mulcher hire, greenwaste disposal and promotional activities.

[1] Other forms of active participation include the rearing of biological control agents in schools.

Figure 5.10: A weedbuster volunteer applying herbicide to a stump of *Clematis vitalba,* with the lopping tools in the background.

Groups can also loan a toolkit containing gloves, a first aid kit, loppers, secateurs, handsaws and kneeling pads. Within governmentality frameworks, these material entities are seen as crucial resources stabilising political rationalities.

Public participation provides multiple benefits. There is a tangible need for 'an extra pair of hands' (Sara Brill interview 1:2005). Sara Brill argued that as regional councils often do not pay for follow up work in nature reserves or areas cleared by contractors, there is a real need for community groups or dedicated individuals to undertake this ongoing weeding themselves. The aims behind public participation activities therefore extend beyond their educative function, through this need for practical help:

> If we were to stop controlling pines, we would never recover. If the tramping groups which go through and thrash out pine seedlings every year were to stop, it would never recover, it would be transformed (Peter Williams, interview 2005).

This supports Agrawal's (2005a) analysis that a shift towards community-based regulation occurs where it is impossible to directly employ enough people to enforce regulations. While this represents an 'enmeshing [of the public]...more closely in the process of government and making them accomplices in the project of regulatory rule' (Agrawal 2005a:31), it is also a positive way the public are empowered in this version of ecological citizenship. Wayne Cowan emphasised the social and individual benefits of participation:

> The benefits are perhaps more social, that people will derive value from feeling pleased about their inputs, will learn as they are doing it, and will take that back to their and other people's gardens (interview 2005).

Wayne Cowan argued that biosecurity participation was inherently a good thing, and allowing people to be involved in something 'good' contributes to a positive change in their environmental behaviour, and social attitudes more broadly. Influencing environmental values through participation is central to the Weedbuster philosophy. Participating in weed control activities is seen to promote public understanding, actively control weeds, and boost public and institutional moral. As Agrawal argues, participation is not just necessary for the actual processes of control, but crucially in generating concern that 'renders environmental protection a moral act' (Agrawal 2005a:22). In chapter two, I highlighted a tension in the perceived direction of influence between behavioural change and environmental values within environmentality and ecological citizenship frameworks. While Agrawal (2005a) argued that participation in regulation was a context through which people revised their subject positions, Dobson (2003) suggested that ecological citizenship could bring about shifts in values at a deeper level than shallow approaches that target behavioural change. The Weedbuster approach to participation draws these positions together. Publics are empowered to join and contribute to this version of ecological citizenship through participation. This is intended to contribute to both changes in values at deeper levels, but also private behavioural changes, as participants take their understandings of weed issues gained in the nature reserve back to their garden. As more people become involved in restoration projects, the increasing familiarisation and appreciation of native plants will also, it is hoped, stabilise the gardening trend for native plants: 'You may have that trend fade in the garden... but because they're actually using them in their bush areas, there'll always be that appreciation (Carolyn Lewis, interview 1:2005). In the following, I go on to consider how the biosecurity regime attempts to influence these public attachments to native and non-native plants, by enrolling plants as educative tools.

5.8 ALTERING DESIRE FOR NON-NATIVE PLANTS

These different aspects of public education produce a public 'responsive' to pest plants. Susan Timmins, however, discussed the need to go further than this, by altering the gardener's impetus to bring new non-native plants into their gardens:

> If we could get into the hearts and minds of people, if we could change their gardening behaviours, we could actually do something about weeds that was more effective, that was beyond the next batch (interview 1:2005).

> While regulation and border protection offer some protection, an educated gardening community will be an important first defence against the oncoming flood of exotica (Timmins and Blood 2003:6).

Institutional efforts to alter this desire for non-native plants operate through what I term replacement techniques. These modes of public education extend beyond the provision of information in different formats, by attempting to substitute an object, a native plant, as a 'friendly alternative' within existing gardening practices. These are 'positive measures' of governance, which contrast with the 'negative measures' of regulatory enforcement as subtraction (Rose 2001:4). Sara Brill, for example, organised a 'weed swap' as part of a 'Weedy Week' of events in the Bay of Plenty. On production of pest plants removed from private gardens as green waste, a native plant was offered to replant in its place. Auckland Regional Council also hold plant swap days, and these events are becoming popular and well attended (Mike Harre interview 2005). The ongoing interaction with the new native plant is seen to continue the public education opportunity, as the gardener learns about the benefits of native plants, and communicates this to friends and family (Helen Braithwaite, interview 2005). It is hoped that interactions with native plants will dispel certain conflicting 'myths' about native plants held by the gardening public:

> Natives aren't grown, people think they can become a nuisance if they get too big, although they're also seen as slow growing. Whichever way they're not thought of as an ideal garden plant (Wayne Cowan interview 2005).

Providing native plants to gardeners allows plants to operate as public education tools in themselves.

The 'Plant Me Instead' booklet also operates through this replacement method of public education. First produced in 2002 as a collaboration between Auckland, Waikato, Northland

and the Environment Bay of Plenty Regional Councils, it is now adapted and utilised by regional councils across New Zealand. The colour booklet is designed to look like a gardening catalogue, with attractive photos and sections on grasses and ferns, ground cover plants, shrubs and trees, creepers and climbers, and aquatic plants. A page is devoted to each pest plant. On half the page there is a photo and description of the pest plant, its dispersal techniques, and its environmental effects. Below, two environmentally benign alternatives to the pest plant that grow under similar conditions, and broadly fulfil similar aesthetic requirements, are pictured and described. If any of these alternatives are New Zealand natives, they are marked by a small symbol of the kiwi. For example, the popular pest plant Mexican daisy (*Erigeron karvinskianus*) is given the pictured 'Plant Me Instead' alternatives of the New Zealand linen flax (*Linum monogynum*), and verbena (*Verbena x hybrida*) (see figure 5.11 below).

The balance between the use of natives and non-natives as 'friendly alternatives' has caused some issues for authors of the booklets. Despite the perceived need to encourage the use of natives, contributors to the original issue were cautious about being seen as anti-exotic:

> You've got to be careful because a lot of people like exotics, you don't want to turn them off the message, because they'll always want to grow exotics... Because you don't want to be seen as exotic bashing (Carolyn Lewis interview 1:2005).

A native and non-native 'friendly alternative' were therefore chosen for each pest plant profiled. However, the growing knowledge of risky characteristics, discussed in the preceding chapter, has led to a greater cautiousness in suggesting non-native alternatives:

> A lot of people are despairing about how many things are going to go weedy. I mean, we had this problem with that *Plant Me Instead* book, because the first issue that went out, someone looked at it two years later and said "Oh shit, some of these things probably are going to go weedy" (Carolyn Lewis, interview 1:2005)

In response to this inherent indeterminate nature of plants, and a perception of the increased receptiveness of the gardening public to native gardening, in 2005 Wellington Regional Council produced an all native 'Plant Me Instead' booklet. Other regional councils were waiting to see what the public reaction to it would be.

Figure 5.11: The 'plant me instead' alternatives for the popular Mexican daisy (Auckland Regional Council 2005:82).

A crucial way in which native plants are promoted, and plant biosecurity concerns are played out, is in debates over the use of natives and non-natives in public areas. The current trend for native plants in domestic gardens is thought to have been initiated by designers doing public planting, such as council gardens, roundabouts, and public amenity areas (Wanganui garden designer, interview 2005). The use of native plants in public areas links to public education of plant biosecurity ideals in a number of ways. Firstly, through the metaphoric association with previously held perceptions of amenity planting, this has helped create a perception that native plants are easy to look after (Wanganui garden designer, interview 2005). Secondly, the familiarisation that plants attain through their use in public spaces is seen as essential to promote a deeper level of support for plant biosecurity ideals:

> Just say you'd only ever grown up around willows and gorse, the chance of you valuing indigenous plants is very slight. You wouldn't, you would find them foreign... The arguments about bringing native plants into the city is to get people to have a greater awareness and value for indigenous plants and animals (Peter Williams interview 2005).

This emphasis on the importance of the remembered landscape in the valuing of specific flora assemblages, links to the impulse to recreate New Zealand 'like home' in the acclimatisation practices of British settlers, discussed in chapter one. These debates are being played out in Christchurch, known as the 'English Garden City,' or the city, as Carolyn Lewis described, 'stuck in a horticultural time warp' (interview 2:2005). Colin Meurk, an ecologist working for Landcare Research, is the key proponent for the use of natives in Christchurch. Peter Williams described the tenor of the debate:

> He's trying to bring back the native component into the city, but there's huge opposition to it, it's hilarious. You read the letters in the paper, it's open warfare between Colin and his supporters, and people in the city who want pictures of the city with punts and weeping willows (interview 2005).

This 'open warfare' is again based on an assumption of native purity. Colin Meurk campaigns for 10% of new planting to be with native plants, to familiarise and build appreciation for natives within Christchurch (interview 2005).

This association between public places and native plants is not unanimously held by institutional actors. Mike Harre, for example, argued that urban areas were highly modified environments, to which alien plants, emanating from Europe, were better adapted (interview 2005). He argued that it was hypocritical to only plant natives in urban areas. In Auckland, the City Council 'beautifies' motorway roadsides with wild (non-native) flowers. This presents difficulties for Auckland Regional Council, who 'don't want to be a wet blanket, but they're planting environmental rubbish' (Ian Popay interview 2:2005). Ian Popay expressed his concern that this would set an example amongst the public:

> This'll be a good citizenship thing: 'Oh look at what Auckland are doing, I'll do it too, I'll buy some lupin seeds and spread them down the braided river systems' (interview 2:2005).

There is the concern that the ecological citizenship duty to nurture the environment in New Zealand only has an unstable contemporary association to native plants, just as it radically shifted from acclimatisation to biosecurity practices.

5.9 Public Education as Information Gathering

In this final section, I will return to the weed awareness stall at the garden show, to argue that these public events are as much about information gathering as they are about information provision.

Firstly, this involves gathering information about new weeds and the spatial extent of weeds. Visitors asking for advice about how to remove certain plants can alert regional councils to the problems plants are causing through invasive behaviour in private gardens before they reach the nature reserve. A visitor to the Wanganui stall mentions a violet bought from a garden centre that she noticed has an invasive quality (Wanganui visitor 10:2005). Visitors also report on the location of existing pest plants in the landscape, signalling their regional extent. On the stall at Gardenz, a visitor reports a sighting of a particularly invasive water-weed in a local river. The DoC staff member takes down both the geographical details of the sighting. On the Wanganui stall, a farmer starts a conversation with Craig Davey: 'You got much nodders [nodding thistles] here?' (Wanganui visitor 11:2005). He goes on to tell Craig Davey where he has spotted it. This information is vital for biosecurity agencies to keep up with newly emerging weeds. The public are not, however, always forthcoming of this information. One lady refused to tell Rob McCaw, the plant biosecurity team leader for the Central Region, Canterbury Regional Council, the location of a garden which she admitted contained the banned purple loosestrife. She argued that it was pretty, well controlled in her garden, and not a problem in the South Island. This suggests a close attachment to particular plants, a personal interpretation of the effectiveness of individual biosecuring activities, and an understanding of the regionality of weed issues. These themes are discussed in the following chapter.

The garden show provides biosecurity agencies with a second information gathering opportunity: a gauge of public opinion. Biosecurity personnel are able to informally trace the changing reception to their message over the years. Carolyn Lewis described the public reaction they received when the Accord was first brought in:

> I use the Hamilton garden show as an example, it happens each year and it's a really good gauge of public opinion. The first one we did was about eight years ago, because that's when they brought in the national list. It was just awful, everyone hated us, it was the most horrible show. "Plant Nazis, you're telling me what I can't grow, but it's a beautiful plant" (interview 1:2005).

Over the years that the Accord and related biosecurity legislation has been in place, and as public education campaigns have continuously profiled the biosecurity message, the reactions received to the weed awareness stall at garden shows have gradually changed:

> You can see things change over the years. It's just anecdotal stuff, but the following year people will know that some plants are banned. The year later they might have got rid of one thing, but will say: "I'm still not going to get rid of this." A year later it might be "I do love that one, but I have got rid of it." Right up until now where people say "Why are you bothering?" (Carolyn Lewis interview 1:2005).

Helen Braithwaite estimated that it takes three to five years after a publicity push for a plant to sink in to public consciousness as a weed. During interviews with biosecurity personnel, historical shifts in public reactions to weed awareness stalls were drawn on as 'evidence' in response to my questions about both changing public values and how to measure public communication success. Carolyn Lewis terms particular highly popular pest plants 'indicator species,' as they offer a sensitive accurate gauge of public opinion:

> Ours is Mexican daisy. At the shows we used to put it right in the middle of the stand [laughs] so everyone would see it. We'd get so much shit about it... Now they'll come in and say, "Oh I do love it, but I know it's such a problem." Before it was like a red rag to the bull. When you hear that about those key indicator species, you know you've won the battle (interview 1:2005).

Banana passion fruit *(Passiflora tripartita)* is a contemporary 'indicator species.' An iconic and evocative plant from many New Zealander's childhoods, it has attractive flowers, and a fruit that is incorporated into traditional home-baked puddings. Having this gauge of public opinion allows biosecurity agencies to informally review the effectiveness of their communication efforts. This includes what information and messages have been absorbed, and what the key barriers are to the public acceptance of biosecurity ideals. These informal methods are drawn on alongside more formal approaches for researching public opinions and assessing the effectiveness of public education campaigns. Weedbusters, for example, commissioned a telephone survey of public knowledge, attitudes and concern towards plant biosecurity issues at the start of the campaign, as a 'baseline' to measure its achievements. These various methods of deriving knowledge about publics contrasts with the emphasis

within environmentality frameworks on the production of expert knowledges about non-humans, as discussed in chapter two. However, Susan Timmins highlighted the difficulties of connecting this public awareness to the ultimate objective of conserving native biodiversity:

> It might get media attention, it might raise awareness, but did that affect behaviour with people not growing certain plants? And did that affect how weedy reserves are? And did that actually increase biodiversity value? We don't actually know... We don't know how changing people's behaviour affects how weedy New Zealand is (interview 1, 2005).

The problem of representing plants as objects of control 'in forms in which they can enter the sphere of conscious political calculation' (Rose and Miller 1992:182) was considered in the previous chapter. This was overcome by drawing on practical, experiential expertise. In this chapter the discussion has been extended as I considered the way public experiential knowledge is also drawn on by the biosecurity regime in their effort to know and control pest plants. The public themselves are difficult to know, and again this has been overcome by utilising experiential knowledge gained through direct encounters at garden shows. The quote above connects the difficulties of 'knowing' the public to the difficulties of 'knowing' weeds.

5.10 Summary

These different methods of public education, persuasion and regulation are undertaken in a myriad of ways by all the agencies with biosecurity responsibilities. This discussion disturbed a simple picture of education and enforcement in a number of ways. Firstly, it is evident that the public are far from passive. This ranges from social norms of courtesy influencing the way pest plant officers approached enforcement activities in the domestic garden, to the essential role the public play in the practical task of weed removal activities. Secondly, 'public education' was shown to involve the communication of practices not just ideas, the opportunity to express institutional non-purism, and an information gathering exercise. Finally, plants themselves emerged as crucial communicative objects. They are used to provide the public with experience of the bad behaviour of pest plants' in the wider landscape, and the good behaviour of native plants in the domestic garden. These interactions between plants and publics in the context of plant biosecurity concerns form the subject of the following and final empirical chapter.

6

BEING A BIOSECURE NEW ZEALAND CITIZEN: LEARNING, DOING AND BELONGING IN THE 'SHARED' GARDEN

> To understand regulatory rule... it is necessary to examine how rule is experienced by those subjected to it (Agrawal 2005a:18).

6.1 INTRODUCTION

The domestic garden has been shown to be a highly significant site for plant biosecurity governance in New Zealand. In this chapter, I pay attention to 'private' gardening practices and forms of personal 'biosecuring', and 'public' biosecurity-related participation, as I consider the meanings and understandings generated through the interactions of publics' with biosecurity discourses and requirements. In doing so, I draw on 24 garden-based interviews undertaken with 30 domestic gardeners based in Auckland, Hawke's Bay and Christchurch, and participant observation and in-depth interviews within 6 community-based weed control and native regeneration projects.

The garden is presented in academic literatures as both the archetypal hybrid site (see Franklin 2002; Hitchings 2003), but also, in the context of settler societies particularly, as a site of the playing out of anxiety over boundaries between nature and culture. These are expressed through 'narratives of redemption', issues of purity, and the question of belonging (Head and Muir 2006; Wilson 1991). In this chapter I consider the ways the politicisation of gardening plants and practices through biosecurity influences these differing positionings of the garden. I argue that this politicisation, together with the actions of gardeners, weeds, native birds and biophysical elements, blur the public/private distinction between the domestic garden and the wider New Zealand landscape, leading to the metaphor of the 'shared' garden.

6.2 National Ecological Identities: Associations between Native Plants and Place

My initial encounter with the opinions of my interviewees regarding biosecurity suggested broad, strong support for biosecurity ideals. Revealing this level of abstract support is Astrid's desire for: 'the more stringent the better' (interview 2005), Cathy's sense that it is 'better not to risk it' (interview 2005), and Carol's that 'you can never be too strict' (interview 2005). In fact, none of my gardener interviewees expressed full disagreement with the principles of biosecurity, or the need for a level of biosecurity protection for New Zealand. Linda expressed mixed attitudes, saying that she would rather have biosecurity than not, but felt that it has gone too far with blanket policies. In contrast, Astrid, a gardener from Christchurch, believed that not enough plants were banned to really affect private gardeners. This difference can be traced to the different histories of my interviewees as gardeners. As a former nursery owner and plant breeder with a large garden in Hastings, Linda has an understanding of the biosecurity issues affecting the nursery trade. Those of my interviewees involved in public participatory practices were particularly strongly supportive of biosecurity principles, being motivated to actively undertake biosecurity-related activities in public settings. What is significant, however, is the discursive context of this aspect of the interviews. These discussions regarding biosecurity were held outside both the physical and conceptual space of the domestic garden, being undertaken at the kitchen table prior to asking questions about individual gardens and gardening practices. I will go on to argue that by taking these interviews into the garden and into the context of practical involvement with public and private forms of 'biosecuring', a more nuanced and complex picture emerges.

This abstract support for biosecurity was strongly linked to a sense of national identity. Milly, a Christchurch gardener, was proud of her country's biosecurity approach, and spoke about the security afforded by the isolation of being 'a little island nation' (interview 2005). She relayed the way in which she defended New Zealand's biosecurity approach when teased about certain border control practices by friends visiting from abroad. This was reiterated by Astrid, who views New Zealand as an ideal place to live that needs to be protected. She described herself as 'strongly protective of our little island' (Astrid, interview 2005). This support for biosecurity principles was justified through both ecological and agricultural concerns. I encountered a great deal of sympathy for issues affecting farmers, and this was

suggested to be due to the closeness of New Zealanders to the land and agricultural systems: 'as everyone either knows someone or is related to someone who works within agriculture or horticulture' (Milly, interview 2005).

Attitudes towards biosecurity agencies were site and context specific. I encountered a high level of trust in the decision-making process behind biosecurity policies related to plant restrictions. Cathy, a gardener from Auckland, thought that there was always a 'good reason' behind plants being banned from trade or the garden (interview 2005). Milly also believed that biosecurity requirements were always based on ecological criteria, and interpreted my question to be suggesting that this was not always the case: 'what, aren't they?' (interview 2005). While this seems to reveal a taken-for-granted trust in biosecurity decision-making, when respondents reflected on their more personal interface with biosecurity requirements, this acceptance was fractured and challenged in key ways. This will be discussed further below, but what is particularly significant here is the active way respondents distinguished between 'accurate scientific criteria' and political practices (Carol, interview 2005). Carol, with a large garden backing onto a restored bush fragment in Hastings, believes that it should be scientists and scientific criteria that set biosecurity standards, rather than politicians, consumers or industry: 'it's the only way really.' The exception to this generic trust in science was from Linda, a former nursery owner, and Chris, her partner and a plant collector, who both questioned the scientific knowledge and experience of biosecurity personnel, and suspected that Auckland Regional Council determined plant biosecurity priorities in other regions rather than local bodies.

Institutional biosecurity concerns were understood to be motivated primarily by attention to land-based industries and rural areas. In contrast, the personal motivations of my interviewees' were more closely aligned to concerns for native nature, despite their sympathy for the farming community. Cathy spoke about the need to keep native forests pristine, and to keep foreign plants out. This was expressed through a sense of a 'right' and 'wrong' place for plants, based on a perceived floral nationality, or on correct ecological communities. Exemplifying this, Astrid argued that pines 'don't fit' in New Zealand's beech forests, Emma suggested 'Sherwood forest is the best place for oak trees', and Cathy told me that lupins *(Lupinus spp.)* 'shouldn't be there, haul them out!' These connections between native plants and national space were often made with reference to New Zealand's settler history. A founder member from the Addington Bush Society in Christchurch, a community group

involved in native bush restoration activities, said 'settlers from England want to turn New Zealand into England, but it's not the same place' (Tracey interview 1, 2005). One attendee at the Travis Wetland Trust AGM, a community group involved in weed control activities within Travis Wetland told me of Christchurch: 'We called this city the 'foreign garden city', we like to joke "How far is it from here to New Zealand? 40 kilometres!" These public understandings of biosecurity are therefore as strongly associated with growing native plants or restoring natural areas, as they are about controlling pest plants.

In contrast, native plants and habitats were repeatedly represented as the true national natural character. Astrid expressed her feelings towards native plants simply; 'I like them because they are from here' (interview 2005). This association between a native ecology and national identity also influenced Milly's affection towards native plants, and she spoke of her pride and sense of belonging when she saw iconic New Zealand natives when abroad:

> If you're visiting a garden in Britain, and you see a cordyline or a bronze flax it's like, it's yours, it's like your country's, it's a symbol... I like them because they belong in my country, I love seeing them in the bush, ... and I love seeing them in my garden, and I love, I think it's what they stand for. It's very patriotic! It's a good thing! (Milly 2005).

These plants represented a sense of self for Milly, as whilst she traced her ancestry to Britain, she felt very much a 'New Zealander.' This expressed enjoyment of native plants justified through recourse to national identity ran across my interviews, and included native plants in the wider countryside and their use in the domestic garden. As Cathy explained: 'Most New Zealanders really love the bush.'

Native plants were a feature in all but two of my respondents' gardens, and they were usually mixed in amongst other garden plants, contributing to the overall tapestry of the garden, or formed a particular section of the garden, frequently at the end. Sally, a weed campaigner, had replaced her country cottage style planting with entirely native plants.

Figure 6.1: Sally's all-native garden

These were calm, green areas, full of the 'wonderful foliage of native trees and plants' (Astrid, interview 2005). When walking through these separate native areas of the garden respondents spoke in more hushed tones.

Figure 6.2: The photo on the left shows the area of Carol's garden near the house. This contains a mix of garden plants. On the right is a photo taken at the end of her garden, where she is restoring a fragment of native bush.

Native plants were a particularly dominant feature for my respondents who were involved in public weed control or native restoration activities, or who worked as Pest Plant Officers (PPOs). This blurs any distinction between national and individual ecological identities.

Such interest in native gardening has been identified as a distinct trend across the western world. Franklin (2002) associates sensitivity to locality in garden design with the vision of Frank Lloyd Wright, who introduced indigenous plantings into his prairie gardens. This developed into an interest in native gardens, which in New Zealand became as much about defining a national gardening style distinct from its British counterpart, as it was about using more environmentally suitable plants. The environmental movement of 1970s has also been associated with the growth of native gardening, as the suburban gardening regime increasingly came to be seen as environmentally inappropriate, damaging, and unsustainable (Franklin 2002). However, the enduring influence of British 'country cottage' gardening styles and plants, and the difficulties of developing a New Zealand garden style due to the micro-climate variability of New Zealand, will be discussed further below.

Drawing on the work of Mary Douglas (1966), Head and Muir (2006:507) consider native and alien plants in the domestic garden in relation to the ordering practices and exclusionary discourses reliant on binary discourses which 'leave some things not belonging'. With committed native gardeners, this purity of native plants and their strict association to a specific environmentally correct space is extended to 'local natives' or correct ecotypes (Head and Muir 2006). To the purist it is possible to plant 'the wrong type of native.' For example, Briony, in whose large Christchurch garden her native planting area was strictly separate from her 'cottage flowers' area, showed me a map produced by the Addington Bush Society that listed the specific native plants that would have grown naturally in her area. Having once received a North Island variety of a native plant from a nursery, she now carefully sources local native plants from a different, specialist nursery. This fractures the association between native plants and national space, making national iconic plants such as the Pohutakawa (*Metrosideros banks*) as alien in the South Island as the English Rose.

The concept of correct environmental fit through claims of natural originality is familiar in native/alien debates. It is further fractured, however, through the mixture of cultivated native varieties and species-true native plants that the gardeners used. Some of Milly's hebes and

flaxes, for example, had been bred to 'fit better' into the garden, with attractive coloured foliage and flowers, or reduced sizes. These culturally adapted natives have been shaped for the garden along aesthetic lines defined through a combination of plant and human creativity. 'Naturalness' in this context is therefore reliant on human expertise and technological procedures (Franklin 2002). This is not an invisible process to my respondents. Cathy, for example, discussed the ways native plants had both 'evolved more and made easier to grow in gardens,' although she was keen to point out that people also had native plants in their gardens that were the same as specimens one would find in the bush (interview 2005). Gardeners themselves also participate in this 'creation' of naturalness: as the aesthetic appreciation of native plants created complex and contradictory associations with other types of plants that produced the same aesthetic effect in the garden, such as sub-tropical spiky plants.

The environmental suitability of native plants in the domestic garden had further contradictions and ambiguities. While Linda argued that New Zealand plants were suited for New Zealand, meaning one could put them in the ground and know they would do well, Chris questioned how well native plants were now adapted to an anthropogenically altered New Zealand. Milly justified that she could not grow native plants alone, however, as her local ecotypes were uninteresting and as native plants were slow growing. The lack of seasonality exhibited by native plants was a frequent complaint raised by my interviewees, and this greatly affected the enjoyment of the changing biophysical processes in the garden. The use of native plants in this context has therefore been to *reduce* the sense of connection with natural processes. As Franklin (2002:144) argues, the gardener is above all else 'watching for change', as the garden draws the gardener into its myriad processes of change, an 'aesthetic of natural processes'. This gardening aesthetic of change therefore emerges as associated with specific ecological assemblages that have come to be expected within the garden, and which affects the enjoyment of native plants for some gardeners. 'Natural' native plants become associated with the unnatural 'suburban' gardening aesthetic of the evergreen (Franklin 2002).

This fracturing of the natural processes/native plant association confirms Head and Muir's (2006: 510-511) identification of the 'considerable diversity in both the conceptual and material boundaries' structured around spaces and species, and the ways these are reinforced and transgressed. They argue that the 'dividing line (between what belongs and what doesn't)

is drawn in many different places under a variety of influences, and is thus highly contingent.' Drawing on Whatmore (2002), they suggest that any differences that emerge between what becomes 'nature' or 'culture' or 'belonging'/'not belonging' is relational rather than static, and takes particular forms in varying contexts. This includes the varying contexts of different gardens. The influence of biophysical processes that traverse the domestic garden does not link simply to a discourse of nativism, as the relational negotiation of these processes generates connections with non-native plants and discursively associated places. Astrid, for example, uses plants from regions in Australia and South Africa whose growing conditions match those of her garden.

Figure 6.3: Astrid's garden in Christchurch contains many Australian and South African plants, to match the conditions of her garden's maritime setting.

She felt she shared more with these distant places than with other regions in New Zealand in terms of the opportunities and constraints imposed on her garden by climate. This regionality of climate in New Zealand is seen to be a key reason behind the perceived difficulty of developing a distinct New Zealand or 'pacific' gardening style. This gaze abroad reflects an earlier gaze to England, but is now justified or produced through reference to physical links, cohering unexpectedly with a discourse of environmental suitability that usually supports arguments for native plants in gardens.

A further ambiguity associated with native plants and natural processes revolved around understandings of the link between native plants and native birds. Bringing native birds into the garden was a key motivation the behind planting choices of my respondents. Through experiential knowledge of what fruits and flowers birds appeared to enjoy in their own gardens, my respondents had differing ideas of the benefits of native and non-native plants in this regard. Linda planted 'not only native plants' to draw birds back into her garden (interview 2005). This 'un-natural' alliance also operated in the opposite direction, as native birds dropped the seeds of non-native plants, disrupting the sanctified native spaces that existed in some of my respondents' gardens. This relationship between native birds and non-native plants is ambiguously understood and a source of considerable debate and tension. Head and Muir (2006) argue that knowledge of these unholy alliances arise through practical engagements available to the gardener through gardening, and assign non-humans considerable agency.

A further way in which this rigid association between native plants and New Zealand national space begins to break down is through the enrolling properties of aesthetically attractive alien flowering plants. When questioned about alien plants growing in the wider New Zealand environment that they enjoyed, interviewees revealed more ambiguous responses to pest plants than their initial disapproval suggested. Milly described her 'head and heart' response to lupins *(Lupinus polyphyllus)*. She said she loved their colours, but spoke at length about the way they must be damaging the braided river systems as 'they shouldn't be there' interview 2005). She then confessed to collecting their seeds to sow in her own garden. Astrid also discussed her enjoyment of lupins and hydrangeas when I asked about non-native plants in the New Zealand countryside. She went on to explain that 'New Zealand plants are not so colourful compared to pretty English things in the bush!' (interview 2005). Astrid referred to the cultural history behind these plants, of hydrangeas growing around the

abandoned properties where they would once have been controlled, and of early settlers scattering lupin seeds to beautify the countryside. Cathy also spoke about how beautiful she found agapanthus, but still believed that it should be removed.

We are beginning to see how it becomes difficult to sustain the initial picture of a unified national ecological identity or a sense of ecological citizenship tied, as Bell (2005) suggests, to a national bounded territory in line with the requirements of the biosecurity regime and normalised through the use of native plants. A fracturing of these notions occurs through the instability of the association between native plants and naturalness, through the alliance between alien plants and native birds, and through the enrolling properties of aesthetically attractive alien plants. This suggests that the abstract discursive space in which these conversations were held is not a stable place where ecological subjectivities are per/formed. In the following section, I move on from considering these 'national ecological identities', to a discussion of the personal identity associations formed between people, plants and spaces. This attempts to tease out some of these 'head and heart' contradictions.

6.3 Personal Ecological Identities: Plants, Embodied Memories and Social Exchanges

This section draws from the parts of my in-depth interviews with domestic gardeners where I drew discussions away from considerations of biosecurity and native plants in the abstract, and asked my respondents about their personal motivations for growing particular plants in their gardens. These discussions were sited within the garden itself. This very different discursive context produced greater nuances and contradictions in the positioning of individuals within wider biosecurity concerns. Emerging from these discussions was the significance of the embodiment of memories in plants as a justification for choosing or retaining them. This operated in two key ways, through the *representational* and the *interactional*.

When discussing their present garden or gardens they had tended in the past, my respondents referred to memories associated with particular garden plants, as a significant justification for choosing to grow these plants. As Brook (2003:232) argues, 'people connect to place through

plants, and these emotional connections are often forged in childhood or through long associations.' This included plants that represented childhood gardens, a memory of a parent, or an ideal of the British countryside. Cathy described in detail the plants that grew in the region where she spent her childhood in England; in particular cowslips (*Primula veris*), bluebells (*Hyacinthoides non-scripta*) and primroses (*Primula vulgaris*) were poignant reminders for her of 'home'. She referred to the smell of wallflowers (*Cheiranthus cheir*), which grew against the orchard wall at the end of her parents' garden. When Linda started her first garden, she was motivated by the desire to have a garden 'just like my mother had in England' (interview 2005). These memories seemed to be experienced particularly vividly. Indeed, Linda said she could describe in detail both her mother's and her grandmother's gardens, and said she always heard customers at her garden nursery remark 'my mother used to grow that!' These memories were sometimes not direct memories, but had been formed through images such as childhood books or pictures on the wall of childhood houses. They were also related to other people's memories. Astrid, for example, described how her grandmother would talk about the flowers she remembered from driving in a horse and carriage through the parks in London. The significance of British 'country-cottage' garden styles as an influence on garden forms and practices in New Zealand cannot therefore be overstated, and was supported by the dominance of British gardening magazines and books available in New Zealand. The use of these styles and plants by my respondents, was, however, frequently connected by them to a more personal memorialisation, rather than the replication of a generic style.

Roses are a feature of Milly's Christchurch garden and she attributed this to their association with the garden of her parents who as ex-pats from England, looked to the 'home country' and reflected this in their choice of plants and gardening style. In contrast to her parents' clipped standardised roses, a key New Zealand trend of the 1950s, Milly's are huge and sprawling, 'a bit more like me' she joked, and more like the pictures she remembers from a favourite childhood book (interview 2005).

Figure 6.4: Milly's roses

The embodiment of these memories in these roses has therefore undergone a modification; they have folded into other memories, and into her sense of self. They link to a received nostalgia for a sense of Englishness, but also of an early colonial New Zealand. This suggests that the memories and emotional connections that Brook (2003) refers to should not be regarded as static, but as continuously forming, being reinforced or merging.

The plants grown to embody these significant memories were effectively representations of the plants remembered rather than being the actual plant itself. Another connected theme running across my interviews was the practice of physically exchanging plants, seeds and cuttings with friends and family and the emotive strength these plants held over my respondents. This direct process of exchanging plants and cuttings with friends, and the ongoing cycle of tending these plants, draws the people and places they embody into the present space-time of the garden. Milly (interview 2005) told me 'I am never alone in the garden, as it is like an ongoing conversation with friends.' When we walked around her garden, Milly occasionally forgot the name of a plant, and referred to it using the name of the

friend she received it from. She told me that she rarely leaves a gardening friend's house empty handed. I asked what it is she remembers about a specific plant acquired in this way:

> You remember everything, you remember the day you got them, moving them in, stuffing them into the back of your car, you remember the person, hugely, you remember where it was in her garden (interview 2005).

Astrid also always remembers the source of 'special' plants, gifted from her mother or from a friend's garden. Plant and cutting exchanges are also organised through gardening clubs. Emma highlighted the significance of these plants if they were from a friend or relative who has since died. This connects to the practice of planting a tree or shrub in memory in the event of a bereavement. Emma referred to a plant given to her by a friend who since died, which she 'always tries to keep going', both within her own garden and by giving cuttings of the plant to as many people as possible.

In this way, plants not only 'jump the fence' but are actively passed over them ('or sometimes they're filched', Astrid interview 2005). This practice is both a cultural expression of friendship and intimacy, but it also contains a distinct physicality: taking the cutting then potting it on or replanting it in ones garden, keeping the soil moist until it takes to its new home. This is supported by the biophysical hospitality of the New Zealand environment as cuttings are, I was told, much easier to root than in England. The plants exchanged were predominantly non-native plants. Cathy (interview 2005) told me that she had 'less confidence taking cuttings from native plants, and they're also hard to grow from seed.' This could be due the development of gardening expertise and knowledge that becomes attached to particular groups of familiar garden plants.

The interaction between these embodied memories and the plants themselves take particular forms due to the materiality of plants and our ways of experiencing these materialities. It is the biological properties of plants that allow them to be cut and grown on to form a new individual at a different spatial location within a reasonable timescale, making them suitable for this form of gifting and exchange. While both plants and animals are frequently used to represent national identity or to symbolise organisations or places (Dunlap 1999), animals are rarely used in the same way to symbolise or memorialise specific people. This is perhaps because their own identity and visual autonomy is too strongly experienced by humans to be representative of other lives (Hitchings and Jones 2004). In contrast, plant agencies are

performed in ways that can be experienced as both life-less or passive enough to represent other lives, and symbolic of life to be a fitting response to death. Our cyclical relationship with plants after death is a further association that makes plants appropriate memorial symbols of people. I have described these memories as 'embodied' both because of the plant's own corporeality, so memories are embodied within the plant, and because of the ongoing bodily interactions between the plant and the gardener within which these memories are generated.

These embodied memories do not always engender a positive interaction with plants. Emma pointed to a particular plant in her garden that she does not like, but tries to do her best for as it was a gift. She said she 'always feels negative' when she thinks of it (interview 2005). Cathy also revealed that the 'Wandering Jew' (*Tradescantia fluminensis*) she battled with in her garden was a present from a friend. Milly spoke of the difficulties of not accepting or removing plants acquired in these ways, even if she struggled with them, or if they were banned due to biosecurity concerns. Milly showed me a pot of Wild Ginger (*Hedychium* spp.), a pest plant, languishing by the shed, which had been given to her by a friend. She had accepted it when it was offered, but felt guilty about planting it as she knew it was a 'baddy' (interview 2005). She had left it there where it might 'accidentally' die from lack of watering. Milly did choose to grow gunnera which she described as a 'quasi-banned' plant. Gunnera is closely tied up with Milly's childhood experiences of plants. Through our conversation, she thought through why she enjoyed having this particular plant in her garden, and decided that she would not remove it even if it was classified as 'code red'. Astrid also speculated about whether she would remove a particular plant that contained significant memories for her if it was banned due to biosecurity requirements.

Hinchliffe and Whatmore (2006) argue that ecological attachments between people and living plants are forged in action, as those people take responsibility and care for seedlings and saplings that they have had a hand in cultivating. They argue that these shared embodiments of people and things form what they term a 'biopolitical domain', a realm of personal political concern for particular natures (Hinchliffe and Whatmore 2006:133). In the ways described, however, this responsibility and biopolitical attachment towards individual plants can conflict with a sense of responsibility for a wider nature produced through biosecurity concerns. This conflict can be seen in the problem respondents have removing plants with embodied memorial status, and has profound significance for the biosecurity regime. Bell

(2005) refers to the liberal 'cost proviso' of citizenship, that if the personal cost of promoting the ecological good is too much, one's duty lapses. In the context of memorial associations to plants, how is this personal cost determined? As the previous chapter revealed, it is not only gardeners but also Pest Plant Officers who interpret some memorial associations to plants as more important than enacting biosecurity requirements.

Milly referred to her garden as 'a patchwork of memories' (interview 2005) and I want to use this metaphor to think through the ways in which different time-spaces, foldings and enfoldings make up these lively gardens. Co-existing plants embody personal memories and national memorialisation of the pre-human New Zealand environment in potentially contradictory ways. These plants make connections, bridging distance and time by bringing people, places and one's own past into the living, growing garden. This mixture of native, British and other international plants used within respondents' gardens leads to a high level of awareness and literacy of the country-origin of garden plants. When I asked respondents to describe their gardens, the majority first described their perceived style, frequently 'eclectic' or 'a mixture,' and then detailed the predominant plant nationalities: 'I use a lot of South African and Australian plants' (Astrid interview 2005). The variety of plants used included specimens that originated in South Africa, the Mediterranean, Australia, California and China. Plants referred to as 'British' plants included plants thought to originate in Britain, as well as plants adopted within a British gardening style, including roses and camellias. In spite of the considerable ecological and social complexity (Head and Muir 2006) contained within the categories of native/exotic, I found that my respondents had a high level of confidence using this distinction and it was even taken for granted as understood within the garden.

It is important, however, not to overemphasise these associative choices for particular plants. One nursery owner I spoke to estimated that at least 50% of his customers want to have something that their neighbours have not got. These justifications for particular plant choices are therefore mixed up with the centrality of innovation, difference, and variety in garden fashions. As Franklin argues, once detailed empirical attention is paid to gardens, it becomes clear that they do not invoke standardisation, despite basic unmistakeable forms and styles. Rather 'one is immediately struck by the diversity, the difference and the creativity involved' (Franklin 2002:164).

This discussion has suggested that once we pay attention to the ongoing exchanges and negotiations that form an everyday part of the forming and reforming of ecological identities through practical 'natural' engagements such as gardening, biosecurity ideals and requirements become increasingly problematised. However, this is not a simple opposition, as gardening and interactional, practical involvement generates the context through which biosecurity is understood. The following section takes up this contention, revealing how the close biophysical associations formed through practice generate a particular expertise which is of profound relevance to biosecurity concerns.

6.4 Knowing Biosecurity: Practice and Expertise through Natural Engagements

Knowledge and understandings of biosecurity displayed by my research participants were strongly related to and mediated through practice, both undertaken through gardening and through wider community participation in weed control and native restoration. Focusing on gardening, this operated in two ways. Firstly, my respondents' identities as gardeners, their wider gardening networks and the concerns that this positioning brings allowed them to both access and seek out biosecurity related information. For example, paper-based information such as leaflets and brochures were picked up at or sent on by gardening groups, or at gardening shows. Cathy referred to the rumours that go around her garden club about which plants are going to be banned in the future. Botanic gardens and other environmental organisations such as Forest and Bird were also sources of biosecurity-related information. Milly was aware of plants which are not available in New Zealand for biosecurity reasons by reading international seed catalogues, by waiting for new release plants which are held in quarantine, and through discussions with gardening web-pals living in other countries. Regional Councils and the Department of Conservation (DoC) were seen as being good at putting out pamphlets and newspaper articles about pest plants, but significantly there are limits to the dissemination of information:

> there's a lot of information, but if you're not a gardener you would turn off (Emma interview 2005).

> If you're interested in gardening the level of information is good, but if not, you wouldn't know how to find it (Cathy interview 2005).

An understanding or acceptance of the need for biosecurity measures was achieved through being an enthusiastic gardener. Astrid felt that without the experience of gardening 'some people would find it hard to see why it matters' (interview 2005). Milly also commented that 'if I wasn't a gardener, I wouldn't know what was on the banned list' (interview 2005). Interviewees revealed an understanding of the multiple ways plants were classified within biosecurity legislation and the flexibility of the individual enforcement practices of biosecurity personnel at a regional level. Milly referred to the 'quasi status' of some pest plants, as a way of understanding the different levels of control requirements in the RPMS. She understood that she was permitted to retain these plants in her garden, but not to exchange them with friends. Astrid also had an interpretation of the differing biosecurity requirements related to differently classified plants. She told me that gardeners are not required to remove honeysuckle (*Lonicera spp.*) if they clip it to control the seeds. The interaction of personal biosecuring strategies such as this with the willingness of gardeners to conform to institutional biosecurity requirements is discussed further below.

Secondly, specific gardening practices were also directly related to learning about biosecurity. Practical interactions with weeds and pest plants within the domestic garden connected my respondents' identity as gardeners with wider biosecurity concerns. Interviewees extensively discussed the particular weeds that they struggled with and pointed these out as we walked around the garden. These discussions revolved around the ways in which the plant had initially got into their garden, how it spread, and why it was difficult to remove. Jo was suspicious of the horse manure she had bought in, which she believed to be full of weed seeds. Emma also experienced high numbers of weeds and new types of weeds in her garden after buying in topsoil. There was frequently a specific weed that was the greatest problem within the garden, which drew the gardener into a constant battle, such as Oxalis (*Oxalis incarnata*) and 'Wandering Jew' (*Tradescantia fluminensis*). These were presented as ongoing battles that could not be won. For example Cathy speculated that she should have kept her 'Wandering Jew' in a pot, to prevent it taking over her garden. She described the arduous job of pulling it up, miming to me as she pulled hand over hand. Her experiences made her wary of other plants that spread by creeping roots. Other patterns of weed behaviour that were observed by respondents in their garden included the ability of certain weeds to survive frosts.

Respondents described the different ways in which they controlled plants with invasive tendencies, what I term personal biosecuring practices, including cutting the seed heads off plants such as honeysuckle (*Lonicera spp.*) and agapanthus (*Agapanthus spp.*), keeping plants with creeping root systems in pots, as well as spraying and pulling up weeds by hand. This physical involvement with weeds corroborates Franklin's (2002:138) assessment that in comparison to other ways of consuming nature that are strongly visual, gardens and gardening are discursively associated with the physicality of the relationship: 'digging, weeding, cropping, pruning, grafting, sowing, eating, thinning, training.' Respondents drew on their own experiences of biosecuring, but also frequently referred to issues that friends had gone through with particular weeds. Astrid, for example, discussed the problems her friends had trying to remove a bank of wild ginger (*Hedychium* spp.) from their garden. Knowledge and experience of the weedy behaviour of particular plants was shared between gardening friends. Emma, for example, told me that she always warned friends if she sees a plant in their garden that she knows will take over. She also takes responsibility for cutting the seed heads off plants in her son's garden. Similarly, Cathy warned a friend who planted a new jasmine plant (*Jasminum officinale*) that it can become invasive.

This intimate experience of dealing with weeds and learning about the physiological characteristics that support weedy behaviour led to a greater reflexivity related to biosecurity that extends beyond a knowing of legislation to encompass knowledge of invasive traits. Emma, for example, discussed the plants she had seen for sale in a garden centre 'that I know will grow invasively' (interview 2005). Before she knew that it was on the 'banned list,' she also removed the climbing plant 'Cathedral Bells' (*Cobaea scandens*) from her garden as she felt it was becoming invasive. Linda described how, when working as a nursery owner, she had propagated a new type of clematis (*Clematis spp.*) from a plant they imported:

> We got 20/20 success propagating it, which is too good. We decided we couldn't sell it and destroyed all the seedlings. It was just too successful (interview 2005).

My respondents therefore had extensive experience of removing a plant from their garden due to biosecurity requirements or through their own judgements of its invasive tendencies. Astrid referred to cutting out a buddleia (*Buddleia davidii*) and a honeysuckle (*Lonicera spp.*) that had become rampant; Cathy dug out her wild ginger (*Hedychium* spp.) once it was designated a pest; Emma removed a jasmine (*Jasminum officinale*) that smelled beautiful, but was affecting her asthma. I found that there was often a double rationalization for removing a

pest plant from the domestic garden, as my respondents referred to both the institutional designation of the plant as a pest and some form of experiential justification. This picture of gardening practices appears to align with Wilson's (1991) portrayal of gardening as the ongoing process of controlling non-humans, by keeping down, maintaining, and fighting against natural growth (Franklin 2002). In the following, however, I complicate this picture by revealing the strength of relational associations within the garden that decentre the gardener as the only 'architect' of the garden (Hitchings 2003).

This process of learning about weedy behaviour was closely associated with knowledge of the specific biophysical conditions of their gardens. Plants that did too well and became invasive were discussed in the same way as plants that struggled in the garden. Milly, for example, described with pride the way in which she has learnt about the unique conditions of her garden and adapted her planting style and use of plants to respond to this. Her garden was subjected to harsh prevailing winds that whip across the Canterbury plains and this is the significant biophysical effect that she and her garden respond to. Milly told me as we looked at one of her roses that it did not do so well last year, she had more problems with rust due to the weather. The memories embodied in plants are therefore being constantly added to as my respondents interact with the environment. In fact, Milly told me that she does not grow so many roses now, and has given up on some other more typical English country cottage type flowers. She described the New Zealand sun bleaching the colours from the more delicate flowers, of the unusual repeated flowering of some plants which extended the traditional triumphant month of the herbaceous border into a draining half year epic, and of the need to water three times a day. This presentation of English-type plants as struggling in the New Zealand environment is particularly interesting in comparison to the discursive representation of non-native plants 'going mad' in the New Zealand climate (Astrid interview 2005). This reminds us that it is not just humans who must learn about a new environment or native ecosystems that are altered through plant introductions, but as Clark (2003) articulates, when ecological exchanges occur, nothing is left unchanged. The plants are not simply struggling in a new physical environment, but struggling to comply with the cultural norms of established garden practice, transferred to a new physical environment. These changes are demanding corresponding changing behaviour from the gardeners, who must water, spray, tend, and deal with the casualties. The ongoing cycle of tending to and learning through gardening leads to an intensive expertise and attachment to place through which choices connected to embodied memorialisations are mediated.

This discourse of the innate environmental features of an area, particularly climate, influencing what type of garden succeeds reoccurred across my interviews. Astrid described the plants she used to try and grow when she first established her current garden: pansies (*Viola spp.*) and rhododendrons (*Rhododendrons spp.*) - plants she remembered from her mother's garden that would 'fry all day in the sun' (interview 2005). For Astrid, only half an hour's drive from Milly, the climate conditions she contends with are a lack of water and salty winds. Other respondents also spoke about garden plants they used to have, which they discovered through practical engagement to be unsuitable for the New Zealand climate. Astrid told me that 'in the end you revert back to what does well, and climate affects the decisions you make'. What is presented is a more 'natural' type of garden winning over a culturally imposed one, a reverting to type. This discourse was used to describe a transition from gardens based predominantly on 'memory plants' associated with britishness, to a mix of plants seen as more suitable for New Zealand. Emma told me wistfully how she would love to grow the 'very English' peonies her mother used to grow, but 'They don't grow in Auckland. I've given up trying' (interview 2005). This practical expertise was therefore not only based on historical learning in one place, but also on geographical movement between places. It emerged particularly as a narrative in interviews with gardeners who had moved from Christchurch to Auckland, and 'learnt' about the distinct regionality of climate in New Zealand: 'I realised that I couldn't garden in the same way' (Emma, interview 2005). This alters a picture of the garden as a static palette of memories. What emerges instead is a picture of the ongoing negotiations and learnings between the needs and desires of the gardener, plants and environment. It also reveals that it is not only the public education campaigns discussed in the previous chapter that have an influence over changing gardening practices, but also practical learning about environmental suitability within a particular discursive context.

The significance of the detailed expertise gardeners acquire of the unique biophysical conditions of their garden and the personal biosecuring strategies that they develop emerges within justifications for retaining plants banned due to biosecurity requirements. In the first instance, however, these practical experiences generated support for biosecurity ideals. Respondents made links back and forth between experiencing problems with pest plants in their gardens, and biosecurity-related control of the same plants in the wider environment. This supports the suggestion that environmental learning is intrinsically embodied

(Macnaughten and Urry 1998). Astrid, for example commented as she described her problems of controlling honeysuckle (*Lonicera spp.*) in her garden, 'things banned do become rampant' (interview 2005). This produced sympathy for the work of biosecurity personnel and can also generate more active involvement in community weed control activities. Leslie is an example of a 'weed campaigner' whose public involvement in weed control was generated by experience of weeds in her garden. From the sitting room window of her house in Devonport, Auckland, where she has lived for the last twenty-two years, she has an expansive view over the nature reserve at the end of her garden, across to the mangroves, and out into the harbour.

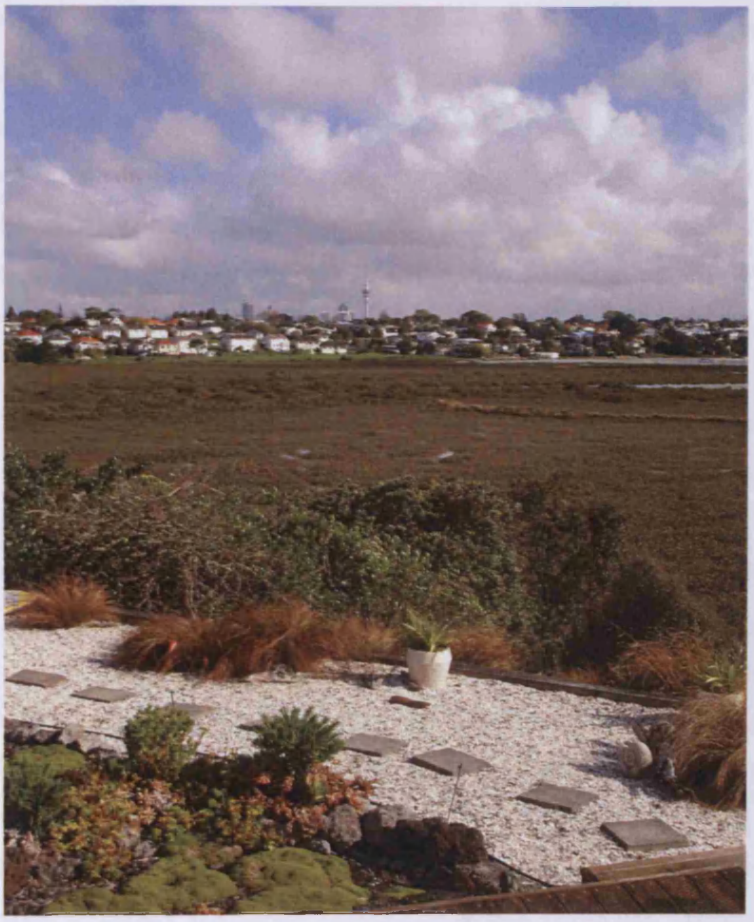


Figure 6.5: Leslie's garden looking out across the harbour, with Auckland's skyline in the distance.

Leslie has received a Weedbuster Award nomination for her work on Norfolk Island hibiscus *(Lagunaria patersonii),* a non-native pine she campaigned to be classified as a pest plant and removed from her local nature reserve due to its invasive tendencies and negative health

effects. I asked how she first got involved in weed advocacy work, and she described the first windy summer in her house, puzzling over this 'fluffy stuff' she had to continuously sweep up inside. She was also perplexed by particular seedlings that were continuously coming up in her garden: 'What was it? Pampas! [*Cortaderia jubata*] Right, council: "get rid of this pampas!" And I was just on and on to them' (Leslie interview 2005).

Often this practical involvement went on to generate an even greater understanding and desire for biosecurity controls. Mike, a founder member of the Addington Bush Society and the associated organisation 'New Zealand Ecological Restoration Network' (NZERN), described how his work restoring his and his neighbours' joined gardens as a native bush reserve affected his attitudes towards wider biosecurity debates: 'having a garden like this makes me ruthless towards biosecurity' (interview 2: 2005). The expression of this support strongly mapped onto those discourses used by biosecurity professionals. Mike, for example, complained about the problems of the dumping of garden waste that he has to contend with and put this down to ignorance and a lack of practical involvement: 'You need to win hearts and minds...Unless you involve people in the management they don't learn...People need to learn to actively look after a place to know what weeds are' (interview 1:2005).

Within his conception of intimate government, Agrawal argues, that 'practice and sociability rather than expertise form the basis of intimate government' (2005b:179). In contrast, these examples demonstrate that practice and sociability form a particular *type* of expertise in themselves. I have shown how this practical expertise formed through interactions with weeds within the domestic garden and personal forms of biosecuring can create understandings of, and sympathy for, plant biosecurity issues in the wider countryside, and can draw gardeners into greater involvement in biosecurity–related practices. This contrasts with what Hinchliffe (1997:202) refers to as the 'disembedding mechanisms' which operate in the home, separating a person's private behaviour from their experience of the environmental consequences of that behaviour. It also contrasts with the empirical context of concern for Dobson's (2003) ecological citizenship thesis, where the ecological citizen is displaced both spatially and temporally from the effects of environmentally unsustainable practices. The New Zealand domestic garden can, in contrast, provide a continuum between the private space and the wider environmental context as the garden fence does not fully insulate the gardener from the environmental consequences of invasive plants. The 'embedding mechanisms' of practical involvement with plants through gardening practices

includes experience both of plants acting as pests in the garden, creating empathetic connections, and the processes of weeds entering and threatening to leave the garden, creating active material connections. These material interactions are interpreted and operate within the discursive context of biosecurity problematisations. However, this practical expertise as the basis for intimate government is an unreliable ally for institutional biosecurity. In the following, I discuss the ambiguous relationship that existed between institutional biosecurity practitioners and community weed campaigners and native restoration volunteers.

6.5 Practical Expertise (1): Encountering Institutional Biosecurity

A theme running across the projects and individuals I visited was their ambiguous relationships with experts and political authority, either biosecurity related agencies such as the Department of Conservation (DoC) or regional, city and district councils. These 'experts' were either enrolled and seen as allies or as figures of conflict and contestation. This was often related to how closely aligned the biosecurity concerns and the perceived interest of the institutional experts were, with the biosecurity concerns of the individual, and this was often raised as a point of tension in our discussions. A broad criticism against biosecurity agencies that emerged from many of the interviews revolved around the lack of attention to certain pest plants already extensively distributed in the countryside. Gorse (*Ulex europaeus*), blackberry *(Rubus cockburnianus)* and 'Old Man's Beard' (*Clematis vitalba*) are 'celebrity weeds' that received frequent mentions within these interviews. Gorse, for example, is a highly visible pest plant, growing along roads, in gullies, and on hillsides. It elicits the attention of the public more than the recently escaped, low prevalence, high control pest plant, and seems the more obvious candidate for attention in the public eye, yet is ostensibly ignored by regional councils.

Figure 6.6: The bright yellow flowers of the Gorse plant (*Ulex europaeus*) make it a highly visible pest plant.

This has ramifications for public perceptions of the dedication and effectiveness of the regional council's approach to plant pests overall. This perception is exemplified by Cathy, who complained:

> There's all this publicity about getting rid of noxious weeds but when you drive around the countryside you see them on many of the waysides, you'll see gorse... and the council haven't done anything about getting rid of them (Cathy 2005).

This highlights the potential conflict of concern between the biosecurity institution and publics over those plants seen as biosecurity threats and those places worthy of protection.

Leslie, in her campaign to have Norfolk Island hibiscus *(Lagunaria patersonii)* removed from her local nature reserve in Devonport, Auckland, defined herself in tension to her local council, 'the Greenies', and to inactive politicians, but in collaboration with certain experts and policy-makers whom she saw as allies. Through email and face-to-face contact, she acted as a 'node' within an international network of experts who shared her concerns, passing information between them. Leslie was particularly successful in prompting different experts to put their understandings and assessments of the Norfolk Island hibiscus into writing and has full documentation of all her correspondence relevant to the campaign.

Sally Tripp, another individual who campaigns for certain pest plants to receive greater institutional attention, and who also manages a native bush restoration project in Governor's Bay, Christchurch, has also drawn herself into expert networks through her campaigning work. I met Sally at the Biosecurity Institute Conference in 2005, where she gave a presentation on local involvement during a community focused field trip to a Maori Pa. In this way she could now be considered an expert herself. Rose and Miller (1992:184) argue that:

> When each can translate the values of others into its own terms, such that they provide norms and standards for their own ambitions, judgements and conduct, a network has been composed that enables rule 'at a distance.'

This is complicated by the way in which the desire of these individuals for biosecurity governance exceeds institutional concerns in specific areas. This questions whether the individuals would experience their relationship with institutional biosecurity personnel as 'rule'. As much as the political forces described in the preceding chapters have sought to 'utilise, instrumentalise and mobilise' the groups and individuals I interviewed in order to 'govern at a distance', they themselves have also engaged in 'governing' ecology according to their own programmes and to mobilise political resources for their own ends (Rose and Miller 1992:181).

A frequent narrative I encountered during my research into community native restoration or weed removal projects was of an initial lack of support on the part of relevant authorities, which sometimes included explicit efforts to block the projects. Motuihe Island is a small island off the coast near Auckland. It has had numerous roles over the history of European settlement, including its use as a quarantine island, and most recently, a recreation spot for boaters. A care group 'The Motuihe Island Trust' is currently restoring the island as a native habitat. The project founder Mary initially worked on the island at a kiosk for boaters. She described how she received no initial support from DoC who also had an office based on the Island. In order to get their attention, she moved a native tree nursery she established directly across the path to their office: 'I was only the kiosk lady, after all' (Mary, interview 2005).

Figure 6.7: Volunteers tending the native plant nursery on Motuihe Island.

Within Bell's (2005) concept of ecological citizenship, this would be interpreted as the individual holding institutions to account where they believe that those institutions are not fully promoting ecologically just arrangements.

This ambiguous relationship to experts and authority is related to what can be described as the 'kiwi do-it-yourself attitude,' as Mike, a founder of the New Zealand Ecological Restoration Network (NZERN) described:

> New Zealand has a do-it-yourself attitude. You build your own place. NZERN has a do-it-yourself attitude too, you're not reliant on an expert (interview 1, 2005).

Mary of the Motuihe Island Trust described how she learnt as she went along: how to drive a tractor, which trees to grow, what were the 'wrong' sort of Pohutakawas, and the differences between pampas grass *(Cortaderia jubata)* and the native toe-toe *(Cortaderia spp.).* She obtained the resource consent needed from DoC to control animal pests on the island herself, after she witnessed the damage they were doing, stripping and killing her newly planted trees. I asked another Motuihe Island volunteer why she came out to do this work herself, rather than give money to the conservation organisations to do the work on her behalf:

> I do, a bit. To Forest and Bird and to Greenpeace. But here I can stop delaying until someone else does it, and just do it myself (volunteer interview, Motuihe Island, 2005).

Leslie also takes personal action to ensure that work gets done, rather than leave it to experts: 'I'm someone who if I see something that needs fixing, I like to fix it' (interview 2005). I asked why: 'Because it won't get done. I think I'm mad really, but I just want the area to look nice and I think someone's just got to get on to them.' She qualifies this criticism with the concession 'The council have been quite good lately' (Leslie interview 2005). Leslie actually uses personal practical action as a negotiating tool in certain situations. When she was agitating to have Norfolk Island hibiscus *(Lagunaria patersonii)* self-seeded saplings removed from the nature reserve, she eventually threatened to do the difficult work herself: 'I said to Mike Cowan "Mike, I'm chopping these out whether you like it or not!" (Leslie interview 2005). This do-it-yourself discourse connects to the portrayal of the physicality of the conservation work as a virtuous way of intervening and achieving objectives. The significance of this physical involvement is highlighted in the genesis of the Travis Wetland Trust. The area was threatened with development and as Travis Wetland Trust field guide describes:

> While the arguments continued, the Trust members got on with the job of containing invasive weeds like willow, blackberry and gorse. Publicity mounted, and a petition in 1994 to protect the whole swamp was signed by nearly 7000 people (Orwin 2005:8).

The physical act of 'getting on with the job' and controlling weeds is seen to have been as important as the political work of the petition in the final success of the campaign. On Motuihe Island, I spoke to volunteers about the differences between tree planting and weed removal activities. An 'old timer' volunteer told me that they get more one-off volunteers for the tree planting events, as people feel good about planting trees. But he said he personally enjoyed the weed work more, particularly the physical involvement of it, and proudly described the thrill of striding across the island, weed killer pack-on-back:

> It's fun, it's more varied and very satisfying. Perhaps it satisfies that basic instinct to kill things [laughter]. We have to solve all sorts of problems (interview, Motuihe Island volunteer, 2005).

Figure 6.8: Volunteers undertaking native tree planting on Motuihe Island.

A key justification I was offered for involvement was the benefit of getting fresh air and exercise, and whilst staggering down the steep hillside trying to keep up with the extremely fit volunteers for the Summit Road Society, a group involved in native restoration and weed control in the hills surrounding Christchurch, I began to appreciate the level of exercise this work provided. In her campaign against the Norfolk Island hibiscus, Leslie took this physical involvement a step further, by undertaking her own bodily experiment, brushing a Norfolk Island hibiscus seed-pod on her forearm to see how long it took for a rash to develop.

This section has discussed the ways in which the biosecurity concerns of expert non-experts, built up through practical engagements, can exceed that of the biosecurity regime, and how practical action is used as a tool in the negotiation and playing out of these conflicts. In the following section, I move on to consider a contrary impulse, as the intense experiential expertise built up through ongoing engagements or 'embedding' with particular plants and places has lead some of my respondents to question aspects of biosecurity legislation.

6.6 Practical Expertise (2): Justifying and Enacting Anti-Biosecurity Behaviour

As I have described, respondents were strongly supportive of the ideals of biosecurity in the abstract. This was reinforced by their personal experience of the negative effects of weeds within their own gardens. Respondents related instances when they had chosen to remove or control pest plants due to their own experiences of their negative effects, or due to biosecurity requirements. However, I also encountered complex ways in which biosecurity requirements were challenged and reinterpreted. These were connected to the development of experiential expertise of plant behaviour in the domestic garden, specifically when connected with understandings of the local climate. The detailed knowledge and intense experience of the biophysical processes traversing the domestic garden, gained through ongoing practical engagement with plants in the unique conditions of their gardens, prompted some of the gardeners interviewed to question the applicability of blanket-ban type biosecurity requirements.

This contradiction ran across all of the interviews I conducted with gardeners living outside of Auckland. Milly, for example, strongly supported biosecurity, out of concern for native species but also farming landscapes made up of non-native species. As she readily acknowledges, however, her actions as a gardener were more contradictory. Her experiences of the environmental conditions of her garden prompt her to question the national ban on particular plants:

> In my area... the climate's not benign enough to have an effect. If I was gardening in Northland, um, I think I might behave better.... So I would like them to say: "Where the average temperature is greater than something or other, it's banned." I would really go along with that. But when it's a blanket ban! (Milly, 2005).

This is not a passive rejection but an active engagement with biosecurity requirements, a personal reinterpretation based on experiential knowledge. Milly was self-aware and unsure of her use of the climate 'as an excuse,' particularly as she felt critical of a friend who retained another banned plant and justified this through reference to their shared regional climate. Milly justified her choice to retain gunnera (*Gunnera tinctoria*) with a detailed explanation of the length and severity of the frost in her area of Christchurch, and the temperature at which she believed gunnera was effectively 'knocked back.' This perspective

was reiterated by other gardeners I interviewed in the Canterbury region. Astrid argued that the ginger lily (*Hedychium* spp.) she had in her garden was only a problem in parts of New Zealand where the climate was more consistently warm, and that all pest plants needed the right climate to 'go wild' (interview 2005). Her specific plant, she also told me, does not seed. Astrid did, however, act indifferently about her ginger lily, saying that she would remove it 'if asked.' I suspect that this portrayed attitude was a product of the interview context and her sensitivity to my questioning. Within interviews conducted in Hastings and Canterbury, I heard frequent comparisons to Auckland, and the greater propensity for plants to go weedy there. Lucy told me 'I wouldn't grow it if I lived in Auckland, but it's a frost tender plant so it's okay here.' This comparison to Auckland and the issue of climatic regionality in New Zealand was more explicitly critiqued by Linda and Chris, who believed that other regions had just adopted Auckland's banned list, as this would have been easier than undertaking research into the specific problems in their own region. Milly also said that she 'doesn't quite trust DoC' for the same reason, and so would like a scientific explanation of the production of the banned plant lists based on climate.

In a more active way, some gardeners spoke about the way in which they, rather than the climate, controlled invasive plants through a variety of strategies, including removing seed heads, trimming roots, and retaining plants in pots. Milly, for example, justified having pennisetum *(Pennisetum purpureum)* in her garden as she kept the plant in a pot, 'so its roots can't spread.' A frequent practice was the removal of seed heads before seeds were dispersed, and this was particularly undertaken for agapanthus *(Agapanthus orientalis)* and honeysuckle (*Lonicera spp.*). These actions were perceived to prevent banned plants reproducing, and so disrupt their identity as a banned invasive plant. The decisions to do so were based on understandings of the behavioural qualities of non-native plants developed through long periods of observation and engagement, generating the sub-category of 'controllable' invasive plant (Head and Muir 2006). While Head and Muir (2006) attribute plants with agency that is 'witnessed' or experienced and then responded to by human actors, what emerged from my gardens was a sense that 'invasiveness' was a relational achievement between the plant, the climate, and human behaviour. Human actors could therefore attempt to disrupt this achievement.

This reinterpretation of pest plant 'rules' that justifies growing banned plants through reference to the regional climate or through controlling a plant's reproductive capabilities, is

based on a personal yet expert experiential understanding, and reveals a desire for more detailed information behind particular blanket policies. The detailed understanding of the regionality of climate or the specific conditions of their garden and its association with plant reproduction/weed invasion is directly related to 'metis' or practical knowledge gained through gardening 'intense and repeated context based interactions or experimentation with the world' (Scott 1998:313). Cloke and Jones suggest that it is through these embodied practices, or 'dwelling' 'the intimate, rich, intense making of the world' (2001:652), that separatist nature/culture paradigms are ruptured, or 'hybrids given a voice.' Head and Muir (2006:522) plainly state that:

> there is a clear connection ... between the diverse everyday engagements in a more than human world (struggling with weeds, developing practical knowledge of how exotic and native species behave, enjoying birds) and the rupture of more separatist views of nature.

My research has shown in contrast that embodied engagements in the domestic garden and wider landscape do not simply lead to a questioning of the principles of biosecurity. In contrast expert practices were often seen as not stringent enough. What these engagements have produced is a questioning of aspects of biosecurity enforcement. Head and Muir's 'clear connection' is perhaps more nuanced, complex and context dependent. Our analysis is more aligned when they say that 'some attitudes and practices have destabilised or broken down the dualisms between nature and society, while others have reinforced them' (2006:522).

While I have considered practical involvement both in the private garden and in more traditional public spaces of participation, I have suggested that these are both biosecuring activities that promote a depth of engagement with biosecurity concerns. Not only do material interactions with the environment generate the obligations of ecological citizenship in the context of biosecurity (Dobson 2003), but they are also the mode through which the issue complex or problematisation is understood. This is relevant both in the context of Agrawal's (2005a) emphasis on practical involvement as a mode of regulation, and the biosecurity regime's use of practical involvement through weed control activities and through interactions with native plants as a tool of enrolment. However, this discussion suggests that practical involvement is an ambiguous ally for institutional biosecurity, as it can lead to a questioning of national level policies, a trust in personal and climatic biosecuring, and concern for species and spaces outside of institutional biosecurity concerns.

In the following section I consider in more depth the way in which these stories have disturbed a distinction between public and private, through biophysical agencies, through gardening practices and through citizenly involvement in biosecurity concerns.

6.7 Breaching the Public/Private Divide

The garden is not a separate, centred site, but instead focuses attention beyond its own physical space and planting, through the changing seasons, mobile and migratory nature, the spontaneity of nature and exposure to natural forces (Franklin 2002). Despite being the centre of the gardener's world, the garden is a transitional space in the geography of other elements, to which the garden fence is inconsequential. As Head and Muir (2006:510) argue in relation to 'weeds, birds, water and the power of the place itself', these non-human elements are powerful co-shapers of domestic environments. This is an important counter-point to the picture of control and suppression of weeds described above, and following Franklin, moves away from Wilson's (1991) 'rejection of the suburban garden' as a space of the domination of nature (Franklin 2002). This recentring of non-human agency within the domestic garden was undertaken and championed by Hitchings (2003) and Power (2005) through the use of ANT, countering the idea that gardens are predominantly human constructions. While this non-human agency can be easily imagined in the case of invasive weeds, it is important to enlarge this perspective to include the energetic influences of other biophysical agencies. In my interviews, climatic processes emerged as co-shapers of the domestic garden, in combination with the needs and relational successes of different types of plants. These processes were incorporated within the narratives of the gardeners about their gardens.

These biophysical agencies and influences do not just operate on and in the domestic garden, but also work to bind the garden and gardener into different and ambiguous links to other spaces. Head and Muir (2006) consider the differing levels of 'boundedness' and associated practices of boundary-marking with or between outside spaces in different domestic gardens. These human strategies included the impulse to 'bring nature in' to the garden through native planting schemes and through the use of physically and visually permeable boundaries with surrounding natural areas. Despite their commitment to hybrid approaches, they do not take this analysis of the 'siting' of the domestic garden in relation to other places further to

consider the ways the agency of plants and biophysical processes themselves contribute to transgressing the boundedness of the garden. The movement of biophysical processes through the garden, including climatic processes, weeds, native plants sprouting 'in the wrong place' and birds, also generates an 'unbounding' of assumed connections between spaces, species, embodied memories and alliances which provokes new connections, associations and the endless re-markings of boundaries.

A key theme of this chapter and the thesis as a whole is the breaching and fragile reinstatement of different sorts of boundaries: between personal and national memory, the bush and rose garden, between public and private space, between valued and unwanted plants, of influences of the external environment on what grows successfully in the garden, and the influence of plants in that garden jumping the fence and naturalising in the broader environment. There are numerous ways in which the public/private divide is being physically and conceptually challenged through the interface biosecurity concerns provoke between ecology and citizenship. One way this manifests is through the sense portrayed within my interviews of the New Zealand environment in which volunteers worked as a 'shared garden.'

The Addington Bush Society in Christchurch provides a literal example of this, as a group of private individuals who unusually have banded together, restored and covenanted, an eight hundred square metres reserve made from their combined gardens. The context here is significant: in Christchurch, considerable pressure exists from the local council and residents active in local politics to retain the city's identity as the 'English Garden City.' The reserve supports over 30 native plants endemic to the Canterbury Plains. These are from seed sourced from Riccarton Bush, a small piece of original bush in the heart of Christchurch, preserved intact by one of the first Scottish settlers to the area. I interviewed the founding couple Mike and Tracey during a visit to the reserve. They described how they used to go tramping and brought back native seedlings for their garden. Through the growing need to support an elderly neighbour, the fence between their two gardens was removed and they began to plant this combined area with natives. At this stage they chose native plants not through conservation motivations but because they believed they would be easier to manage. This got the ball rolling: another neighbour expressed interest, and their dividing fence was also removed. And so on, until by 1994, seven or eight families were involved. At this point the residents approached the city council to ask them to buy the land to prevent it being taken by developers. The council, however, were against the use of the area for native bush restoration,

suggesting instead an open parkland area for health and safety reasons. The residents decided instead to take on the project themselves. The council attempted various methods to block the residents' project, while the publicity generated by their battle swelled the group from the initial eight to over four hundred supporters by 2002. The group split into two functions: the Addington Bush Society, a local group who run the reserve and other local native areas as they have expanded, and the New Zealand Ecological Restoration Network (NZERN), a national information sharing organisation. NZERN, which began through the removal of a garden fence as a gesture of care between neighbours, is now a national organisation whose benefits are described as 'seeing your individual project as part of a wider effort' (Mike interview 2:2005). It is run from a divided section of Tracey and Mike's home: 'NZERN is taking over the house as it grows!' (Tracey interview 2, 2005). The Addington Bush Society has now expanded its focus from the combined garden area, taking over public areas in Addington and planting them with natives. As private gardens are bequeathed to the nation, grassroots organisations take over the front room, fences are pulled up between neighbours, and seedlings for public restoration projects are nursed within a private vegetable patch, public/private boundaries are being blurred.

This discourse of New Zealand as a 'shared garden' also operates through a sense of practical involvement promoting a sense of sharing, enjoying and contributing to the shaping of the New Zealand landscape. Conservation participation was a substitute for gardening for some individuals I interviewed as volunteers on community projects, who do not themselves have access to a private garden. This practical involvement leads to a very personal sense of ownership over what are 'public' spaces. Leslie, for example, referred to 'my' reserve. An avid gardener, the line demarcating her garden from the reserve beyond was marked only by a line of stones, and Leslie purchased plants for the part of the reserve bordering her garden, as much a she did in her own garden.

Leslie has a strong sense of home that expands into her local environment, beyond her property fence line or even four walls: 'This is where I live. I like this area. I don't want this area taken over with weeds' (interview 2005). This involvement in biosecurity therefore contributes to feelings of empowerment, efficacy and belonging.

Figure 6.9: The dividing line between Leslie's garden and the nature reserve where she plants natives.

This transgression of the public/private boundary is not simply related to a human impulse but is also attached to the way in which the spatialities of plants and 'weeds' undermine the garden fence and necessitate this blurred boundary between the garden and beyond. Not only do plants 'jump the fence' from the garden and out into the environment but they also move freely in the opposite direction. It was pampas grass (*Cortaderia jubata*) seeds blowing into Leslie's house and garden that first drew her into the public arena of weed campaigning work. Leslie now sprays alongside the fence line bordering the public pavement of other houses along her street to prevent weeds growing up here and then seeding into her garden. This movement of weeds into the 'private' domestic garden is not only physical but also visual: the Norfolk Island Hibiscus *(Lagunaria patersonii)* visually reached through the window into her sitting room and drew Leslie from this very private place into a public campaign. Yet this blurring of conservation activities and private gardening activities could also work in ways contrary to a biosecurity ethic. After a day removing weeds from one reserve area, I was amused to see a banana-passion fruit vine (*Passiflora mollissima*), which we had uprooted carefully potted up, ready to be illicitly enjoyed in someone's private garden.

6.8 SUMMARY

Ecological attachments are forged through personal memories and embodied associations with plants bound through representational and interactional links to friends, family, and past places, which 'live-on' through the plant itself, or through the same species. This is affected by the place of the garden, as the desire to nurture these memories is negotiated with the environmental specificities of the garden. In a country of historic and contemporary human and non-human mobility, this produces an attachment to place, and an intensive expertise, as the expert gardener achieves a depth of involvement and practical enfoldings. The significance of this 'inexpert' experiential knowledge is the parallel that can be drawn between 'expert' experiential knowledge discussed in chapter four. A contrast may be the different scales at which these knowledges function and from which they draw their references. This reinforces the assertion that biosecurity is understood and engaged with through practice.

Plant nationalities are experienced through this memorialisation of places, and through an awareness of the geographic origins of plants. New Zealand native plants are typically enjoyed and given a shared place. This is either mixed up within the garden, or in distinctly separate areas, particularly woodland areas. Both of these arrangements are associated with a sense of ecological national identity, with heterogeneous gardens referred to as 'typical' New Zealand gardens, but also with the sanctified native area allowing for a commune with a pre-human 'natural,' ancient but modern New Zealand.

Biosecurity enters or exists in this configuration in particular ways. It is experienced by the gardener at the scale of the garden, as particular plants do too well and become bullies, or through the constant battle with more common weeds. My respondents exhibited a high level of weed literacy, which was associated with the specific conditions of their gardens. This produced personal interpretations of how weed invasion is affected by climate and by individual biosecuring practices, which were used to justify growing particular pest plants in particular ways. Biosecurity concerns were only one influence over choices in the garden. Biosecurity therefore has to contend with the other decision-making influences of embodied memorialisations and exchanges, mediated through biophysical negotiations.

7

BIOSECURITY: AN EMBLEMATIC ENVIRONMENTAL ISSUE?

> The possible directions of contemporary shifts in security are not predictable; they are constrained but multiple. Therefore, rather than casting contemporary changes in terms of their epochal significance, we suggest a more specific focus on how security has been problematised (Collier, Lakoff and Rabinow 2004:4).

7.1 INTRODUCTION

Over the course of the last six chapters I have moved from the first immigrant ships approaching New Zealand bringing hopes, dreams and European seeds, through the development of institutional responses to invasive agricultural weeds, to the contemporary lists and weed risk assessment processes for environmental pest plants. I have followed the Pest Plant Officer knocking on the householder's door and putting together a 'weed awareness' stall at the garden show, and the gardener mulling over a gifted pest plant and battling with rust on her 'mothers' roses and lemonwood in her lilacs. Finally, I left the volunteers slashing and poisoning 'Old Man's Beard' (*Clematis vitalba*), and chuckling over impersonations of a very gruff English botanist. I will begin this chapter by providing a review of the empirical and theoretical insights developed by traversing this diverse terrain.

I then position this thesis and frame its research contributions by considering it in the context of biosecurity literatures which emerged during the course of the thesis. The contingencies on which I focused are considered through attention to other empirical biosecurity practices as a way of tracing the unique contributions and limits of this thesis. I widen the scope to situate the thesis within a review of academic debates related to native and alien species, and perspectives on environmental management emanating from some areas of cultural geography. Finally, I summarise the key themes of this thesis, and offer some conclusions in terms of contributions to enactments of biosecurity, academic understandings of biosecurity, and more broadly insights into the governing of mobile natures in contexts of uncertainty.

Hajer (1995) describes his case study of acid rain as an 'emblematic environmental issue,' an issue that functions as a metaphor for the environmental problematique at particular times. I would like to begin this chapter by proposing that biosecurity is an 'emblematic' environmental issue for the beginning of the twentieth-first century. Across a wide variety of political concerns there are resonances with the problematisation of biosecurity presented in this thesis: the extension of security, selective territorialisations against ever increasing mobility, questions of local/global identity for humans and non-humans, and issues of state and citizenship responsibility. Rather than just stating its 'epochal significance' (Collier, Lakoff and Rabinow 2004:4), however, I will use this chapter to consider the insights that have been gained by paying attention to the unique problematisation of ecological plant biosecurity in New Zealand.

7.2 Thesis Review

This thesis began in **chapter one** by tracing a history of biological immigration to New Zealand from the start of European contact. This history emphasised the effects of 'radical displacement' on transported biological entities, which transformed the terrain, the entity, socio-natural identity attachments, and the direction of environmental concerns. This inherent indeterminacy became the context in which biosecurity concerns were considered. The growth of conservation concern over invasive plants in New Zealand was shown to be strongly agronomic, and this genesis contradicts the representation of biosecurity as a metropolitan dominated environmentalism (Clark 2002). The gradual development of biosecurity responses grappled from the start with questions over the balance of regional and national regulation, the question of differentiating control responses to weeds, and ambivalence over the usefulness/nuisance value of some weeds. Chapter one described the growth of concern for 'environmental pest plants,' which was supported by knowledge, legislation and social concern constructed around agricultural weeds. Yet this new justification for biosecurity practices also altered the relevant stakeholders, issue-complex and practices problematised through biosecurity, with concern moving from extensive weeds such as gorse *(Ulex spp.)*, blackberry *(Rubus fruiticosus)* and broom *(Cytisus spp.),* to early naturalising pest plants. This shift problematised gardening practices and the domestic garden. Attention to 'the historico-epistemological conditions of the emergence of the object of

study' (Darier 1996:594) demonstrated that biosecurity is not simply a response to the phenomena of invasive biological entities, but a contingent problematisation through which biological immigration has been constituted as a concern of state.

An overview of the contemporary biosecurity regime in New Zealand was then provided, beginning with a discussion of recent legislation and institution-building, emanating from the Biosecurity Strategy Review in 2005. The regime was 'mapped' across its sites of focus from the international legislative scene, through the pre-border, border, post-border and finally pest management arenas. This revealed the very different cultures of practice at each 'site.' The materiality and visuality of the system was illustrated, by the beagles sniffing new arrivals, the visual inspections of cargo, the plant lists printed on ring-bound card with full-colour photos, the bright regional council vans, the plastic barrels of poisons and lopping tools, and the plants themselves: the yellow flowering gorse (*Ulex spp.)*, the multi-coloured lupins (*Lupinus spp.)*. A discussion of the internal pest management arena raised questions about the way 'environmental pest plants' are constituted by the biosecurity regime, and the rationalities and practices through which they are classified, categorised and controlled. The centring of the domestic garden within ecological biosecurity concerns also raised questions about how biosecurity ideals are communicated to the gardening public, how gardening practices are regulated in the private space of the domestic garden, and the ways in which these concerns are understood and responded to by gardening publics.

In **chapter two,** critical social science literatures were drawn on to frame these emerging research questions. I argued for the need to produce a political account of the governance of mobile natures that might add further critical purchase to descriptions of their socio-materiality and complexity. I turned to literatures that provided the resources to understand the issue complex of state governance, knowledge formation, public understandings, and environmental vitality or exuberance. Firstly, concepts of 'biopolitical governmentality' were discussed. 'Governmentality' was understood as a conceptual resource that draws attention to the construction of the apparatus of government, its association to specific instrumental knowledges, and the development of techniques for the control of the population. A proliferation of sites and methods through which humans are governed occurs, expanding control into aspects of everyday 'non-political life.' This includes normalisation processes 'recasting subjectivity' to produce self-governance. 'Biopolitical governmentality' is focused on optimising the 'vital characteristics' of life. This operates through two distinct

interconnecting poles: an 'anatomo-politics of the human body,' and a 'biopolitics of the human population.'

Secondly, I considered the different ways formulations of governmentality and biopolitics have been drawn into the environmental arena, through conceptions of 'ecological governmentality,' 'ecopolitics,' and significantly Agrawal's (2005a) 'environmentality' thesis. This drew attention to the geography of governance, to 'technologies of self' in producing environmental subjectivities, and to the practical involvement of publics in governance as a crucial way through which subjective interests are recast. The extension of Foucauldian concepts to the non-human world produced instability between the disciplinary control of non-humans, and the normalisation of human subjectivity and self-governance.

Thirdly, I drew on conceptions of environmental citizenship. This explicit manoeuvre was undertaken in an effort to explore less 'subject'-ive discursive formulations or uncomfortable language for understanding and describing the role of publics in environmental governance. Dobson's (2003) unique conception of ecological citizenship as a product of the interactions between an individual and their everyday environment, and Bell's (2005) conception of a citizen of a bounded environment were discussed. This enabled an account of the material production of politics. However, I argued that the production of ecological citizenship needed to be situated within the contingencies of environmental problematisations. I discussed a number of debates in the literature, including a tension over the territorialisation of ecological citizenship, its allocation of rights and responsibilities, and how it can be promoted. Dobson's (2003) emphasis on the private sphere as a relevant sphere of citizenly activity was utilised to frame analytical attention to the domestic garden. Finally, I considered the ways the divergent academic approaches of ecological citizenship and environmentality could be brought together.

Through the intersection with these particular literatures my research questions became framed as:

1. How is contemporary plant biosecurity, with specific reference to internal pest plant control, ecological protection and the impact of garden plants, organised in New Zealand?
    - How are governance regimes organised and situated?
    - How have unwanted plants as objects of governance come to be defined legislatively?
    - How are they categorised and classified legislatively?
    - What are the roles and impact of expert knowledges?

2. How is contemporary plant biosecurity enacted in situated practice?
    - How are control regimes regulated and enforced in the context of the private domestic garden?
    - What are the roles of publics in plant biosecurity practices?
    - In what ways are publics, particularly the 'gardening public,' encouraged, enforced, or educated to adopt plant biosecurity ideals?

3. In what ways and for what reasons do publics participate within, actively produce or challenge, plant biosecurity ideals and practices?
    - What are the practices/understandings of publics who choose to play an active role in biosecurity outside the domestic garden?
    - What are the impacts of plant biosecurity within the domestic garden?
    - How do plant biosecurity requirements interact with other processes of interaction within the domestic garden?
    - How are these 'conflicts' understood and negotiated by the home gardener?

In **chapter three**, I considered the way the theoretical literatures could provide methodological direction. Biopolitical governmentality approaches suggest attention to discourses and practices by emphasising both governmental 'technologies' and 'rationalities.' Environmentality draws methodological attention to embodied practices of regulation, and particularly to everyday experiences of governance. Ecological citizenship implies attention

to the private sphere, and raises questions about individual agency in governance frameworks. This highlighted the need to look beyond powerful textual or discursive representations of biosecurity. In addition, I drew on work considering the methodological implications of attending to people-plant encounters. In-depth and embodied methodologies, which access the rich everyday relational interactions between people, plants and places are emphasised.

I then described the way textual analysis, creative interviewing techniques and participant observation were utilised to approach this research. In particular, I paid attention to the research situation in order to bring the appropriate situated context into play, by undertaking interviews in gardens, nature reserves, and during work shadowing. I attempted to take a symmetrical approach to the research, by allowing my research participants to overlap the categories of 'institutional actor' and 'domestic gardener,' for example. This methodological approach enabled me to access the everyday practices and shifting discursive framings brought into play through the enactment of plant biosecurity.

I presented the material generated through the intersection between my theoretical, methodological, and empirical context within three subsequent chapters. In **chapter four** I traced the way the Biosecurity Act (1993), which arose through concerns over agricultural pests and animal disease, led to particular innovations with specific effects. I identified high levels of statutory *power*, high levels of *flexibility* in defining pests and in developing methods of enforcement, and a specific set of criteria on which decision-making is built. Within internal pest plant management, this produced particular cultures of practice. I looked in detail at two processes through which environmental pest plants come to be defined as objects of control, and are classified and categorised legislatively. Regional Pest Management Strategies (RPMS) and the National Pest Plant Accord (the Accord) are different 'technologies of governance', which arose as responses to the nature of the governing context *and* the strictures of discursive governing rationalities. By paying attention to the development and practice of these two regulatory approaches I revealed the ways ecological factors (e.g. plant spatio-temporalities, the ecological spatiality of regional councils), public understandings, scientific 'experiential' expertise, the agency of legislation, and political rationalities come to define the practice of biosecurity. RPMSs and the Accord 'fit together' to enable greater flexibility and response to the nature of biological invasion, through the play between regional and national scales of governance and 'voluntary' and 'mandatory' regulation. The balance between national legislative powers and standardisation, and regional

level expertise and accountability is dynamic. It will continue to shift as the effects of the Biosecurity Strategy review of 2005 continue to come into play.

In **chapter five** the interaction between this regulatory framework and the socio-material reality of human and plant actors was considered through regulatory access to the domestic garden. I traced the aims and methods of public education activities. This ranged from efforts to communicate the classification of pest plants, the concept of weedy characteristics, and promote active participation in weed control. This discussion highlighted aspects of these public education activities significant to the emerging picture of biosecurity. Firstly, there is the perceived necessity for a more than passively accepting public. Practical engagements provide the dual function of both an educative experience and a way of reducing weed spread. Secondly, the 'public communication campaign' is a way of gathering information, communicating 'non-purism' to the public and promoting learning within the biosecurity institution. Thirdly, interactions with specific plants made them 'educative tools', by increasing familiarity, acceptance and positive ecological associations. Public participation in controlling weeds in the wider environment was connected to recognising weeds in the domestic garden. However, plants are not reliable collaborators, as demonstrated in the continual propensity for 'benign' non-native plants to 'go weedy' in the *'Plant Me Instead'* booklet (ARC 2005).

The point of regulatory interaction with the domestic gardener was also examined. This becomes a negotiation between the stipulation of the legislation, and the more humanly interactions with Pest Plant Officers (PPO). This allowed gardeners to emerge as far from passive, influencing the enactment of biosecurity, and even utilising it to their own ends in 'neighbourly' disputes. The dichotomy between 'regulation' and 'public education' was brought into question, as legislation is a social driver of moral norms, and as moments of regulatory enforcement are 'educative.' Finally, parallels were drawn between the difficulty of researching public attitudes and understanding the 'success' of public education, and the difficulties of weed research discussed in the preceding chapter.

In **chapter six,** I considered biosecurity from the perspective of enthusiastic domestic gardeners and participants in community weed control and native restoration projects. I argued that there is strong abstract support for biosecurity, which appears to align with a national ecological citizenship linked to native plants, constructed and normalised by the

biosecurity institution as discussed in chapter five. This ecological citizenship appears to play out through attachments to native plants in the domestic garden and wider landscape. However, I argued that this abstract discursive space is not a stable place where subjectivities are per/formed. To understand how ecological identity interacts with biosecurity concerns, attention must be paid to context relevant practices.

Once attention is moved to the context of everyday material interactions with plants, this national ecological citizenship is fractured. Firstly, native plants are unstable embodiments of this identity, because of their uneasy association with concepts of naturalness, including environmental suitability, seasonality and native birds. Secondly, alien plants, particularly those associated with British country cottage gardening styles, are both representationally and interactionally connected to embodied memories of other people, places and times. Personal histories of movement are negotiated with an intense experience of place through encounters and exchanges within the biophysical space of the domestic garden. This is an incoherent, unbounded meeting place (Massey 2005). The ecological attachments generated through these embodied memories and gardening interactions can conflict with wider responsibilities of biosecurity. Thirdly, I argued that gardening cannot simply be thought of as a space of conflict with biosecurity, as it is a crucial practice through which biosecurity is learnt about and understood. This mediates the tension between individual ecological identities and national ecological citizenships, as gardeners experience emphatic and material connections with institutional biosecurity concerns through personal experiences of biosecuring. Fourthly, the practical expertise this generates can lead to greater participation in public biosecurity activities, often in perceived conflict with institutional biosecurity. However, it can also produce questioning of biosecurity policies, particularly their national applicability. This problematises the notion of gardeners as simply enrolled by the biosecurity regime. Technologies of power, of self, and of material relational interactions are the context in which subjectivities relevant to biosecurity are continuously formed.

The key themes emerging across this thesis are 'flexibility and reflexivity,' 'practice and experiential expertise,' and tensions between national ecological citizenships and personal ecological identities. To review the contributions of these themes, I will now consider the representation of biosecurity within literature that has emerged during the course of this thesis.

7.3 BIOSECURITY: (IN)SECURE ACADEMIC TERRITORY?

> Surely the essence of critical thought must be its capacity to make distinctions that can facilitate judgement and action (Rabinow and Rose 2003a:9).

With Foot and Mouth, Bird Flu and now 'Bluetongue' Disease in the UK media headlines as I complete this thesis, it seems almost too easy to highlight the contemporary importance of biosecurity issues. This growth of media and policy concern has been accompanied by a growth of academic writing. Biosecurity has emerged as a social science research field, and it has been a challenge to write this thesis as the terrain has changed so rapidly. In the following, I will consider some key framings of biosecurity within this literature, and the links between these concerns and the account I have presented. This draws not only on recent work produced about biosecurity, but also on the lineage of approaches to biosecurity that are influencing these accounts.

Biosecurity encompasses a range of justifications, objects and issues of concern, and a variety of practices and approaches. The different academic accounts of biosecurity reviewed below are to some extent based on interventions at different empirical sites. Emerging social science research constructs wolves and badgers as biosecurity threats in England and France in more traditional portrayals of opposition between environmental and agricultural interests (see Buller forthcoming 2008 and Enticott forthcoming 2008). Nerlich and Wright (2006) discuss the ways biosecurity came to be symbolically associated with ritualistic cleansing and disinfecting, a response against farmers' feelings of insecurity during the UK's 2001 FMD outbreak. Donaldson (2008, forthcoming) considers biosecurity as a technical practice, and a political tool with a moral dimension, which shifts responsibilities onto farmers. Collier, Lakoff and Rabinow (2004) associate biosecurity with emerging articulations of biological weapons and biodefense. My account differs from these approaches as it deals with biosecurity not as an 'event' (Donaldson 2008, forthcoming), but as an ongoing process. Many authors point to the multiplicity of biosecurity. Nerlich and Wright (2006:444) for example, refer to the 'multiple practices and meanings ... that are covered by the umbrella term 'biosecurity''. Enticott (2008:8, forthcoming) argues that biosecurity 'involves all manner of social, technical and natural combinations.'

This raises two important questions: Firstly, how much can biosecurity be seen as a unified practice, given these huge differences? Secondly, is the distinct approach of this thesis to do with the different types of biosecurity it encounters? This thesis has followed biosecurity into a range of different sites. A key underpinning of both my theoretical approach and methodological attention to embodied practices is that biosecurity is constructed and obtains meaning in practice. What, therefore happens to concepts of biosecurity within other practices? Braun (2007:7) in reference to Rose's (2001) concept of biological citizenship asks for whom this 'story' is true: 'do these accounts fully exhaust how the relation between our biological existence and our political existence is lived today?' If as Hinchliffe and Bingham (2008:29 forthcoming) suggest, 'purifying schemes and *conventional* surveillance tend to fail' (emphasis added), is New Zealand's biosecurity regime, and the particular aspects I have highlighted, unconventional?

Boundaries, Rigidities and Indeterminacies

In chapter two, I considered how the expert processes of categorisation and calculation as a practice of governmentality are seen to produce conceptual and material boundaries through which the environment is governed. Attention to practices of boundary making forms a strong current within social science accounts of biosecurity, exemplified within the work of Donaldson and Wood (2004) on Foot and Mouth Disease (FMD) in the UK. Through their account, biosecurity is constructed as an inflexible and rigid response to biological emergence, and this is used to explain both why the FMD outbreak occurred and why it failed to be contained. In the following I contrast my findings with this account.

With its high profile border control systems and powerful legislation, New Zealand's biosecurity regime does seem to involve the imposition of static territorial boundaries onto a complex socio-material entanglement of people, plants, and differing values. It is doomed, it would seem, to failure. Through a detailed empirical engagement, however, what emerges is rather different. Instead of an inert, authoritative, 'all-or-nothing' governing approach, by drawing together institutional attitudes and practices, public conflicts and pest plants' sociability, a different narrative unfolds. The unsettling context of 'toings and froings' described in chapter one was added to the *complexity* and *mobility* of conceptual and physical boundaries within biosecurity practices, analysed in chapter four. My account therefore

questions the representation of biosecurity as the 'maintenance of static territorial integrity' (Donaldson and Wood 2004:385) and 'the maintenance of a spatial separation between categories of biological things' (Donaldson 2008, forthcoming) in two ways. Firstly, my empirical research questions the concept of biosecurity-territorialisations as 'static,' by showing the ways biosecurity related boundaries in New Zealand are mobile and flexible. This is achieved by paying attention to the temporalities of biosecurity practice. Secondly, and related to the first, I have reflected greater complexity in the spatialities of biosecurity-related control. This is aligned with Enticott's (2008, forthcoming) account of biosecurity practices in the management of bovine tuberculosis, in which he argues that biosecurity draws on multiple configurations of space and natural agency.

Contemporary policy responses in New Zealand to different forms of socio-natural indeterminacy can be seen in the inbuilt flexibility of differentiated control responses (chapter four). The changing time-space distributions of pest plants are used to inform specific policy tools that determine the allocation of control responses. The agency of pest plants has therefore had mutually constitutive effects on biosecurity approaches, as their socio-materiality 'animates and articulates' the political and cultural realm of plant biosecurity practice (Clark 2003:169; Hinchliffe 2001). For those plants that have achieved extensive spread throughout New Zealand, a product of entanglements with the environment and human actions (chapter one), this has affected the level of control ascribed by the contemporary governing process. The variation this produces between RPMS control categories leads to a complexity of overlapping physical and conceptual boundaries of differing permeability and mobility. By tracing the effects of different spaces on different weeds subject to different control categories, what can seem to be a sharp polarisation of the New Zealand landscape between 'natural' and 'agricultural' space is fractured.

Flexibility in categorisation processes and boundary marking also occurs through the openness of the decision-making process through the progressive review of RPMSs. The temporal mutability of entities justifies strategy reviews at specified intervals, taking into account the possibility of other values and changing knowledges. Coupled with the ecologically-appropriate spatiality of regional councils, I have argued that this inbuilt flexibility represents an attempt to take seriously the changing, indeterminate time-space geographies of plant invasion. Overall, biosecurity practices in New Zealand were shown to

produce a complexity of semi-permeable boundaries of control that are flexible and sensitive to the shifting *spatio-temporal geographies* of indeterminate entities, and to changing and competing human values. These practices are contingent as they are dealing with uncertainties.

A nuanced treatment of boundaries and categorisation processes, which offers an alternative to Donaldson and Wood's (2004) approach, comes from Mol and Law's (2005) editorial. This provides resources to match the detailed empirical picture that emerged from my attention to the boundaries of biosecurity control (chapter four). Through a series of probing and expansive questions, Mol and Law (2005) unravel key assumptions about the fixity attributed to boundaries in understandings of space and identity. Drawing on biological imagery, it becomes possible to imagine boundaries that are blurred, that move around, that fold (Mol and Law 2005). Mobility remains possible in spite of boundaries, or even because of the imbalances created by boundaries (Law 2006). They show that crossing a boundary does not always imply a change in identity; boundary crossing may be part of identity. But, when shifts do occur, these may be fractured and unstable. Crossing the national boundary into New Zealand, imported plants went from native to introduced, but did not become 'alien,' with negative connotations, until social-ecological values had shifted. This shift may be explained in part by other boundaries crossed: from a national identity defined by Britain to a home-grown identity, or the physical crossing plants made from the garden to the nature reserve. A boundary may not exist until it is 'crossed.' Clark (2003), drawing on the writing of Derrida, highlights that it is 'the encounter with something or someone strange that institutes a border... the border or demarcation of territory cannot pre-exist the arrival of 'strangers' or 'others' or 'aliens'' (Derrida, 1993: 33-5, in Clark 2003:177). Donaldson and Wood's (2004) 'strange materiality' is therefore given an active role in *producing* borders, not just defying them.

Predicting whether the future trajectory of plant biosecurity will be towards more rigid boundary impositions is difficult, due to the high level of complexity of the system. Equally, I do not want to suggest that rigidities are not a feature of biosecurity practice in New Zealand. On the one hand, moves towards earlier points of intervention such as the expansion of the Accord (chapter four), or the persistence of the Environmental Risk Management Authority (ERMA) process for the control of New Organisms (chapter one), is indicative of

an increasing rigidity towards introduced species and a heightened evaluation of risk. Donaldson (2008:8, forthcoming), in the context of FMD contingency planning in the UK, argues that confining biosecurity to a risk politics acts 'anti-politically', preventing debate and dissent through its self-driving logic of extending control. For the ERMA process, however, this is a debate over greater sensitivity to what is, and what will never be risky to import. Debate both within the biosecurity establishment, and more vocally from the nursery and agricultural industries, concerns criticism towards the process for failing to differentiate sufficiently between risky and safe organisms. It is an *insufficient* risk assessment. This is seen to be crippling the development of new agricultural and horticultural products. As this debate is unlikely to subside, I would expect a review of this process within the near future. This thesis has shown that these regulatory interventions are set within a process that is hesitant, fractured, and responsive to change. The potential for rigidity is even more significantly undermined by the agency of species themselves. This thesis therefore provides a challenge to the assumed practice of biosecurity as a totalising, rigid governance framework

Biosecurity is not just about maintaining boundaries either physically or imaginatively. It is also about generating connections and associations, enabling participation, and incorporating diverse socio-ecological influences. Hinchliffe and Bingham (2008:4, forthcoming, referring to Dillon and Lobo-Guerrero 2007) argue that biosecurity is about 'differentiating, valuing, promoting and regulating circulations as well as demarcating territories.' Buller (2008:3, forthcoming) also argues that biosecurity, in the context of bovine tuberculosis, has moved 'away from the traditional mechanisms of spatial distanciation and exclusion, to a new... rhetoric and dispositive of association, relation and integration.' Viewing categorisation and boundary-making processes, 'technologies of power', through the lens of New Zealand's biosecurity regime has also allowed me to highlight greater complexity in the interaction between political practices and the time-space geographies of indeterminate entities. In the following section I pay attention to the connected representation of 'experts' within emerging biosecurity literatures, and contrast this with the picture I have built over the course of this thesis.

Experts and Experiential Knowledges

The explicit and implicit understandings of expert knowledge practices within the biosecurity and cognate literature focuses on the ways different forms of uncertainty and indeterminacy are seen to figure in decision-making processes. The pest plants as objects of biosecurity governance were shown in chapter one to not only be 'social nature,' a singular nature around which there are multiple perceptions, but a 'sociable nature,' of material plurality and relationality (Hinchliffe 2001, Wynne 1992). Hinchliffe (2001) argues that the insights of related academic work on these sociable socio-natures are not taken seriously within biosecurity-related policy and crisis responses. Instead, inherent indeterminacy becomes fixed as a 'best possible representation' of a natural entity. Hinchliffe and Bingham (2008:29, forthcoming) argue that the current design of biosecurity surveillance retains a 'logic of control and instrumentalism' which 'underestimates the nonhuman and thereby fails to adjust to the indeterminate characteristics of networks.' The assumption of a pre-existing, passive, singular natural world, accessible through the development of better representations, is seen to seriously undermine the possibility of reducing bio-insecurities through governance frameworks.

Socio-natural indeterminacies are also seen as sidelined through attempts to form political consensus. While the consensual approach of deliberative models or interest group pluralism has almost become the expected norm in environmental decision-making, Hinchliffe (2001:183) argues that this 'consensus' is formed through specific inclusions and exclusions. This leads to a particular geography of knowledge that informs policy-making processes. This exclusive geography privileges expert knowledges. Enticott (2008, forthcoming) produces a familiar story of the conflict between scientific (biosecurity) knowledges and practical knowledges in debates over bovine tuberculosis in England and Wales. Nerlich and Wright (2006), in the narratives of farmers affected by the UK 2001 FMD crisis, also reproduce an opposition between supposed experts and 'non-experts.' However, they connect biosecurity to 'common sense' understandings *outside* of scientific knowledges. Drawing on Wynne (1996), they argue that government scientists were seen to be unwilling to work with local expertise. Biosecurity practices were appropriated by farmers as resistance against authorities whose perceived inaction was ridiculed.

This analysis suggests that governance approaches naively assume that biosecurity control will be straightforward and predictable. This reduced sensitivity, flexibility and complexity of expert knowledges stands in stark contrast to the depictions of the entities themselves. This conflicting picture of indeterminate materialities and deterministic political approaches is used to explain the 'failures' of biosecurity decision-making, told through the monstrous stories of Bovine Spongiform Encephalopathy (BSE) and Foot and Mouth Disease (FMD) (Donaldson and Wood 2004; Hinchliffe 2001; Nerlich and Wright 2006; Law 2006). As Hinchliffe and Bingham (2008:32, forthcoming) argue, however, these approaches 'too often unintentionally promote the powerful and lead one to imagine there is nothing left to be done.' This thesis has in contrast attempted to bring into question biosecurity as a fully authoritative mode of governance, by showing how it does, tentatively, work. This has been achieved through a number of approaches this thesis has adopted in researching biosecurity knowledges.

Firstly, this emerging academic picture of biosecurity has been destabilised through the provision of a *historical context* to this thesis. The historical development of biosecurity-related responses to pest plants, traced in chapter one, described shifting public and institutional knowledges, values and practices towards particular plants. Biosecurity emerged as a historically and geographically contingent practice, which manifests in different ways in different times and in different places. This historical picture also showed that the impulse to control for a variety of shifting justifications through biosecurity measures is caught up in indeterminate ways with the socio-materiality of the governing context, where these biosecurity responses are also generative of change. The changing relationship of particular plants to the regime revealed the flexibility of institutional values. For example, gorse can be understood to act as a nursery plant, kiwifruit, a symbol of national identity and a key trade export is increasingly being recognised as a weed, and other iconic non-native plants have become subject to biosecurity restrictions, including banana passionfruit, arum lily, and agapanthus. This temporal flexibility contradicts a picture of expert knowledges imposing a grid of standardisation on a complex messy world.

Secondly, the emphasis on *experiential expertise and practice* undermines the conception that expert knowledges are divorced from the instability of their governing context. This draws a parallel between expert and public 'ways of knowing'. While Scott (1998) centres 'métis' or practical knowledge as a panacea to state projects, this thesis has shown that due to

the recognised difficulties of 'knowing' pest plants, practical knowledge and practical judgements are treated as a valuable way to devise political responses. Due to the continuously evolving nature of practical understandings attained through direct engagements, decision-making rationalities are flexible.

Braun (2007) highlights the difficulties of undertaking biosecurity in practice, particularly how to bring the 'unspecified future' into the realm of political calculation. These difficulties were considered in detail in chapter four, and the utilisation of expert experiential knowledge feeding into risk assessments was revealed to be one response. The use of garden shows to gather information on weed prevalence and spread through face-to-face interactions with gardeners, discussed in chapter five, was another. While expert practical knowledges are validated through their associations to centres of authority and through trust, this thesis has shown that public practice and practical knowledge is increasingly significant for both the active control of weeds and as an educative tool (see chapter five). Further, chapter six revealed that practical knowledges and engagements were a crucial way in which biosecurity ideals were understood in the domestic garden and wider landscape, questioning expert knowledges in certain circumstances. This emphasis on practical knowledge therefore undermines a simple state/non-state binary.

Biosecurity literatures are frequently focused on highlighting failures and offering diagnosis. Hinchliffe and Bingham (2008:2, forthcoming), argue that attention to biosecurity failures allows social scientists to productively intervene in the making of current biosecurity practices. In contrast, this thesis has paid attention to biosecurity success. I have argued that this success is achieved by building biosecurity practice around 'the constant registration of 'failure'' (Rose and Miller 1992:191), the *expectation* of failure, and the means to adapt practices after each failure through a progression of sites of intervention. In responding to the dynamism and looseness of the networks of invasive entities, Hinchliffe and Bingham (2008:2, forthcoming) argue that 'the need for control is also the need for an absence of control,' what they term the 'paradox of control.' I have shown in chapter four that this managed absence of control forms part of the biosecurity regime's response to the indeterminacy of biosecurity objects. The handover of pest portfolios when eradication is not possible is an inbuilt process for 'failures' to become 'mundane.' Enticott regards this as a definitional aspect of biosecurity, describing biosecurity as 'a strategic compromise' (2008:21, forthcoming). Biosecurity attempts are pragmatically seen by those enacting them

to be imperfect – 'we're propping up the leaning tower of Pisa' (Carolyn Lewis, Pest Plant Officer for Waikato Regional Council and National Weedbuster Coordinator, interview 2005), but these imperfect attempts are justified by the social benefits and ethical necessity of making an effort. This is an institutional recognition that 'a steady state of biosecurity... can never be reached' (Hinchliffe and Bingham 2008:31, forthcoming).

Biosecurity personnel have emerged within this thesis as intelligent, self-aware and reflexive, but operating within the inevitable strictures of a regime with a purpose to govern in the face of difficulties and imperfections. The passion of the actors and richness of engagements, of governance and of gardening, contrasts with a static, tightly controlled, 'empty' representation of biosecurity which is presented in opposition to the material richness of 'natural' processes and engagements. As this thesis has demonstrated, biosecurity itself is a rich engagement, a proliferation, a generating of complexity. This is corroborated by Hinchliffe and Bingham, who argue that 'securing involved a rich variety of processes, materials, people, places' (2008:19, forthcoming). In the following section I pay attention to the role of publics within this rich variety of processes, by contrasting my account of biosecurity as a citizenship concern with Braun's (2007) representation of biosecurity as sovereignty.

Citizenships and Sovereignties

Donaldson (2008, forthcoming) argues for a move from social science accounts that ask 'what is' biosecurity to 'what else is with' biosecurity. This pays attention to the relations which help produce biosecurity. In this thesis, I have shown that amongst other practices, gardening has come to be *with* biosecurity. This has created significant effects, including the centring of public practices, and a requirement for an engagement of the biosecurity regime with gardening publics (chapter five). In contrast, there is little discussion in biosecurity-related literatures of the inclusion of public values within the decision-making process. This omission constructs biosecurity as an expert practice imposed in a top-down manner on publics with differing values that remain unaccounted for (for an example of an exclusively expert-focused methodology, see Collier, Lakoff and Rabinow 2004). These publics become the victims of governance strategies that hurt them 'economically, socially, personally, spiritually' (Law 2006:235), or that fail and expose them to disease (Hinchliffe 2001), or that

treat them as agents of transmission (Donaldson and Wood 2004). Donaldson and Wood (2004) advocate a top-down surveillant effort in their review of the UK's FMD crisis. I would question whether control geographies are only successful when coupled with a top-down decision-making and implementation processes. Drawing on citizenship-based approaches described in chapter two has allowed me to challenge both this passive positioning of publics, and the assumed opposition between citizens and state in matters of biosecurity.

In chapter four, I considered the consultation process for RPMSs, which although partial, creates the possibility for other values to affect biosecurity decision-making. The inclusion of a 'community-led' category within RPMSs is a tangible way for these to be put into practice, and side-steps the need for consensus. The association between governance practices and the social context of public opinion and attitudes was shown to be crucial. This was discussed within the trajectory of the development of the Accord. This revealed that while legislation can operate as a social driver or norm setter, it can equally be out of sync with social values and preferences and therefore 'fail'. This prompted the biosecurity regime's change in tactic from voluntary to mandatory approaches, driven by public and stakeholder preferences.

There are further key ways in which publics influence and interact in unexpected ways with biosecurity practice. The regulation of enforcement practices, and an emphasis on courtesy shifted the 'authoritative' construction of biosecurity (chapter five). The active participation of publics in weed control activities issues challenges the assumed negative effects of biosecurity on publics, through both expert and lay considerations of the social value of participation. Personal forms of biosecuring can disrupt institutional biosecurity agendas when used to justify retaining pest plants (chapter six). Nerlich and Wright (2006) also discuss the negative biosecurity consequences of personal biosecuring strategies adopted by farmers during the 2001 FMD crisis in the UK. In chapter five we encountered the ways some publics utilised biosecurity for their own ends, for example in neighbourly disputes. Buller (2008, forthcoming) provides a further example, as the agrarian anti-wolf lobby in France mobilised biosecurity in an attempt to label wolves as an invasive or alien species.

Drawing on ecological citizenship, I considered whether the *experience* of ecological biosecurity was as a 'top-down' imposition of alien values. The construction of experts and

authorities as sometimes antagonistic to public concerns for particular species and spaces arose from many of the voices relayed in chapter six. Biosecurity concerns were constructed as a national form of ecological citizenship within institutional *and* public discourses. This form of citizenship, mediated through embodied interactions within the private garden and wider landscape, highlighted the impact of personal forms of ecological identity in the gardening publics' response to biosecurity.

I would like to consider this account of biosecurity, citizenship and public participation in the light of Braun's (2007) approach to global biosecurity and concerns over bird flu in the re-ordering of relationships between humans and animals in the global south. In what is likely to become a central account of biosecurity, Braun (2007) draws on approaches to biopolitics, governmentality and sovereignty in a response to Rose's (2001) thesis of biological citizenship. Braun criticises Rose for his complete erasure of sovereign power in his understanding of the relation between biological and political existence. In contrast, Braun argues that 'biosecurity' mobilises forms of sovereign power 'by which life is ever more tightly integrated with law' (Braun 2007:14). This assessment is aligned with Donaldson's (2008, forthcoming) account, built around the influence of the 2001 FMD crisis. Donaldson argues that biosecurity has been confined to a risk politics that acts 'anti-politically.'

Braun (2007) understands biosecurity to be operating through particular temporal and spatial registers. This is crucial in the association of biosecurity with sovereign power. Biosecurity is seen to take the unpredictability of molecular life as its justification. This unpredictability is used to justify 'future innovative' acts (Braun 2007:15). Moving beyond Hinchliffe's (2001) arguments that expert knowledges do not fully recognise indeterminacy, Braun looks at the *effects* of indeterminacy as the basis of political rationality. He particularly pays attention to the temporal 'affect' of biosecurity as fear and dread, arguing that state action is rationalised through appeal to immanent danger. This aligns with Nerlich and Wright's (2006:449) assessment of the anxiety, fear, worry, anger and rage that UK farmers underwent as they waited for FMD to arrive on their farm.

Braun (2007) argues that biosecurity concerns produce spatialised responses, with Western nations acting extraterritorially in order to achieve security at home. Biosecurity is characterised by Braun as a 'geopolitical exercise concerned with the sanctity of borders,

dangerous migrations and foreign risks' in which the geography of security is moved 'over there' before it 'reaches here' (Braun 2007:22). In a paper presented at the Association of American Geographers Annual General Meeting in 2006, Braun provocatively asked 'how can we think about the mutability of life without the answer being security?'

There are two ways Braun's account is useful to consider in relation to a positioning of this thesis. Firstly, he produces a very different type of biosecurity story. Braun (2007) is looking specifically at the global biopolitics of biosecurity, animal diseases, surveillance and intervention in the global south. Braun argues for a move away from the universals of contemporary biopolitical accounts. However, he risks making his conception of biosecurity universal, by representing it as 'the' biosecurity, and burying a reference to other types in the endnotes. Braun typecasts biosecurity as 'imminent catastrophe.'

This thesis has presented different stories about biosecurity. Rather than Braun's (2007:17) 'radically open' and 'inherently mutable world' being something that generates fear and dread, positive associations occur as gardeners, biosecurity personnel and conservationists muddle through this radically open world. In one example, gardeners responded to the perceived difficulties of growing imported plants under particular biophysical conditions, by adopting new combinations of plants associated with newly forming ecological identities (chapter six). Braun characterises 'security' as the only political response to this open and mutable world. The practices I have described as 'security' are constituted by engagement and interaction. Publics participate in community weed removal programmes, Pest Plant Officers don 'woody weed' outfits at local garden shows, and gardeners negotiate between 'head and heart' responses to banded plants. The body is therefore 'immersed in the world' in very different ways through these types of biosecurity concerns. These 'immersions' are also subject to biosecurity control. Paying attention to them gives us a story not about fear and terror but about the making and unmaking ecological connections. Braun's (2007) 'dynamic world,' in the context of gardening and conservation practices, is a source of excitement and passion. Overall, this debate highlights different stories which emerge from combinations of particular biological materialities and co-constitutive political rationalities. This was explored by readapting Dobson's (2003) concept of ecological citizenship, to account for the production and understanding of biopolitical problematisations through material engagements.

Secondly, Braun rejects concepts of governmentality as a basis to understand biosecurity, by criticising Rose's (2001) emphasis on governmentality and self-management. In Rose's account, citizens take individual ethical responsibility over their body, but this is no longer defined in regards to the national body. Braun (2007) questions the possibilities of individual choice within body politics, as many are excluded from decision-making processes, and those included can be compelled to make particular choices.

I have also questioned the balance of individual choice within biosecurity practices. This was framed as a tension between the different subject positions offered by governmentality and citizenship frameworks. While citizenship can be seen as a process of the 'making up' of subjects by the state, it also offers an alternative account of *active* participation in identity formation. Ecological biosecurity in New Zealand is framed through a representation of national (native) ecological citizenship (chapter five). However, this is negotiated with individual ecological identities, making space for the active citizen within biosecurity politics.

Nerlich and Wright (2006) offer a different way of considering this debate. During the 2001 FMD crisis in the UK, farmers experienced isolation, disempowerment and individually directed blame. In contrast, the association of biosecurity with national ecological citizenship in New Zealand is an exercise in public empowerment. Rather than national citizenship formulations restricting subject positions, there may be benefits in constructing biosecurity as a national rather than an individual issue.

Hinchliffe and Bingham (2008:12, forthcoming) argue that the relationship between sovereignty and other modalities of power is a key issue in contemporary analyses of biosecurity. They highlight that for Foucault, and the 'most obviously faithful of his heirs' including Rose, Rabinow and Dillon, sovereignty and governmentality can be coexisting, correlating, but irreducible political modalities. Hinchliffe and Bingham (2008, forthcoming) consider this debate in a review of political responses to bird flu outbreaks in Egypt. They argue that this could be seen as an example of Braun's conception of biosecurity where 'life is ever more closely integrated with the law.' However, they show that 'securing' is 'involved with many *other* practices, in a variety of locations and with a variety of effects' (Hinchliffe and Bingham 2008:28, forthcoming, emphasis added). They highlight that understandings of these different modalities of power should be attained through attention to

practices, as the 'biopolitics of biosecurity is a deeply empirical affair' (Hinchliffe and Bingham 2008, forthcoming, 15).

I now want to consider my response to Braun's (2006) question: 'how can we think about the mutability of life without the answer being security? Collier, Lakoff and Rabinow's (2004:5) argue for a move away from questions such as 'why – culturally – has security in general become such a pre-eminent concern?' to asking 'how is it that experts bring threat and security into a framework of technical intervention?' This suggests that Braun's question would be better reframed as:

> How do we know how much security to seek? ... And what is the process through which, socially and politically, answers to such questions can be found? (Collier, Lakoff and Rabinow 2004:7).

This thesis has centred these types of questions, and in doing so has revealed an answer to Braun. Responses to the mutability of life, while framed as security, can in themselves be rich and generative.

'Biosecurity' and the associated academic analyses reviewed above can be classified and differentiated in a number of ways: according to the threat (plant, plant pest, animal) or the threatened (agriculture, ecology, human health), the site of intervention (international, border, post-border), the level of concern adopted by the country, or according to the contingencies of the country (island state, continental, settler society). This thesis has cut a particular story through these different sites, objects, threats and contingencies, by focusing on ecological concerns over invasive plants. I have foreground historical contingencies to keep the differing and shifting nature of biosecurity practices at the forefront of the reader's mind. For example, I have shown how ecological concerns over the impact of invasive plants on native landscapes have historically overlapped and drawn on agriculturally-based concerns and practices.

In terms of the commonalities of these different biosecurity approaches, they are unified through their concern over 'vital processes': the management and control of the movement and exchange of living matters (Hinchliffe and Bingham 2008, forthcoming). This has specific effects on the politics involved in responding to mutable and associative biological agencies. Do these commonalities hold together more than the differences pull biosecurity

apart? As Hinchliffe and Bingham (2008:17 forthcoming) state, 'biosecurity...is...a materially and socially heterogeneous activity which may or may not hold together.' This may question the usefulness of the term 'biosecurity' as an academic tool to describe varying approaches. Further descriptive categories such as the term 'ecological biosecurity' utilised in this thesis may be required. I would argue, however, that biosecurity is held together by empirically derived overlapping institutions, practices, and policies, as well as by its discursive references. The gradual development of an integrated system approach to managing biosecurity in New Zealand is suggestive of a concern of practitioners to keep a sense of these practices unified, despite the ways in which they are complex, heterogeneous and differentiated.

7.4 Implications for New Zealand Biosecurity Regime

I will turn now to the question of whether the distinct approach of this thesis and the critique it poses to existing and emerging social science biosecurity literatures is restricted by the heterogeneous nature of biosecurity. What I have produced is undoubtedly a contingent account as it must be if, as I claim, I paid detailed attention to the context dependent embodied practice of biosecurity. Within New Zealand however, the structuring context of institutional biosecurity practices outlined in chapters one and four applies across any differences between threats and threatened. However, different biological threats mobilise public and political responses within this structuring complex in different ways. In terms of possum control, for example, while there is widespread public support and a recognised need to control possums, the hunting lobby and the very small animal rights lobby are unlikely partners in contesting the use of poison. The act of killing a possum or of wearing possum fur hats and gloves is seen as an 'act of good citizenship' and drawn into a national citizenship discourse. For the highly controversial eradication campaign against the Painted Apple Moth, in which large residential areas of Auckland were blanket sprayed with pesticides, there was public outcry against the perceived lack of consultation. In the context of New Zealand, the overall arguments employed in this thesis, of the significance of biophysical material context in the production and understanding of biosecurity politics, of greater complexity in the interaction between biosecurity politics and the time-space geographies of indeterminate entities, and of the relevance of citizenship formulations in understanding state-public

interfaces, therefore remain. In the context of biosecurity practices outside New Zealand, I would argue that the nexus between biopolitical governmentality, environmentality and ecological citizenship provides the resources to support the penetration of academic analysis into different sites of biosecurity practice. This approach links consideration of knowledge/power configurations and the geography of governance, with attention to the role of non-state actors and the contingencies of material contexts.

New Zealand's biosecurity regime represents an extensive, complex response to contemporary concerns over biological immigration, which has developed over a hundred and fifty years of biophysical and political interaction. It is a difficult task, therefore, to offer recommendations based on four years engagement. What I do have to suggest is based on retaining and extending the regime's existing differentiated response to biosecurity concerns.

Firstly, while there is a codified approach to differentiating control responses to plants, there is perhaps a lack of distinction in the way the regime engages with publics. The specific enthusiastic gardening public I researched was an expert group who desired greater information and explanation for policies, such as the National Pest Plant Accord's blanket ban on particular plants. This is not to suggest that with the provision of information these publics would adopt the required behavioural changes. That was shown to be mediated through a complex interaction of embodied ecological identities and practical expert engagements with biophysical agencies, in the context of biosecurity problematisations. However, I encountered a strong desire for this level of explanation. This must be based on recognition that this is an expert group with the capacity, interest and comparable concern to engage with this type of detail. Treating enthusiastic gardeners as experts could also be beneficial for biosecurity surveillance. As Franklin (2002:144) argues, the gardener is above all else 'watching for change'. While the garden show is utilised by biosecurity practitioners as an opportunity to gather information on both weeds and public values, this is not visible to gardeners. Drawing explicitly on gardeners' knowledge and close attention to natural change, perhaps by asking gardening groups to collate their members' sightings or experiences of newly emerging weeds in the garden, would more successfully enrol gardeners as experts. The success of this approach is suggested in the popularity of schemes such as Springwatch in the UK.

Secondly, an important practice that emerged from my interviews was the exchange of plants or cuttings with friends and family members. I have explored plant exchange as a cultural expression of friendship, intimacy and shared values, as an embodied action, and as a material process that contains a distinct physicality (Degen *et al.* forthcoming). This enlarged understanding of plant exchange is of profound relevance for the biosecurity regime as a practice with the potential to both produce and disseminate environmental weeds. Due to the difficulties perceived by gardeners in propagating native plants, I would suggest training on the propagation of native plants be added to those educative approaches which actively attempt to substitute native plants within existing gardening practices.

Thirdly, and more significantly, I would caution against any attempts to move biosecurity intervention to earlier stages of weed production. A 'natural' next step for the regime that was mooted quietly in different ways during this research process was the production and promotion of sterile plants within the gardening trade. As plants that could not naturally reproduce or easily be propagated, this would fully prevent any chance of them becoming weedy. However, this thesis has shown the significance of interactions with plants' reproductive tendencies both as a cultural expression of friendship and memorialised identity, and as the context through which environmental learning occurs. Removing this interactive possibility would restrict what gardening can be, and erode socio-natural associations through which care for any nature is produced. An indifferent public would not benefit the biosecurity regime.

7.5 Implications for Wider Literatures: Global and Mobile Natures

I began this thesis with a set of interests that revolved around the ways socio-natural associations and the governance of natures is affected by both human and non-human mobility and change. The cultural geography literature formed one starting point for this research, particularly the ways some of the tenets of this literature have been applied to debates over nativist conservation. This was driven by what I perceived to be an assortment of unexamined assumptions emanating from a debate over the use of native/alien classifications in conservation practice, projected by cultural geography assumptions. In the following I will reflect on the contributions of this thesis to this debate. My key concerns

were a lack of detailed empirical research with many contributions framed in the abstract, and the basis of the debate in the contingencies of the western hemisphere, particularly Britain and North America. I believe that my key contributions come through my considerations of national and individual ecological citizenship formations, and through my attention to the pragmatic and differentiated way the biosecurity regime organises control responses to invasive plants.

Nature/Culture Dualisms: Native Purism in Expert Practices

Nativism forms a highly contested scientific terrain, receiving critique and debate from a wide variety of stakeholders and academics, including restoration ecologists, environmental historians, representatives of ethnic groups, cultural geographers, urban ecologists and anthropologists amongst others (see for example Kendle and Rose 2000; Green 2002; Harper 2002; Hettinger 2001; Peretti 1998; Simberloff, 2003; Smout 2003; Warren 2007). These discussions cover issues of appropriate language and definition, the suitability of classification criteria, the underpinning science, the pragmatic justifications for nativist policies, the ecological consequences, as well as the ideological assumptions and cultural motivations. Contributions to this debate therefore range from the more pragmatic, to the 'post-structuralist re-assessment of the philosophical bias of Western societies' (Kendle and Rose 2000:22).

The native/alien conflict sits squarely within debates in cultural geography about the definition of what is 'natural', and the separation of humans and nature through this definition (Cronon 1995). The introduction of 'alien' species is synonymous with anthropogenic disturbance or human migration – points at which 'nature' became contaminated by 'culture' (Peretti 1998; Crosby 1986). Kendle and Rose take apart such anthropogenic-based markers, to reveal these moments as points when humans 'ceased to be in any ordinary sense a part of nature' in discursive constructions, becoming instead unnatural or post-natural, due to technological development (Webb 1985, in Kendle and Rose 2000). The definition of native is therefore seen to hinge on the idea that human agency is always opposed to nature, that nature and the human are defined by the exclusion of the other (Kendle and Rose 2000), and that what is natural and uninfluenced by humans is especially valuable (Smout 2003). The argument is that this bi-polar distinction becomes equated to

'native good, aliens bad,' leading to all alien species being 'tarred with the same brush', and difficulties in targeting management attention to those species that do present environmental problems.

These arguments prompted my attention to the contingencies of New Zealand's environmental management situation. Geographical isolation has produced an environment which is fragile to invasion and change. Two waves of human settlement and the increasing integration of New Zealand into ecological associations with the rest of the world through transportation technologies has removed this isolation. Clark (2002), in his comparison of biological invasion to free-burning, hints that the prevention of species mixing produces more fragile, less secure environments. In New Zealand, this is not the place that we might end up, however, but the place where we started. The tolerance of biological invasions would, it could be expected, produce an environment more resilient to change. But at what cost? The biota is already highly endemic, unique and fragile, and this underpins contemporary ecological biosecurity concerns (see chapter one). This allows for clarity of distinction between 'native' and 'introduced' species based on human contact, in contrast to the UK and its connection to a history of human settlement which complicates the distinction between native and alien.[1]

What this thesis has shown to be significant is the process by which introduced species are assessed as either benign or environmentally damaging, and assigned to a hierarchy of control responses. This fractures the assumption that environmental management approaches are driven by simplistic purist criteria or a naivety surrounding introduced species. This connects to what I have described as a pragmatism that is needed to differentiate between those which are agriculturally and economically valuable species, the foundation of the New Zealand economy and initial driver of concern towards pests, and what are dynamically classified as problem species.

Communicating this pragmatism was a key aspect and perceived benefit of face-to-face communication between biosecurity personnel and the gardening public. This effort is, I would argue, undermined by the use of emotive language drawing on anti-immigration,

[1] There have been re-evaluations of certain flora and fauna from 'introduced' to 'native' in New Zealand, and debates over the 'natural' arrival of certain species without human intervention, after human settlement.

terrorism or war-associations, as discussed in chapter five. I have revealed that increased caution towards such emotive language is emanating from within the biosecurity regime itself. This speaks to the many contributions to the native/alien debate that are focused on the popular context of native/alien terms and their social implications. Wong (2005), for example, highlights the negative connotations of utilising native-national plant associations in conservation and other discourses, particularly the exclusionary message that 'native good, aliens bad' has for ethnic minorities. In the context of a settler society this is complicated. Chapter one discussed the influence of Maori values on dominant environmental values as a factor prompting a rise in concern for ecological biosecurity. The necessity to consult Iwi was shown to be a factor of the ERMA assessment process for new organisms. However, Clark (2003) suggests that indigenous values can often be more open to environmental change than post-colonial European values. Further research is needed to consider these interplays and understand the ways in which non-European groups interpret or influence biosecurity ideals.[2] Historical attention to changes in association between values attached to native and introduced species in New Zealand (see chapters one and six), reveals that the association between 'native good, alien bad' is historically and geographically contingent. What becomes more important, therefore, are the consequences of enacting these associations, and this thesis has paid attention to this through in-depth research into everyday public values and practices. The intense human input required in order to achieve 'natural' areas is seen to have positive social ramifications, and participation in protecting native biota has become tied up with concepts of national ecological citizenship. This could be seen as an attempt to positively re-categorise the settler society as 'natural' through involvement with the native biota, or a 'socio-ecological de-colonisation.' Buller (2008:11, forthcoming) in analysing the return of wolves to the French Alps, describes the human achievement in creating 'natural' areas as 'the corporeal expression of an ethical commitment to naturality and a celebration of the fact that here, at least, is an environment that can be won back.' In the following section I go on to consider the suggestion that nativist conservation and ecological biosecurity concerns are associated with an unproblematic national space, before considering in greater detail the connections between particular plants, peoples and places enacted and contested through ecological biosecurity concerns.

[2] I undertook an interview with a representative from the Chinese Conservancy Trust, and visited a Maori Pa involved in ecological restoration during the fieldwork for this thesis. However, consideration of non-European settler voices has not formed a large part of this thesis.

The Geography of National Boundaries: National/Regional Territorialisms

A crucial critique of nativist policies is that geographical considerations are taken to distinguish alien from native species, and political or geographic boundaries rather than ecological zones are more frequently used in this distinction (Kendle and Rose 2000). Attention to the scales of governance and identity formation, the geography of biosecurity, has been a crucial focus of this thesis. This has undermined any simplistic association between nativist concerns, biosecurity governance, and the unproblematic national scale.

Agrawal's (2005a) environmentality thesis was utilised to draw attention to questions surrounding the geography of governance. The balance and interplay of national governance and standardisation and regional differentiation was explored in chapter four through a discussion of Regional Pest Management Strategies (RPMS) and the National Pest Plant Accord (the Accord). This balance is negotiated according to the tempo-spatiality of individual pest plants and understandings of human capacities to instigate change. The justifications for the Accord were shown to be predominantly political, but also referred to the ecological and climatic regionality of New Zealand. In addition, the regionality of governance was shown to have ecological relevance. Regional differences in legislative responses and in the significance afforded to biosecurity, as well as different experiences of invasive plants, produces different cultures of practice within regional councils. For example, Auckland Regional Council is frequently seen as a major policy-driver, but also a major producer of weeds. It is crucial to note that regional and national actors overlap in the context of New Zealand.

The geography of biosecurity is interesting to consider in tension with Dobson's (2003) explicit challenge to the spatiality of traditional citizenships. The causes and consequences 'map' of environmental sustainability utilised by Dobson is distinctly non-territorial. Biosecurity concerns have, however, been shown to provide an interesting interplay in this debate. While invasive species as 'life out of bounds' (Bright 1999) could be argued to be non-territorial and 'constitutively international in the sense that they do not, cannot, and will never respect national borders' (Dobson 2003:2), and while responses are also enshrined in global legislation, the problem is only made sense of *because of* those national (regional, ecological or geographical) borders. In New Zealand, while the national border is crucial in

distinguishing the categories of native from introduced within which invasive species often, though not without tension, make sense, the category 'native' is itself broken down geographically through concerns over eco-sourcing and local indigenity.

Geographically defined citizenship identity is central to the promotion of ecological biosecurity, as the act of controlling or responding to invasive species is portrayed to the individual as a national act, Guthrie-Smith's (1921 [1999]) 'good citizen' in a different era. However, chapter six discussed the profound localised experience of invasive plants, which led some to question expert knowledges and the need for national policies such as the Accord. In the context of ecological biosecurity therefore, there is only in some respects a re-centring of the nation-state as the container of ecological citizenship identity for both humans and non-humans alike (Bell 2005). Enticott (2008:9, forthcoming) argues that these multiple spatialities are a founding feature of biosecurity, that 'spatial and natural multiplicity holds discourses of biosecurity together.' He argues:

> If we are to understand how biosecurity works and creates new spatial configurations, it becomes important therefore to look for these elements of negotiation, determine their importance and assess the balance between negotiation/prescription within the spaces of biosecurity (Enticott 2008:11, forthcoming).

Attention to New Zealand's biosecurity regime through the lens of these conceptual approaches has highlighted the fractured spatiality of governance practices and provided a profound challenge to the association of nativist policies and biosecurity practices to the uncomplicated national scale. This supports the necessity of attention beyond the national border and the scale of the nation state in the consideration of biosecurity.

People-Plant-Place Attachments

Within academia, attention has been focused on public associations to everyday natures principally through the work of urban ecology and hybrid geography approaches (see for example Whatmore and Hinchliffe 2003). This academic arena has drawn attention concurrently to the 'other nature' of urban areas, and the 'other (lay) knowledges' and values that intersect with this nature. Urban ecology developed as an academic field in creative tension with both traditional approaches to urbanisation, which was seen to overlook the

nature of cities, and with ecology that discounted this nature, classifying it as unnatural, weedy, alien. In contrast, urban ecology celebrates this mundane, ordinary, and often exotic/alien nature, seeing it as 'vital-ly' contributing to the liveability of cities, and providing crucial everyday interactions with nature for urban inhabitants (Degen *et al.* forthcoming; Hinchliffe *et al.* 2005; Hinchliffe and Whatmore, 2006). These approaches and this politics draw attention to everyday interactions with nature, in which knowledges and values are forged through lived personal experiences, including embodied interactions with nature. The skills and familiarities that constitute these vernacular ecological knowledges are often seen to contradict the attribution of value accorded to native species by expert scientific ecological knowledges (Hinchliffe and Whatmore, 2006).

This thesis considers this idea of a conflict over different attachments to nature from a different perspective – the personal conflict over emotive links with alien plant species in the space of the private garden (chapter six). What this thesis can add to this body of work, through attention to everyday interactions in the context of the politicisation of these spaces and practices, is a very detailed examination of the *dynamic* ways in which memories and identity associations are embodied in 'natures' in the shifting context of wider institutional and public values. Any assumptions of associations between particular natures, peoples and spaces have been avoided, as my methodological approach allowed these attachments to emerge through empirical attention. This also revealed the continuously changing nature of these associations – sometimes aligning, sometimes diverging with expert understandings.

When Whatmore (2002:98) argues that: 'the fabric of associations between plants and people is so densely woven as to render their disentanglement perverse', I would argue that this is both more, and less true than she states. *More*, because this thesis has demonstrated that governance does not always 'interrupt' associations between people and plants, instead making them more complex and densely woven through their politicisation. *Less*, because the fluid and active processes of association can change. This has been considered in the macro-context of a national ecological citizenship identity (see chapter one), and in the micro-context of individual ecological citizenships formed and explored within the domestic garden (see chapter six), as well as the reciprocal influences between these spaces. A 'void' of associations is not part of the New Zealand story, whether it be settlers recoiling from unfamiliar landscapes, to third generation Europeans interpreting their national identity through pre-European landscapes and biotas.

However, this has further implications for the native/alien debate. As chapter six portrayed, the association of identity of *any* peoples to any particular plants or places is a contingency, and this challenges the assumptions of some work on botanical cosmopolitanism. There is a danger of replacing the closure of 'native good, alien bad' with a 'botanical cosmopolitanism good, nativism bad' thesis. Debates over traditional cosmopolitanism have become more sophisticated – with the previously celebrated figure of the cosmopolitan now understood to have specific gendered, racial and economic power effects (see Ho 2006). So too do we need to approach our analyses of botanical cosmopolitanism with subtlety. In chapter six for example, I explored the ways intense experience of very *local* spaces generated connections with more distant places with comparable climates, leading to the material presence of these other places in the garden through their embodiment in plants. At the same time, native plants were associated at once with a distant past and a modern present, and were therefore perceived as more 'cosmopolitan' than 'old-fashioned' non-native plants. Dobson's (2003a) account of ecological citizenship as a form of post-cosmopolitan citizenship provides a conceptual metaphor here. As Dobson (2003a) argues, the intense metabolic interaction between individuals and their everyday environment in the private sphere produces temporal and spatial associations to distant people, places and times. This breaks down any opposition between localism and cosmopolitanism, not through undifferentiated global commonality, but through material associations.

Cosmopolitanism can also be closely associated with understandings of diversity, and this also has a particular place within the cultural geography literature. Scott (1998) emphasises the importance of diversity for both ecological and social reasons. Buller (2008:14, forthcoming) argues that (bio)diversity and (bio)security 'seem almost intrinsically antagonistic.' He suggests that Foucauldian processes of standardisation subjugate natural diversity into the norm: 'natural diversity becomes subjected to normalisation, to governmentality' (2008:14, forthcoming). In terms of biosecurity, however, who owns the 'diversity' argument? Biosecurity itself is justified through a need to protect global biodiversity and unique socio-natural associations from the threat of the 'McDonaldisation of the natural world.'

Academic critics within the native/alien debate frequently draw links between the anti-cosmopolitan attitudes towards people and towards alien species, therefore questioning the underlying social and ideological motivations for nativist policies. A typical contribution in this vein comes from Peretti (1998), who utilises the much-cited historical link between the emergence of purist biological nativism and fascist and apartheid governments. Peretti describes nativism as a 'purist, xenophobic, and racist way of thinking' (1998: 188-189). I would argue that a suspicion of all attempts to govern nature pervades cultural geography literatures, and this has been added to through the celebration of messy urban natures and everyday interactions, which are seen to operate outside of the constrictions of different governance approaches. Peretti's (1998) arguments were a particular source of frustration for me, and drove my interest in paying attention to the practice of biosecurity as well as its discursive representations. It also influenced my adoption of Rose, Miller and Rabinow's (Rabinow and Rose 2003a, 200b; Rose and Miller 1992) liberal approach to Foucauldian theory and biopolitics, and the use of ecological citizenship to counter-balance any tendencies within this approach. In attempting to draw the analysis of biopolitics away from an association with Nazi and eugenic policies, Rabinow and Rose (2003) make the following argument which I feel applies to the associations between nativist conservation and Nazism described above:

> It is to trivialize Auschwitz to apply... Foucault's analysis of biopower to every instance where living beings enter the scope of regulation, control and government. The power to control under the threat of death is exercised by States and their surrogates in multiple instances.... But this is not to say that this form of power ... is the guarantee or underpinning principle of all forms of biopower in contemporary liberal societies.... Surely the essence of critical thought must be its capacity to make distinctions that can facilitate judgement and action (Rabinow and Rose 2003a:9).

There is therefore a need, pursued in the methodological approach to this thesis, to return to empirical context, and particularly the 'lived experiences' of biosecurity through attention to everyday practices, in order to explore the ways in which concepts of difference, diversity, localness and distance are played out. What is clear is that this is a complex association.

7.6 Conclusions: Ecologies of association in the link between Environmentality and Ecological Citizenship

This thesis attempted an ambitious synthesis between governmentality, environmentality and ecological citizenship frameworks to analyse the practice of ecological biosecurity in New Zealand. Governmentality formulations highlight the association between expert knowledges and policy practices, direct attention to governmental practices of classification and categorisation, and provide normalisation and discipline as approaches for the control of populations. These concepts have been taken into the environmental arena by a variety of theorists. These resources were drawn on as I considered the categorisation of pest plants, and the rationalisation of enforcement and educative approaches to the public. National concepts of ecological citizenship were shown to be a 'technology of power' utilised and produced by the biosecurity regime in the attempted normalisation of pro-biosecurity behaviour.

Agrawal (2005a), however, argues that undue weight is placed on 'technologies of power' in the explanation of subjectivity formation for governance objectivities. In contrast, Agrawal (2005a) emphasises 'technologies of the self' within the construction of ecological subjectivity. This manoeuvre proved to be vital to fully incorporate the multifarious ways in which publics participate in generating biosecurity ideals. Ecological subjectivity is produced by individuals in dialogue with biosecurity concerns. This occurs both in the public realm and the private sphere.

Various processes through which this environmental subjectivity is relationally redistributed with the biophysical world were discussed. I drew on Dobson's (2003) account of ecological citizenship to pay attention to the politicisation of corporeal interactions with the environment. This extended Dobson's emphasis on metabolic ecological interactions, by highlighting the significance of *relational subjectivity* produced through gardening. I referred to this as 'ecological subjectivities' or 'ecological identities,' as I believe these identities become 'ecological citizenships' in the context of shifting politicisations. Biosecurity discourses are one such politicisation.

This thesis therefore argues that 'ecological citizenships' are, in the context of biosecurity concerns, formed through a junction between:

- *'technologies of power'* or political rationalities,
- *'technologies of the self'* or processes of self-transformation,
- and *'ecologies of association'*, or relational, contingent and fluid socio-natural associations.

These three elements are negotiated and mutually influential through *practice*.

This highlights that the relationships of significance to understanding biosecurity include not only the relationships between citizens and the state, but also between people and the 'interdependent species' which provoke biosecurity concern. These 'ecologies of association' (Degen *et al.*, forthcoming) are produced within the domestic garden, and through connections between national identity and particular species or landscapes. Returning to the frameworks of environmentality and ecological citizenship to account for these associative ecologies, an unsuitable explanation of non-human nature emerges. From the account in this thesis, it is clear that these 'interdependent species' are far from the inanimate objects which become passive subjects of representation in Agrawal's (2005a) assessment. Scott's (1998) account includes an understanding of natural complexity, but this is incorporated only through the failure of state projects. The role for non-humans in an environmentality framework is as submissive, inert entities, worked upon by human processes: objectified, standardised and controlled. From within ecological citizenship frameworks, non-human nature emerges as a provider of human needs, a repository of values, and a theoretical-ethical difficulty. Both of these approaches therefore render non-human nature essentially passive. In pulling these threads together, I therefore need to (re)turn to contemporary approaches to human-non-human relationality in cultural geography.

Whatmore (2006) highlights four research directions and impulses in cultural geography which give greater attention to the 'livingness' of the world. These include a shift in analytical focus from *discourses to practice*, and the reworking of discourse as a specific type of practice, has close resonances with the approach of this thesis. My attention to non-human agencies in the historical picture of botanical immigration to New Zealand, the generative effects of legislation itself, the educative capacities of plants, and the close personal

associations with plants in the domestic garden and wider landscape, aligns with Whatmore's (2006) attention to the *co-fabrication of socio-material worlds*. Additionally, attention to the *politics of knowledge*, including the attribution of 'expertise' to both biosecurity practitioners and gardeners, and the unexpected agency of plants, is centred as a new concern of materialist cultural geography (Whatmore 2006). Biosecurity could therefore be as emblematic of issues in cultural geography, as it is of wider political concerns.

I have discussed the ways the contradiction of producing 'natural' native areas through human agency is avoided by the positive associations generated by connecting New Zealand society to the 'natural-native.' Just as acclimatisation practices attempted to make New Zealand 'like home', biosecurity could be thought of as a second 'home-making' activity. Head and Muir (2006) associate native gardening with settler anxieties about their own belonging, referring to the 'redemptionist narrative of native purism' (2006:521). The act of protecting indigenous nature renders those involved native. It offers a chance to interact with original New Zealand in a way that should be unavailable – the 'after' mixing into the 'before'. Biosecurity practices in this context do not so much offer a chance to undo damage, to halt change, or to make up for mistakes, but instead produce familiarity. Biosecurity sets up an exchange, through practice, which creates relationships, belonging, a shared time and place: putting down roots, removing the weeds of other memories. I revealed some specific ways gardeners negotiate conflicts between their emotional attachments to plants imbued with personal meanings, subsequently classified as 'pest plants' by the biosecurity regime. This produces a tension between a sense of responsibility forged through material practices (Hinchliffe and Whatmore 2006), and a sense of responsibility to a wider landscape through collective belonging to a national ecological community. The material consequences of these negotiations of belonging can be seen within the domestic garden and wider landscape. Those entities which no longer belong are cut, poisoned, and pulled out or, in the case of the lemonwood in the lilacs, relocated (Head and Muir 2006).

Through the concept of biopolitical governmentality, Foucault distanced himself from the view that such power over life is unambiguously nefarious (Rabinow and Rose 2003a:7). This allows theorists to contemplate the ethical balance in the management of human life as both controlling, enabling and open to the transformative possibilities of contestation. This balance must be extended to our analyses of the governance of non-human life. The celebration of 'wildness' (see Hinchliffe *et. al* 2005) should be held in tension with an

appreciation that the governance of nature is sometimes necessary, and can produce positive effects for both human and non-human participants. As Clark (2003) argues, all social activities potentially contribute to the dissemination of life. Biosecurity approaches in New Zealand form a sophisticated attempt to engage with the complex entanglements between nature/society/space bound up in invasive species. Our academic analyses must be willing to reflect and even learn from these extraordinary everyday engagements.

Figure 7.1: 'A closed gate is no barrier to weeds'. Hamilton Agricultural Show, 2005.

APPENDIX 1: SAMPLE INTERVIEW SCHEDULE

Interview schedule for Suzanne Main, MAF NPPA Co-ordinator

- What existed before NPPA?
- Could you tell me a little about the early history of NPPA?
  Other country examples?/ Different stages of development?
- Why is there a need for NPPA? What is the thinking behind NPPA?
- Who supported its establishment? Who detracted from it?
- Why the NPPA rather than other possible formats?
- Whose values does it reflect?
- Is the committee required to consult? Who petitions to put plants on the list and why?
- How does a plant qualify for inclusion? Is it scientific or risk values that determine inclusion?
- What changes are entailed for the plant once included?
- Who is it aimed at – the gardener or the nursery owners?
- Why does it operate through a ban? Why not a voluntary code? Transition from voluntary to mandatory?
- What are the reactions to a list?
- Why were some plants dropped?
- Key resources – what format did they take? How are they presented? Who uses them? How are they communicated?
- Have there been any problems? Has there been a review? Are there plans for future changes? What future changes do you envisage?
- Who is involved in the reviewing process?
    - How widely do the values of stakeholders differ?
    - Is it just an administrative device or is it a method in itself?
- What is the power/effectiveness of a list?
    - Why is it important that it is legally binding?
    - Might too many lists be confusing?
- Why is this a central rather than a regional issue?
    - Why is this a concern for government? (What are the roles and responsibilities of the centralised state?)
- Have there been compensation claims? What provisions are there for compensation claims?

APPENDIX 2: GARDENERS INTERVIEW SCHEDULE

- **Questions about gardening practices and preferences**
- **Questions about choosing plants**
- **Questions about plant nationalities**
- **Questions about biosecurity and weeds**

Questions about gardening practices:

- How long have you had this garden?
    - Have you had other gardens?
- Why do you garden?
    - What do you enjoy about it?
- How much time do you spend in it?
    - Does anyone else help look after the garden?
- How would you describe your garden, and what sort of gardener are you?
- Is it an easy spot to garden?
    - Could you tell me about some of the limitations or positive aspects of gardening this spot?
    - Do you get to grow the sorts of plants you'd like to here?
- What do you like about your garden?
- Where do you get ideas for your garden?
- Are there particular gardening styles that you like?
    - Do you attempt to reflect this style in your garden?
    - Have you always favoured that style or do your tastes change?
- Has your gardening style or choice of plants changed since you began gardening?
- Do you have particular ideas about what makes a good garden?
- Do you think your gardening style or choice of plants says or reflects something about you?
- What is your ideal garden?
    - What affects you achieving this?

Questions about choosing plants:

- What are your favourite plants or type of plants?
    - What do you like about these plants?
    - Do they have any particular associations for you?
- How do you choose the plants for your garden?
    - What are some of the different ways you choose plants? – magazines, television programmes etc.
- Do you get ideas from garden centres, or choose before you go?
- Where do you buy or get your plants from?
    - Why these sources particularly?
- Do you get the right plant for a particular spot in the garden, or do you find the right spot in your garden for a particular plant?
- Do you tend to remember where you have got particular plants from – and does this change the way you think about the plant?
    - For instance – if it is from a friend ... Could you give me an example?
- Does having a garden in New Zealand affect the types of plants you choose to grow and enjoy? If so in what way?
- Do you visit other people's gardens or show gardens as a way of learning about and choosing plants?
    - Do you grow plants that you have seen and like in other gardens around New Zealand, or around the world?
- Did you ever order or buy seed from abroad?
    - If not, would you like to be able to do this?
- Is gardening a social activity for you?
    - Do you exchange plants with friends?
    - Is that an important aspect of gardening for you?
- I'm interested in the memories that plants can hold for gardeners, as a reason for them growing particular plants. Does that ring true for you?
    - For instance – did your parents use to garden?
- How would you describe your *relationship* with your plants?
    - Does this affect the way you enjoy them?
- Which is the oldest plant in your garden?

- How long on average do plants stay in your garden?
- Do you have more success with certain plants than with others?

Questions about the geography of particular plants in the garden:

- Do you know which countries your plants come from?
    - Does it matter?
    - Is it something you think about?
- Do you grow New Zealand natives?
    - What do you like about New Zealand garden plants?
    - What don't you like about them?
    - Do you like them because they are native or would you like them anyway?
    - Would you grow them if you weren't in or from NZ?
- Which countries other than New Zealand do your plants come from?
- Why do you grow these plants?
    - What do you like about them?
- Do plants from other countries remind you or make you think about those places?
- How would you describe a typical New Zealand garden?
    - Is there one?

Questions about biosecurity:

- What are your experiences of biosecurity requirements in gardens or elsewhere?
- What do you *know* about the biosecurity rules and requirements that affect gardening?
    - What do you think about it?
- What do you think are the aims of plant biosecurity/weed control?
    - What is it protecting?
    - Why do you think these rules have been introduced?
    - Is it important?

- Do you think gardening and garden plants are relevant to biosecurity issues?
    - Why?
- Who do you think benefits and who loses out?
    - Does this matter?
- Do you think the rules and methods are effective?
- Who should decide which plants are banned or controlled?
- What criteria should they use?
- Whose interests are being represented?

- about restrictions on particular plants:

- Are there any plants that you use to grow that you can't or don't grow now due to biosecurity requirements?
    - Does this bother you?
    - Why did you/do you want to grow these particular plants?
- Do you know which plants you cannot grow now?
    - Do you care?
    - Where have you read about which plants you can and cannot grow?
    - Have you seen these plants grown or sold anywhere?
    - Do you like these plants?
    - Do you think it is important that they shouldn't be grown?

- about 'pest plant' photos:

- Have you ever grown any of these plants?
- Do you remember people growing them in the past?
- Do you think they are attractive plants?
- Do you like them?
- Have you seen them growing anywhere?

- about education campaign:

- Have you seen the 'Plant Me Instead' booklet before?
    - What do you think of it?
    - What do you think about the alternative plants suggested?

- Have you heard of, and could you tell me about, any other education campaign about weeds?
    - Who ran it, what did you think about it?
- Have you seen adverts in a newspaper or educational campaign stalls at garden shows?
- Have you heard of or seen 'Weedbuster' events?
    - What did you think?
    - What were they trying to do?
- Have you ever met or been visited by a Plant Pest Officer, or do you know someone who has?
    - Could you tell me about it?
    - What do you think they do?
    - Have you ever had to remove a plant, or chosen to? How did you feel about this?

-about non-natives/weeds in the countryside:

- Do you like New Zealand bush?
    - How would you describe it?
- Have you seen non-native plants or weeds growing in New Zealand?
    - If so where?
    - Does it matter?
    - Do you think garden plants should be kept out of the countryside?
    - Does it make a difference where they grow, for example, in the countryside or in the cities?
- Are there any garden plants that grow in the countryside or in public places that you enjoy?
- How do you think non-native plants have got into the countryside?
    - How do, or could, plants leave your garden?
    - What about garden waste?
- In what other ways might your garden link into the surrounding countryside or environment?

- about the overall idea of plant biosecurity:

- In what other ways have you had to change the way you garden?
- Do these rules affect the way you think about gardening as an activity?
- Is this your family's private space?
    - Do you think people should be able to tell you what plants you can and cannot grow?
- Whose responsibility is it to control plants and weeds?
- What effects might this control have over gardening in the future?
- Have you visited and got an impression of the ways biosecurity requirements affect gardeners in other countries?
    - What do you think makes New Zealand different?
- What difference does a New Zealand context make to the way you choose to garden or think about gardening?
- How does gardening differ in other countries?

- about weeds in the garden:

- Have you had any problems with particular weeds?
- How did they get here?
- How did you deal with them?
- How would you define 'weeds' – native/alien?
- How similar a problem are weeds in the garden and weeds outside the garden?

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